# Draft of the National Energy and Climate Plan of the Republic of Albania

July 2021

REPUBLIKA E SHQIPËRISË
MINISTRIA E INFRASTRUKTURËS DHE ENERGJISË

REPUBLIKA E SHQIPËRISË
MINISTRIA E TURIZMIT DHE MJEDISIT

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Responsible for this document: Ministry of Infrastructure and Energy of Albania

Purpose of this document: Submission to Energy Community for comments, in order to improve the final version of the NECP document

Document version: Draft NECP 19th July 2021

The development of this document was supported by Capacity Development for Climate Policy in the Countries of Southeast, Eastern Europe, Southern Caucasus and Central Asia, Phase III. This project is part of the International Climate Initiative (IKI). The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

# Table of Content


List of abbreviations and acronyms ..... i

1 OVERVIEW AND PROCESS FOR ESTABLISHING THE PLAN ..... 1

1.1 Executive Summary ..... 1

1.1.1 Political, economic, environmental, and social context of the plan ..... 1

1.1.2 Strategy relating to the five dimensions of the Energy Union ..... 2

1.1.3 Overview table with key objectives, policies and measures of the plan ..... 3

1.2 Overview of current policy situation ..... 5

1.2.1 National energy system and policy context of the national plan ..... 5

1.2.2 Current energy and climate policies and measures relating to the five dimensions of the Energy Union ..... 11

1.2.3 Key issues of cross-border relevance ..... 42

1.2.4 Administrative structure of implementing national energy and climate policies ..... 43

1.3 Consultations and involvement of national entities and their outcome ..... 44

1.3.1 Involvement of the national parliament ..... 45

1.3.2 Involvement of local and regional authorities ..... 46

1.3.3 Consultations of stakeholders, including the social partners, and engagement of civil society and the general Public ..... 46

1.3.4 Consultations of other Contracting Parties ..... 47

1.3.5 Iterative process with the Energy Community Secretariat ..... 47

1.4 Regional cooperation in preparing the plan ..... 47

1.4.1 Elements subject to joint or coordinated planning with other Contracting Parties ..... 47

1.4.2 Explanation of how regional cooperation is considered in the plan ..... 48

2 NATIONAL TARGETS AND OBJECTIVES ..... 49

2.1 Dimension Decarbonization ..... 50

2.1.1 GHG emissions and removals ..... 50

2.1.2 Renewable energy ..... 51

2.2 Dimension Energy Efficiency ..... 52

2.2.1 The elements set out in point (b) of Article 4 ..... 52

2.2.2 Long-term renovation strategy addressing the national building stock ..... 54

2.2.3 Other national objectives and long-term strategies ..... 54

2.3 Dimension Energy Security ..... 54

2.3.1 The elements set out in point (c) of Article 4 ..... 54

2.3.2 National objectives with regard to diversification and resilience ..... 56

2.3.3 National objectives with regard to reducing energy import dependency ..... 56

2.3.4 National objectives with regard to increasing flexibility ... 57
2.4 Dimension Internal energy market ... 57
2.4.1 Electricity interconnectivity ... 58
2.4.2 Energy transmission infrastructure ... 60
2.4.3 Market integration ... 60
2.4.4 Energy poverty ... 61
2.5 Dimension Research, innovation and competitiveness ... 62
3 POLICIES AND MEASURES ... 63
3.1 Dimension Decarbonisation ... 67
3.1.1 Overarching legal framework ... 67
3.1.2 GHG emissions and removals ... 67
2.1.1. Renewable Energy ... 79
3.2 Dimension Energy Efficiency ... 87
3.2.1 Overarching legal framework ... 87
3.2.2 Energy efficiency obligation schemes and alternative policy measures ... 88
3.2.3 Long-term renovation strategy and stimulating cost-effective deep renovation ... 88
3.2.4 Uptake of energy performance contracting and other EE service models ... 94
3.2.5 Exemplary role of public buildings and energy-efficient public procurement ... 95
3.2.6 Promoting energy audits and energy management systems ... 96
3.2.7 Consumer information and training measures ... 98
3.2.8 Energy Efficiency in transport ... 99
3.3 Energy Security ... 104
3.3.1 Overarching legal framework ... 104
3.3.2 Power sector ... 104
3.3.3 Oil & Gas Sector ... 105
3.3.4 Regional Cooperation ... 110
3.4 Internal Energy Market ... 111
3.4.1 Overarching legal framework ... 111
3.4.2 Electricity Infrastructure ... 111
3.4.3 Energy Poverty ... 113
3.5 Research, Innovation and Competitiveness ... 115
3.5.1 Overarching legal framework ... 115
3.5.2 Research ... 115
3.5.3 Innovation and Competitiveness ... 117
4 CURRENT SITUATION AND PROJECTIONS WITH EXISTING POLICIES AND MEASURES ... 119

4.1. Projected evolution of main exogenous factors influencing energy system and GHG emission developments ... 119
4.2. Dimension Decarbonisation ... 134
4.2.1 GHG emissions and removals ... 134
4.2.2 Renewable Energy ... 146
4.3. Dimension Energy Efficiency ... 152
4.4. Dimension Energy Security ... 165
4.5. Dimension internal energy market ... 170
4.5.1 Electricity interconnectivity ... 170
4.5.2 Energy transmission infrastructure ... 173
4.5.3 Electricity and gas markets, energy prices ... 175
4.6. Dimension research, innovation and competitiveness ... 176
5 ASSESSMENT OF IMPACTS OF PLANNED POLICIES AND MEASURES ... 180
5.1 Impacts of planned policies and measures, including comparison to projections with existing policies and measures ... 180
5.2 Macroeconomic and other impacts of the planned policies and measures, including comparison to projections with existing policies and measures ... 225
5.3 Overview of investment needs ... 229
5.4 Impacts of planned policies and measures on other Member States and regional cooperation, including comparison to projections with existing policies and measures ... 233
6 References ... 235
7 List of Tables ... 238
8 List of Figures ... 241
9 Annex ... 247
9.1 Overview of institutions ... 247

# List of abbreviations and acronyms

| | |
|---|---|
| ACA | Albanian Competition Authority |
| ACER | Agency for the Cooperation of Energy Regulators |
| AEE | National Agency of Energy Efficiency |
| AFD | *Agence Française de Développement* |
| AKPT | National Territorial Planning Agency |
| ALKOGAP | Albania Kosovo Gas Pipeline |
| APEX | Albanian power exchange |
| ASOR | State Agency for Security of Oil Reserves |
| AZHBR | National Agency for the Rural and Agricultural Development |
| BaU | Business as Usual |
| BPA | Code Best Practice in Agriculture |
| BRE-E | RES in the electricity sector |
| BRE-N & F | RES in the heating and cooling sector |
| BRE-T | RES in the transport sector |
| cap | capita |
| CAPEX | capital expenses |
| CCL | Citizens' Climate Lobby |
| CDD | cooling degree days |
| CfD | Contract for Difference |
| $CH_4$ | Methane |
| CO2 | Carbon dioxide |
| $CO_2$eq | $CO_2$ equivalent |
| DCM | Decision of Council of Ministers |
| EBRD | European Bank for Reconstruction and Development |
| ECMs | Energy Conservation Measures |
| EE | Energy Efficiency |
| EEAP | Energy Efficiency Action Plan |
| EED | Energy Efficiency Directive |
| EIA | Environmental Impact Assessment |
| EPBD | Energy Performance of Buildings Directive |
| EnC | Energy Community |
| ENTSO-E | European Network of Transmission System Operators |
| ERE | Energy Regulatory Authority |
| ERRU | Albanian Water Regulatory Authority |
| ESCO | Energy Service Company |
| ESIA | Environmental and Social Impact Assessment |
| ESO | Transmission system operator of Bulgaria |
| ETS | Emission trading system |
| EV | Electric Vehicle |
| FEC | Final Energy Consumption |
| FiT | Feed in Tariff |
| GACMO | Greenhouse Gas Abatement Cost Model |
| GDP | Gross Domestic Product |
| GHG | Green House Gas |
| ha | hectare |
| HDD | heating degree days |
| HEI | Higher Education Institutions |
| HERE | Higher Education Reform Experts |
| HPP | Hydro Power Plant |
| HVDC | High Voltage Direct Current |
| IAP | Ionian Adriatic Pipeline |
| IECC | Inter-Ministerial Energy and Climate Committee |
| IEE | Industrial Energy Efficiency |
| INDC | Intended Nationally Determined Contributions |
| INSTAT | Albanian Institute of Statistics |
| IPA | Instrument for pre-accession assistance |
| IPARD | Instrument for pre-accession assistance for rural development |
| IPPU | Industrial Processes and Product Use |
| ISARD | Intersectoral Strategy for Agriculture and Rural Development |
| IST | Intelligent Systems of Transport |
| ISWM | Integrated Solid Waste Management |
| ITS | Intelligent Transport System |
| KESH | Albanian Power Corporation |
| KfW | *Kreditanstalt für Wiederaufbau* |
| KOSTT | Kosovo power system operator |

| | |
|---|---|
| LNG | Liquified Natural Gas |
| LPG | Liquified Petroleum Gas |
| MARD | Ministry of Agriculture and Rural Development |
| MEPSO | Transmission system operator of North Macedonia |
| MIE | Ministry of Infrastructure and Energy |
| MMR | Monitoring Mechanism Regulation |
| MFE | Ministry of Finance and Economy |
| MHSW | Ministry for Health and Social Welfare |
| MTE | Ministry of Tourism and Environment |
| MVP | Monitoring and Verification Program |
| MW | Megawatt |
| NAMAs | Nationally Appropriate Mitigation Action |
| NANR | National Agency of Natural Resources |
| NASRI | National Agency of Scientific Research and Innovation |
| NCREAP | National Consolidated Renewable Energy Action Plan |
| NDC | Nationally Determined Contributions |
| NEA | National Environment Agency |
| NECP | National Energy and Climate Plan |
| NEEAP | National Energy Efficiency Action Plan |
| NREAP | National Renewable Energy Action Plan |
| NSDI II | Second National Strategy for Development and Integration |
| NSE | National Strategy of Energy |
| nZEB | Near Zero Energy Building |
| OSHEE | Power supplier and distribution system operator |
| OST | Transmission system operator |
| PaM | Policy and Measure |
| PBL | Policy-Based Loan |
| PECI | Projects of Energy Community Interest (list). |
| PHEV | Plug-in Hybrid Electric Vehicle |
| PMU | Phasor Measuring Unit |
| PREs | Policy Reforms Elements |
| PT | Public transport |
| PV | Photovoltaic |
| QA/QC | Quality Assurance / Quality Control |
| RES | Renewable Energy Source |
| RFNBO | Renewable fuels of non-biological origin |
| SCC | Security Coordination Centre |
| SDG | Sustainable Development Goals |
| SEA | Strategic Environmental Assessment |
| SEAP | Sustainable Energy Action Plan |
| SEE CAO | South-East Europe Coordinated Auction Office in Montenegro |
| SET-Plan | Strategic Energy Technology Plan |
| sHPP | small Hydro Power Plant |
| SLED | Support for Low Emission Development in Southeast Europe |
| TAP | Trans Adriatic Pipeline |
| TEFC | Total Energy Final Consumption |
| TEN-E | Trans-European Energy Networks |
| TEN-T | Trans European Transport Networks |
| toe | ton(s) of oil equivalent |
| ToR | Terms of reference |
| TPES | Total primary energy supply |
| TPP | Thermal Power Plant |
| TSSAP | Sectorial Transport Strategy and Action Plan 2016-2020 |
| TYNDP | Ten-Year Network Development Plan |
| UNDP | United Nations Development Programme |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VAT | Value added tax |
| WAM | With Additional Measures |
| WB | Western Balkans |
| WB* | World Bank |
| WB6 | Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, Serbia |
| WBIF | Western Balkans Investment Framework |
| WEM | With Existing Measures |
| WWTP | Waste Water Treatment Plant |

# SECTION A: NATIONAL PLAN

## 1 OVERVIEW AND PROCESS FOR ESTABLISHING THE PLAN

### 1.1 Executive Summary

Albania has committed to prepare its first NECP 2021-2030 during the year 2020. The development period had to be extended due to the COVID-19 pandemic.

This NECP builds on the National Energy Strategy and the first NDC and has been aligned with the draft of the revised NDC. Differences compared to the existing policy documents have been analysed and can be attributed to, among others, the need for adjustments due to the evolving knowledge base. Detailed explanation is provided in chapter 2.

Drafting the NECP calls for a broad range of reliable and consistent data. The most relevant data on climate change have been collected and processed by the UNDP technical assistance projects during the preparation of the National Communications to UNFCCC. With regard to the NECP drafting process, accessibility of data and the level of detail was not always ideal due to different procedures and timelines. Despite of these challenges, good progress has been made with alignment of NECP and NDC for future progress reports and updates. Nevertheless, formal actions are necessary to ensure disaggregated data collection, data consistency and data transparency for future activities.

#### 1.1.1 Political, economic, environmental, and social context of the plan

**Political context:**

It can be summarized that there is policy and legislation in place for each of the five dimensions of the Energy Union.

Albania is involved in the process of creating a supportive domestic energy market, ensuring energy security, energy efficiency, environmental protection including GHG emissions reduction which are described and presented through so many planned measures and investments identified in different policy documents. The National Strategy of Energy, 2nd and 3rd Action plan on EE, Consolidated Renewable Energy Action Plan, National Plan for the Mitigation of GHG and the Strategy of Transport have defined objectives and targets on increasing the security of supply by investments in the power sector, gas penetration in the Albanian market, increasing the share of RES and EE followed by a reduction of GHG emissions.

The law no.155/2020 on Climate Change has created the basis for transposition of the Governance Regulation and the relevant EU legislation on climate change.

For the full implementation and enforcement of energy and climate policies, the secondary legislation on energy efficiency including the energy performance in buildings is fully adopted during 2020 and the secondary legislation on renewable energy sources is still in the process of being drafted or drafting needs to be started.

The institutional setup for planning and reporting energy and climate related policies and measures is under development. The following institutions and professions that have been establish by law need still

to be established in practice: Renewable Energy Agency[1], Renewable Energy Operator, Energy Services Companies, Electro energetic companies, Hydrocarbons Scientific Institute, Natural gas operators.

**Economic context:**

The development and implementation of the national energy policies and establishing the NECP will impact significantly on the economic growth in different economic sectors. Many investments foreseen to be realised in whole energy sector will have a very great impact to increase the sectorial GDPs, generating revenues and the increase in labour forces in different areas.

Policies and measures related with the construction and renovation of buildings as well as the construction of Photovoltaic systems will contribute substantially to creating green jobs. Reduced dependence on energy imports will not only contribute to improving the security of energy supply but also to macroeconomic and political security of the country through decreasing the domestic budget deficit.

**Environmental context:**

Albania's energy policies pursue three objectives:

i) support for the overall economic development,
ii) increase of the security of energy supply,
iii) protection of environment.

Renewable energy especially other than hydro is a solution for decreasing the strategic dependence on energy imports and mitigating the impact of climate change resulting in unreliable hydropower production. However, there are conflicts of interest with environmental protection goals, which must be handled properly.

**Social context:**

The increase of employment mainly through investments in the energy and building sector led to the increase of the personal/families revenues followed by the increase of living standard of the society. There is a strong connection between personal and society welfare which means that investments create not only jobs but they have their impact on municipalities and governmental revenues through taxes, fees, etc and their use in budgeting forms to be spent for purposes such as health, education, etc.

Specifically, targets on Energy Efficiency aim at the reduction of energy consumption per unit and thus at a contribution to affordable energy supply and reducing the poverty.

### 1.1.2 Strategy relating to the five dimensions of the Energy Union

The five dimensions of the Energy Union are: (i) energy security; (ii) the internal energy market; (iii) energy efficiency (iv) decarbonisation; and (v) research, innovation and competitiveness.

The strategy relating to the five dimensions of the Energy Union rests on four pillars:

(1) To discuss and review sectoral targets, policies and measures in order to identify gaps and synergies, especially with regard to alleviating energy poverty and providing affordable energy for people, and with regard to job creation. Therefore, an important focus is on financing measures.

(2) To make high-quality quantitative data available as far as possible. They must be provided in detail as much as possible to support the process of analyzing and getting results needed for in-depth analyses, planning and monitoring in different energy-related sectors.

[1]So far this role is being carried by the NANR. It has not been defined yet which is the agency that will permanently take over its responsibilities.

(3) To streamline processes of data collection, documentation, and reporting, in order to limit the burden on public administration responsible for these tasks. This is a general concern and therefore also applies to, but is not limited to, the development of the NECP.

(4) To create awareness and acceptance of the NECP among all stakeholder groups by organising public information and consultation procedures.

The basis for this is the establishment of a coordination structure and a coordination procedure across different ministries and departments playing a role in the five dimensions of the Energy Union.

The Inter-Ministerial Energy and Climate Committee (IECC) has been established to ensure that developed targets, policies and measures will be feasible and realistic in terms of implementation and expected impact at national level.

The development of the NECP is regarded as an open-ended management process based on continuous improvement. Especially the situation regarding data availability is challenging and has been identified as high priority field of action in order to improve future versions of the NECP.

### 1.1.3 Overview table with key objectives, policies and measures of the plan

An overview table with key policies and measures is provided in chapter 3 (Table 11: Overview table of key policies affecting the national climate target to 2030). The analytical basis of the NECP (chapters 4 and 5) explains that targets are influenced mainly by the mode of operation of renewable plants, the reduction of fossil fuel use in transport and industry by fuel switch and energy efficiency measures targeting the building sector. Furthermore, forestry management has a major influence.

Targets to be achieved by 2030 are presented in the table below.

| **Targets (2030) and reference** | | **Sector contribution** | |
|---|---|---|---|
| GHG emission savings (Reduction relat. WEM) | -18.7% | | |
| | | GHG emissions [kt CO2eq] as projected with additional measures for 2030 | |
| | | Demand | 4833.0 |
| | | Transformation | 250.8 |
| | | Non Energy | 5139.0 |
| | | | More details see chapter 5, Table 36 |
| Energy Efficiency (Final Energy Consumption reduction relat. WEM) | -8.4% | | |
| | | Final energy consumption [ktoe] as projected with additional measures for 2030 | |
| | | Residential | 348.9 |
| | | Services | 195.2 |
| | | Industry | 542.4 |

| | | | |
|---|---|---|---|
| | | Transport | 1003.4 |
| | | Agriculture Forestry | 110.5 |
| | | Fisheries | 56.0 |
| | | Non energy | 70.6 |
| Renewable energy share in final energy demand | 54.4% | | |
| | | RES shares of final energy demand [Percent] as projected with additional measures for 2030.<br>* Values over 100% are due to electricity exports. | |
| | | RES- Electricity | 178.1 %*<br>More details see chapter 5, Table 40 |
| | | RES-Transport | 34.6 %<br>More details see chapter 5, Table 41 |
| | | RES-Heating&Cooling | 16.6 %<br>More details see chapter 5, Table 42 |

**Table 1: Objectives 2030 and sector contributions**

## 1.2 Overview of current policy situation

### 1.2.1 National energy system and policy context of the national plan

*National energy system*

The Albanian Energy sector[2] covers the following sub-sectors[3]:

- Security of supply and (Energy) infrastructure
- Energy market regulation
- Energy efficiency
- Hydrocarbon
- Renewable energy

The national energy system in terms of supply and demand and the main challenges it faces are briefly described below.

In a nutshell, import dependence and high distribution losses in the electricity grid are challenges to be dealt with. Plans to increase the use of natural gas must be carefully developed and aligned with other plans, to ensure that GHG and final energy reduction targets and EE improvement targets will be achieved.

Albania depends almost exclusively on hydropower for its electricity generation (98% of its electricity generation comes from hydropower), making it increasingly vulnerable to unfavourable hydrological conditions in the summer, especially in view to predicted effects of climate change in the Western Balkans region. Apart from the fact that there is no constant production, electricity from hydropower is not sufficient to meet the needs. Albania is a net importer of electricity and ensuring the security of its power supply is a challenge. Thus, Albania started to plan adequate measures to increase investments in renewable energy projects other than hydropower. Due to the fall in technology costs and significant renewable energy potential that the country has, wind and solar PV can be deployed cost-effectively to mitigate the impact on the end-consumer electricity price. By the end of 2018, there were additional 10 MW of solar PV installed.

For the years 2019-2020, the Consolidated Renewable Energy Action Plan foresees the expansion of installed electricity generators based on renewable sources by 738 MW, as follows: 57 MW of hydropower energy; 490 MW of photovoltaic energy; 150 MW of wind energy; 41 MW of MNU (waste to energy). The related additional potential for renewable generation in Albania is estimated 1761 GWh. (Source: The Consolidated Renewable Energy Action Plan 2019 - 2020)

However, especially regarding concession contracts to build and operate HPP, doubts have been expressed about the quality of SEAs and EIAs carried out on energy projects. Overall, implementation of energy projects lags far behind schedule which needs to be addressed in strategic planning. Table 2 shows the slow development of non-hydropower in renewable power capacities.

[2] Referring to the National Sector Strategy for Energy (NSSE) 2018-2030

[3] Referring to the law on Power sector, other subsector laws and NSSE 2018-2030

| Year | 2017 | 2018 | 2019 |
|---|---|---|---|
| **Total installed power** | 2,145 MW | 2,204 MW | 2,275 MW |
| **Hydropower** | 100% | | |
| **Photovoltaic** | 1 MW | 11 MW | 15 MW |
| **Annual production** | 4,525 GWh | 8,552 GWh | 5,200 GWh |
| **Hydropower** | 100% | | |
| **Photovoltaic** | | 1,334 MWh | 22,190 MWh |
| **Comments** | 1MW PV in Korçë but out of system | 1MW PV in Korçë but out of system | |

**Table 2: Electricity generation from renewable energy sources (Source: The Consolidated Renewable Energy Action Plan 2019-2020; page 24)**

The Vlora thermal power plant (built with financing from the EBRD of EUR 40 million, EIB financing of EUR 40 million, and WB* financing of EUR 20.5 million) has never been put into operation since its completion in 2011. This is due to a failure in the plant's cooling system that has not been repaired. The conversion of the Vlora power plant from oil use to gas use once it is connected to the TAP is encouraged. This would contribute to stabilizing the generation of electricity during droughts in the southern part of Albania. However, this will increase gas consumption and thus also $CO_2$ emissions and must be taken into account accordingly in strategic planning.

### Structure of the Albanian energy system

In a graphical way, we are introducing the structure of the Albanian energy system:

In terms of **Gross inland consumption** (to be confirmed) **2019,** the Albanian energy system has been dominated and still continues to be dominated by oil by products for transport use (appr. 53.3%), followed by electricity produced from hydropower (appr. 28.17%), and in the third place is biomass (fuelwood, appr. 6.8%) used for heating, cooking and domestic hot water. Fuelwood is mostly used in household (rural areas) and in the service sector (Figure 1).

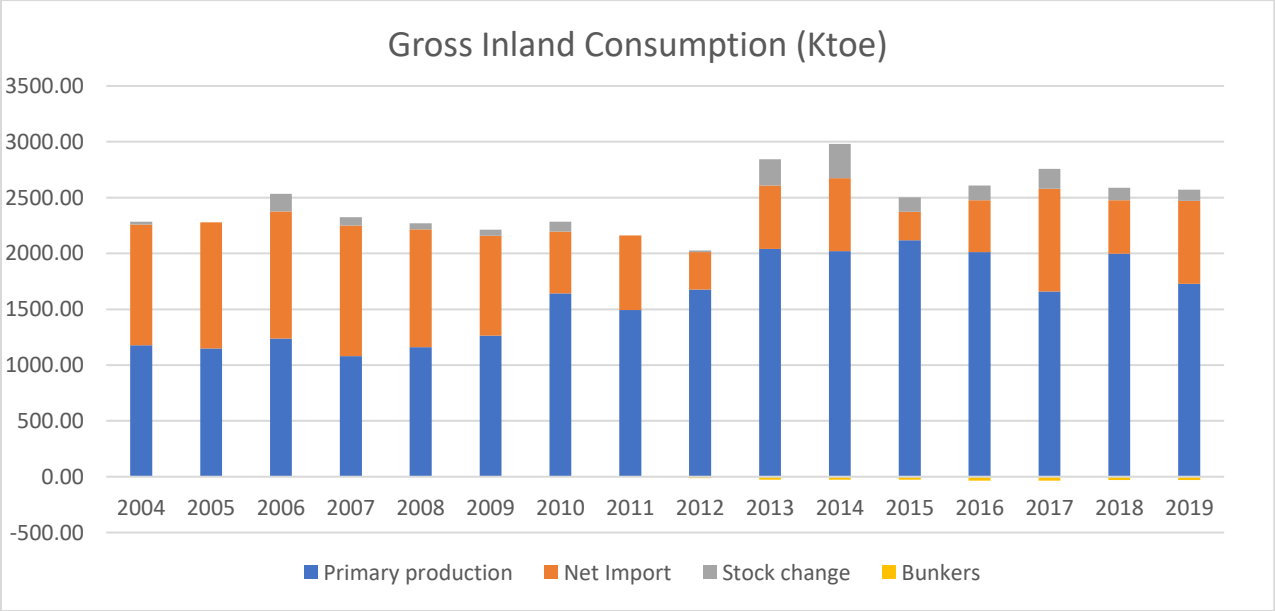



**Figure 1: Gross Inland Consumption (ktoe) (Source: Albanian Energy Balances)**

**Dependency on imports** is an important reason that the Albanian energy system must be developed towards a diversified energy system using alternative energy resources like gas and renewables with less GHG emissions, and implementation of energy efficiency measures - based on cost effectiveness. The system must rely on domestic production and being affordable for consumers by creating an impact on poverty reduction.

Figure 2 shows the import dependence of the energy system. The share of import in percentage of the Gross Inland Consumption is high, thus affecting the security of supply. The energy system needs to be more diversified and more efficient, also due to increase of self-sufficiency energy demand.

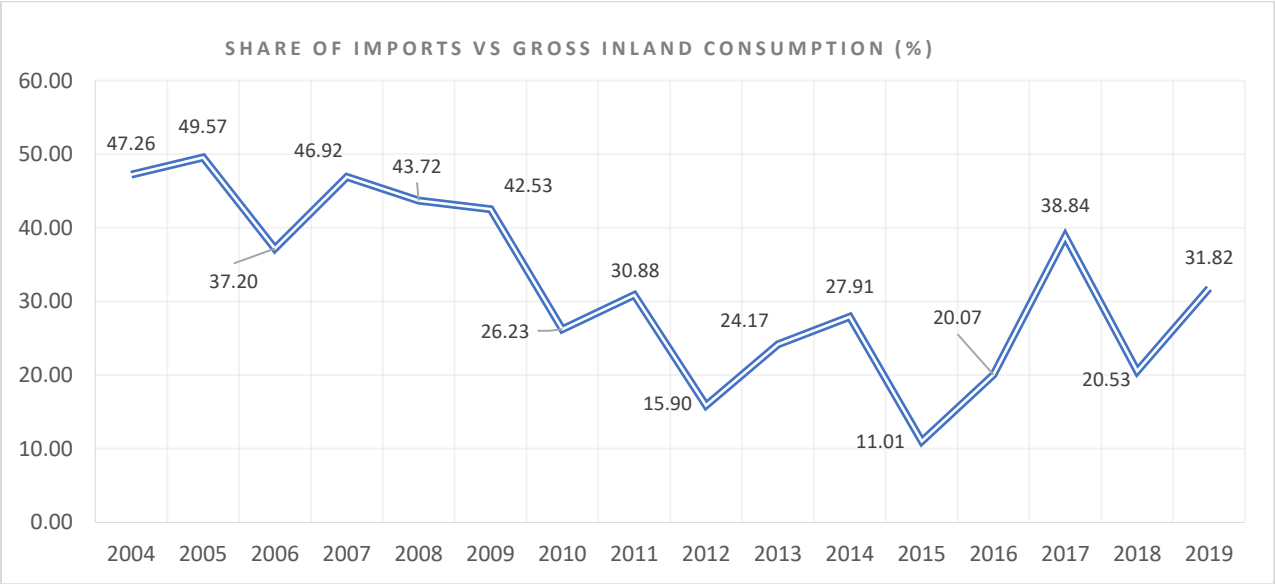



**Figure 2: Imports vs Gross Inland Consumption 2004-2019 in % (Source: Albanian Energy Balance)**

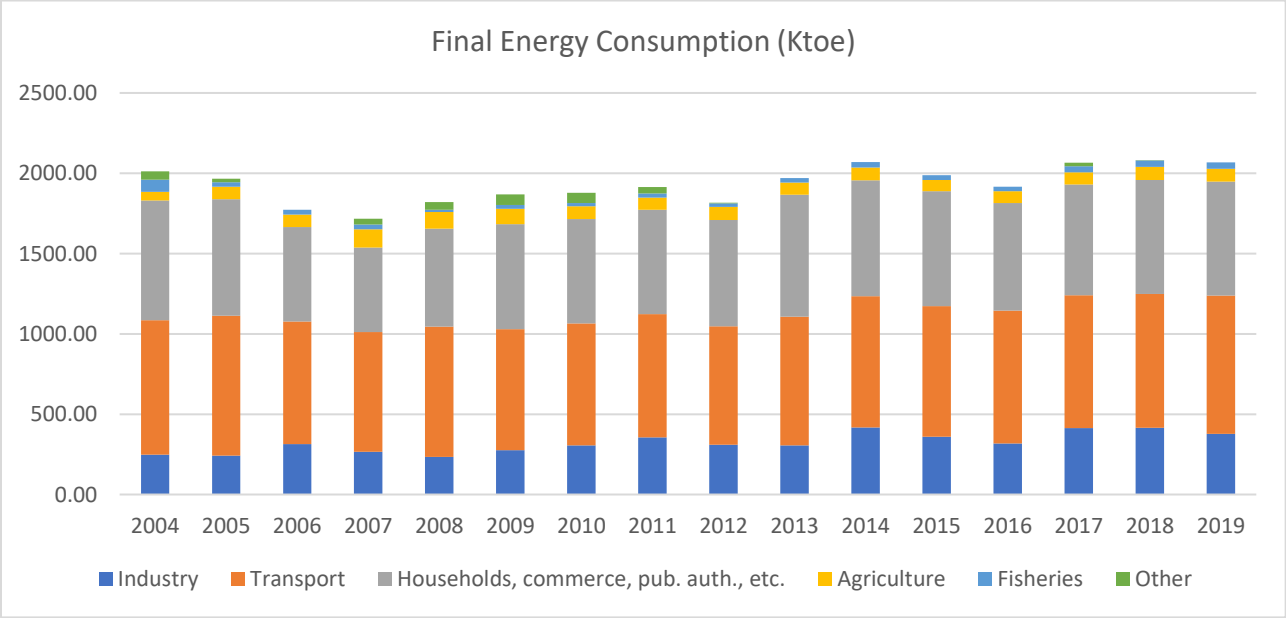



**Figure 3: Final energy consumption by sectors (ktoe) (Source: Albanian Energy Balance)**

Development of the final energy consumption during 2004-2019 is dominated by transport, followed by household & commerce. Specifically, the year 2019 is dominated by the transport sector at the range of

41.6%, the second place is households and commerce at the range of 34.7%, Industry is at the range of 18% and the remaining share is agriculture and others.

Figure 4 shows that the biggest share of energy sources is dominated by oil and oil by-products, especially in the Transport sector, followed by Hydro & Electricity and Biomass.

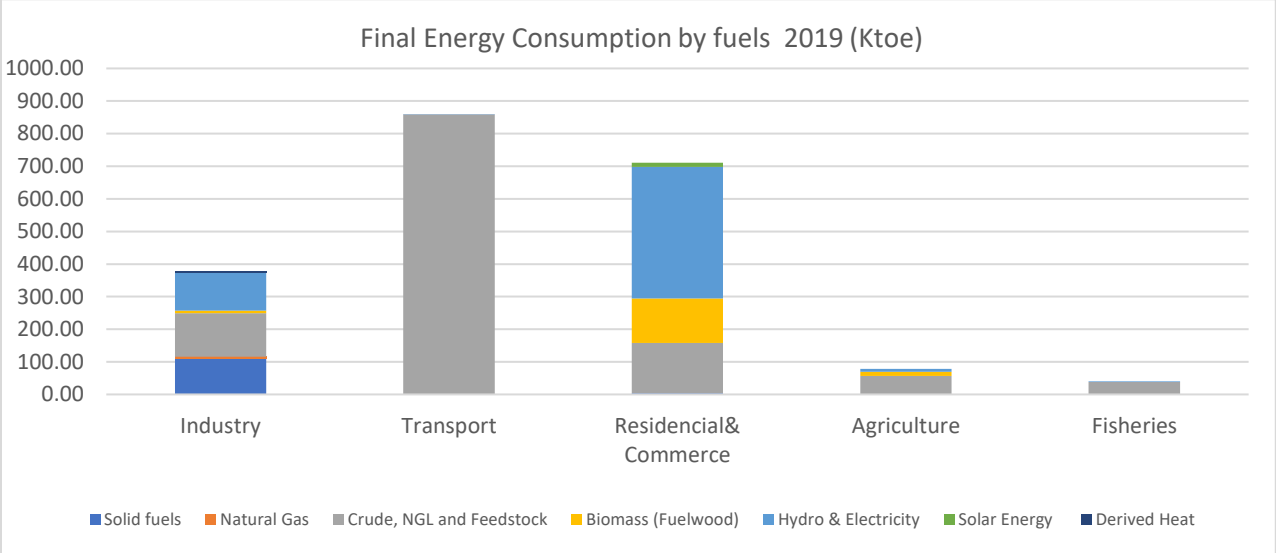



**Figure 4: Final Energy Consumption 2019 by fuels and sectors (Source: Albanian Energy Balance)**

Based on the energy policy documents, sectors which are considered having a big potential for energy savings are the transport sector, public and private buildings, and industry.

### Electricity transmission and distribution

A key issue for the performance of Transmission and Distribution companies as a very important aspect of energy supply is the phenomena of transmission and distribution losses.

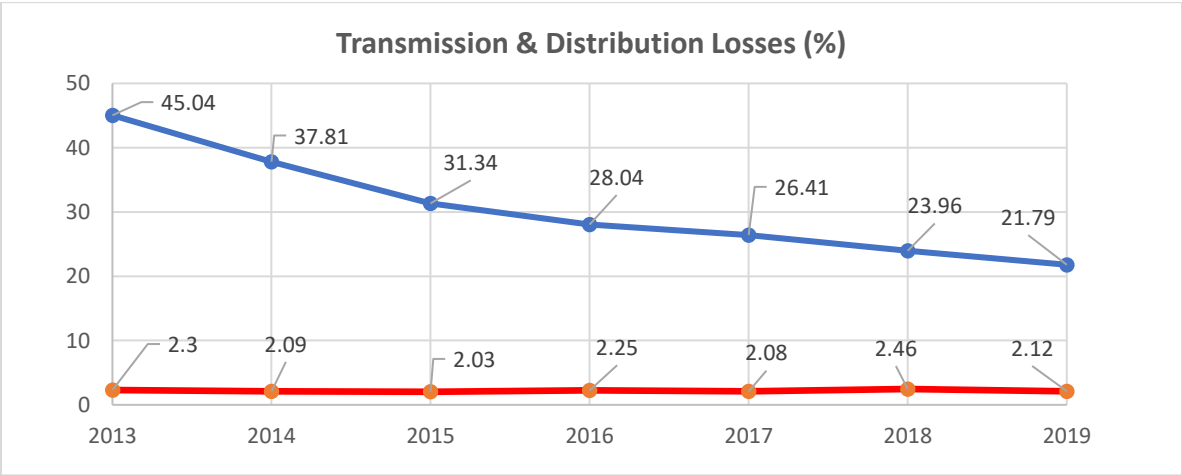



**Figure 5: Transmission and distribution losses vs electricity transmitted and distributed into the grids (Source: ERE annual reports) (red line: transmission losses, blue line: distribution losses)**

Based on the ERE annual reports, there are some achievements due to EE investments in the power sector concerning the reduction of technical losses in transmission and distribution. Transmission losses were reduced from 2.46% in 2018 to 2.12% in 2019. There is an improvement of 2.17% in the level of

distribution losses for 2019 as for 2018 losses were 23.96%. According to ERE, transmission and distribution losses were nearly 23.91% in total in 2019. (Source: ERE annual reports)

**Energy intensity**

As can be seen from Figure 6, for 2014 the energy intensity has been 0.219067 ktoe/Bill Euro GDP, for 2020 it is expected to be 0.209423 and with a prediction for 2030 to have an energy intensity at 0.175174 ktoe/Bill Euro GDP. (Source: National Strategy of Energy)

The Albanian energy system can achieve the target of energy intensity reduction if measures of the 2nd and 3rd NEEAP are implemented.

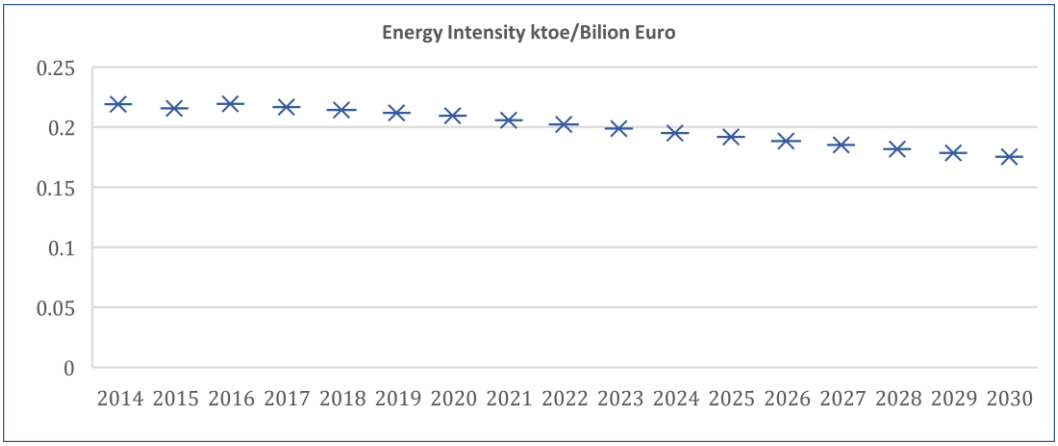



**Figure 6: Energy intensity (Source: National Strategy of Energy)**

*Policy context of the national plan*

The NECP is developed in line with:

- the second National Strategy for Development and Integration (NSDI II) which is aligned to the United Nations' Sustainable Development Goals;
- the obligations arising from the signature of the United Nations Framework Convention on Climate Change (UNFCCC);
- the Energy and Climate Acquis of the Energy Community.

## Sustainable Development Goals

The second National Strategy for Development and Integration (NSDI II) presents the national vision for the social and economic development of Albania over the period 2014 to 2020 as the main visionary and planning document of the country and is explicitly aligned to the SDGs. While the intention is to maximize the utilization of indicators adopted at the global level, the vision is also to maximize the use of indicators that would be most relevant to Albania[4].

Referring to Sustainable Development Goals, the SDG 7- Affordable and Clean Energy, calls for ensuring universal access to modern energy services, improving energy efficiency and increasing the share of renewable energy.

According to INSTAT, the relevant energy supply indicators measuring SDG7 in Albania are:

- By 2030, ensure universal access to affordable, reliable and modern energy services
- Proportion of population with access to electricity is 100%
- Proportion of population with primary reliance on clean fuels and technology is 34.38%

[4]Environmental Performance Reviews 3, UNECE

The challenges currently facing the Albanian energy sector include:

- Meeting the energy demand for a sustainable economic development in different sectors and the growing level of energy consumption per capita;
- Improving the trend of energy intensity reduction;
- Enhancing the security of energy supply by improving energy efficiency, increasing the share of renewables and other indigenous energy sources, and increasing welfare through regional cooperation and integration;
- Continue investments to further improve the performance by reducing distributions losses in the grid and improve collection rates.

## United Nations Framework Convention on Climate Change

During the last two decades, Albania has paid special attention to environmental protection in general and climate change in particular. The Albanian Constitution itself has included "a healthy and ecologically adequate environment for present and future generation" as one of the social objectives that need to be taken into consideration by all state institutions.

Albania is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), adopted at the "Rio Earth Summit" in 1992 and ratified by the Albanian Parliament in 1994, which established the objective to combat climate change by stabilizing GHG concentrations in the atmosphere and limiting average global temperature increases to support sustainable development. Albania has started the process of changing the status from a developing country to a developed country, in the context of the UNFCCC. This process is an integral part of the process of integration into the EU and involves the development of capacities at the national level for monitoring and annual reporting of Greenhouse Gases (GHG), the formulation and implementation of policies for GHG emission reduction and climate change adaptation, and the transposition and implementation of the EU Acquis on climate change. In order to achieve the emission reduction objectives, the Paris Agreement adopted in December 2015 and ratified by the Albanian Parliament through law No. 75/2016 dated 14.07.2016, establishes a "bottom up system" where Parties have to prepare and communicate successive nationally determined contributions (NDC) every five years with the aim of progressively improving their efforts. In addition to their NDC, Parties should also formulate long-term, mid-century low GHG development strategies, and submit them by 2020 that demonstrate how their efforts will contribute to the goal of zero-net emissions by the second half of this century.

The next NDC update is due by 2020, and the NECP development process should be in line with the NDC update process.

In 2014 the Order of the Prime Minister No. 155, dated 25.04.2014 established an inter-ministerial working group on the coordination of the Ministries tasks, according to the country's obligations on UNFCCC. The group, chaired by the Deputy Minister of Environment, includes the representatives of 12 Albanian Ministries. The group has the mandate, among others, to draft policies and strategies, and to ensure inter-institutional coordination for the implementation of climate change activities.

## Energy and Climate Acquis of the Energy Community

Although Albania is making progress with transposing and implementing the Acquis, crucial points remain:

- the reliability of the energy database and the need for macro-economic data in much more detail in order to improve analyses, in-depth reviews and monitoring of the action plans and strategies related with energy;
- the low implementation of legislation and strategic documents;
- the need for a financial framework for implementing policy measures.

Non-implementation of previous NEAPs or EE legislation was linked with lack of a financial framework for implementation (EE fund or dedicated state financing). To avoid this risk, setting up financing mechanisms for NECP implementation is the key to success. In view of the very high investment costs and the long periods of time required to realise investments across the energy sector, strategic investments in RES and RE are becoming key issues in terms of increasing security of supply, reducing emissions and adapting energy demand on the basis of least cost planning.

**Transposition of EU Directives under the Energy Community Acquis**

Information about the status of transposition and implementation of Directives is provided in the chapters of the respective Dimension. Albania has prepared and adopted a number of policy documents, strategies and action plans aligned with the Energy and Climate Acquis of the Energy Community.

The main energy-related policy documents are described below:

- National Sector Strategy for Energy 2018-2030, approved by DCM No. 480 dated 31.7.2018 is the core strategic document for the country's energy sector clearly defining national energy targets until 2030.
- Strategic Plan for Reform in Energy Sector in Albania (2018-2020), approved by DCM No. 742, dated 12.12.2018, is a roadmap for reforming the entire electricity sector in Albania. It is the basis for the Policy-Based Loan (PBL) for the implementation of the specific Policy Reforms Elements (18 PREs) listed in this Strategic Plan.
- Albania's Economic Reform Programme (2020-2022) related to energy sector reforms includes the following: (i) Effective liberalization of the energy market, with complete unbundling and a functioning power exchange; (ii) Implementation of the law on renewable energy sources; (iii) Adoption of the secondary legislation for the laws on energy efficiency and the energy performance of buildings.
- NEEAP 2nd and 3rd has set up some objectives and targets up to 2020, EE measures, investments and responsible institutions.
- National Consolidated Renewable Energy Action Plan (NCREAP 2019 – 2020) approved by DCM No. 580 dated 31.7.2018, foresees an average increase of electricity generators from renewable sources of 738 MW out of which 490 MW from photovoltaic (PV) and 150 MW from Wind Power.

### 1.2.2 Current energy and climate policies and measures relating to the five dimensions of the Energy Union

*Overview of key policies*

**National Energy Strategy for Albania**

The Energy Strategy for Albania 2018-2030, as the core strategic document for the country's energy sector, is fully coherent with other national policies and strategies and the European Green Deal's objectives: Supplying clean, affordable and secure energy; Building and renovating, promoting a cleaner construction sector; Accelerating the shift to sustainable and smart mobility; Eliminating pollution through measures to cut pollution rapidly and efficiently.

The five dimensions which the energy strategy supports are:

1. Energy security, based on diversification of energy resources;
2. Full integration in the regional market and later to the European one;
3. Energy efficiency which contributes to the moderation of demand;
4. Decarbonization of the economy;
5. Research, innovation and competition

The Albanian Energy Strategy is fully in line and in harmony with EU "Low-carbon Economy Roadmap" and promotes EE, RES and natural gas policies that promote a stable business climate which will encourage low-carbon investments for the period 2017-2030. As the analyses supporting this strategy shows, there is significantly greater GHG reduction potential in the Albanian energy system than the initial NDC commitment. Therefore, the energy strategy and the policy objectives it envisions are in-line with the increasing ambition goals of both the UNFCCC and the EU/Energy Community. Given the current status of Albania as a candidate country in accession to the EU, it is likely during the period covered by this strategy Albania will accede to the EU. For this reason, as well as required by its Energy Community membership, it is of great importance that the Energy Strategy is in line also with EU Climate Change Policy by ensuring that the energy policy objectives and the respective energy action plans identified in this document are supporting the levels of ambition expressed in EU $CO_2$ reduction targets and climate change political goals.

The figure below shows other key policies in the form of an overview. A more detailed description can be found in those dimensions for which the respective policy instruments are particularly important.

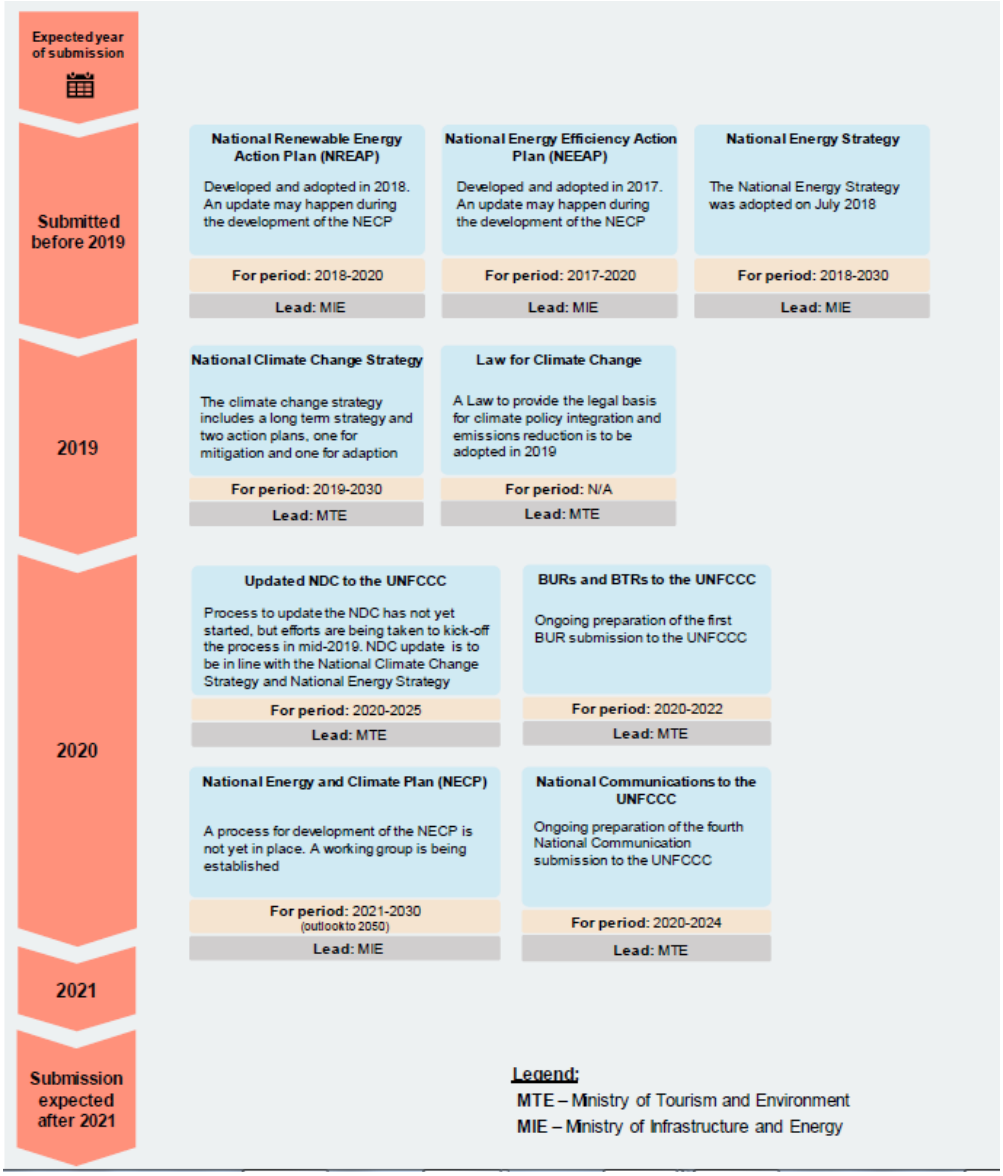



**Figure 7: Overview of policy documents (Source: Consolidation of climate planning processes in the Energy Community Contracting Parties, New Climate Institute, May 2019)**

*Overview of governmental institutions*

The most significant institutions in setting policy and regulation in the power sector in Albania are the Ministry of Infrastructure and Energy ("MIE") and the Energy Regulatory Authority ("ERE"). In addition to MIE and ERE there are a number of ministries that have a smaller role in the sector, and also a number of government agencies with responsibilities with respect to the power sector that are delegated to them by the ministries. These are: Ministry of Finance and Economy ("MFE"), Ministry for Health and Social Welfare, Ministry of Tourism and Environment ("MTE") and government agencies and companies involved in energy supply, as shown in the figure below. A detailed description of the presented organisations is available in the Annex.

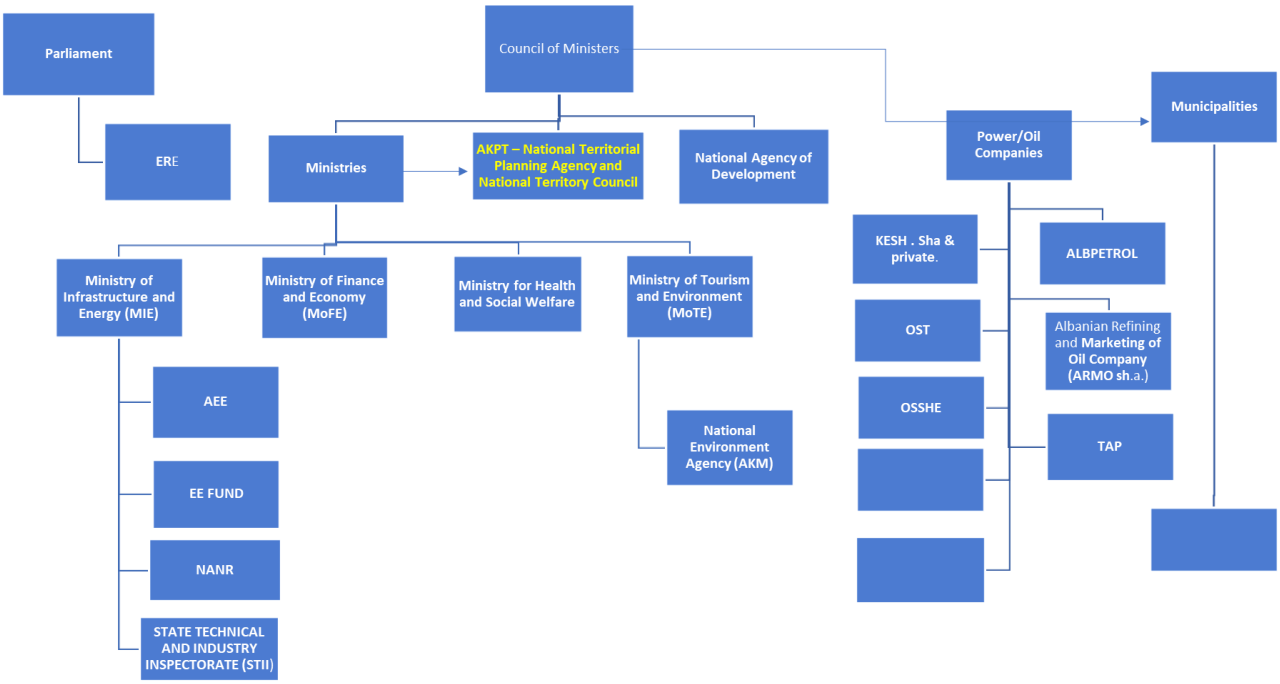



**Figure 8: Organigram of governmental institutions involved in NECP development and implementation**

*Dimension Decarbonisation – GHG emissions and removals*

Key policies are the INDC and the National Strategy for the Climate Change.

**INDC (Intended Nationally Determined Contributions)**

Though Albania is a country with a low-carbon economy, the INDC (Intended Nationally Determined Contributions) of Albania commits to reduce its $CO_2$ emissions by 11.5 % as compared to the baseline scenario for the period 2016 to 2030. This reduction is equivalent to a $CO_2$ emission reduction of 708 Gg by 2030. The emission trajectory of Albania allows a smooth trend for achieving 2 tons of GHG emissions per capita by 2050, which can be taken as a target for global contraction and convergence of greenhouse gas emissions.

The main mechanisms of achieving this objective are related to maintaining the low-level greenhouse gases emissions from energy production sector and developing low carbon policies in order to prevent the increase of greenhouse gases emissions from other sectors of the economy.

All sectors need to contribute to the low-carbon transition according to their technological and economic potential. The EU Low Carbon Economy Roadmap calls for actions in all main sectors responsible for Europe's emissions – power generation, industry, transport, buildings, construction, and agriculture - and significant investments need to be made in:

- New low-carbon technologies
- Renewable energy
- Energy efficiency and
- Grid infrastructure.

An initial inventory of potential NAMAs (**N**ationally **A**ppropriate **M**itigation **A**ction) in Albania was established with UNDP support (2013- 2014).

**National Strategy for the Climate Change (2019-2030)**

The National Strategy for the Climate Change (2019-2030) is aligned with the following key documents:

- Obligations under the Energy Community
- National Strategy for Development and Integration – 2015-2020 (Albanian Council of Ministers, 2017)
- Albania's Economic Reform Programme (2020-2022)
- Albanian Renewable Energy Source Action Plan (NREAP) Draft of 2019
- Third National Communication of the Republic of Albania under the United Nation Framework Convention on Climate Change (Tirana June 2016)
- The first National Determined Contribution (NDC) document pursuant to the achievement of the UNFCCC target, approved by DCM No. 762, dated 16.9.2015
- The National Consolidated Renewable Energy Action Plan (NCREAP 2019 – 2020) (DCM No. 580 dated 31.7.2018)

Most important policy measures are key laws creating the enabling framework conditions to increase the number of renewable energy plants for generating electricity (see next chapter "Dimension Decarbonisation – Renewable Energy).

### *Dimension Decarbonisation – Renewable Energy*

Albania's RES Plan is the key policy and is harmonized in terms of goals, energy sector details and timeline with a number of other strategic and legal documents that are in force, adopted or drafted, as shown in the tables below.

| **Albanian legislation** | **EU Directive** | **Status quo** |
|---|---|---|
| The Law No. 7/2017, On the Incentives for the Use of the Renewable Energy Resources | Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources | → This law is partially approximated with the Directive 2009/28/EC of the European Parliament. It entered in full force and effects late in February 2017.<br>→ This law sets out several incentives for the operators producing the energy from renewables, as well as it envisages the right to apply with and obtain from ERE the guarantees of origin for each 1MWh of renewable energy produced.<br>→ The law is relatively new and lacks important secondary legislation necessary for its application. |
| Law No. 9876, dated 14.02.2008 amended "On production, transport and trade of biofuels and other renewable fuels for transport" | Directive 2003/30/EC | → Directive has been repealed in EU and in the Energy Community, replaced by Directive 2009/28/EC; the Law no 7/2017 does not include relevant Articles (17 to 21) related to biofuels. The existing law on biofuels or a new law should be adopted in order to comply with the provisions of the new EU Directive 2009/28/EC on biofuels and address issues of measures to reach biofuel target, sustainability verification scheme and body etc. |

| | | |
|---|---|---|
| | | →The draft law 2019 ”On production, transportation and trade of biofuels and other renewable fuels for transport” applies to the activities of production and use of biofuels and other renewable fuels used for internal combustion engines in transport, where the biodiesel and bioethanol levels are in accordance with Albanian standards. Starting from 2020 the minimum annual quantity of biofuels and other renewable fuels for transport in the market shall be not less than 10% of the amount consumed by transport in 2018 and 2019; biofuels produced from waste, non-food cellulosic materials and the resulting non-waste cellulosic materials shall be half the target level set for other biofuels. |
| | | Law No. 43/2015, dated 30.04.2015 “On power sector” sets out the main principles for the energy sector development, including RES power plants and the transmission and distribution networks. Law transposes the EU Directive 2009/72 on electricity and repealing the previous law on electricity (Law no. 40/2015, dated 22.05.2003). This law also includes the requirements and criteria for granting a license to carry out an activity in energy sector. The law also includes a number of specific provisions regulating the construction of a direct line or of a commercial interconnection line. |

**Table 3: Aligning Albanian Energy Legislation with Energy Community and EU Directives for RES**

| **Renewable Energy Indicators** | **Transposition Assessment** | **Implementation Status** | **Descriptions** |
|---|---|---|---|
| National Renewable Energy Action Plan | √ | 94% | Albania amended its National Renewable Energy Action Plan incorporating a revised target of 490 MW for solar PV and 150 MW for wind to contribute to the 38% target in 2020. High dependence on hydropower has taken its toll on the renewable energy share, which has decreased to 34,6% due to low hydrology in 2017. |
| Quality of support schemes | ~ | 82% | The first renewable energy auction for 50 MW of solar PV conducted at the end of 2018 needs to be concluded and the contractual package adopted. Albania must improve the framework for the next rounds of auctions. |
| Grid integration | √ | 55% | Secondary legislation to implement access to and operation of the networks has to be finalized and made available to all applicants. Transitional balancing rules are in place. The adopted rules for self-consumption remain to be implemented in practice. |
| Administrative procedures | ~ | 50% | The administrative procedures for authorization, permitting and licensing are not streamlined and require simplification, including the designation of a one-stop shop for small projects. |

| | | | |
|---|---|---|---|
| Renewable energy in transport | X | 1% | A sustainability regime for biofuels is still not in place. |

**Table 4: Renewable Energy Implementation (Source: Annual Implementation Report 2018/2019 Energy Community Secretariat 1 November 2019, page.23/24)**

The Albanian Government and ERE are reviewing by-laws, with the aim of meeting the requirements of the new laws on energy sector[5], including a number of adopted by-laws provided below:

- DCM No. 480 dated 31.7.2018 "On the National Strategy of Energy 2018-2030".
- DCM No. 580 dated 31.7. 2019 "On approval the National Consolidated Renewable Energy Action Plan (NCREAP 2019 – 2020)" sets a target of 38% Renewables until 2020.
- DCM No. 822, dated 7.10.2015, "On approving the rules and procedures for the construction of new capacities of electricity generation, that aren't subject to concession".
- DCM No. 369, dated 26.4.2017, "On approving the methodology for determining the purchase price of electricity produced from small renewable sources of sun and wind".
- DCM No. 349, dated 12.6.2018, "On adopting of support measures to promote the use of electricity from renewable sources of sun and wind".
- DCM No. 858, dated 4.11.2020, amended legal basis for the development of hybrid auctions "Some changes and additions on Decision no. 349, dated 12.06.2018".
- Decision of the Council of Ministers no.198, dated 3.3.2021 on the establishment of the Renewable Energy Operator, which will act as another body to the Contract for Difference (KpD) for all priority producers of electricity from renewable sources and producers benefiting from feed in support tariff (FIT).
- Order of Minister no.27, dated 18.01.2021 adopting the strategy to transform the FIT support scheme into a CfD support scheme for renewable energy has been developed and reviewed by the Energy Community. This strategy will help to create a plan for transforming the current FIT scheme into a market-based support scheme.
- DCM No. 416, dated 13.05.2015 "On approval of the general and special conditions, accompanying documents, term of validity, application forms for authorization and permit, procedures for the revision of decision-making process and forms of authorization of permit for the use of water resources", which defines the specific conditions and procedures for reviewing and decision-making to grant an authorization or permit of use of water resources, including the use of water for construction of hydropower plants.
- Decision of ERE No. 120, dated 27.07.2017 "On the determination of prices of electricity produced by small plant PV with installed capacities up to 2 MW and by wind with capacity installed to 3 MW".
- DCM No. 27, dated 17.1.2018, "On the approval of the methodology for determining the purchase price of electricity produced by small generators with renewable sources of biodegradable solid waste using industrial, urban and rural waste"
- It is under preparation the regulation on "Methodology for calculating the electricity price for self-producers that benefit from the Net Metering Scheme", based on the order of Minister of Infrastructure and Energy No. 3, dated 20.06.2019 "On the approval of the procedure for the authorization of connection to the distribution grid of the small renewable self-producers by the sun".
- The Energy Regulatory Authority (ERE) approved by Decision of the Board of Commissioners of ERE no. 229, dated 20.12.2019 "Regulation on the issuance, transfer and cancellation of

[5] Law No. 43/2015 "On Power Sector", which was approved by the Albanian Parliament in April 2015;
Law No. 124/2015 "On Energy Efficiency", which was approved by the Albanian Parliament in November 2015;
Law No. 7/2017 "On Renewable Energy Sources", which was approved by the Albanian Parliament in February 2017.

guarantees of origin for electricity produced from renewable sources" for the purpose of exchanging renewable energy, to achieve the objectives in other countries that can invest in RES.

The Energy Strategy addresses new laws, regulations and institutional reforms currently underway in Albania, including incentives for EE and RES, electricity tariff reform, market development and integration with EU and regional markets.

### *Dimension Energy Efficiency*

The key policy document is the Albanian Energy Strategy. It defines the objectives and targets to increase the security of energy supply by diversification of electricity production, reduction of the level of technical and non-technical losses of power the network, increasing the EE in the whole energy system, by increasing the share of RES based on least cost planning followed by the reduction of the amount of energy imported, energy intensity improvement and GHG emissions reduction.

Policy documents and key laws create the enabling environment for the implementation of energy efficiency measures shown in the table below.

Revising the EE law and development of by-laws is an important policy measure as it facilitates the implementation of the legislation.

| Current energy policies | Law/DCM | Description |
|---|---|---|
| **Policy and Legislation in place** | | |
| National Strategy of Energy | No. 408 dated 31.7.2018 | Setup objectives and targets for all energy sector, investments, and responsible institutions |
| "On some amendments and additions of Law no. 124/2015 "On energy efficiency", as amended | Law no. 28/2021 | The aim is the full approximation with the provisions of the Directive 2012/27/EU of the European Parliament. |
| Law "On energy efficiency" | No.124/2015 dated 12.11.2015 | Partly Transposition of EE Directive 2012/27/EU.<br>The purposes of the law are:<br>a) drafting national rules and policies for the promotion and improvement of energy efficiency with the aim of saving energy and increasing security of supply as well as removing barriers to the energy market;<br>b) setting national energy efficiency objectives;<br>c) increasing the competitiveness of operators. |
| Law "On the energy performance in buildings" | No. 116/2016 dated 10.11.2016 | Transposition of Directive 2010/31/EU (EPBD)<br>This law aims to create the legal framework for improving the energy performance in buildings keeping into account the local and |

| | | |
|---|---|---|
| | | climatic conditions of the country, interior comfort of buildings and cost effective.<br>Secondary legislation not yet fully in place. |
| Law on "Energy consumption Information and on other products related to the energy" | No. 68/2012 | Needs to be recast according to the new EU Eco-design and Labelling Policy (Eco-design Directive 2009/125/EC and Energy Labelling framework Regulation EU 2017/1369) |
| Second and Third National Energy Efficiency Action Plan for Albania, 2017-2020 | DCM No. 709 of 01.12.2017 | The document aims to provide an overview of the implementation status and future policy plans and financial mechanisms for energy efficiency due to match the objectives for energy savings at final energy consumption by 6.8% by 2020 vs base scenario. |
| "For the approval of the Transport Strategy and Action Plan 2016-2020" | DCM No. 811 of 16.11.2016 | The main goal of the strategy is to have an efficient transport system which promotes economic development and upgrades the citizens' quality of life. The overall objective of the National Transport Strategy and Action Plan 2016-2020 is to (i) further develop Albania's national transport system, and in addition; (ii) to significantly improve its sustainability, interconnectivity, interoperability and integration with the international and European wider transport system and region. |
| The Sustainable Transport Plan, "On approval of the Sectorial Strategy of Transports and the Action Plan 2016-2020" | DCM No. 841 of 16.11.2016 | The main goal of the strategy is to create basis for an efficient transport system which promotes economic development. |
| **Secondary legislation in place for EE in buildings and industry** | | |
| "On the approval of the regulation on the categories, conditions, qualification and experience requirements for certifying of energy auditors" | DCM No. 407 of 19.6.2019 | According to Directive 2010/31/EU (Energy Performance of Buildings Directive - EPBD) |
| "On the approval of categories, conditions and requirements of qualification for energy manager" | DCM No. 342 of 22.5.2019 | According to Directive 2012/27/EU (Energy Efficiency Directive - EED) |
| "On the approval of the methodology for calculating the optimal cost levels for the minimum energy performance requirements in buildings, units and building elements" | DCM No. 256 of 27.3.2020 | New adoption according to Directive 2010/31/EU |

| | | |
|---|---|---|
| "On the Criteria and procedures of selection and the amount of certificates to be verified, as well as the process of supervising the energy performance certificates" of buildings " | DCM No.934, dated 25.11.2020 | According to Directive 2012/27/EU (Energy Efficiency Directive - EED) |
| "On the procedures and conditions of energy performance certification of buildings and the model, content, conditions of registration of "Certificate of energy performance" of the respective buildings". | DCM No.958, dated 02.12.2020 | According to Directive 2012/27/EU (Energy Efficiency Directive - EED) |
| DCM "On the National Methodology of calculating energy performance in buildings adopted by 24th December 2020. | DCM No. 1094, dated 24.12.2020 | According to Directive 2012/27/EU (Energy Efficiency Directive - EED) |
| "On the minimum criteria of energy performance in buildings" | DCM No. 537, date 08.07.2020 | According to Directive 2010/31/EU (Energy Performance of Buildings Directive - EPBD) |
| "On technical rules for labelling energy consumption by air conditioners" | DCM No. 65 of 21.10.2015 | |
| "On the approval of the technical rule" On the labelling of washing machines for household use in relation to energy consumption" | VKM No. 928 of 19.12.2012 | |
| "On the establishment of the State Inspectorate of Market Surveillance (SIMS)". | DCM no. 36 dated 20 January 2016 | |
| **Legislation under development** | | |
| National Energy Efficiency Action Plan 2017 – 2020 needs to be developed for the period 2021-2030. | | The NECP will define the relevant targets for energy efficiency and GHG emissions for the period 2021 – 2030. |

**Table 5: Policies and key laws related to the EE dimension, including Energy Community and EU legislation**

The document related to the Energy strategy and defining the targets for increasing energy efficiency by 2020 is the 2nd and 3rd National Energy Efficiency Action Plan (NEEAP) for Albania 2017-2020, approved by DCM No. 709 of 01.12.2017**.** NEEAP has described and estimated EE measures to be undertaken, investments, responsible institutions, power companies, private sector and different actors, etc., concerning energy savings, energy-saving costs, CO2 emission impact and the cost-effectiveness of intervention packages. The National Energy Efficiency Action Plan 2017 – 2020 will be updated for the period 2021-2030 as an integral part of the National Energy and Climate Plan (NECP) 2021 – 2030. The 2nd and 3rd NEEAP of Albania envisaged a plan for the development and implementation of a suit of energy efficiency policy measures at the generation, transmission, distribution, and consumption side of energy sources in all economy sectors. Distinctly three sectors will be in focus for EE measures: Buildings, power sector (electricity generation, transmission, and distribution), and the transport sector.

**The target defined for energy savings in Final Energy Consumption for 2020 is predicted by 6.8% or 123. 72 Ktoe compared to the base scenario for the same year 2020**.

Specifically, energy savings targets by sectors at Final energy Consumption are estimated to be as shown in the table below.

| Sectors by year 2020 | Ktoe |
|---|---|
| Buildings | 37.43 |
| Services | 16 |
| Industry | 6.9 |
| Transport | 49.49 |
| Horizontal | 13.9 |

Table 6: Final Energy savings by sector

**Some developments and implementation of EE measures at primary energy and final energy consumption level**

Due to the investments planned and realised from Albanian power companies for strengthening of power capacities for transmission and distribution, and efficiency increasing of the grids (less technical and non-technical losses in both Transmission and Distribution), the situation has been already improving regarding the reduction of technical losses and increasing the collection of electricity bill payments (non-technical losses).

According to ERE annual report, **OST** has been undertaking some investments resulting in an improvement from 2.3% losses in 2013 to 2.12% losses in 2019. OST is going to continue investments for improvement of the grid. (www.ere.gov.al, annual reports)

Specifically, at **OSSHE** there is in place DCM No. 763 of 20.12.2017 "On some amendments to DCM No. 1086 of 14.12.2013 "On the set up of the Task-Force for the improvement of the bill collection rate and lowering of losses in the power distribution network". This DCM extended the activity of the Task-Force from 31.12.2017 until 31.12.2019, in order to improve the level of collection and reduce the non-technical losses in the electricity distribution system. OSHEE S.A. is steadily improving its performance on reducing the electricity losses and increasing the bill collection rates. (www.ere.gov.al, annual reports)

The results achieved are shown in the table below.

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|
| **Bill collection rate** | 81.04 | 92.69 | 100.65 | 93.50 | 96.60 | 101.9[6] | 98.4 |

Table 7: Bill collection rate in 2013 – 2019 (in %) (*Source: Energy Regulatory Authority (ERE annual reports)*

[6] More than 100% collection rate: Backward bill collecting of the period 2007-2017 (partly uncollected in the previous years)

Some other progress and developments achieved with regard to the EE at final energy consumption level are described below, based on the 2nd annual report from AEE.

In the building sector, activities have started and need to be widely rolled out:

- The Project "On Energy Auditing of Public Buildings" contracted from the MIE under the state budget as foreseen in the Mid-Term Budgetary Programme 2018 – 2020 aims at:
    - Creating an inventory of public building stock and to place data on a server of the Energy Efficiency Agency by naming and codifying them in the national electronic register, capable of integrating and allowing its own data to be integrated into the servers and databases of the Albanian Agency for Information Society (NAIS);
    - Auditing the entire stock of buildings for three years and to register it on the server with the data related to the cost's effective analysis of their renovation. During 2018, 60 buildings have been selected representing all the identified typologies, providing the necessary information to draft energy efficiency policies taking cost effectiveness into account.
- The project for improving the Energy Efficiency in the Student City 2 has been completed and in some buildings in Student City 1.
- The Municipality of Tirana has developed projects to improve the energy efficiency by interfering with the facade of several private buildings. These projects are carried out with the investment of jointly, 50% from the fund of the Municipality of Tirana and 50% from the residents.
- In the transport sector, measures for the rehabilitation and reconstruction of some streets help to reduce the fuel consumption of the vehicles. Increasing the use of bicycles and increasing the share of public transport has facilitated to reduce the use of private vehicles. A tax was induced to promote the use of new and less fuel consuming vehicle causing less emissions. Nevertheless, EE measures must be significantly expanded.
- Little progress was achieved in the industry sector. The need for the improvement of the EE law concerns the obligation schemes and energy audits as a key element for identification of the actual energy consumption and energy targeted to be consumed after investing in EE measures implementation.

Recently, AEE issued the 4th annual report with some new findings:

- The most important activity of this year was the certification of the first energy efficiency auditors. The agency tested the candidates on 21 May 2020, and 26 experts are now certified as energy auditors in buildings and processes. Currently, the AEE is receiving the first audit reports.
- Smart Energy Municipalities is a project financed by the Switzerland Embassy. The objective of this bilateral project is to support selected Albanian municipalities to manage energy in a sustainable manner and to implement the national energy policy at a local level. To this end, it will pilot and institutionalize an energy management system that is based on the European Energy Award (EEA) and incorporates the requirements of the national energy legislation. The project contributes to improve energy management, reduce energy consumption, to mitigate climate change, and to promote sustainable economic development.
- Interreg IPA II Cross-border Cooperation Programme Greece-Albania 2014-2020. The objective of the project is the implementation of small-scale nZEB (nearly zero energy buildings) investments and the development of a joint approach towards public nZEBs through smart initiatives and the establishment and operation of energy communities in the eligible area. The main outputs are:
    - Output 1: Detailed application studies for nZEBs with EE applications and cost-optimal measures for upgrading demonstrative public facilities to nZEB buildings in 3 regions of the cross-border area (Arta, Gjirokastra, Western Macedonia)
    - Output 2: Implementation of the aforementioned small-scale investments.
    - Output 3: Establishment of a joint approach that will facilitate dialogue, derive common

initiatives, develop a common procedure and facilitate the energy communities' operation and implementation of nZEB investments in the cross-border area.
    - Output 4: Dissemination actions for supporting the penetration of nZEBs in the area through a website, social media and an on-line platform, communication / dissemination materials, local thematic workshops in the 3 regions, media press conference.
- On 25 November 2019, under the REEHUB project in collaboration with the University "Marin Barleti", the MIE, and the AEE, the Regional Center for Energy Efficiency was opened. This project aims to increase the energy efficiency of the public buildings inside the Programme area, through a network of hubs, enabling the training of building managers on energy-efficiency measures. In addition, the project aims to guarantee suitable and effective communication to consumers and awareness-raising at all levels of society. The ambitious result is to shift from old buildings to low-energy or zero-energy buildings.
- On 20 February 2020 in Tirana was signed the memorandum of collaboration between the Agency for Energy Efficiency and GSE SpA (*Gestore dei Servizi Energetici*). They should collaborate to favour joint activities and European projects focused on capacity building initiatives, exchange of know-how and best practices, ad hoc seminars, study tours, workshops, trainings and demonstration projects in the renewable energy and energy efficiency sectors including the innovative technologies related to smart grid and smart metering projects.

The Law No. 124/2015 on Energy Efficiency is currently amended to introduce requirements of the Energy Efficiency Directive (incl. article 5 and article 7), through the Law no. 28/2021"On some amendments and additions of Law no. 124/2015 "On energy efficiency", as amended.

Central Government buildings (Article 5 EPBD)

According to the law No. 116/2016 "For Energy Building Performance", Article 10 C, all buildings with a usable area of over 500 $m^2$ are addressed that are in use by a public authority or by institutions providing a service to the public and are frequently used by the public.

Starting from 9 July 2018, the demand for the above boundary of the usable area is reduced to 250 $m^2$. In this case, energy performance certificates should be placed in places clearly visible to the public.

On 17 December 2019 was successfully completed the process of technical evaluation of bids for the design of the project of reconstruction with Energy Efficiency of the buildings of "Student City No. 1" in cooperation with KfW. This is a big investment that has started earlier in 2017 with the rehabilitation of "Student City No.2".

Energy efficiency obligations (Article 7)

The private residential and building sector in Albania is benefiting from a fund of €6 million loan that the EBRD is providing to Albania's Union Bank. Also, other financing mechanisms in Albania like "Besa" Fund are benefiting from EBRD loan. This financing is provided under the EBRD €85 million Western Balkans Green Economy Financing Facility (GEFF).

In 2018, the municipality of Tirana has provided a fund of €565'000 that is an incentive for the citizens who want to invest in energy efficiency. The municipality grants a part of the investment.

It is important to note that specific measures in the NEEAP may be subject to updates up to 2030, to full regulatory impact assessments, to estimate net costs for their implementation, both for the public and private sectors. This means the measures provided in this document will have concrete development plans for further interventions, which will provide more concrete data on their implementation.

The National Strategy for Energy (NSE) 2018–2030 has defined the key institutions and power sector companies in Albania, responsible for its implementation:

- Government and regulatory actors, which include government bodies - ministries, the regulator,

agencies to whom ministries delegate specific sector responsibilities;

- State owned companies, such as KESH, OST, and OSHEE, which are currently major players in the energy sector in Albania and specifically in relation to the EE investments;
- Municipalities for their specific duties which concern and relate to the EE measures implementations.

The MIE, together with ERE, NANR, and the AEE are responsible for monitoring and ensuring an efficient implementation of the Energy Strategy for all relevant sectors. In the case of EE implementation, AEE has the duty to submit the annual report to the MIE defining the realization of the EE measures in quantities and qualities, level of the realized investments, barriers and reasons behind them, the way of overcoming them, so that energy savings, emission reduction and the remaining targets are achieved.

AEE is the responsible institution for the Monitoring and Verification of energy savings achieved under the NEEAP.

### *Dimension Energy Security*

The targets of the security of energy supply have been outlined in country strategic plans and government decisions for their implementation. The government policy to increase security of energy supply is based on:

1. diversification of energy sources and fuels,
2. sufficient and decentralised energy production systems,
3. reliable transmission and distribution systems and networks,
4. well-functioning of energy markets,
5. clear long-term energy policy that encourages investments,
6. energy efficiency.

Albania has no nuclear power plant on its territory, nor is it planning to build one. There is a National Nuclear Agency whose mission is to put in place a system to calculate energy demand for the next 20-30 years.

Albania has two coastal oil and gas terminals: Porto Romano in Durres, and Petrolifera in Vlora. Each has capacity to store liquid petroleum gas, crude oil, diesel, gas, and additional liquids and dry products.

Overview of key laws:

- Strategic Plan for Reform in Energy Sector in Albania (2018-2020), approved by DCM No. 742, dated 12.12.2018, is a roadmap for reforming the entire electricity sector in Albania. It is the basis for the Policy-Based Loan (PBL) for the implementation of the specific Policy Reforms Elements listed in this Strategic Plan.
- National Sector Strategy for Energy 2018-2030, approved by DCM No. 480 dated 31.7.2018
- Master Plan of Natural Gas for Albania, approved by DCM No. 87 dated 14.02.2018
- Albania's Economic Reform Programme (2020-2022) approved by DCM No. 92 dated 05.02.2020, related to energy sector reforms includes the following: (i) liberalizing the energy market, with complete unbundling and a functioning power exchange; (ii) Implementing the law on RES; (iii) Adopting the secondary legislation for the laws on EE and the energy performance of buildings.

The implementation of performance for each area of work indicators is summarised in the figure below and was calculated and compiled by the Energy Community Secretariat. Based on it the overall implementation performance 2018/2019 of Albania is 47%.

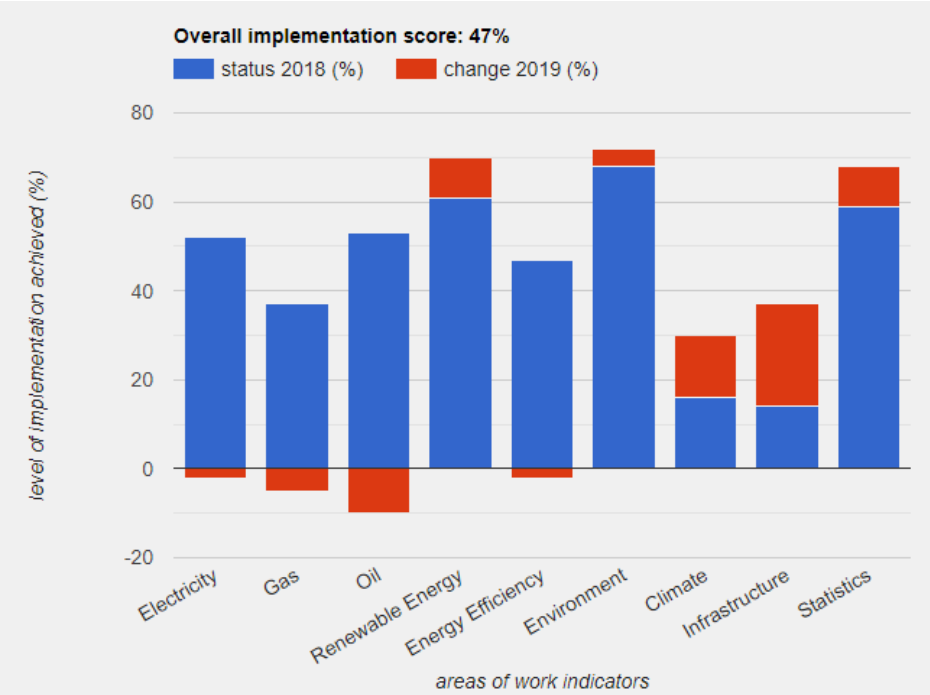



**Figure 9: Overall implementation performance 2018/2019 of Albania (Source: Energy-community.org Status 1 November 2019)**

### Oil - Stockholding obligation

Albania's current emergency oil stockholding system is assigned to the oil industry. According to the Law No 8450 dated 24.02.1999 "On refining, transportation and marketing of oil and gas and their by-products", as amended, and Decision of Council of Ministers No 808 of 5.11.2004 "On the maintenance and management of emergency stocks for oil, gas and their by-products", as amended, the oil refineries and wholesale oil and their by-products companies are obliged to maintain minimum stocks, equal to 90 days of average sales, which is calculated based on the actual data results of previous year's operations.

The figure below shows the implementation by oil indicators as calculated and compiled by the Energy Community Secretariat.

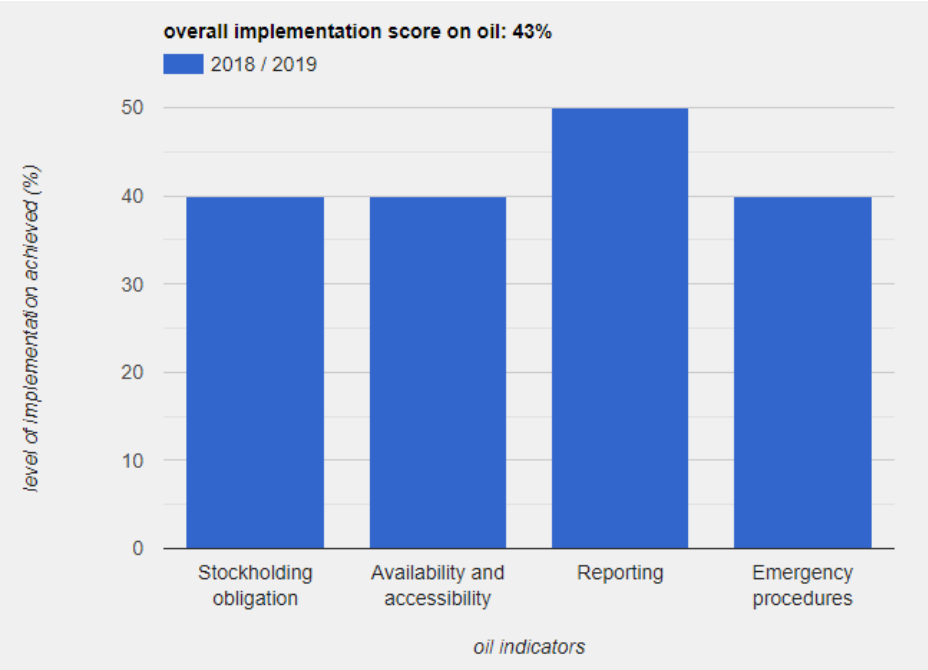



**Figure 10: Implementation by oil indicators (Source: Energy-community.org Status 1 November 2019)**

However, the current system is not compliant with Directive 2009/119/EC and for this purpose, a working group was set up by the Order of the Prime Minister in December 2013. The draft Law "On the establishment, maintenance and management of security minimum stocks of crude oil and petroleum products" foresees the set-up of the State Agency for Security of Oil Reserves (ASOR), which will be a public body in charge to establish, maintain and manage the security stocks. ASOR is foreseen to be the only body in Albania, which will authorise the purchase, management and sale of the security stocks of crude oil and/or petroleum products, as stipulated in the abovementioned draft Law.

The legal procedure for the approval of the draft Law by the Government started in July 2018. Following the reflection of the preliminary comments of line ministries, the revised draft Law was redistributed for coordination to these institutions and the Competition Authority, in order to prepare a final version. Currently, the representatives of different institutions are discussing the Law in order to reach a final draft, which should then be approved by the Government and afterwards by the Albanian Parliament.

Specific stocks

In Albania, no specific stocks are currently in place. However, the new draft Law on Emergency Oil Stockholding foresees that the Government may decide on the specific stocks constitution as part of the compulsory stocks and the list of hydrocarbon energy products to be used, the level of specific stocks and the duration of the obligation to maintain specific stocks. According to this draft Law, the establishment and maintenance of the specific stocks has affected at least one calendar year.

Availability and accessibility

In Albania, the new draft Law foresees that "compulsory stocks maintenance is a priority and compulsory stocks must be available and physically accessible at all times". A part of the compulsory stocks may be stored in the Member States of the European Union and / or signatories to the Energy Community Treaty, subject to a bilateral agreement between the Government and the state in which the compulsory stocks shall be stored. Compulsory oil stocks that are owned by the Government must be insured at all times. Economic operators are responsible for any losses of stocks and damages to third parties and the environment.

The Government shall ensure that there are no obstacles to the transfer of the compulsory stocks from the territory of Albania to another state with which such a bilateral agreement has been concluded.

Reporting

In Albania, the draft Law foresees that the Minimum Oil Stocks Agency will keep and continually update detailed records of all stocks that it holds and also all others that are maintained in the territory of Albania and in third countries under the bilateral agreements. Albania submits regularly the Joint Organizations Data Initiative - Oil (JODI) Questionnaire.

Emergency procedures

The new draft Law establishes the necessary procedures for intervention in case of a serious shortage of petroleum products in the market. In the event of difficulties in supply, the release of the stocks is decided by the Government, upon the proposal of the minister in charge of energy and approval of the crisis management committee of the Government. In the event of an effective international decision to release the compulsory stocks, the Government is entitled to decide on the release of the stocks as fulfilment of its international obligations. According to the draft Law, the rules and procedures for drafting the National Response Plan, including the determination of the market price and use of the security stocks, shall be defined by the Government. In such a case, the Ministry of Infrastructure and Energy notifies the governmental decision immediately to the European Commission and the Energy Community Secretariat.

Number of days of oil stocks in Albania

According the Law No 8450 of 24.02.1999 "On refining, transportation and trading of oil and gas and their by-products", as amended, and Decision of Council of Ministers No 808 of 5.11.2004 "On the maintenance and management of emergency stocks for oil, gas and their by-products", as amended, the oil refineries and wholesale oil, natural gas and their by-products companies, are obliged to maintain minimum stocks, equal to 90 days average sale, which is calculated based on the factual and data results of previous year operations.

| Fuel type | Quantities (in tonnes) |
|---|---:|
| Crude Oil | 58,154 |
| Gasoline (Motor Gasoline) | 21,848 |
| Gas/diesel oil | 188,182 |
| Fuel oil | 2,115 |
| Liquefied petroleum gas (LPG) | 46,473 |
| Kerosene type jet fuel | 3,040 |
| Aviation gasoline | 3 |
| TOTAL | 319,815 |

**Table 8: Quantities of oil stock reserve for crude oil and by-products for 2019 (Source: Ministry of Infrastructure and Energy)**

### Gas - Emergency plan for natural gas

Policy documents:

- Emergency plan for natural gas, in accordance with the minimum supply security standards, and the rules to guarantee secure and effective good supply[7]
- Natural gas sector development plan in Albania and identification of priority projects[8]

7 Approved by DCM No. 417, dated 10.5.2017, based on the law No. 102/2015, "On the natural gas sector".

8 Approved by DCM No. 87, dated 14.2.2018 based on the Law no.102/2015 "On the natural gas sector".

Respective DCMs provide more detailed information: Decision of Albanian Government No. 417, dated 10.5.2017 on the approval of the emergency plan for natural gas, in accordance with minimum standards for safety supply and rules for safe and effective supply with natural gas.

The National Emergency Plan for natural gas defines the standards related to the minimum requirements suitable for the security of natural gas supply in the Republic of Albania, the mandatory criteria for ensuring reliable and efficient supply of natural gas as well as the duties and responsibilities of institutions for managing emergency situations in gas supply to customers.

The Emergency Plan, specifically includes:

- Determine standards for minimal requirements for safety supply;
- Instruments and measures to guarantee an adequate and clearly defined supply of gas for protected customers, in accordance with supply safety standards;
- Instruments for prediction and assessment of potential risks, which clearly set out actions to prevent these risks and measures to mitigate possible damages related to them;
- A program to reduce or stop the supply of natural gas to specific categories of customers in the event of a crisis situation;
- The role and responsibilities of gas provider companies and non-household consumers, taking into account the various impact measures in case of a crisis in the natural gas sector;
- Criteria regarding storage plants, in order to meet supply safety standards, as well as possible contributions for storage plants located either in the Republic of Albania or in another contracting party in the Energy Community, or member country of the Union European;
- Important measures and actions to be taken to eliminate or mitigate the impact of a natural gas supply outage, in accordance with different levels of crisis.

**Assessing the impacts of policies and measures,** Albania is at a moderate stage of preparation on security of supply. Qualitative indicators are displayed below.

1. Gas supply framework

The existing gas network is outdated and mostly non-operational. Its domestic natural gas production is marginal, of which the majority is consumed for own use in oil production and by the refining industry.

On hydrocarbons, Albania has not aligned its legislation with the Hydrocarbons Licensing Directive, but there has been some progress with its secondary legislation. The Directive on safety of offshore oil and gas installations has not been transposed. In February 2018, the Albanian government adopted the ‘gas master plan’, which assesses investment needs until 2040. In May 2018, Albgaz SA, the combined gas operator in Albania, was admitted as an observer at the European Network of Transmission System Operators for Gas. Albgaz should continue with permanent capacity building to be prepared for operation of future gas infrastructure.

2. Electricity supply framework

In the coming years, Albania should in particular pursue the transition process towards diversification away from hydropower and promote alternative sources of renewable energy while complying with environmental standards.

3. Emergency and crisis management system and demand restraint programs

Albania’s oil-stock legislation is not in line with the Acquis. There was no progress in creating a central stockholding body for oil. The country is working in implementation of a model for an emergency oil-stock reserve and for a law on the minimum stocks of crude oil required for security of supply.

Albania must complete the alignment with the Acquis on minimum oil stocks of crude oil and/or petroleum products. It must also amend its emergency oil-stock model.

## 4. Energy

The national energy strategy 2018-2030 was adopted in 2018. The gas master plan was adopted by the government in February 2018. Further efforts need to be made to adopt the SEA and project identification plan related to the gas master plan. Adoption of this SEA and plan will help the development of TEN-E projects. Progress was made on improving the infrastructure for power transmission. The trans-Adriatic pipeline is progressing on schedule, with 84.1% of the project completed by the end of 2018. The pipeline is expected to be operational in 2020. Major gas interconnector projects are provided for under the gas master plan.

However, Albania failed to transpose and implement the Regulation (EU) 347/2013 on guidelines for trans-European energy infrastructure by 1 January 2017, and in November 2018 the Ministerial Council of the Energy Community adopted a decision establishing a breach of Albania's obligations under the Energy Community Treaty.

### *Dimension Internal Energy Market*

On the internal energy market, Albania has adopted legislation on gas and electricity in line with the EU's Third energy package.

In March 2017, the Albanian Energy Regulator Entity (ERE) approved the certification of OST SA as the transmission system operator, following a positive opinion from the Energy Community Secretariat. The ENTSO-E assembly therefore admitted OST SA as a full member of the network. Progress has been achieved in the legal unbundling of the distribution-system operator OSHEE SA from its supply activity.

Electricity prices are still regulated but should be gradually liberalised. On May 2019, the Government of Albania adopted a decision to establish a power exchange, with day-ahead and intraday markets. The electricity market remains closed by a regulated contract between state-owned generation and supply companies.

**Power Sector**

The Power Sector Law deregulated the prices for electricity generation and wholesale in 2015. However, the wholesale market is not yet fully liberalized. The distribution system operator and supplier OSHEE is still obliged to buy all the electricity that is required to supply customers under universal service and cover losses in the distribution system from the generation company KESH under an exclusive mutual contract and regulated conditions, based on the Council of Ministers' Decision on public services in the electricity sector. This is in breach of the Energy Community Acquis and represents a major obstacle to the development of competition in the wholesale market in Albania. The contract between KESH and OSHEE was prolonged in March 2019, however, without the approval of ERE.

Albania's electricity sector is characterized by a market structure in which most of the energy procurement is dominated by bilateral transactions for large customers, while most of the other customers and the retail market remains operated under a regulatory regime. Positively, the unbundling of operations and interests is underway, and the one positive aspect in the transmission ownership was adopted by law in 2016.

The Market Rules for operation of the electricity market following the Market Model and including organized day-ahead and intraday functions were adopted by ERE in December 2017. Also, a law for a market-based procurement of balancing was approved.

The figure below shows Albania's electricity market scheme as of July 2020.

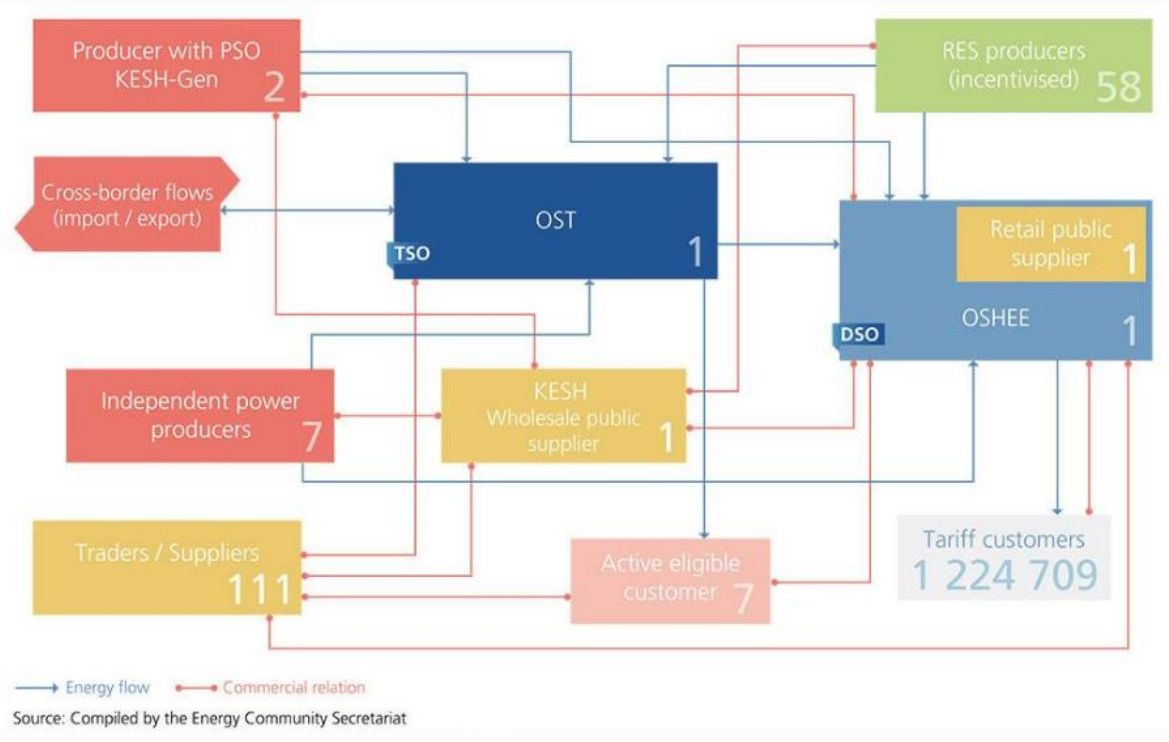



**Figure 11: Albania's electricity market scheme (Source: Energy Community Secretariat)**

The establishment of a day-ahead market has been delayed. The Council of Ministers decided on the establishment of APEX, as a separate legal entity established by the transmission system operator OST with initial capital fully financed by this company, in May 2019. The Decision also provides for the possible entry of shareholders other than OST through a competitive procedure and outlines the domain of shareholders and structure of the capital. In its related Decision of 11 September 2019, the Council defined the detailed procedure for the selection of shareholders in APEX and allocated responsibilities to the relevant ministries and the selection committee. The Council defined the bidding and selection criteria, procedures, and requirements for each individual category of potential bidders from the EU and the Energy Community, including transmission system operators, international market operators, market participants and international financial institutions. The minister responsible for energy shall initiate the competitive selection procedure however the deadline for its initiation is not defined.

The Market Rules for operation of the electricity market following the Market Model and including organized day-ahead and intraday functions were adopted by ERE in December 2017, their full implementation being conditioned by the establishment of APEX.

The final balancing rules that would allow for the full implementation of the requirements of the Law for a market-based procurement of balancing services have not yet been adopted. The transitional balancing rules, adopted by ERE in November 2017, are still in force. Imbalances are settled using reference hourly prices from the Hungarian day-ahead market. Although the rules allow new entrants to the balancing market and potential balancing service providers are available, KESH is still the sole provider. The Law and the Market Model support the possibility for the transmission system operator to exchange balancing services, under market-based conditions, across the borders. This possibility has not been implemented yet. The figure below shows the implementation by electricity indicators as calculated and compiled by the Energy Community Secretariat.

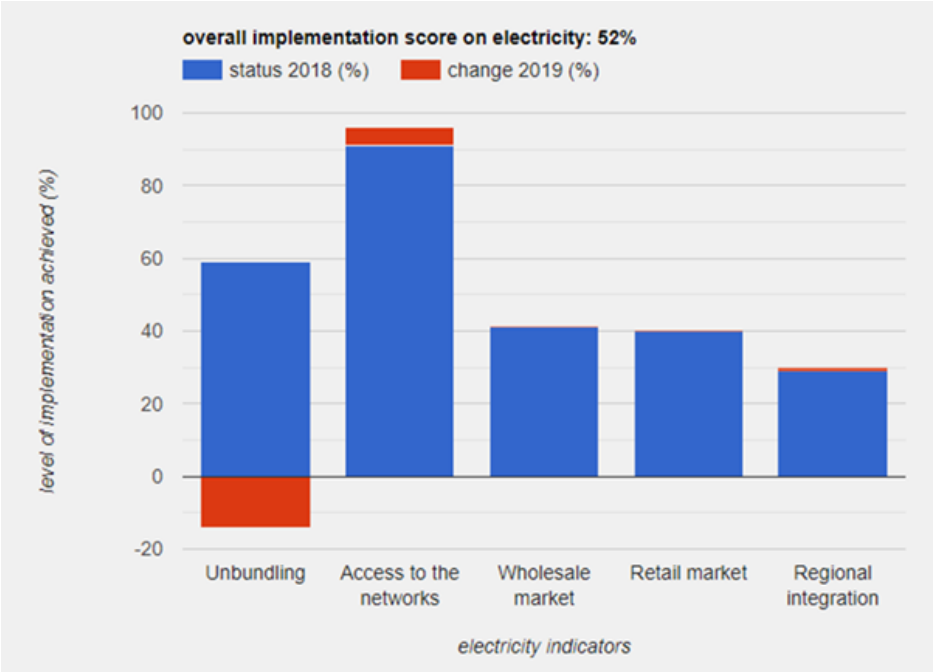



**Figure 12: Implementation by electricity indicators (Source: Energy-community.org Status 1 November 2019)**

In July 2017, ERE adopted rules on publication of basic electricity market data, transposing the Regulation (EU) 543/2013 on submission and publication of data in electricity markets. OST is publishing on its website part of the required data on load, generation, transmission infrastructure and imbalances, while SEE CAO forwards the data on cross-border capacity to ENTSO-E for publication.

**Unbundling of KESH S.A**

Albania has fully implemented the separation of KESH S.A. ownership from the ownership of OST S.A., an obligation under the Third Energy Package.

**Unbundling of OST S.A**

The transmission system operator of Albania (OST) was unbundled according to the Third Package ownership unbundling model and conditionally certified in 2017. Following the Energy Community Secretariat's Opinion 01/2017, the regulator's Certification Decision included the obligation to transfer the competences for investment in OST from the Ministry of Infrastructure and Energy to the new shareholder, the Ministry of Finance and Economy, by March 2018.

**Unbundling of OSHEE S.A**

In 2018, OSHEE established three daughter companies to perform respectively the functions of a distribution system operator, a universal service supplier and a free-market supplier and trader, and obtained the necessary licenses by the regulator, ERE.

**The retail market** remains only partially deregulated, due to the possibility given by the Law to all categories of customers, except those connected to high voltage, to continue to be supplied by the last resort supplier, OSHEE, at regulated prices for a period of two years after the technical preconditions for switching are in place. As a result, most of the customers remain at regulated prices, except for a part of the 35 kV customers. This undermines the eligibility right and the interest of new suppliers to enter the retail market.

The figure below shows the situation regarding Retail Market Opening until 2018.

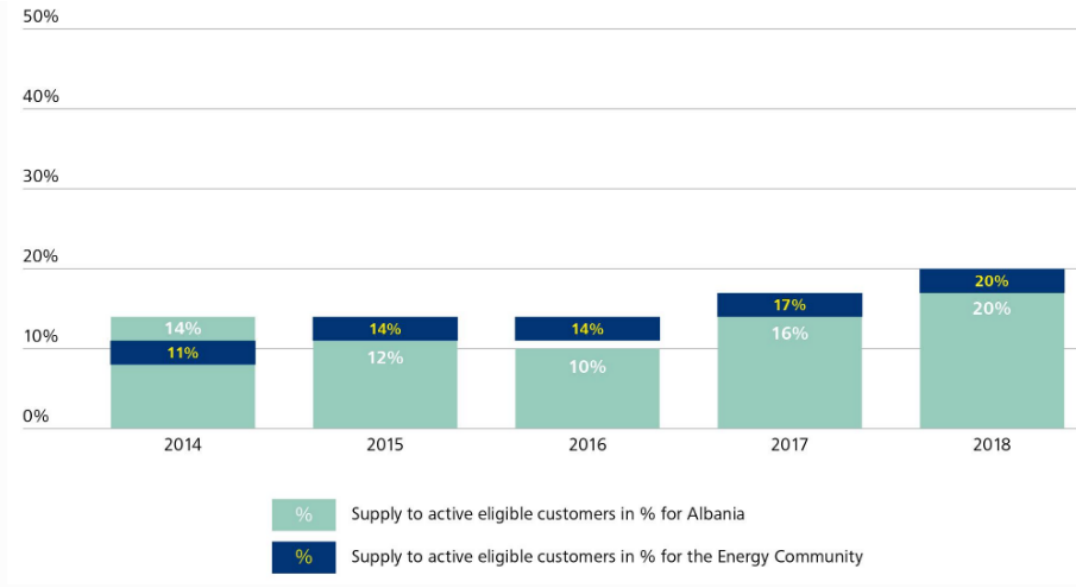



**Figure 13: Retail Market Opening (Source: Ministry of Infrastructure and Energy)**

Vulnerable customers are identified and supported under a legal framework and conditions not related to energy and governed by the Ministry of Social Affairs, which allocates financial support from the state budget. The rules, conditions and mechanisms for compliant support of vulnerable customers, as stipulated in the Acquis and transposed in the Power Sector Law, have not been implemented.

**Gas Sector**

Albania still has no gas market and it is not connected to any international gas infrastructure. However, the basic legislative framework is in place:

- *Law No. 102/2015, dated 23.9.2015 "On natural gas sector", amended by Law No. 64/2018 and Law 89/2018*

The Law No 102/2015 of 23.09.2015 "On the natural gas sector", is fully aligned with the EU *acquis* as reported previously in the first Albanian contribution to the 2016 EC Report on Albania. For the implementation of the Law No. 102/2015 of 23.09.2015 "On the natural gas sector", the following implementing acts are approved:

- Decision of Council of Ministers No. 417 of 10.05.2017 "On the approval of the natural gas emergency plan, in accordance with the minimum security standards of supply, and the rules to ensure safe and efficient supply with natural gas";
- Decision of Board of Commissioners No. 100 of 5.08.2015 "On the approval of the provisions for the certification or the natural gas transmission operator", as amended;
- Decision of Board of Commissioners No. 96 of 17.06.2016 "On the approval of the Regulation on the organisation, functioning and the procedures of ERE";
- Decision of Board of Commissioners No. 114 of 8.07.2016 "On the approval of the Regulation on handling of complaints submitted by clients and resolution of disputes between the license-holders in the electricity and natural gas sector";
- Decision of Board of Commissioners No. 119 of 21.07.2016 "On the approval of the Regulation on procedures for transfer of assets from the licensees";
- Decision of Board of Commissioners No. 34 of 2.03.2017 "On the approval of the Guideline on the criteria to decide the access to premises for the depositing of the natural gas";

- Decision of Board of Commissioners No. 77 of 26.05.2017 “On the approval of the compliance programme of the natural gas transmission system”;
- Decision of Board of Commissioners No. 78 of 26.05.2017 “On the approval of the contract to offer compliance officer services in the natural gas sector”;
- Decision of Board of Commissioners No. 95 of 4.07.2017 “On the approval of the Regulation on conditions and procedures to levy fines and the concrete punishment for each breach in the natural gas sector”;
- Decision of Board of Commissioners No. 97 of 4.07.2017 “On the approval of the Regulation on the procedures for licensing, modification, transfer and removal of licenses in the natural gas sector”.

DCM No. 590, dated 9.10.2018 "On the approval of the natural gas market model"

DCM No. 69/2018, dated 07.02.2018 “On the approval of the conditions and procedures on the determination of the last natural gas supplier”

In October 2018, Albania adopted the Natural Gas Market Model. General rules on the setup of the natural gas market were set and consist of bilateral trading on the natural gas retail and wholesale market, the day-ahead natural gas market and the natural gas balancing market.

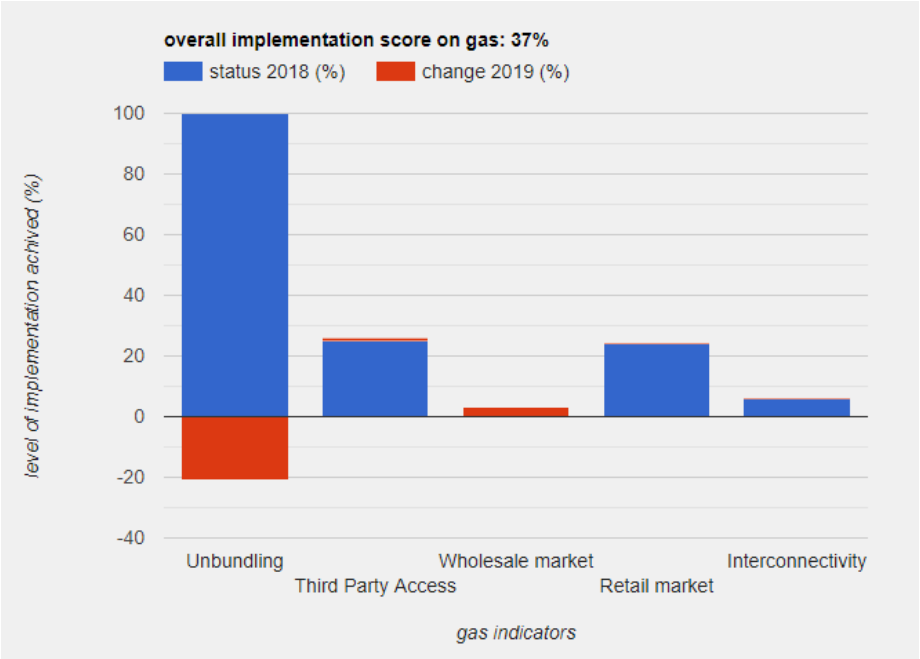



**Figure 14: Implementation by gas indicators (Source: Energy-community.org Status 1 November 2019)**

The gas market model requires the adoption of market-based balancing rules carried out by the transmission system operator. Tariffs for balancing services must be calculated and set in accordance with market-based conditions. A day-ahead natural gas market should be established using a natural gas trading platform allowing anonymous sale and purchase. The establishment of the market requires a decision of the Ministry of Energy and Industry in consultation with ERE and other stakeholders.

Albania’s regulator adopted a transmission tariff methodology for the gas sector in November 2017. An entry/exit methodology was introduced and fees according to the entry/exit model were established by ERE.

Non-discriminatory access to the transmission and distribution networks as well as to LNG and storage facilities is guaranteed in line with the Third Energy Package. A decision of ERE transposed amendments to Annex I of Regulation (EC) 715/2009 as adapted by the Energy Community. The transmission network codes of TAP and Albgaz are in preparation.

In general, the TAP Code contains all specific points and operationalizes some other requirements from the Exemption Decision. For the non-exempted capacities, third party access services offered by TAP, capacity trading and capacity allocation are in line with Regulation (EC) 715/2009, and also to a great extent with the Capacity Allocation Mechanisms Network Code (Regulation (EU) 2017/459).

Albgaz has been receiving technical assistance for capacity building-related development from the EBRD, which is closely working with the Energy Community Secretariat.

The Law on Natural Gas set the eligibility provision for all customers in line with the Third Energy Package. All customers are allowed to choose and switch their gas supplier freely.

Household customers and small enterprises are entitled to regulated gas supplies under public service obligations and the supply of last resort is foreseen for all customers. The majority of requirements under Directive 2009/73/EC with regard to customer protection and vulnerable customers were transposed by the Law. However, the criteria and procedures for determining who qualifies as a vulnerable customer are yet to be adopted by the Council of Ministers. The Natural Gas Emergency Plan was adopted by the Government with the Energy Community Secretariat's assistance.

General rules on procedures for switching of the natural gas supplier and general conditions for the supply of natural gas were adopted by the ERE in July 2018 in line with the Third Energy Package.

The Gas Law of 2015 set the unbundling requirements which are in line with the Third Energy Package. Subsequently adopted certification rules have supplemented these provisions in a proper manner.

Both transmission system operators – Trans Adriatic Pipeline (TAP) AG, operator of the TAP in Albania and Albgaz, the state-owned transmission and distribution system operator, are certified.

Compliance issues with Albgaz's certification decision procedure were the main discussion point in 2018/2019, in particular with regards to the proper separation within the State. The issue will be addressed further by the Energy Community Secretariat in cooperation with MIE and ERE. The adoption of an independent compliance officer was a step in the right direction, but the whole year has passed without any satisfactory solution.

**Competition Law**

The Law on Competition Protection contains provisions corresponding to Articles 101, 102 and 106 of the Treaty on the Functioning of the European Union. During the reporting period, secondary legislation regarding restrictions directly related and necessary to concentrations and damages has been adopted.

The Albanian Competition Authority's (ACA) activities in the energy sector mainly focus on recommendations. However, full compliance with the Treaty's obligation on enforcement of the competition Acquis requires more rigorous enforcement activity by ACA.

Based on a complaint transmitted by the Energy Community Secretariat, ACA investigated potential infringements on the market of storage and deviation of electricity. In its decision, the ACA found that KESH abused its dominant position through the implementation of two contracts with GSA SHPK and EFT AG and obliged KESH to discontinue these contracts.

**System for tendering new generation capacity**

The Decision of Council of Ministers No. 349 dated 12.06.2018 "On the approval of support measures for the promotion of the use of electricity from renewable sources of sun and wind, as well as procedures for selecting projects for their benefit" is in force. This Decision establishes support measures for the promotion of the use of electricity from renewable sources of sun and wind and procedures for selecting projects that benefit from these measures, according to Article 8(1) of Law No. 7/2017 dated 2.02.2017 "On promotion of the use of energy from renewable sources" and the objectives of the Consolidated National Renewable Action Plan 2019 – 2020.

**Regulation (EC) 1099/2008 on energy statistics**

NANR has been compiling an annual energy balance and questionnaires as defined by Regulation (EC) 1099/2008 and submitting annual questionnaires to EUROSTAT. The breakdown of energy consumption in households in accordance with Regulation (EU) 431/2014 amending Regulation (EC) 1099/2008 is reported and transmitted to EUROSTAT.

As regards annual energy statistics, including quality reporting, Albania has implemented the requirements of the Acquis.

The obligations related to the preparation and dissemination of monthly statistics are also assigned to NANR. Preparatory activities for implementation started in 2014, nevertheless, only monthly electricity data are available. Although monthly gas and oil data were transmitted for 2018, information for 2019 is still missing.

The necessary questionnaires and methodologies for the collection of oil statistics as required by the statistics and oil stocks acquis have not been developed yet and data are not published by NANR nor INSTAT. Data submissions to EUROSTAT and the UN Statistics Division are also not taking place.

Submission of monthly data on coal, gas, oil and electricity to EUROSTAT or, as a first step, to the UN has not started yet. Largely due to the lack of human and financial resources, compilation of monthly energy statistics is still not adequate and monthly data are not disseminated as required by the Acquis.

NANR has submitted its first quality report in accordance with Article 5 of the Regulation to EUROSTAT.

## Electricity interconnectivity

Albania's electricity system has been interconnected with the neighbouring systems of Greece and Montenegro since 2014, when the European Network of Transmission System Operators (ENTSO-E) approved synchronous operation of the Albanian electricity transmission system with the continental European system. Electricity distribution losses in the Albanian power grid in 2018 were high at 24.4%, although they were lower than in 2017 when they stood at 27.5%.

Third party access to the transmission system and provisions on congestion management on cross-border lines comply with the acquis. Cross-border transmission capacities on the borders with Montenegro, Kosovo and Greece are allocated via the regionally coordinated platform of the South-East Europe Coordinated Auction Office in Montenegro (SEE CAO).

The tariff methodologies are approved by ERE and in December 2018 ERE approved the tariffs for access to transmission and distribution networks and for universal supply for 2019. The prices remained at the same level as in the previous period. Rules and procedures for construction of direct lines have been in force since January 2017.

A delay in the establishment of the power exchange, ALPEX, has slowed down the initiative for the coupling of the day-ahead markets of Albania and Kosovo.

In March 2019, the transmission system operator, OST, signed a Memorandum of Understanding with the transmission system operators of North Macedonia, MEPSO, and Bulgaria, ESO, on the development of the electricity market and strengthening regional cooperation through mutual assistance. The operators expressed willingness to couple their national day-ahead markets, implementation of which depends on the completion of the 400 kV interconnection between Bitola and Elbasan.

Another market coupling initiative in the early stages is between Albania, Italy, Montenegro and Serbia. The terms of reference for the project, adopted in January 2018, requests functional national power exchanges in all parties, as well as an established legal and contractual framework and a coherent regulatory environment with no barriers to trade, as prerequisites. No concrete roadmap for the implementation of the coupling has been adopted so far.

The allocation of cross-border capacity on the borders with Montenegro, Kosovo and Greece is applied through the regionally coordinated platform of the SEE CAO. The common capacity calculation methodology for the "shadow capacity calculation region 10", which includes Albania, has been developed and its implementation is pending a recommendation from the Energy Community Regulatory Board, to be adopted in the course of 2019. OST has signed a service agreement with the Security Coordination Centre (SCC) and started the procurement of services in June 2018.

ERE adopted decisions for transposition of the Network Codes on demand connection, requirements for generators and high voltage direct current (HVDC) connection in June 2016. Derogation criteria are not published, and implementation has not started yet.

The figure below shows the Albanian overall scoring for the implementation of the project for soft measures for a regional day-ahead market and cross-border electricity balancing in Western Balkans (WB) known as WB6 soft measures.

The objective of the project is to implement an efficient stepwise creation of a regional day-ahead market and to implement a regional cross-border balancing in the in the WB and its neighbouring countries.

Part of the project are 6 WB countries: Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, and Serbia.

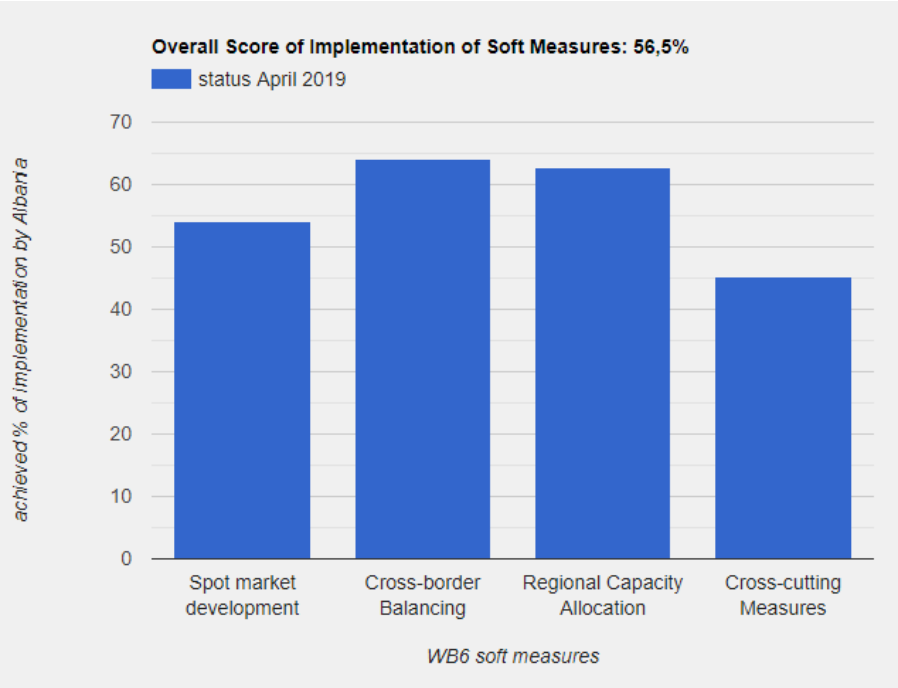



**Figure 15: Albania's WB6 electricity soft measures implementation (Source: Energy-community.org Status 1 November 2019)**

## Energy transmission infrastructure

### Power Sector

The figure below shows in a schematic way the structure of the transmission network in Albania.

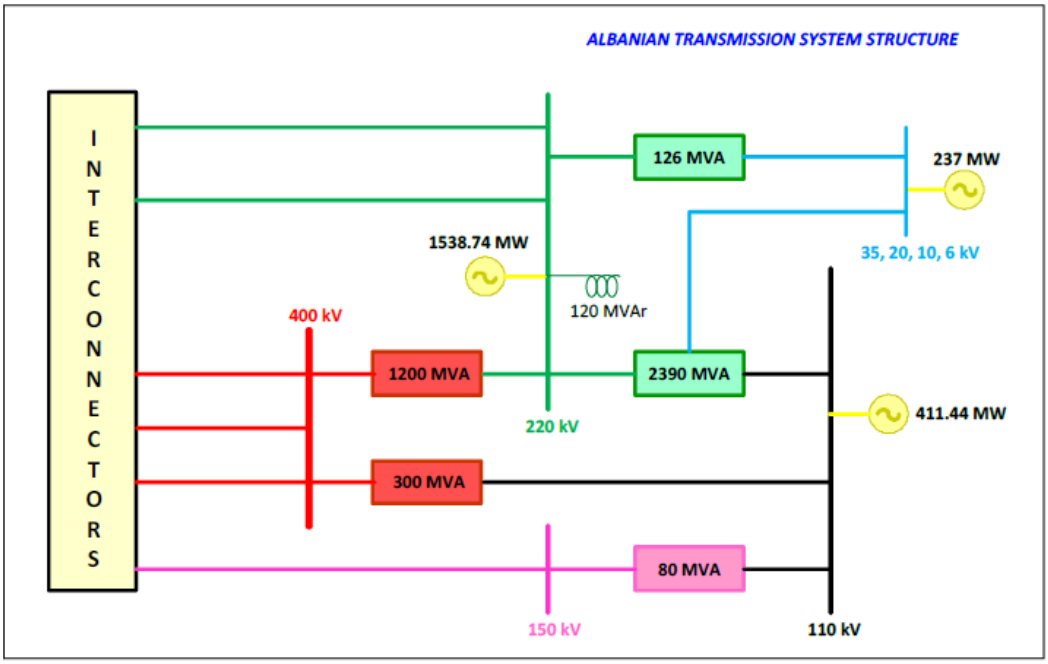



Figure 16: Scheme of Albanian transmission network

**Main projects in electricity transmission interconnections**

1.- 400 kV interconnection line Tirana (Albania) – Pristina (Kosovo)

the 400 kV interconnection line Tirana (Albania) – Pristina (Kosovo) was completed on 28.06.2016.

2.- 400 kV Interconnection line Elbasani (Albania) – Manastir (North Macedonia)

Regarding the construction of the 400 kV Interconnection line Elbasani (Albania) – Manastir (North Macedonia) connecting Albania with the Republic of North Macedonia, on 10 July 2019, the concerned applicants/companies submitted their applications for the pre-qualification phase. The prequalification phase for Lot 1st (interconnection lines) was completed and the winning bidders were notified. The tender documents will be forwarded to them to proceed to the second phase, the technical stage. For the 2nd lot (substations), OST S.A is awaiting the no objection from KfW for the prequalification evaluation report. Upon receipt of no objection the winning bidders will be notified and the tender documents for the 2nd (technical stage) will be given to them

**Gas sector**

Albania is not connected to international gas networks and the existing gas network is outdated and mostly non-operational. Its domestic natural gas production is marginal, of which the majority is consumed for own use in oil production and by the refining industry.

The TAP pipeline, which is under construction and planned to be operational in late 2020, will open the route for gas supplies from the Shah Deniz II field in Azerbaijan and link the country with the European gas market through connections with Greece and Italy.

The Ministry of Infrastructure and Energy adopted in December 2018 an act on designation of service areas for transmission and distribution of natural gas. Its provisions aim at ensuring development of natural gas infrastructure.

**Main projects in gas interconnections**

The construction of gas interconnections in Albania is elaborated in details in the Gas Master Plan (GMP) for Albania adopted by the DCM No 87 of 14.02.2018 “On the approval of the Plan for the

development of the natural gas sector in Albania and the identification of the priority projects" as well as by the National Territory Council (NTC) with its Decision No 2 of 26 July 2018

1.- Trans Adriatic Pipeline (TAP) project

TAP project started officially on 17 May 2016. At the end of September 2019, 89.8% of works for TAP project was completed. The project is developed according to the main schedule regarding the construction of the onshore part, construction of the facilities above surface (blocking valve stations, compressor stations and the pipeline terminal) and construction of the offshore pipeline installation. Based on the construction permits issued by the Minister of Energy and Industry (actually the Minister of Infrastructure and Energy) the TAP completed the construction and rehabilitation of the access roads and bridges: the construction of some 24.7 km new transit routes and upgrading, repair and maintenance of about 136.2 km access routes. In addition, 41 bridges were improved and two new bridges were built, respectively in the three districts of Berati, Korça and Fieri.

Trans Adriatic Pipeline after the construction of pipeline in December 2020 started commercial broadcasting and in March 2021 broadcasting reached 1 BCM.

TAP AG applied to Albanian Regulatory Authority (ERE) to be licensed as a transmission operator. TAP AG was licensed in the natural gas transmission activity by the Decision of the Board of Commissioners of Energy Regulatory Authority (ERE) No 15 of 31.1.2019 "On the licensing of Trans Adriatic Pipeline AG Albania on the natural gas transmission activity, registered at the National Business Centre (NBC) as a subsidiary of the foreign joint stock company (S.A.), Trans Adriatic Pipeline AG".

After this decision of ERE, TAP AG in cooperation with ERE will finalise the preparation and approval of the Gas Transmission Code.

During 2019, the Trans Adriatic Pipeline organised a new Market Test, referring to the Decision of the Energy Regulatory Authority No 95 of 17.06.2019 "On the approval of the "Trans Adriatic Pipeline Market Testing Guide".

TAP AG has signed the Maintenance Contract with "Albanian Gas Service Company" S.A. (a Joint Venture between Albanian Gas Company, "ALBGAZ" S.A. and Italian Company SNAM S.p.A.), for maintenance of the TAP during its operational phase.

2.- Ionian Adriatic Pipeline (IAP) project

Preliminary design is being prepared under the WB15-REG-ENE-02 "Preliminary design of the Ionian Adriatic Gas Pipeline – Montenegro and Albania sections". The preliminary design is being prepared by the consultant SUEZ (IPF6 TA). The project started in September 2018 and will be running for 24 months, till September 2020.

During 2019, the rerouting process for the Albanian section was completed and it was approved by the Albanian institutions. On 6 November 2019, the consultant presented the draft Preliminary Design for the Albanian Section.

3.- Albania – Kosovo gas interconnector pipeline (ALKOGAP project)

The prefeasibility Study was completed at the end of 2018, under the WB15-REG-ENE-01 "Pre-feasibility Study for Albania to Kosovo Gas Pipeline" (ALKOGAP project), implemented by IPF4 TA, financed by the WBIF with grant 0.3 million euro.

The Ministry of Infrastructure and Energy of Albania together with the Ministry of Economy of Kosovo will re-apply in the next Call for Technical Assistance Grants of WBIF for the preparation of the Feasibility Study and full ESIA/EIA for the ALKOGAP Project.

4.- Underground Gas Storage Dumrea (UGS Dumrea)

The project "Underground Gas Storage Dumrea (UGS Dumrea)" was included in the National Sectorial Plan for the Albanian gas sector (Albanian GMP) approved by the DCM No. 87 of 14.02.2018 "On the approval of the Plan for the development of the natural gas sector in Albania and the identification of the priority projects" as well as by the National Territory Council (NTC) with its Decision No. 2 of 26 July 2018. UGS Dumrea Project is proposed to the Energy Community Secretariat to be included in the Projects of Energy Community Interest (PECI list). The Steering Committee of WBIF in its meeting of 6 December 2018 approved a grant of 1 million euro for the preparation of the Feasibility Study and ESIA for this project.

The ToRs for the preparation of the Feasibility Study and ESIA for the project WB20-ALB-ENE-01 "Albania, Dumrea Underground Natural Gas Storage" are prepared by the consultant and submitted to the WBIF and EBRD for further procedures.

## Electricity and gas markets, energy prices

**Electricity**

As provided in Article 3 of the Law No. 7/2018 dated 15.02.2018 "On some amendments and addenda to Law No. 43/2015 dated 30.04.2015 'On Power Sector", the final customer supplied with electricity by the supplier of last resort and who, as foreseen in the Article 109 of the Law No. 43/2015 dated 30.04.2015, enters for the first time in the liberalized market, is obliged to sign a supply contract with a new supplier within two years from the start of the supply contract from the supplier of last resort. At the end of this period, the system operator will interrupt the power supply to this customer.

This amendment (the period of two years) takes into account the lack of customer experience to operate into the liberalized market, and gives to the customers the necessary time to adapt to the transition from the regulated market to the liberalized market.

All customers connected to 35 kV should be supplied in the unregulated market. Currently, 98 customers are connected in the 35kV grid, but until now only a limited number of them (28 customers) connected to the 35kV grid, have chosen to be supplied in the unregulated market. According to the amendments to Law No 43/2015 of 30.04.2015 "On Power Sector", all the customers connected to the 35 kV grids, by the end of 2019 will not be supplied by the OSHEE S.A. as a Last Resort Supplier.

**Price regulation and adjustment**

Concerning price regulation, the Albanian Power Regulator decided on 12 December 2019 to leave in force the existing tariffs.

**Regulation (EU) 2016/1952 on European statistics on natural gas and electricity prices**

Price statistics fall in principle under the responsibility of INSTAT. In the absence of a clear separation of duties between AKBN and INSTAT, the former began collecting data in cooperation with ERE. AKBN is collecting and disseminating data on electricity prices charged to households. Data linked to natural gas is not relevant for Albania yet. Nevertheless, the set of compiled data is still incomplete. Prices charged to industrial end-users are not available yet.

In addition, the breakdown of electricity prices into main components, as required by the Regulation, is not compiled and transmitted to EUROSTAT. The missing datasets include price components charged to both household and non-household customers. Currently, Albania is the only Contracting Party failing to report end-user prices charged to non-household customers.

The statistics on end-user prices charged to non-household customers (industry) and the breakdown of prices, both household and non-household, into price components are not complete and do not comply with Regulation (EU) 2016/1952.

**Gas Sector**

In the natural gas sector, ERE approved the Decision of Board of Commissioners of ERE No. 269 dated 21.12.2018 "On leaving in force the Decision of Board of Commissioners of ERE No. 97 dated 23.04.2018 "On the approval of the natural gas transmission tariff for the Albgaz S.A., for 2018" as amended". According to this Decision, the natural gas transmission tariff will be the same until 31.03.2019.

In 2019, ERE started the procedures for the adoption of the "grid code harmonizing tariff structures for gas transmission", through the Decision of Board of Commissioners of ERE No. 168 dated 4.11.2019 "On the initiation of the procedure for the adoption of the "grid code harmonizing tariff structures for gas transmission".

## Energy poverty

Albania provides access to electricity for the entire population, through a process completed before the transition period in the 90's. Albania has succeeded to provide universal access to all its citizens and the country relies on domestic electricity production which is based primarily in clean hydropower energy. The substantial investments in the energy sector over the recent years have improved significantly the quality of electricity supply and attracted the interest of private sector participation, including notable international companies, to develop electricity production plants. The electricity grid constantly expands and upgrades to meet the increased demand and new connections. Substantial improvements have been achieved over the recent years in the collection of electricity bills, resulting in an improved performance of the public companies operating the core of the energy sector.

Despite the improvements and the advantage on relying on clean energy sources, the country should focus further on the affordable aspect of this target as the electricity prices are relatively high compared to regional level. The Albanian Law on the Power Sector (OG 43/2015) defines a vulnerable customer (Article 3) as a household consumer who due to social reasons, in special conditions and by definition of this law, is entitled to certain special rights regarding the supply of electricity. The vulnerability criteria are, according to Article 95, determined by the Ministry of Social Affairs in cooperation with the Ministry for Energy and Ministry of Finance together with the state Energy Regulatory Entity. Vulnerability is addressed through different energy and social policies in accordance with the Social Strategy in the Energy Community (2013).

However, Energy poverty as such is not yet clearly defined and systematically monitored. There are no specific policies in place designed to alleviate energy poverty. "Energy poverty, in general terms, represents the inability of a household to secure adequate amounts of energy in the home – allowing it to keep living spaces adequately warm and well lit, to have access to a needed range of energy services, and to be able to afford a sufficient amount of energy for everyday requirements."9

**Assessment of policies and measures** shows that Albania has adopted legislation on gas and electricity in line with the EU's third energy package. The new national energy strategy 2018-2030 has been adopted. There was progress in the gas sector and on interconnection lines.

1. Unbundling and third-party access rules

Albania has to finalize the unbundling of energy companies and abolish legal obstacles to the right of customers to change their electricity supplier.

In March 2017, the Albanian Energy Regulator Entity (ERE) approved the certification of OST SA as the transmission system operator, following a positive opinion from the Energy Community Secretariat.

[9] Energy Poverty in South East Europe – Surviving the Cold. South East Europe Sustainable Energy Policy programme (SEE SEP), 2016

The ENTSO-E assembly therefore admitted OST SA as a full member of the network. However, ERE also imposed conditions on OST SA in the final certification decisions. These conditions concerned the transfer of investment tasks to the new public body owner of the TSO. These conditions have not yet been met, and the deadline for meeting them has been postponed for three years.

Some progress has been achieved in the legal unbundling of the distribution-system operator OSHEE SA from its supply activity. This was achieved by the establishment of three new companies.

ERE's legal framework is to a prevailing extent in line with the acquis except for a few but central missing competences, namely the right to impose measures to promote competition, to require transmission and distribution system operators to change their terms and conditions and to raise the penalty level ERE is entitled to impose. On the practical side ERE should develop into a well-equipped and skilled independent institution that addresses shortcomings in the national energy markets more actively.

2. Harmonization of market rules on a regional level

The country has delayed electricity market reforms and should accelerate implementation of the connectivity reform measures, especially by removing legal and contractual obstacles to the integration of energy markets. The country has to establish an organized day-ahead electricity market.

Electricity prices are still regulated but should be gradually liberalized once legislation is implemented. The freedom for all customers to switch suppliers is effectively prevented by amendments to the Power Sector Law; implementation is still lacking since most customers connected to 35kV are allowed to buy supply of last resort, and all connected to lower voltage level – by universal service supplier. The electricity market remains closed by a regulated contract between state-owned generation and supply companies. This contract must be terminated urgently.

3. Interconnection congestion and reliability management

Albania is not connected to international gas networks.

Albania's electricity system has been interconnected with the neighboring systems of Greece and Montenegro since 2014, when the European Network of Transmission System Operators (ENTSO-E) approved synchronous operation of the Albanian electricity transmission system with the continental European system.

It also has a power interconnection line with Kosovo. The 400 kV interconnection line between Albania and Kosovo was completed in June 2016.

Albania also participates in the EU's macro-regional strategy for the Adriatic and Ionian region (EUSAIR), for which the improvement of connectivity (transport and energy networks) is a main priority.

## Trans-European networks

Albania has some level of preparation in the area of trans-European networks. Some progress was made in developing transport and energy networks. Some progress was made on its gas interconnection with the implementation of the trans-Adriatic pipeline project.

In the coming years, Albania should in particular:

- continue development of the core transport and energy networks in line with:
  (i) the national strategies for transport and energy;
  (ii) the infrastructure investment prioritization under the single project pipeline; and
  (iii) the connectivity agenda;
- harmonize the legal framework with the EU Acquis and the regulations on TEN-T (trans European transport networks) and TEN-E (trans-European energy networks), including transposition of Regulation (EU) 347/2013 on guidelines for trans-European energy

infrastructure;

- implement connectivity reform measures and strengthen the institutional framework and administrative capacity to develop and monitor TENs.

Albania is making progress in setting up the country's strategic framework **for transport networks.** Albania intends to harmonize its legal and institutional framework with the EU TEN-T Regulation and the Transport Community Treaty, which it signed in June 2017 and ratified in February 2018. Albania participates actively in the South-east Europe Transport Observatory (which was replaced by the Transport Community Treaty in January 2019) and Western Balkans 6 (WB6) processes, focusing on improving connectivity within the WB6 and with the EU. The national transport strategy and action plan for 2016-2020 envisages an extension of the TEN-T Comprehensive and Core Networks to Albania and an alignment with TEN-T guidelines and EU standards and regulations. There was progress in drafting the second review of the Albanian national transport plan (ANTP3), which was completed in January 2019.

Albania has made progress in repairing its road infrastructure in the core network. Albania is progressing with the preparation of road and rail infrastructure projects, especially along the Adriatic-Ionian corridor and corridor VIII. Upgrading of the railway from Durres to Tirana is planned to start by mid of 2019. Albania needs to ensure that its transport network projects are implemented in line with the TEN-T regulatory framework. Future infrastructure investments need to be implemented in compliance with EU standards on public procurement, state aid, and EIAs. Projects should be channelled through a single project pipeline, confirming the country's strategic orientation towards TENs. Further efforts are needed on road safety. More serious measures should be taken to fix 'blackspots' along sections of roads with high accident rates. Adoption of the multiannual maintenance plans for the entire core network (rail and road) remains a challenge.

Albania is partially aligned with the Acquis on a single European railway area, railway system interoperability and rail freight corridors for competitive freight.

Further efforts are needed to:

(i) align the country with the Directive on intelligent transport systems,
(ii) develop the national strategy for intelligent transport systems (ITS); and
(iii) prepare for implementation of that strategy.

### *Dimension Research, Innovation and Competitiveness*

The legal basis for Research and Innovation is the National Strategy for Science, Technology and Innovation DCM No. 710 dated 1.12.2017.

National objectives:

- Reforming the institutional system of scientific research
- Increased investment in research and innovation with public funds and other alternative sources at 1% of GDP in 2022
- Involvement of the Albanian scientific diaspora in science, technology and innovation
- Increasing cooperation between the scientific community and business 2017-2022
- Evaluation of scientific research quality

Support for universities and other research-oriented entities is regulated in the following documents:

- REPUBLIC OF ALBANIA, COUNCIL OF MINISTERS - National Strategy for Development and Integration 2014-2020 pp 72
- DCM No. 710 dated 1.12.2017 National Strategy for Science, Technology and Innovation
- COMMISSION STAFF WORKING DOCUMENT Albania 2019 Report Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and (chapter 15 Energy pp.74)

The Erasmus+ Office (www.erasmusplus.al) supports the mobility of students and staff and the collaboration of Higher Education Institutions by exercising the following functions:

- It processes, promotes and distributes the information and documentation of Erasmus+ Programme to all Higher Education Institutions (HEI);
- It advises, informs and helps all persons concerned on how to apply to Erasmus+ projects;
- It carries out the monitoring and implementation of Tempus projects, which are still running;
- It supports and coordinates activities of national group of Higher Education Reform Experts, HERE, who have an advisory and supporting role in achievement of Erasmus+ programme objectives;
- It contributes to assessment of projects that will be submitted in the framework of "Capacity Building of Higher Education" component in Erasmus+ (ex-Tempus projects).

In 2014 Albania signed the agreement with the EU to participate in the framework program for research and innovation Horizon 2020 (2014-2020). More information on the participation of Albanian research and scientific institutions in the Program Horizon 2020 is available in the "National Strategy for Science, Technology and Innovation", DCM No. 710 dated 1.12.2017, page 18.

Albania participates in activities related to the Strategic Energy Technology (SET) Plan on the following legal basis: Commission Staff Working Document, Albania 2019. Report Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee (chapter 15 Energy pp. 74).

### 1.2.3 Key issues of cross-border relevance

Cross-border cooperation is the key to increasing the share of solar power in the electricity grid and to achieving economies of scale in terms of financing the implementation of energy efficiency measures, among others in building renovation, for example through the aggregation of projects. In this regard, it is essential to exchange experience and collaborate on the development of strategies, in order to align economically important decisions.

Another crucial sector of cross-border relevance is the transport sector. The present "National Sector Strategy for Transport 2016-2020" has been aligned with the National Strategy for Development and Integration which defines Albania's vision for its national social, democratic and economic development over the period 2015-2020. The development and modernization of Albania's transport infrastructure has been and remains one of the top priorities of the GoA. The aim has been:

- to create the preconditions for the development of other sectors of the economy,
- to increase the accessibility of freight and passengers in trade and service delivery, and
- to significantly contribute to overall economic growth and development of the economy.

The strategic priority is to accelerate the integration of Albania's transport system and the establishment of an integrated market comprised of transport infrastructure by land (road and rail), by sea and by inland waterways. Despite significant investments especially in improving road infrastructure, the transport sector has yet to become a significant promoter of economic development in Albania. The timely and adequate funding of annual and medium-term programme investments remains problematic. Further, the quality of transport related public works is still not yet up to EU standards. Aligning Albania's transport policy with the European Transport Policy and coordinating its transport infrastructure with its neighboring countries – the Western Balkans countries comprising Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia (FYROM), Montenegro, Serbia, and Kosovo - have become two must-do's for Albania's transport decision-makers.[10]

[10] Sectorial Strategy of Transport & Action Plan 2016 – 2020, First Monitoring Report, No. 811, dated 16th November 2016

Concerning Road Transport the main challenges in the road sector for the 2016-2020 planning period are:

- Harmonize the national legislation with the EU Acquis for road transport of goods and passengers;
- Complete the construction of the national road network, including strategic arteries;
- Complete the feasibility study for the Adriatic-Ionian Highway North-South;
- Reform the intercity passenger road transport network.

Regarding Rail transport the main challenges in the rail sector for the 2016-2020 planning period are:

- Reform the rail system to set up an open market for public and private investors whether in terms of market regulation, infrastructure management or rail operations;
- Strengthen human capacities and resources at all levels, in particular to effectively build up the legal and institutional structure that are necessary to ensure a smooth operation of an open market;
- Create favourable legal and institutional conditions for attracting foreign investment; and
- Create a level playing field with other modes of transport.

In terms of integration into the European energy market, collaboration is important with:

- ENTSO-E (European Network of Transmission System Operators for Electricity)
- ENTSO-G (European Network of Transmission System Operators for Gas)

More information is provided in chapter 1.2.2 Dimension Internal Energy Market.

With a view to innovation, it is essential to strengthen research cooperation on topics which are especially relevant for the region.

Basis for regional collaboration including cross-border collaboration is the Energy Community. The Energy Community Secretariat organises different working groups which provide a platform for exchange of information and experience relevant for each dimension of the NECP.

In addition, Energy Community Secretariat launches studies and initiatives which are relevant for the region, among others:

- Western Balkan 6 Initiative
- Energy Community Carbon pricing study (study launched in January 2020 https://energy-community.org/news/Energy-Community-News/2020/02/03.html)

### 1.2.4 Administrative structure of implementing national energy and climate policies

The Inter-Ministerial Energy and Climate Committee (IECC) has been established as an inter-institutional working group with the presence of Ministry of Infrastructure and Energy (which, due to the extended competences, has the most crucial role and the highest number of representatives from the areas of hydrocarbon, energy, transport, urban planning but also a number of other energy related institutions), Ministry of Tourism and Environment, Ministry of Finance and Economy, Ministry for Europe and Foreign Affairs and INSTAT.

The IECC is primarily responsible for the political and strategic steering, the coordination and decision-making, the verification of results and final assessment and approval of the target-setting during the NECP process. According to the NECP Policy Guidelines by the Energy Community, the Inter-Ministerial Committee on Energy and Climate meets not less than twice a year.

A Technical Secretariat has been established with the Ministry of Infrastructure and Energy, responsible for the following tasks:

- To manage organization, design and elaboration of NECP;
- To organize public consultations and hearings;
- To prepare and process the NECP material to be used for meetings and public consultations;

- To organize technical meetings with all relevant stakeholders;
- To facilitate cooperation and coordination between Working Groups;
- To advise the IECC regarding the adaptation of the drafting timeframes of NECP.

Monitoring and reporting on the implementation of measures and their effects is ensured by the effective collaboration between stakeholders (government and local authorities and others), meetings, consultations, and discussions for issues raised, defining the challenges and steps to overcome them.

Cooperation is institutionalised through the Inter-Ministerial Committee. The Committee meets up to 4 times a year to coordinate activities and adjust timelines. The Agenda contains a slot for reporting, a slot for problem solving, and a slot for strategic discussions. Minutes are circulated among participants. A politically agreed summary is provided to stakeholders via messenger service or website of MIE.

The Albanian government institution MIE through AKBN, ERE, and AEE have the task to monitor and follow up the NSE implementation at each sector and for all energy resources. They submit an annual report to the MIE defining the realization of the EE, RES, and power companies concerning measures in quantities and qualities, level of the realized investments, barriers and reasons behind them, the way of overcoming them, so that energy savings, emission reduction and the remaining targets are achieved.

This way implementation of NECP policy measures can be monitored.

## 1.3 Consultations and involvement of national entities and their outcome

The draft NECP due to find better solutions, achievements, etc. is the subject of hearings, discussions, opinion exchanges with the participation of the following stakeholder groups: different ministries/agencies affected directly or indirectly by the NECP, local governments (big ones), civil society, energy experts, different associations of businesses. Stakeholders are involved partly/entirely through the cycle of the compilation, implementation and monitoring of the NECP.

Consultation procedures are organized according to Law No. 146/2014 "On Public Information and Consultation" and according to Decision of CM No. 247 dated 30.04.2014 "On the definition of rules, requirements and procedures for public information and their involvement in processes of decision-making". Law No. 146/2014 applies rules and procedures on public information and consultation held by public authorities/institutions in policy and decision-making processes.

It is important to note that there are some pieces of legislation included in the duties of governmental bodies, municipalities, etc., which clearly define the right of civil society groups of interests to be involved in the process of drafting policies and legislation and environmental impact assessment.

According to the clearly defined procedures of MIE, after the necessary consultations via meetings, round tables, websites, etc. with all stakeholders of this comprehensive process, MIE and Ministry of Tourism and Environmental will be obliged to reflect feedbacks and to find the right ways to overcome barriers (technical and financial), encouraging and supporting the implementation of the NECP in their own specific sections based on certain guidelines or roadmaps.

The NECP consultation process is managed as an interactive process by the Technical Secretariat on behalf of the Inter-Ministerial Committee on Energy and Climate and with support of GIZ (see Figure 17). The Technical Secretariat is hosted by MIE.

The consultation process is planned as a two-way process, this means that MIE asks for feedback on planned policies and measures, and that stakeholders are able to request more or specific information on certain topics related with the NECP.

Elements of the consultation process:

- All policies and measures are presented on the website of MIE, and all identified stakeholders can provide feedback (online consultation). A word file is provided for download and feedback

can be submitted via email. Alternatively, an online survey tool is used to inform stakeholders and collect feedback.

- Stakeholders are invited to ask for more information or specific information in relation with the NECP.
- Joint meetings or call conferences with other neighbouring countries to exchange information and the best practices are also important elements of the process. This applies to selected policies and measures were regional or cross-border collaboration is essential.
- Involvement of experts through Working Groups and external Stakeholder engagement is the key element of the process. The respective organisational chart is shown in the figure below.

Due to the COVID-19 situation physical meetings and workshops have been substituted by virtual meetings and workshops.

The consultation process is documented and evaluated in order to be able to improve the procedure when the next NECP revision is due.

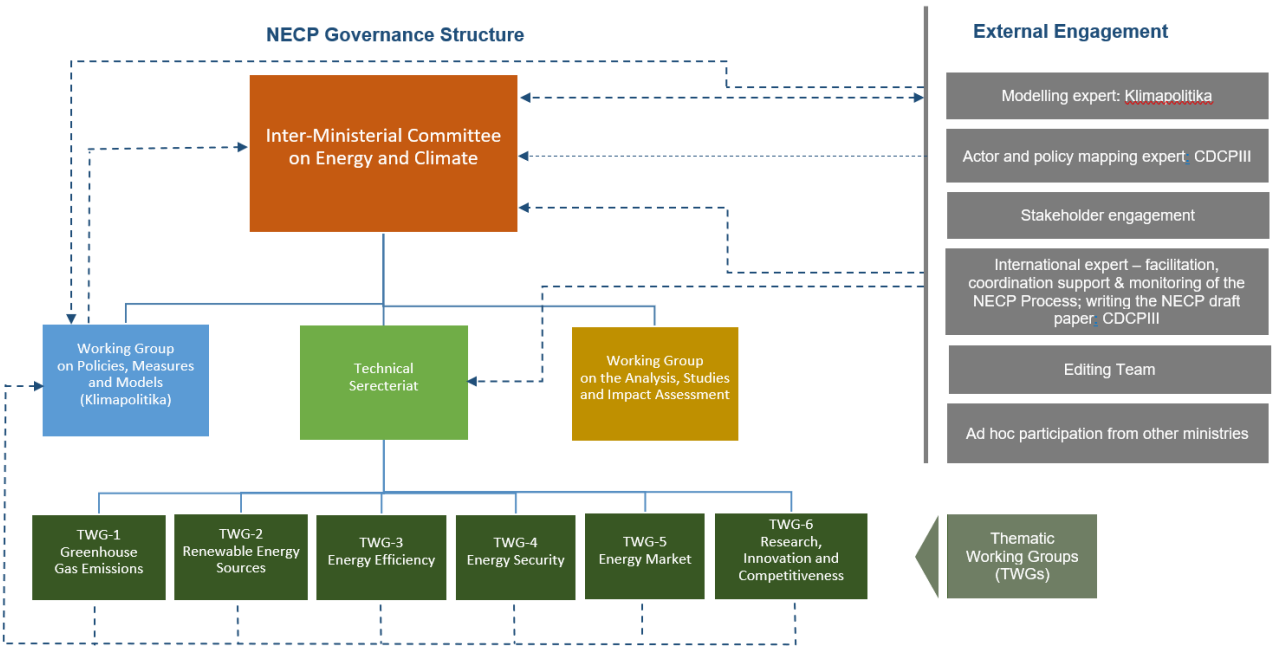



**Figure 17: Involvement of experts through Working Groups and external Stakeholder engagement**

### 1.3.1 Involvement of the national parliament

MIE after drafting the NECP, will hand on the draft for consultations to institutions which are directly or indirectly involved in the process of implementing NECP related project investments in all NECP dimensions. Getting feedbacks, MIE reflects all suggestions provided by different actors to the NECP draft and submits the draft including the reflections provided to the Albanian Parliament and more specifically to a specific body within the Albanian Parliament where the process continues with discussions.

Ministries involved in this process introduce and inform the Parliament on expected advantages related with the NECP, namely, to tap the full potential of synergies between all NECP dimensions for the benefit of the society and the environment. They ask for their support, for example to approve the EE investment funds.

Plenary sessions with the Parliament are organized, for example on energy and climate issues, in order to increase the awareness how to achieve clean air with minimum GHG emissions at the same time. This plenary session aims to explain that this is possible by means of a reliable NECP (based

on NSE and NEEAP), a sufficient investment package (a part provided by state budget), implementation of EE measures, naming the responsible institutions, and an effective monitoring process.

### 1.3.2 Involvement of local and regional authorities

The local governments are active stakeholders during the process of drafting and implementing the NECP.

Local government authorities prepare local environmental action plans periodically in conformity with the strategies and plans referred to in Article 21 of the Law No. 10 431 dated 9.6.2011 "On environmental protection" (This law is fully aligned with Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 "On Environmental Responsibilities, Prevention and Repair of Environmental Damages" as amended).[11]

Therefore, they are involved in the process of energy policies compilation, in the round tables with different actors, as they will be a very important actor for the implementation of the EE measures in building projects, design, transport and services areas. Local governments compile their own Energy Efficiency Action Plans and have a great role through EE public procurement for their necessities. Implementation of policies and measures related with investments results in energy savings and emission reductions, and also impacts positively on the labour market, GDP growth and social benefits. Responsible institutions together with local governments may encourage the businesses and advise the population in efficient use of energy resources.

Main institutions being involved in this process are:

Ministry of Infrastructure and Energy, Ministry of Finance and Economy, Ministry of Tourism and Environment, Albanian Investment Development Agency, National Agency of Energy Efficiency, Public Procurement Agency, Albanian Business Association, Albanian Association of Constructors, Albanian local governments, the National Territory Planning Agency and the National Territorial Council.

### 1.3.3 Consultations of stakeholders, including the social partners, and engagement of civil society and the general Public

An interactive process aiming at participating in the decision making or on drafting policies should be planned especially between actors represented by public institutions, central and local government institutions, and banks, ESCOs, and other financing institutions to inform about and exchange options on investments for NECP measures implementation (Law No. 146/2014 "On Public Information and Consultation").

The process of information and public consultation is realized based on the plan described at the beginning of this chapter on the basis of the following principles:

- Transparency during the public information and consultation process with inclusive and non-discriminatory participation;
- Effectiveness of the decision-making process;
- The responsibility of public authorities/institutions towards the parties/actors concerned on certain issues.

[11] Report on Analysis of on pre-planning processes for HPPs in Albanian legislation and its implementation. Tirana, March 2018 (provided by Alma Saraci)

### 1.3.4 Consultations of other Contracting Parties

Consultation of other Contracting parties takes place on specific topics with cross-border relevance and on specific topics where sharing good practices is helpful.

More information on policies and measures implemented based on a cross-border or regional collaboration is available in the respective chapter 1.4.

### 1.3.5 Iterative process with the Energy Community Secretariat

The Energy Community Secretariat has been involved from the beginning and has supported with input in the drafting phase as well as with the discussion of preliminary versions.

The Secretariat has participated in the following meetings:

- Virtual meetings for informal coordination among the members of the core team
- NECP working group meetings
- Other coordination meetings

## 1.4 Regional cooperation in preparing the plan

### 1.4.1 Elements subject to joint or coordinated planning with other Contracting Parties

Energy and climate planning issues related with the Energy Market are consulted with other Contracting Parties as described in chapter 1.2.2 Dimension Internal Energy Market. Transport is another subject of coordinated planning.

In terms of promoting and further facilitating the implementation of the Gas Master Plan, inter-ministerial cooperation has already been established between Albania, Montenegro, Bosnia and Herzegovina and Croatia on the IAP (Ionian Adreatic Pipeline) project. There is also an established cooperation with Kosovo for the ALKOGAP project.

Procedures are based on the international agreements described below.

**International agreements with regard to joint or coordinated planning:**

***"Energy Community Treaty ",*** ratified by the Albanian Parliament, Law No. 9501, dated 3.4.2006, "On the ratification of the Treaty establishing the Energy Community". Since 2006, the Energy Community acquis has significantly evolved to incorporate new directives and regulations  Presently, the acquis covers legislation on electricity, gas, oil, infrastructure, renewable energy, energy efficiency, competition and State aid, environment, statistics, cybersecurity and climate. The implementation in the electricity sector of Albania is moderately advanced[12].

The ***Greece-Albania-Italy (Intergovernmental Agreement - IGA)*** tripartite agreement has been signed in the natural gas sector, ratified by the Albanian Parliament with Law No. 104/2013, dated 25.03.2013, "On the ratification of the Agreement between the Republic of Albania, the Republic of Greece and the Republic of Italy on the Trans Adriatic Pipeline Project (TAP Project)". (Entered into force on 19 February 2014).

TSO signed the **Synchronous Area Framework Agreement (SAFA)** for Regional Group Continental as a member of the European Network of Transmission System Operators for Electricity (**ENTSO-E**) on 6th March 2019, which entered into force for unlimited duration on 14.04.2019. The scope of this Agreement is to provide a legal framework for the operation of the interconnected grids by the TSOs of

[12] Annual Implementation Report by Energy Community Secretariat, 1 November 2019

the Synchronous Area of Continental Europe (ENTSO-E members of this region) through compliance with the methodologies, conditions and values adopted by ENTSO-E.

TSO signed the **South East Europe Coordinated Auction Office (SEE CAO)** Agreement on 01.04.2014, with the objective to perform the explicit allocation of cross-border transmission capacity in both directions between Control Areas of Participating TSO's, through NTC based Auction Processes in accordance with conditions for access to the network for cross border exchanges in electricity. Operations of SEE CAO, concerning harmonization of congestion management methods in SEE, the common rules for the internal market in electricity and where applicable, its implementation in the national legislation of concerned countries relating to each of them. Albania started the coordinated auctions on Albania-Montenegro borders as of May 2015.

The European Union and the Parties of Southeast Europe, Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, Serbia signed the **Treaty establishing the Transport Community**, adopted by law No. 8/2018, in the field of road, rail, inland and maritime transport, as well as to develop a transport network between the European Union and the Parties to Southeast Europe. Among other reasons, Albania signed this Treaty acknowledging the need for: environment protection, climate change mitigation and sustainable transport development. Albania has committed to implement the relevant environmental part of the Acquis relating to transport, in particular the Strategic Environmental Assessment, Environmental Impact Assessment, nature, water, air quality directives.

The four Action Plans of the Transport Community are an instruction manual on all important steps and milestones, with accompanying timeframes, that will guide us on the path of delivering on concrete aims and ambitions: safer roads; reduced waiting time at border crossings; reliable and modern rail; and roads of the future with integrated green and digital elements. The Road Action Plan aims towards development of climate resilient, intelligent, and resource-efficient TEN-T road network in Western Balkans by incorporating green and smart elements in road investments. Our final aim is to stimulate innovative, low emission and fit for digital age road transport operations.

### 1.4.2 Explanation of how regional cooperation is considered in the plan

Regional cooperation is facilitated by working group meetings organised by the Energy Community Secretariat.

The CDCP III project has facilitated regional cooperation between Albania and Montenegro to exchange information and experience especially about Modelling approaches for Part B of the NECP.

GIZ implements the regional program "Capacity Development for Climate Policy in the Countries of South East, Eastern Europe, the South Caucasus and Central Asia, Phase III (CDCP III)". CDCP III aims to support the Albanian government during the whole NECP process and provides also a platform for facilitating information exchange, among others on needs for coordinated planning between Albania, Montenegro and North-Macedonia.

# 2 NATIONAL TARGETS AND OBJECTIVES

**Preliminary note aligning NECP, National Energy Strategy and NDC**

Existing national plans that have been considered in the development of this document include the National Energy Strategy and the Nationally Determined Contribution (NDC). The National Energy Strategy has set a target of 42% in TPES and 15% reduction of energy use compared to the baseline for 2030. The modelling underlying the strategy differs in GDP growth and population. The RE target of the National Energy Strategy uses efficiencies of 78% and less for renewable power generation, which upscales the renewable share in TPES. In final energy, the NECP also achieves a higher RES share. On sectoral level, the National Energy Strategy does not consider the strong renovation projected by SLED (2015) and adopted by the NECP. It uses biomass pellets for space heating, while the NECP builds on electrification and renovation. In Services, the National Energy Strategy projects a strong increase in energy demand. In transport, it does not consider electrification, while transmission grid losses are underestimated. A large difference is seen in the uptake of natural gas, which is used to meet 20% of final energy demand in 2030 in the National Energy Strategy overall and used in many subsectors, from minor use cases in industry today. Despite these differences, the comparison with the National Energy Strategy proved a very useful and insightful reference to the work underlying the NECP.

The NDC of Albania was submitted in 2015 and covered the energy sector only. In parallel to the elaboration of the NECP, the revision of the NDC was undertaken by a separate team, aiming to also cover the full economy. The Governance regulation foresees that the NECP takes precedence over the NDC. The activity underlying the elaboration of the NDC was nonetheless carried out in parallel, despite several attempts to harmonize and align efforts. From the material provided by the NDC team, it was possible to improve the scope of PaMs underlying the non-energy sectors, while the estimates of effects have been elaborated separately. The estimate underlying the LULUCF sector of the NECP have been taken from the NDC. The energy sector estimates of the NDC are reportedly based on the National Energy Strategy, with a limited update to the modelling underlying this document. The differences with this document and the underlying modelling have been discussed above.

**Preliminary note on the National Energy Strategy**

The National Energy Strategy (NSE) 2018-203013 is an overall energy sector strategy and was thus the main policy document in the energy sector, serving as input to the Dimensions 1-4 of the Energy Union and Albania's NECP. NSE (page 107) estimates that the contribution of public investments is equal to 252 MEur for the period 2018-2030, mainly for supporting awareness campaigns and pilot projects to promote EE in all economic sectors. Private investment and donor financing are estimated with 3,399 MEur for the period 2018-2030.

With regard to the Dimensions Decarbonisation and Energy Efficiency, the targets of the NSE have been adjusted based on the evolving knowledge base.

[13]Approved by DCM No. 480, dated 31.7.2018 based on law no. 43/2015, "On power sector".

## 2.1 Dimension Decarbonization

### 2.1.1 GHG emissions and removals

*The elements set out in point (a) (1) of Article 4*

**Targets based on the NECP Analytical Part B**

In terms of GHG emissions, the WEM scenario leads to total emissions of 12.6 Mt CO2eq in 2030, whereas the values in WAM reach 10.2 Mt CO2eq, which corresponds to a reduction of 18.7% relative to WEM values.

In comparison with the base year 2018, WAM entails a reduction of emissions of 6.1% in 2030, with an increase of emissions seen in the years after 2030, reaching values just above 2018 in 2040 (plus 4.0%). The WEM scenario sees an increase of emissions by 15.4% in 2030 and an increase by 30.5% in 2040.

GHG emissions [kt CO2eq] as projected with additional measures for 2030:

Demand: 4833.0

Transformation: 250.8

Non Energy: 5139.0

**Previous Targets for comparison**

**NDC – National determined contribution:**

The Document for the intended/national determined contribution pursuant to the achievement of the UNFCCC target approved by DCM No. 762, dated 16.9.2015 foresees that the INDC (Intended Nationally Determined Contributions) of Albania is a baseline scenario target: it commits to reduce its CO2 emissions by 11.5 % as compared to the baseline scenario for the period 2016 to 2030. This reduction is equivalent to a CO2 emission reduction of 708 Gg by 2030. The emission trajectory of Albania allows a smooth trend for achieving 2 tons of GHG emissions per capita by 2050, which can be taken as a target for global contraction and convergence of greenhouse gas emissions.

Due to data weaknesses, the reference to the base year 2005 is not available.

| Target | 2020 | 2025 | 2030 | Source |
|---|---|---|---|---|
| $CO_2$ emission reduction (NDC), compared to 0% in 2015 | 0% | 5.75% | 11.5% | Energy Strategy for Albania |

Table 9: NDC baseline scenario targets

80% of national GHG emissions reduction will be achieved in the sectors of Energy (with a special focus on Transport), Agriculture, and Land Use Change and Forestry (LUCF).

**National Energy Strategy:**

The Albanian National Energy Strategy[14] is in line with the EU "Low-carbon Economy Roadmap" and promotes EE, RES and natural gas policies that support a stable business climate which will encourage low-carbon investments for the period 2017-2030. There are various scenarios but the one recommended was showing a reduction of 28% compared to a baseline scenario, or 5276 TCO2eq in 2030.

*Outlook up to 2050*

Under development

### 2.1.2 Renewable energy

*The elements set out in point (a) (2) of Article 4*

**Targets based on the NECP Analytical Part B**

Renewable shares in final energy consumption are determined according to Directive 2009/28/EC (RED; EU (2009); also see European Commission (2018)).

In overall terms, the additional measures increase the share of renewables in final energy from 33.5% (WEM scenario) in 2030 to 54.4% (WAM scenario). Historic values of 2018 reach 37.9%, so the WAM scenario leads to an increase by 20.9%-points.

RES shares of final energy demand [Percent] as projected with additional measures for 2030.

* Values over 100% are due to electricity exports.

| | |
|---|---|
| RES- Electricity: | 178.1 %* |
| RES-Transport: | 34.6 % |
| RES-Heating&Cooling: | 16.6 % |

**Previous Targets for comparison**

**National Energy Strategy:**

The Renewable Energy scenario presented in the National Energy Strategy incorporates Albania's National Renewable Energy Action Plan (NREAP) 2019. According to NREAP, Albania has committed to a binding 38% target of energy from renewable sources in gross final energy consumption in 2020, starting with 30 % in 2009 and to be further developed by 2030.

The Government's commitment to further develop RES by 2030 is also expressed in the framework of the National Energy Strategy 2018-2030 approved by DCM No. 480 dated 31.07.2018. The target by 2030 will be at least 45% of the TEFC (total final energy consumption) projected for this year.

*Estimated trajectories for renewable energy*

Estimated trajectories by renewable energy technology are available in Part B of the NECP.

Estimated trajectories on bioenergy demand (disaggregated) are available in Part B of the NECP.

Estimated trajectories on RES shares in the transport sector, energy sector, and in heating and cooling are available in Part B of the NECP.

[14] Energy Strategy for Albania. Analysis of Energy Development Scenarios in Support of the National Energy Strategy of Albania, Report to USAID and Ministry of Energy and Industry, December 2016

## 2.2 Dimension Energy Efficiency

### 2.2.1 The elements set out in point (b) of Article 4

*(1) the indicative national energy efficiency contribution to achieving the Union's energy efficiency targets of at least 32,5 % in 2030 as referred to in Article 1(1) and Article 3(5) of Directive 2012/27/EU, based on either primary or final energy consumption, primary or final energy savings, or energy intensity.*

**Targets based on the NECP Analytical Part B**

While in the WEM scenario, final energy consumption increases (compared to 2018) by 20.8% until 2030 and 46.5% until 2040, it increases only by 10.7% until 2030 and 29.0% until 2040 in the WAM scenario. Comparatively, the final energy consumption in the WAM scenario decreases compared to the WEM scenario by 8.4% in 2030 and 12.0% in 2040.

Final energy consumption [ktoe] as projected with additional measures for 2030:

| | |
|---|---|
| Residential: | 348.9 |
| Services: | 195.2 |
| Industry: | 542.4 |
| Transport: | 1003.4 |
| Agriculture Forestry: | 110.5 |
| Fisheries: | 56.0 |
| Non energy: | 70.6 |

**Previous Targets for comparison**

**National Energy Strategy:**

Energy efficiency targets are foreseen at Gross Inland Consumption level and at Final Energy Consumption level, whereby much more EE measures are elaborated for energy savings at final energy consumption level. Except EE measures planned to be realize at generation, transmission and distribution of power sector, the EE targets in buildings, transport and industry are more expanded in NEEAP 2nd-3rd.

EE targets based on Article 3 of Directive 2012/27/EU predicted at NEEAP, are as follows:

- Energy savings goal referring to final energy consumption has been predicted by 6.8% in 2020 or a total of 123.7 Ktoe to be saved, 10% in 2025 and 15.5% in 2030 compared with baseline scenarios respectively for specific above mention years.

Reducing energy intensity of GDP by 18% by 2030.

*(2) the cumulative amount of end-use energy savings to be achieved over the period 2021-2030 under point (b) of Article 7(1) on the energy saving obligations pursuant to Directive 2012/27/EU;*

Targets to 2030 (nor to 2020) according to Article 7 (1) (b) – Obligation schemes are not available yet because the 2nd and 3rd NEEAP did not stipulate the proposed approach to achieving Article 7 targets. However, it is foreseen to have an amendment of the EE Law to cover this provision.

The draft law is already prepared and amendments to the existing law will cover the inclusion of elements currently absent, including Article 4 (Building Renovation Strategy), Article 7 (Energy

Efficiency Obligation schemes and alternatives), Article 14 (Promotion of energy efficiency in heating and cooling), Article 15 (Transformation, transmission and distribution) and Article 24 (Reporting).

*(3) Strategy for the renovation of the national stock of residential and non-residential buildings, both public and private, the roadmap with domestically established measurable progress indicators, an evidence-based estimate of expected energy savings and wider benefits, and the contributions to the Union's energy efficiency targets pursuant to Directive 2012/27/EU in accordance with Article 2a of Directive 2010/31/EU;*

Based on Article 4 of Directive 2012/27/EU on energy efficiency in building renovation, Albania has not yet completed the strategy for supporting and encouraging cost effective investments in the renovation of the national building stock. It is the objective to develop the strategy for mobilizing investments in the renovation of buildings in line with the requirements of article 2a Directive 2010/31/EU on the Longterm renovation strategy.

Referring to the law on Energy Performance of Buildings (transposing Directive 2010/31/EU) it is planned to establish a national plan to increase the number of buildings with "nearly zero energy performance", increasing the energy performance of private and public buildings.

*(4) the total floor area to be renovated or equivalent annual energy savings to be achieved from 2021 to 2030 under Article 5 of Directive 2012/27/EU on the exemplary role of public bodies' buildings;*

The 2$^{nd}$-3rd NEEAP defines a target for the renovation rate and measures to improve energy efficiency for public buildings:

By 2020 the annual prediction is as follows:

- Renovation of the stock of public buildings by 2% each year, heated/cooled area for buildings under administration or use by a public authorities/institution due to meet the minimum energy performance requirements.

By 2022 the following measures are expected:

- high efficiency thermic isolation in buildings
- soft loans and other financial stimuli for new constructions should be developed, as well.

The data available about the public building stock is not sufficient and needs to be addressed. Information needs to be available in much more in detail to be able to determine the total floor area to be renovated and the energy efficiency level which must be achieved.

In general, main challenges to be addressed are:

- AEE has to fill the number of the staff, employees in order to manage all issues related to the EE, NEEAP and implementation of EPB/EE laws;
- Primary and secondary legislation on Energy Performance of Buildings to be put in place;
- Budgeting questionnaires;
- Energy auditors and the first certification of the first energy efficiency auditors. AEE tested the candidates on 21 May 2020, and 26 experts are now certified as energy auditors in buildings and processes. EE auditors and audits will start to realize their duties depending on the type of certification. An action plan to identify the tasks and expected results should be established.

### 2.2.2 Long-term renovation strategy addressing the national building stock

The strategy for the renovation of the building stock according to article 2a Directive 20210/31/EU is not yet available. However, the work on the Long-term renovation strategy has been started as part of the SLED project[15].

The goal of the SLED project was to provide background information for the sectoral modelling of the public building stock in Albania. A key element of the work was the development of the very first public building typology for Albania, including indicators such as delivered energy per energy source, primary energy, and $CO_2$ emissions for heating, domestic hot water and cooling. Different renovation options were defined, and the resulting energy savings were determined. Specific investment costs are also presented per building type and measure as well as the monetization other benefits such as thermal comfort, avoided $CO_2$ emissions, avoided economic impacts of airborne pollutants, impacts on employment, and economic growth.

### 2.2.3 Other national objectives and long-term strategies

**Heating and cooling**

There are no other national objectives. There are no long-term strategies for heating and cooling.

**Transport sector**

Transport Sector Strategy in Albania – Final Strategy & Action Plan, DCM No. 811 of 16.11.2016

The Sustainable Transport Plan Draft (06/02/2016) is a key document (draft still) assisting MIE in achieving the expected energy savings for the transport sector in Albania. However, the time horizon for the STP implementation was 2016 – 2020.

## 2.3 Dimension Energy Security

### 2.3.1 The elements set out in point (c) of Article 4

The objective of energy security is to ensure a lasting, secure and quality supply of all energy-generating and supply systems. Security means that the energy has to be available, accessible, affordable and acceptable in proportion with the development of the country.

To achieve this objective, the Albanian Government has approved the National Strategy of Energy 2018–2030 as an overall energy sector strategy.

National security objectives defined by the National Energy Strategy and relevant in the context of the NECP connecting with energy security are:

- Increasing and further development of national primary energy sources in a sustainable and competitive way. In order to achieve this objective, it is necessary to introduce integral and systematic planning of supply of all energy-generating products and forms of energy.
- Development of diverse supply sources through new investments, increasing regional cooperation and integration and interconnection with regional and European electricity and natural gas networks in accordance with the *Acquis* of the Energy Community Treaty.
- Enhancing security of energy transmission and supply through diversification of supply routes of energy and improving the security and the reliability of them through cost-effectiveness

[15] The typology of the residential building stock in Albania and the modelling of its low-carbon transformation (2017). Support for low-emission development (SLED) in South East Europe (SEE)

investments. Increase the security of energy supply with affordable costs for Albanian citizens and the economy.

- Integration of the Albanian electricity and natural gas market with Kosovo, the region and European markets. Couple the electricity market in line with the commitments made under the so-called Berlin process.
- The security of energy supply shall be based on well-functioning energy competitive markets that offers the right signals for the production and consumption of electricity and gas and a clear long-term energy policy that encourages investments.
- Increasing gas, oil and energy storage capacity in the energy system in accordance with Directive 2009/119/EC of 14 September 2009 imposing an obligation to maintain minimum stocks of products.
- The achievement of country objectives for renewable energy sources, energy efficiency, reduction of energy intensity of GDP and development of cost-effective policies and strategies to increase energy performance in public and residential buildings is expected to have a stabilizing effect on security of supply.
- Development of a policy framework for energy (including energy efficiency for sustainable transport) in transport based on the Albania Sector Transport Strategy, and the introduction of new technologies in all its sectors is also expected to have a stabilizing effect on security of supply by reducing the amount of oil and petrol imports.
- The road transport shall be shifted to other transport modalities, like the rail or water transport. The fulfilment of this objective will contribute to reduce fuel consumption.
- Renovation of oil and petroleum industry and supply infrastructure, quality control systems and the introduction of new technologies to the oil sector.
- Planning the exploration of country oil reserves and creation of a national security/reserve stock.

The **Master Plan of Natural Gas for Albania** was approved by DCM No. 87 of 14.02.2018. This plan aims to develop a sustainable natural gas system that enables a balanced contribution to the energy system, ensuring gas supply through competition and environmental protection. A completely new gas transmission and distribution system is needed.

It identifies the following gas objectives and projects which are relevant in the context of the NECP:

The Gas Master Plan defines the main lines for the development of the gas market and services in Albania based on natural gas supplied through the Trans Adriatic Pipeline (TAP Project), as well as potential gas sources discovered and concretized in the country, or even through natural gas pipelines such as the Ionian Adriatic Pipeline (IAP Project) and the Albania - Kosovo Pipeline (ALKOGAP Project). Albania intends to develop an underground natural gas storage site in Dumre, near Elbasan (UGS Dumrea Project).

The construction of the pipeline that will link the TAP project near the Fier Compressor Station area to the Vlora TPP and the entire Vlora region, will make it possible to restore the Vlora TPP by using natural gas as fuel.

In 2040, the potential consumption of natural gas for electricity generation could be around 770 million $m^3$, while the projected consumption at the country's refineries could be around 89.2 million $m^3$.

Vision, strategic objectives and projects of the Albanian Government for the development of the gas sector by 2040:

- Creating a favorable investment climate for investments in national gas transmission and distribution system and integration into the regional and international networks. TAP project presents an opportunity to introduce in a larger scale the consumption of natural gas for

households by creating a gas market and increment of new investments in gas infrastructure. Priority shall be the implementation of "Feasibility Study" and detailed design and then construction of the national gas transmission network, including strategic axes and connection to regional gas networks;

- Harmonization of national legislation such as tariff systems, network codes, supply rules, and market code in accordance with the *Acquis Communitaire*;
- Creation and functioning of the gas market in accordance with EU standards, as defined in the Third EU Energy Package;
- Improving the maintenance and performance of the existing gas transmission and distribution network with the involvement of state sector company (ALBGAZ sh.a.) and specialized private companies, through a system of management of existing assets and those that will be created during the implementation of the Master Plan. Priority: Revitalization of the existing natural gas transmission and distribution network, currently administered by state sector company ALBGAZ sh.a., which operates as a combined operator;
- Priority: Preventive measures and action plan to improve security and mitigate potential risks in the existing network and in what will be built, using and implementing technical standards and codes for the gas sector, which are in line with the relevant standards and codes of EU countries.

### 2.3.2 National objectives with regard to diversification and resilience

The national energy strategy foresees the stimulation of appropriate diversification of energy production through new investments, increasing of regional cooperation and integration and interconnection with regional and European electricity and natural gas networks in accordance with the *Acquis* of the Energy Community Treaty. In the power sector, Albania is almost entirely dependent on hydropower. Increasing the share of RES other than hydropower in the structure of used energy-generating products will contribute to reduce dependence on water resources.

The integration of the Albanian electricity market with Kosovoalso shall increase the diversification of electricity sources and supply, as Albania has almost 100% hydro capacity (sensitive to changing hydrological conditions) and Kosovo has almost 100% thermal capacity.

The coupling of the two systems, combining the generating would improve the security of supply through more efficient use of the capacities of existing interconnection lines and tariff signals.

The construction of the TAP gas pipeline and the related objective of creating a regional gas market is expected to contribute to the diversification of energy sources. Supply with gas of the existing thermo power station in Vlora shall contribute to increasing energy diversity.

Biofuel targets of 10% as share of biofuels versus total fuel consumption in the transport sector in 2030 is expected also to have an effect in diversification of energy sources in the transport sector.

### 2.3.3 National objectives with regard to reducing energy import dependency

The main objectives are as follows:

- to reduce import dependency regarding electricity
- to reduce import dependency regarding oil products

**Power sector:**

Expansion of new generation capacity in the future: some new large HPP as Devolli River Cascade, Fan River Cascade, some small power plants which are under construction, Photovoltaics, etc. also shall contribute in reducing energy import dependency.

**Gas sector:**

Creation and functioning of the gas market and creating a favorable investment climate for investments in national gas transmission and distribution system and integration into the regional and international networks shall contribute on reducing energy import dependency and increasing the flexibility of the national energy systems. Supply with gas of the existing thermo power station in Vlora and the planned TPP in Korça shall contribute to the reduction of energy import quantity and increase energy diversity.

**Oil sector:**

Albania has become highly dependent of imported oil products due to a declining of oil production in combination with a sharply growing demand for gasoline, diesel and heavy fuel oil. The transport sector was the greatest energy consumer, with about 40% of the final total consumption (2013). Unless the fact that Albania is rated as one of Europe's richest countries in onshore hydrocarbon reserves, very little has been done for increasing productivity and technological improvements which was therefore integrated in the NECP.

The objective to shift the existing road transport to other transport modalities, like the rail or water transport will contribute to reduce fuel consumption.

The goal for the share of the bio-fuels vs. total fuel consumption in transport sector 10% in 2020, 10% in 2025 and 10% in 2030 as compared to 3.55% in 2015 will also contribute to reduce fossil fuel consumption in transport.

### 2.3.4 National objectives with regard to increasing flexibility

The national targets for 2030 about increasing the contribution of primary energy sources, increasing of renewable energy production, increasing of natural gas penetration, development of diverse supply sources through new investments, increasing regional cooperation and integration and interconnection with regional and European electricity and natural gas networks, integration of the Albanian electricity and natural gas market with Kosovo, enhancing security of energy transmission and supply through diversification of supply routes of energy and improving the security and the reliability of them through cost-effectiveness investments shall increase the flexibility of the national energy system.

The Master Plan of Natural Gas for Albania was approved by DCM No. 87 of 14.02.2018 and aims to develop a sustainable natural gas system that enables a balanced contribution to the energy system, ensuring gas supply through competition and environmental protection. A completely new gas transmission and distribution system is needed. In 2040, the potential consumption of natural gas for electricity generation could be around 770 million m³, while the projected consumption at the country's refineries could be around 89.2 million m³. Priority projects identified in the Master Plan of Gas for Albania are described in chapter 3 of the NECP draft document.

Expansion of new generation capacity is planned in the future: some new large HPP as Devolli River Cascade, Fan River Cascade, some small power plants which are under construction, two new thermo power stations in Korça, Kuçova, etc. also shall contribute to increasing the flexibility of the national energy system.

## 2.4 Dimension Internal energy market

The objective of internal energy market is to harmonize and liberalize the country's internal energy market, to address market access, transparency and regulation, consumer protection, supporting interconnection, and adequate levels of supply.

The goal is to build a more competitive, customer-centered, flexible and non-discriminatory electricity market with market-based supply prices. In so doing, they strengthen and expand the rights of individual customers and energy communities, address energy poverty, clarify the roles and responsibilities of market participants and regulators and address the security of the supply of electricity, gas and oil, as well as the development of regional and European networks for transporting electricity and gas.

To achieve this goal, the Albanian Government has approved The National Strategy of Energy 2018–2030 as an overall energy sector strategy in which objectives connected with the dimension of the Internal energy market are:

1.- Opening of the electricity market 100% in 2025

2.- Cash collection from electricity selling 92% in 2020, 95% in 2025 and 98% in 2030 as compared to 90% in 2018

3.- Development of diverse supply sources increasing regional cooperation and integration and interconnection with regional and European electricity and natural gas networks in accordance with the *Acquis* of the Energy Community Treaty.

4.- Integration of the Albanian electricity and natural gas market with Kosovo, the region and European markets. Couple the electricity market in line with the commitments made under the so-called Berlin process.

5.- Well-functioning energy competitive markets that offer the right signals for the production and consumption of electricity and gas.

6.- Increasing gas, oil and energy storage capacity in the energy system in accordance with Directive 2009/119/EC of 14 September 2009 imposing an obligation to maintain minimum stocks of products.

7.- Development of plans for the creation of the Albanian gas market and its regional integration, as well as for the sale, transmission, distribution and retail sale of natural gas by TAP and other gas sources. Implementation of market reforms necessary to comply with the *Acquis* of the Energy Community;

8.- Consolidation and further strengthening of ALBGAZ s.a., on the role of the combined gas transmission and distribution operator;

Natural gas objectives connecting with Internal energy market as defined in Master Plan of Albania's natural gas sector for the period 2020-2040 are:

- Harmonization of national legislation such as tariff systems, network codes, supply rules, and market code in accordance with the *Acquis Communitaire*.
- Creation and functioning of the gas market in accordance with EU standards, as defined in the Third EU Energy Package;
- Building a database about transmission and distribution networks, as well as the underground gas storage or GNL terminals of the market operators, which will enable comprehensive monitoring of all gas sector activities.

### 2.4.1 Electricity interconnectivity

Integration into the regional and EU energy markets is a strategic objective of the Albanian Government to meet its growing demand for energy, diversity of energy sources, efficiency and flexibility of the national energy system. To achieve this objective, Albania has to invest in electrical energy interconnectivity infrastructure.

Albania has interconnectivity infrastructure with Kosovo, Montenegro and Greece through six Interconnection lines:

- 400 kV line Zemblak - Kardia (Greece)
- 400 kV line Tirana 2 - Podgorica (Montenegro)
- 400 kV line Tirana2 - Kosovo B (Kosovo)

- 220 kV line Koplik - Podgorica (Montenegro)
- 220 kV line Fierzë - Prishtina (Kosovo)
- 150 kV Bistrica 1 - Igumenica (Greece).

The analysis in chapter 4 shows that Albania's water-based electricity system is exposed to shortages in dry years. This means that an increment of exchange capacity with the neighbor systems is expected in the near future and the need for investment in strengthening and development of the interconnection network is evident. The development of new projects will be based on technical and economic considerations and based on cost-benefit analysis in accordance with the ENTSO-E methodology.

The strengthening and development of the interconnection network will create more favorable technical conditions to develop an integrated market of electricity in the region and help the country's energy sector to continue its transformation towards a more competitive marketplace, while aligning with the Third Energy Package initiative and objectives. As part of the Third Energy Package emphasis, cross-border market integration is a crucial step towards a pan-European regional energy market.

In the National Strategy of Energy 2018–2030, it is foreseen:

- Aligning the electricity sector's legal and regulatory framework with the EU *Acquis* and meeting the obligations of the Third Energy Package.
- Construction of a new 400 kV interconnection line Fier – Elbasan – Manastir (North Macedonia). The project includes construction of a new 400 kV transmission line Elbasan - Ohrid – Manastir, 151 km (56 km in Albania territory), extension of Elbasan2 Ss and installation of new 120 MVAr shunt reactor, construction of 68 km new 400kV line, from Elbasan2- Fier. extension of Fier Ss, with 1 new AT-400 MVA.

In the Transmission System Operator development plan, it is foreseen also the development of the existing 400kV network by closing the 400kV ring between Albania – North Macedonia – Greece, which shall have the following benefits:

- improving network capacity to facilitate anticipated load and transit growth, new generation connections, in the context of improving transmission capacity in Albania and Macedonia, and in the Balkans region generally,
- improvement of the reliability of the regional network, the overall security of supply, and flexibility in the operational of the power system,
- decrease of the technical losses in the transmission system,
- elimination of overload in the national 220 kV ring.
- improving the quality of electricity supply (normalize the voltage levels, stabilize the load flow and the frequency fluctuations, etc.),
- supporting the potential to develop the regional energy market in South East Europe and creating trading opportunities with Bulgaria and Italy,
- mutual support between Macedonia and Albania because of complimentarily of generation types (Albania – hydro, Macedonia – thermal),
- reducing the cost of providing reserve capacity and providing mutual emergency support.

Third party access to the transmission system and provisions on congestion management on cross-border lines comply with the *Acquis*. Cross-border transmission capacities on the borders with Montenegro and Greece are allocated via the regionally coordinated platform of the South-East Europe Coordinated Auction Office in Montenegro (SEE CAO).

Albanian Transmission System Operator and Kosovo's power transmission system operator KOSTT have signed an agreement to set up a common energy market as two neighboring countries. The agreement is in line with the new ENTSO-E regulations aimed at promoting the co-operation of the TSOs in terms of safe operations of the energy systems and the minimization of costs.

The results of the Albania-Kosovo power market scenario show there is a significant potential for better utilization of cross-border transmission capacity and increase the welfare through market optimization

of operation of the thermal power resources in Kosovo and hydro resources in Albania (specifically, the Drin River Cascade), as well as exchanging balancing reserve requirements.

### 2.4.2 Energy transmission infrastructure

**Electricity transmission infrastructure**

Key targets for the electricity transmission infrastructure are the following ones:

- Achievement of the reduction of technical losses in electricity transmitting network by 1.7% in 2030
- Improve the reliability of the transmission system and the security of electricity supply
- Improve the reliability of the communication network and remote monitoring and control system to increase the security of electricity supply
- Develop the network to respond to increases in demand for transmission capacity from industrial consumer and/or hydro generation
- Accelerated integration of variable RES into the power system, and increased availability of regulatory reserves to balance their production
- Timely realization of investment plans, in particular capital investments that enable the integration of RES into the power system
- Supporting market transactions in the territory of the state and the region so that the transmission network does not represent a constraint on competitiveness
- Revitalization and replacement of old grid units
- Increasing the transmission capacity of individual lines planned for revitalization
- Application of new technologies in transmission, if they are technically and economically justified

Due to its climate characteristics, Albania, is particularly suitable for the development of wind and solar power plants, and there is a strong investor interest in the construction of new facilities. The existing transmission grid and interconnection capacity to neighboring countries have to be developed to enable the integration of expected installation of RES.

Main infrastructure projects to achieve 2030 targets: see chapter 1.2.2 Dimension Energy Market.

**Key goals for the gas transmission infrastructure**

The gas master plan is to be implemented to develop a sustainable natural gas system that enables a balanced contribution to the energy system, ensuring gas supply through competition and environmental protection. A completely new gas transmission and distribution system is needed. The development of the gas storage system is also expected.

Main infrastructure projects to achieve 2030 targets: see chapter 1.2.2 Dimension Energy Market.

### 2.4.3 Market integration

Integration into the regional and EU energy markets is one of the main objectives of the Albanian Energy Sector Strategy which underline that energy security has to be achieved based on energy sources diversification, solidarity and trust.

The principles guiding the development of the Albanian Energy Sector Strategy are fully in line with the principles of the Second National Strategy for Development and Integration.

For items concerning market integration the objectives are:

- Full opening of the electricity market 100% in 2025
- Further diversification of supply sources and interconnection with the regional and European electricity and gas networks
- Establish a competitive and organized market that provides correct signals for production and

consumption of electricity and natural gas, considering the specific influence of climate changes on the domestic power production

- Couple the electricity market in line with the commitments made under the so-called Berlin process

### 2.4.4 Energy poverty

Energy poverty is not yet clearly defined and systematically monitored.[16] Thus, a respective PaM was integrated in the plan.

[16] Energy Poverty in South East Europe – Surviving the Cold. South East Europe Sustainable Energy Policy programme (SEE SEP), 2016

## 2.5 Dimension Research, innovation and competitiveness

It is the objective to transform Albania towards a more competitive, more innovation-driven and knowledge-based economy. To this end, policy instruments have been developed. However, no specific emphasis has been put on clean energy technologies and low-carbon technologies until now.

Overall, the final goal is that public annual expenditures for scientific research and innovation in total reach 2% of GDP by 2022 and that this level of expenditure is to be maintained in the future.

For the period 2020-2022, the target for High Education and scientific research is foreseen as follows:

- Increase by 10% -15% per year the number of applications from bilateral programs and the Horizon 2020 Program, as well as ERASMUS+ programs;
- Funding for scientific research work for 3,500-4,000 researchers per year in public HEIs in the period 2019-2022;
- Funds for excellence and innovation target to reach 1% of GDP by 2020.

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Public budget ALL (x 1000 ALL) | 6,562,117 | 7,204,009 | 7,354,958 | 9,730,000 | 9,796,000 | 11,696,000 |
| GDP (x billion ALL) | 1,551,3 | 1,630.9 | 1,688.9 | 1,777.2 | 1,879.8 | 1,990.2 |
| % PBB | 0.42% | 0.44% | 0.44% | 0.55% | 0.52% | 0.59% |

**Table 10: Budget for High Education**

More information on Research, Development and Innovation is available in DCM No. 710 of 1.12.2017 “The national Strategy for Science, Technology and Innovation”, page 14.

# 3 POLICIES AND MEASURES

**Policies and Measures (PaMs) for Scenario with Existing PaMs and Scenario with Additional PaMs**

Policies and Measures presented below are identified based on the definitions given in Article 2 Governance Regulation:

- **'policies and measures'** means all instruments which contribute to meeting the objectives of the integrated national energy and climate plans […]
- **'existing policies and measures'** means implemented policies and measures and adopted policies and measures;
    - 'implemented policies and measures' means policies and measures for which one or more of the following applies at the date of submission of the integrated national energy and climate plan or of the integrated national energy and climate progress report: directly applicable Union or national law is in force, one or more voluntary agreements have been established, financial resources have been allocated, human resources have been mobilised;
    - 'adopted policies and measures' means policies and measures for which an official government decision has been made by the date of submission of the integrated national energy and climate plan or of the integrated national energy and climate progress report and there is a clear commitment to proceed with implementation;
- **'planned policies and measures'** means options that are under discussion and that have a realistic chance of being adopted and implemented after the date of submission of the integrated national energy and climate plan or of the integrated national energy and climate progress report;

PaMs are allocated to Scenarios with Existing PaMs (WEM Scenario) and with Additional PaMs (WAM Scenario), the latter referring to planned policies and measures and new policies and measures with a realistic chance of being implemented. Scenario modelling is documented in chapter 4.

**Analysis resulting in new PaMs**

The analysis of conflicting goals and other challenges identified during the work led to the development of new PaMs aiming at addressing these issues. New PaMs with a realistic chance of implementation are considered in the WAM scenario although they are still under elaboration:

- R-E6 Demand side management and electricity storage systems for power grid flexibility
- EE-L5 Financial support schemes for improving energy efficiency in buildings
- EM-P1 Eradicate Energy Poverty

**Alignment of NECP PaMs and NDC PaMs**

Great efforts were made to align the preparation of the NECP and the NDC. Although early coordination meetings were held, in practice there were significant challenges due to the different teams and timelines applied to the NECP and NDC. Data availability and data transparency posed another major challenge. Nevertheless, with the creation of the Draft NECP, it has been possible to create a transparent database for future updates.

**Sources of PaMs**

Policies and measures were compiled based on the policies and strategies presented in chapter 1, based on studies carried out such as the SLED study, and based on good practice examples.

**Description of PaMs**

The table below shows the overview of key policies and measures affecting the national climate target to 2030 and beyond.

The detailed descriptions are available in the subchapters by Dimension.

| Dimension | Nr. | Code of PaM | PaM name | Type of PaM | Allocated to Scenario |
|---|---|---|---|---|---|
| Decarbonisation / GHG emissions & removals | 1 (1) | G-T1 | Improvement of extra-urban bus network | Regulatory | WAM |
| | 2 (2) | G-T2 | Integrated freight management | Regulatory | WAM |
| | 3 (3) | G-T3 | Efficiency-based car fees and incentives for fleet renewal | Regulatory; Fiscal | WEM |
| | 4 (4) | G-B1 | Policies to support RES in Heating and Cooling Sector | Regulatory; Financial; Educational | WEM |
| | 5 (5) | G-I1 | Implementation of the ETS in Albania | Regulatory; Educational | WAM |
| | 6 (6) | G-I2 | Establishment of a mechanism for implementation of MMR | Regulatory | WAM |
| | 7 (7) | G-A1 | Promotion of organic agriculture | Regulatory; Financial | WEM |
| | 8 (8) | G-A2 | Improve the Agricultural Monitoring in Albania | Regulatory | WAM |
| | 9 (9) | G-A3 | Regulating the Agricultural burning practices | Regulatory | WEM |
| | 10 (10) | G-W1 | Emission reduction from waste | Regulatory; Financial | WEM |
| | 11 (11) | G-W2 | Use of Waste Incineration Plants for the waste integrated management process in Albania | Regulatory; Financial | WEM |
| | 12 (12) | G-W3 | Increase of Wastewater Treatment Plants and their related coverage | Regulatory; Financial | WEM |
| | 13 (13) | G-LF1 | Increasing the natural carbon sink capacity of forestry and pastures | Regulatory; Financial | WAM |
| | 14 (14) | G-LF2 | Environmentally friendly forest management | Regulatory; Financial | WAM |
| Renewable Energies | 1 (15) | R-E1 | Mechanism of Feed-in-Tariff for small renewable capacity | Regulatory; Financial | WEM & WAM |
| | 2 (16) | R-E2 | Auctions for new renewable capacity (wind and solar) and contract-for-difference | Regulatory; Financial | WEM & WAM |
| | 3 (17) | R-E3 | Mechanism of net metering for installations up to 500 kW | Regulatory | WEM |
| | 4 (18) | R-E4 | Robust power grid to accommodate increased renewable energy capacity | Financial | WEM |
| | 5 (19) | R-E5 | Facilitate regulatory and physical connection to the electricity grid. | Regulatory | WEM |
| | 6 (20) | R-E6 | Demand side management and electricity storage systems for power grid flexibility | Regulatory | WAM |
| | 7 (21) | R-E7 | Metering strategy and digitalization of the power sector | Regulatory | WEM |

| | | | | | |
|---|---|---|---|---|---|
| | 8 (22) | R-T1 | Electrification of the transport sector | Regulatory | WAM |
| | 9 (23) | R-T2 | Sustainable / Advanced biofuels | Regulatory; Fiscal | WAM |
| | 10 (24) | R-I1 | Supporting the deployment of small-scale renewable energy applications in the non-food industrial sector | Investment, Financial; Information; Educational | WAM |
| **Energy Efficiency** | 1 (25) | EE-O1 | Energy efficiency obligation scheme and alternative measures for Albania | Regulatory | WAM |
| | 2 (26) | EE-L1 | Implementation of the Minimum Energy Performance Requirements in buildings | Regulatory | WAM |
| | 3 (27) | EE-L2 | Long-term renovation strategy *(for public and private buildings)* | Regulatory; Financial; Information | WAM |
| | 4 (28) | EE-L3 | Retrofitting of the existing central governmental building *(excluding other public buildings owned by municipalities, etc.)* | Investment; Regulatory | WAM |
| | 5 (29) | EE-L4 | Retrofitting of the public building stock *(all public buildings except central government buildings)* | Investment; Regulatory | WAM |
| | 6 (30) | EE-L5 | Financial support schemes for improving energy efficiency in buildings (private sector) | Financial; Fiscal | WAM |
| | 7 (31) | EE-S1 | Uptake of ESCO models | Regulatory; Financial | WAM |
| | 8 (32) | EE-P1 | Energy efficiency measures related to purchasing by public authorities | Regulatory | WAM |
| | 9 (33) | EE-P2 | Municipalities Energy Efficiency Action Plans, implementation, and reporting | Regulatory, Educational | WAM |
| | 10 (34) | EE-E1 | Energy audits for large energy consumers with focus on industrial activities | Regulatory; Organizational | WAM |
| | 11 (35) | EE-E2 | Energy management systems for SMEs | Regulatory; Organizational | WAM |
| | 12 (36) | EE-C1 | Introducing the Energy labelling and Eco-design requirements | Regulatory; Informational | WAM |
| | 13 (37) | EE-T1 | Energy labelling of new cars | Information; Educational | WAM |
| | 14 (38) | EE-T2 | Increase the share of Electrical Vehicles in the national car fleet. | Regulatory; Financial; Fiscal | WAM |
| | 15 (39) | EE-T3 | Support mechanisms for EE and clean vehicles | Regulatory; Financial; Fiscal | WEM |
| | 16 (40) | EE-T4 | Increasing the share of public transport for passengers and freight (roads, railways and waterways) | Regulatory | WEM |
| **Energy Security** | 1 (41) | ES-P1 | Gas supply for Vlora Thermal Power Plant | Regulatory | WEM |
| | 2 (42) | ES-P2 | New construction of power plants – Skavica, Vau Dejes, Moglice | Regulatory; Financial | WEM & WAM |
| | 3 (43) | ES-O1 | Fully functional legal framework for a reliable and safe gas supply to customers | Regulatory | WAM |
| | 4 (44) | ES-O2 | Implementation of priority projects identified in the Gas Master Plan | Regulatory; Financial | WAM |
| | 5 (45) | ES-O3 | Linking Albania with the international gas network | Regulatory | WEM |

| | | | | | |
|---|---|---|---|---|---|
| | 6 (46) | ES-O4 | Increasing hydrocarbons exploration and production | Regulatory; Financial | WEM |
| | 7 (47) | ES-O5 | Emergency plan for natural gas | Regulatory; Financial | WEM |
| | 8 (48) | ES-O6 | Approval of Law "On the establishment, maintenance and management of the minimum reserves of crude oil security and its products" | Regulatory; Financial | WEM |
| | 9 (49) | ES-R1 | Ionian Adriatic Pipeline & Albania Kosovo Gas Pipeline | Regulatory; Financial | WEM |
| **Energy Market** | 1 (50) | EM-I1 | Electricity interconnectors | Regulatory; Financial | WEM |
| | 2 (51) | EM-I2 | Electric Energy Sector Reform | Regulatory | WEM |
| | 3 (52) | EM-I3 | Establish RES operator and transform Feed-in-Tariffs | Regulatory | WAM |
| | 4 (53) | EM-P1 | Eradicate energy poverty | Regulatory | WAM |
| **Research, Innovation and Competitiveness** | 1 (54) | RIC-E1 | Improvement of the regional and international collaboration in the scientific research related to the energy sector | Regulatory; Informational; Educational; Financial | WEM |
| | 2 (55) | RIC-E2 | National program of R&D | Financial | WEM |
| | 3 (56) | RIC-E3 | Business Investment Development Strategy (BIDS) | Regulatory | WAM |
| | 4 (57) | RIC-E4 | Demonstrating Innovation and Competitiveness | Financial | WAM |

**Table 11: Overview table of key policies affecting the national climate target to 2030**

## 3.1 Dimension Decarbonisation

### 3.1.1 Overarching legal framework

The main legal acts (including strategies and plans) related to this dimension are listed below:

1. **Law No. 155/2020, of 17.12.2020 "on Climate Change"**
2. **Law No. 57/2020 of 30.4.2020 "on Forests"**
3. **Law No. 7/2017 of 2.2.2017 "on the Promotion of the Use of Energy from Renewable Sources"**
4. **Law No. 43/2015 of 30.4.2015 "on Power Sector", amended**
5. **Law No. 9957 of 28.7.2008 "on National Taxes" amended**
6. **Albanian Intended Nationally Determined Contribution (INDC)**
7. **DCM No. 418 of 20.5.2020 "on the Approval of National Integrated Waste Management Strategy and the Action Plan for Albania for the period 2020–2035"**
8. **DCM No. 580 of 28.8.2019 "on the Approval of the National Consolidated Action Plan for the RES 2019-2020"**
9. **DCM No. 466 of 3.7.2019 "on the Approval of the Strategic Document and National Plan for the Mitigation of Greenhouse Gas Effects and Adaptation from Climate Change"**
10. **DCM No. 814 of 31.12.2018 "on the Approval of Forestry Policy Document for Albania for the period 2019–2030"**
11. **DCM No. 633 of 26.10.2018, "On Measures against air pollution by emissions of engines vehicles and reduction of air emissions of gaseous pollutants and particulate matter from positive ignition engines and Compressed Ignition engines using natural gas and Liquefied petroleum gas used for vehicles ", amended**
12. **DCM No. 369 of 26.4.2017 "on the Methodology Approval for the Establishing the Purchasing price of the Electric Energy produced by solar and wind small renewable sources"**
13. **DCM No. 811 of 16.11.2016 "On approval the sectorial transport strategy and action plan 2016-2020" (TSSAP)**
14. **DCM No. 709 of 29.10.2014 "on the Approval of ISARD - Intersectoral Strategy for Agriculture and Rural Development for the period 2014–2020", amended**
15. **Guideline of the Minister of Infrastructure and Energy No. 3 of 20.6.2019 "on the Approval of the Simplified Authorization Procedure for the Connection with the Distribution Grid of Small Renewable Projects of Self producers of Electric Energy from Solar Sources"**
16. **Sector Study for Investment Demand for Integrated Solid Waste Management (ISWM) in Albania (2018)**
17. **Nationally Determined Contribution** (2021 draft version)
18. **Law "On the production, transport and trading of biofuels and other renewable combustibles for transport"** (draft version)
19. **Sustainable Transport Plan** (draft version)

### 3.1.2 GHG emissions and removals

In the Tables below are the Policies and Measures divided by the sectors they are related to.

*Transport sector*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory* |
| **Title of PaM (Coding)** | *Improvement of extra-urban bus network (G-T1)* |
| **Timeframe** | *2020 – ongoing* |
| **Legal basis and planning documents** | *DCM No. 811 of 16.11.2016 "On approval the sectorial transport strategy and action plan 2016-2020"* |
| **Actions taken to date** | - *Reorganization of passenger transport lines by bus according to the Instruction of the Minister No. 5628 of 18.11.2016*<br>- *Establishment of the Task Force according to DCM No. 465 of 26.07.2018 on "Improving the level of control of vehicles and the trailers"*<br>- *Approval of the network according to the Instruction of the Minister No. 5628 of 18.11.2016 "On approval of the interurban line network"*<br>- *Construction of 10 km of dedicated lanes for bicycles in Tirana*<br>- *Feasibility study and terms of reference, for the concession of the new passenger terminal in Tirana (Municipality of Tirana)*<br>- *The use of electric taxis and electric buses for passengers in Tirana*<br>- *Construction of the new passenger terminal in Vlorë and Durrës Port*<br>- *Study "Possibility of developing Intermodal Transport in Albania" (Albanian Transport Institute)* |
| **Main Objective of PaM** | *The main objectives are: (i) improving the infrastructure of passenger terminals; (ii) increase the efficiency of the extra-urban bus network; and (iii) reduce $CO_2$ emissions caused by the extra-urban bus network.* |
| **Results to be achieved** | - *Increasing the economic-financial effectiveness of operators by 30-40% (within a year)*<br>- *Reduction of traffic congestion due to the reduction of the number of buses in circulation on the national road network.*<br>  o *Reduction of departures and arrivals of buses by 15-20% (within one year)*<br>  o *Reduction of $CO_2$ emissions, as the number of circulating buses decreases by 15-20%*<br>- *Promoting multimodal transport*<br>- *Improving the financial efficiency of the operators of the interurban network.*<br>- *Increased reliability in interurban transport*<br>- *Energy intensities in the transport sector will be reduced by 10%, as a result of better management*<br>- *Increasing the safety and quality of service on interurban lines*<br>- *Reduce needs for mobility and distances by means of integrated planning*<br>- *Reduce fuel consumption of vehicles and shift traffic to towards more efficient modes*<br>- *Use low carbon fuels such as sustainable biofuels or renewable electricity*<br>- *Possibility of multimodality and intermodality between modes of transport*<br>- *Setting up of Passenger Terminals* |
| **Measures to be implemented** | - *Eliminate overlaps of lines in their itineraries*<br>- *Using of new technologies "Intelligent Transport Systems" and "Smart Logistics" help to manage transport systems efficiently*<br>- *Improving the quality of roads*<br>- *Use of energy efficient vehicle, reducing needs for mobility and distances by means of integrated planning*<br>- *Promoting public passenger transport*<br>- *Increasing access to bicycle use*<br>- *Public awareness campaigns*<br>- *Carbon tax* |

| | |
|---|---|
| | - *Road tax*<br>- *Setting traffic tariffs and limiting the use of vehicles (their use on certain days of the week, e.g., according to license plate of the car)*<br>- *Improving the vehicle load factor in the freight transport*<br>- *Drafting an optimal parking plan and optimal parking tariffs, especially in the main nodes of passenger and freight transport*<br>- *Reduction in the use of energy resources* |
| **Budget (source of budgeting)** | *Specific budget not Available*<br>*The total budget foreseen for investments in the transport sector for a period of 20 years (2019-2038) is 4,888.03 MEur of these 4,458.53 MEur are for projects developed by the public sector while, 429.5 MEur are private investments* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure & Energy; General Directory of Transport Service; Companies operating in interurban bus transport; Travel agencies. Albanian Road Authority*<br>*Task Force established for the control* |
| **Relation with other dimensions (if any)** | *Energy Efficiency* |

| | | |
|---|---|---|
| **Energy Dimension** | | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Transport* | |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* | |
| **Title of PaM (Coding)** | *Integrated freight management*<br>*(G-T2)* | |
| **Timeframe** | *2020 – 2025* | |
| **Legal basis and planning documents** | *DCM No. 811 of 16.11.2016 "On approval the sectorial transport strategy and action plan 2016-2020"* | |
| **Actions taken to date** | - *Stimulation for the use of vehicles with improved aerodynamic shape*<br>- *Weight reduction*<br>- *Use of vehicles with improved energy performance.*<br>- *More efficient tires*<br>- *Improving the truck maintenance system to reduce pollution levels.*<br>- *Establish a system of taxes and tariffs to stimulate efficient transport of goods.*<br>- *Improving driver training to increase the quality of driving* | |
| **Main Objective of PaM** | *The main objectives according to the National Energy Strategy includes an active transport scenario and aims to reduce by 10% the energy intensity in the transport sector. Objectives: Logistics cost reduction. Reduction of road traffic and congestion.* | |
| **Results to be achieved** | - *Integration of road, rail, sea and air transport in the transport of goods (medium term 5-8 years)*<br>- *Improving the efficiency of the transport of goods*<br>- *Reduction of transit time and transport costs along the freight chain*<br>- *Reduction of traffic congestion on the national road network*<br>- *Reduction of energy consumption (ton/km)*<br>- *Reduction of $CO_2$ emissions*<br>- *Reduce fuel consumption of vehicles and shift traffic to towards more efficient modes*<br>- *Use low carbon fuels such as sustainable biofuels or renewable electricity*<br>- *Increase of Investments in the freight transport management sector*<br>- *Reduction of the cost of transport from the Origin to the Destination of the goods (during the transport chain)* | |
| **Measures to be implemented** | - *Integration of the Freight System with EU networks*<br>- *Establishment of Intermodal and Logistic nodes*<br>- *Implementation of Intelligent Systems of Transport (IST)* | |
| **Budget (source of budgeting)** | *See G-T1, specific budget not available* | |

| | |
|---|---|
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; Albanian Seaports, Albanian Railways Authority, Albanian Customs, Albanian Road Authority*<br>*Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | *Energy Efficiency* |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory; Fiscal* |
| **Title of PaM (Coding)** | *Efficiency-based car fees and incentives for fleet renewal*<br>*(G-T3)* |
| **Timeframe** | *2020 – ongoing* |
| **Legal basis and planning documents** | *DCM No. 633 of 26.10.2018, "On Measures against air pollution by emissions of engines vehicles and reduction of air emissions of gaseous pollutants and particulate matter from positive ignition engines and Compressed Ignition engines using natural gas and Liquefied petroleum gas used for vehicles ", amended; Law No. 9957 of 28.7.2008 "on National Taxes", amended* |
| **Actions taken to date** | - *No registration fee for electric vehicles*<br>- *The state reimburses 7500 ALL, approx. 55 Euro, for the PHEV*<br>- *New vehicles for three years are exempt from taxes* |
| **Main Objective of PaM** | *The measure aims at reducing the average age of cars and increasing the required standard. The measure is consistent with the INDC mitigation scenario. It includes the banning of registering the cars and increasing taxes for second-hand category cars in order to reduce at maximum their introduction to Albanian market.* |
| **Results to be achieved** | - *Decrease of the import of used vehicles*<br>- *Increase the use of new vehicles*<br>- *Increase the use of electric vehicles* |
| **Measures to be implemented** | - *The measures described in the actions taken to date*<br>- *Annual taxes increase base on the car age and type of fuel used* |
| **Budget (source of budgeting)** | *See G-T1, specific budget not available* |
| **Implem. Entity (Monitoring Entity)** | *Customs Authority, Ministry of Infrastructure and Energy, Ministry of Tourism and Environment, General Directorate of Transport, Local Government Units*<br>*Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | *Energy Efficiency* |

### *Building sector*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Building Sector* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory; Financial; Educational* |
| **Title of PaM (Coding)** | *Policies to support RES in Heating and Cooling Sector*<br>*(G-B1)* |
| **Timeframe** | *2017 – 2030* |
| **Legal basis and planning documents** | *Law No. 7/2017 of 2.2.2017 "on the Promotion of the Use of Energy from Renewable Sources"* |
| **Actions taken to date** | *Up to now, increase of capacities activities have been taken.* |

| | |
|---|---|
| **Main Objective of PaM** | *Promote the widespread use of renewable energies in the heating and cooling sector* |
| **Results to be achieved** | - *Increase the installed capacity of RES in buildings* |
| **Measures to be implemented** | - *Financial incentive schemes*<br>- *Regulatory schemes*<br>- *Guidance, or educationally based schemes* |
| **Budget (source of budgeting)** | *No state budget foreseen because the cost of scheme would be covered by the electricity tariffs* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy*<br>*ERE* |
| **Relation with other dimensions (if any)** | |

### *Industrial sector*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Industry* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Educational* |
| **Title of PaM (Coding)** | *Implementation of the ETS in Albania*<br>*(G-I1)* |
| **Timeframe** | *2022 – 2030* |
| **Legal basis and planning documents** | *Law No. 155/2020 of 17.12.2020 "on Climate Change"; DCM No. 466 of 3.7.2019 "on the Approval of the Strategic Document and National Plan for the Mitigation of Greenhouse Gas Effects and Adaptation from Climate Change"* |
| **Actions taken to date** | *Law 10448 of 14.7.2011 establishes environmental permitting system for operation of certain groups of polluting industrial activities in compliance with environmental standards. The industrial operators are obliged to monitor and report the emissions of their activities into the environment, based on the conditions set in the respective environmental permit.* |
| **Main Objective of PaM** | *Setting up the ETS in Albania will contribute to reach the NDC target for reduction of GHG emission from the industry sector as well as the NECP target for decarbonisation of the economy.* |
| **Results to be achieved** | - *Aiming to reduce the GHG emission from the industry sector till 2030 by 50%*<br>- *Starting 2025, Albania introduces trading of free allowances at national level with the participation of the cement, fertilizers, iron and steel industries*<br>- *An appropriate MRV system for tracking emissions needs to be in place, as foreseen in the recently adopted "Law on Climate Change"*<br>- *By 2027, 20 industrial operators from the Annex II of the law 155/2020, are capable to monitor, report and verify the GHG emissions in compliance with relevant EU guidelines.* |
| **Measures to be implemented** | *Design of the future ETS according to EU-standards in order to facilitate the process of any potential future linking with the EU-ETS:*<br>- *Improvement of the legislative framework (secondary legislation on procedures of issuing GHG permit and technical guidelines)*<br>- *Creating the help desk for industrial operators*<br>- *Setting the carbon price*<br>- *Training of industrial operators on establishing:*<br>  o *Monitoring Plan (Categorisation, Tier system, Calculation based approach, Uncertainty, Other requirements)*<br>  o *Verification and Reporting (Annual emission report with verified data on emissions;*<br>  o *Verification report; Improvement report)*<br>  o *How to obtain EU allowances (buy, get for free), surrender EU allowances*<br>- *Starting the accreditation process and/or recognition of external verifiers due to the size of the market.* |

| | |
|---|---|
| **Budget (source of budgeting)** | *2 MEur (as an indicative figure based on benchmarking, covering the costs of capacity building of competent authority and operators and putting in place technical framework).*<br>*Budget can be obtained through various EU financing mechanisms, such as, IPA technical assistance, TAIEX etc* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Tourism and Environment, and Ministry of Infrastructure and Energy*<br>*National Environmental Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation; potential impact on Energy Efficiency and Research, Innovation & Competitiveness* |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Industry/ Cross cutting* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory* |
| **Title of PaM (Coding)** | *Establishment of a mechanism for implementation of MMR (Monitoring Mechanism Regulation)*<br>*(G-I2)* |
| **Timeframe** | *2022 – ongoing* |
| **Legal basis and planning documents** | *Law No. 155/2020 of 17.12.2020 "on Climate Change"; DCM No. 466 of 3.7.2019 "on the Approval of the Strategic Document and National Plan for the Mitigation of Greenhouse Gas Effects and Adaptation from Climate Change"; UNFCCC ratification by the Albanian Parliament in 1994* |
| **Actions taken to date** | *Preparation and approval of the law on Climate Change and the process of revising the NDC.* |
| **Main Objective of PaM** | *Ensured alignment with EU climate change Acquis and fulfilment of the UNFCCC requirements through introduction of a mechanism for monitoring and reporting GHG emissions and other information relevant to climate change on regular basis.* |
| **Results to be achieved** | *According to the 2015 NDC, the progress towards the following targets must be reported:*<br>- *Building sector (insulation) will achieve 50 kt$CO_2$ (or 7% of the total GHG emission reduction of 708 Ktonnes in the country), by 2030*<br>- *Industry sector (more efficient boilers) will achieve 225 kt$CO_2$ (or 32% of the total GHG emission reduction of 708 Ktonnes in the country), by 2030*<br>- *Industry sector (switching to other fuels) will achieve 52 kt$CO_2$ (or 7% of the total GHG emission reduction of 708 Ktonnes in the country), by 2030*<br>- *Transport sector (cost effective measures) will achieve 116 kt$CO_2$ (or 16% of the total GHG emission reduction of 708 Ktonnes in the country), by 2030*<br>- *Transport sector (switch to 10% biofuels) will achieve 265 kt$CO_2$ (or 38% of the total GHG emission reduction of 708 Ktonnes in the country), by 2030* |
| **Measures to be implemented** | - *New acts drafted on monitoring, reporting and verification, etc. as required by the CCL*<br>- *An Implementation Plan for the MMR*<br>- *Core GHG inventory team of at least 6 persons established across institutions and fully conversant with the tasks of inventory team (Sector experts, co-coordinator, QA/QC, peer review)*<br>- *Core team for MMR of at least 10 persons from institutions established and fully conversant with the tasks they were trained for and able to carry out all statutory tasks required by the MMR*<br>- *Capacity building for skilled staff of MoTE, NEA, MIE, MARD and all stakeholders identified by the CCL*<br>- *Capacity building for skilled accredited independent verifiers of the GHGs monitoring reports*<br>- *Capacity building for skilled and other institutions' staff in data processing, indicators development, management and archiving*<br>- *Creating enriched pool of data, archives and exchange of information between all institutions involved with the MMR* |

| | |
|---|---|
| | - *An electronic system in place for activity data uploading/downloading by MIE, MARD, MoTE, NEA and all other institutions involved with MMR*<br>- *Improve coordination capacities at MoTE and the inter-institutional cooperation for the implementation of the CCL, MMR and other climate change Acquis*<br>- *Compliance with policy reporting requirements* |
| **Budget (source of budgeting)** | *1 MEur* |
| **Implem. Entity (Monitoring Entity)** | *National Environmental Agency, Regional Environmental Agency and Inspectorate*<br>*National Environmental Agency (Preparation and verification of GHG emission reports)* |
| **Relation with other dimensions (if any)** | |

## *Agricultural sector*

| | | |
|---|---|---|
| **Energy Dimension** | | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Agriculture* | |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory; Financial* | |
| **Title of PaM (Coding)** | *Promotion of organic agriculture*<br>*(G-A1)* | |
| **Timeframe** | *2020 – 2030* | |
| **Legal basis and planning documents** | *DCM No. 709 of 29.10.2014 "on the Approval of ISARD - Intersectoral Strategy for Agriculture and Rural Development for the period 2014–2020", amended* | |
| **Actions taken to date** | *No report available on the progress but it is known that the IPA instrument (IPARD) supports this direction (organic farming).* | |
| **Main Objective of PaM** | *Promotion of organic farming and increase of the share of organic farming in the agriculture sector and the improvement of the fertilization methods.* | |
| **Results to be achieved** | - *Increase the number of organic farms from 123 (2012) to 1,000 (Objective 2020)*<br>- *Increase the area of organic farming from 5848 ha (2012) up to 20,000 ha (Objective 2020)*<br>- *Decrease of average rate of fertilization by 10% between 2019 and 2030 and a reduction of 50% of the urea spread between 2019 and 2030* | |
| **Measures to be implemented** | - *Financial support (mainly through IPARD instrument)*<br>- *Improvement of the legislative framework related to organic farming*<br>- *Drafting, publishing, and disseminating the Code Best Practice in Agriculture (BPA)*<br>- *Training of farmers in implementation of the Code of BPA*<br>- *Data collection on organic farms and area under organic farming* | |
| **Budget (source of budgeting)** | *Agri-environmental, climatic and organic farming measures in total foreseen in the IPARD II (2014-2020) scheme have an indicative budget of 1.7 MEur and have an indicative starting date in 2018 (IPARD programme 2014-2020)* | |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Agriculture and Rural Development; National Agency for the Rural and Agricultural Development*<br>*Regional Agencies of Agricultural Extension* | |
| **Relation with other dimensions (if any)** | | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Agriculture* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Improve the Agricultural Monitoring in Albania*<br>*(G-A2)* |
| **Timeframe** | *2015 - ongoing* |
| **Legal basis and planning documents** | *DCM No. 709 of 29.10.2014 "on the Approval of ISARD - Intersectoral Strategy for Agriculture and Rural Development for the period 2014–2020", amended; Law No. 8244 of 17.6.2004 "on the protection of Agricultural Land", amended* |
| **Actions taken to date** | *No report available on the progress.* |
| **Main Objective of PaM** | *Establish a permanent national monitoring of land and agricultural activities in relation to $CO_2$ emissions.* |
| **Results to be achieved** | - *A national registry is to be established under the auspices of INSTAT in the year 2025-2030*<br>- *Training of municipal staff, farmers, etc.* |
| **Measures to be implemented** | - *Financial support (mainly through IPARD instrument)*<br>- *Improvement of the legislative framework related to the methodology of monitoring.* |
| **Budget (source of budgeting)** | *No budget identified specifically for this PaM* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Agriculture and Rural Development; INSTAT*<br>*INSTAT; Regional Agencies of Agricultural Extension* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Agriculture* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Regulating the Agricultural burning practices*<br>*(G-A3)* |
| **Timeframe** | *2019 - ongoing* |
| **Legal basis and planning documents** | *DCM No. 709 of 29.10.2014 "on the Approval of ISARD - Intersectoral Strategy for Agriculture and Rural Development for the period 2014–2020", amended; Law No. 8244 of 17.6.2004 "on the protection of Agricultural Land", DCM No. 608 of 17.9.2014: For the determination of the necessary measures for the collection and treatment of bio waste.* |
| **Actions taken to date** | *No report available on the progress.* |
| **Main Objective of PaM** | *Prohibition of outdoor burning of agricultural waste.* |
| **Results to be achieved** | - *Reduction of emissions coming from the burning of agricultural waste*<br>- *Training of farmers, etc.* |
| **Measures to be implemented** | - *Intensify control over incineration of agricultural waste*<br>- *The burning of agricultural waste should be controlled by taking security measures from the fire as well have a defined schedule and areas designated for their incineration*<br>- *Drafting, publishing, and disseminating the Code Best Practice in Agriculture* |
| **Budget (source of budgeting)** | *No budget identified specifically for this PaM.* |

| | |
|---|---|
| **Implem. Entity (Monitoring Entity)** | *Ministry of Agriculture and Rural Development; INSTAT*<br>*INSTAT; Regional Agencies of Agricultural Extension* |
| **Relation with other dimensions (if any)** | |

### *Waste Management sector*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Waste Management* |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Emission reduction from waste*<br>*(G-W1)* |
| **Timeframe** | *2020 – 2035* |
| **Legal basis and planning documents** | *DCM No. 418 of 20.5.2020 "on the Approval of National Integrated Waste Management Strategy and the Action Plan for Albania for the period 2020–2035"; Sector Study for Investment Demand for Integrated Solid Waste Management (ISWM) in Albania (2018)* |
| **Actions taken to date** | *Only 15 out of 61 municipalities have a Waste Integrated Management Plan in place. 17% of all waste streams go for recycling and approx. 10% of packaging waste is collected by the municipalities. 40% of batteries and accumulators, 5% of sewage sludge and 0% of inert waste is collected and properly treated.* |
| **Main Objective of PaM** | *Improved waste management has enabled waste collection and treatment in an integrated manner in line with EU standards. Establishment of a system for integrated management of other municipal waste streams, which is based on the waste hierarchy.* |
| **Results to be achieved** | - *All municipalities have a Waste Integrated Management Plan in place by 2035. 40% of all waste streams go for recycling and not less than 70% of packaging waste is collected by the municipalities by 2035.*<br>- *All municipalities have closed the non-compliant landfills by 2035.*<br>- *80% of batteries and accumulators, 80% of sewage sludge and 80% of inert waste is collected and properly treated by 2035.*<br>- *The beginning of $CH_4$ capture in 2025 and linear evolution until the capture of 10% of 1.34 million tonnes of $CH_4$ in 2030 (estimated by considering data from the GACMO tool of Third National Communication Scenario and the NDC).* |
| **Measures to be implemented** | - *Drafting a plan for waste management from packaging and a program for waste prevention in support of the implementation of the strategic policy document for Integrated Waste Management and Action Plan*<br>- *Closing and treatment of all inherited municipal landfills (non-compliant landfills), according to the instructions in force*<br>- *Installation of methane capture installations in the landfills*<br>- *Implementation of national schemes of extended producer responsibility for packaging and packaging waste* |
| **Budget (source of budgeting)** | *The estimated value for landfill rehabilitation is approx. 76 MEur; Collection of dry recyclables approx. 18.5 MEur and collection of organic waste and composting approx. 13 MEur. (All values have been calculated until for the period 2018-2032.)* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; National Agency for Water Supply and Sewerage and Waste Infrastructure; Municipalities*<br>*National Agency for Water Supply and Sewerage and Waste Infrastructure; National Environmental Agency; Municipalities* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Waste Management* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory; Financial* |
| **Title of PaM (Coding)** | *Use of Waste Incineration Plants for the waste integrated management process in Albania (G-W2)* |
| **Timeframe** | *2020 – 2035* |
| **Legal basis and planning documents** | *DCM No. 418 of 20.5.2020 "on the Approval of National Integrated Waste Management Strategy and the Action Plan for Albania for the period 2020–2035"; Sector Study for Investment Demand for Integrated Solid Waste Management (ISWM) in Albania (2018); DCM No. 178 of 6.3.2012, "On Waste incineration"* |
| **Actions taken to date** | *There is already an incinerator constructed and operative in Elbasan and other two that are under construction and ready to operate in short time in Tirana and Fier. As of 2020, 6 municipalities send their waste in the respective incinerators.* |
| **Main Objective of PaM** | *Improved waste management has enabled waste collection and treatment in an integrated manner in line with EU standards. Transport of waste to plants that convert waste into energy.* |
| **Results to be achieved** | - *Number of municipalities that send their waste in the Waste to Energy (WtE) plants from 6 in 2019 will go to 12 in 2025.*<br>- *All municipalities within the WtE plants service range are expected to send their waste within 2030 (covering approx. 58% of the Albanian population).* |
| **Measures to be implemented** | - *After following all the preliminary processes of differentiated collection, recycling, composting, solid waste disposal in accordance with the policies in this Document and the technical schemes established in the National Sectoral Plan for solid waste management, municipalities and other waste producers can send other combustible waste to these plants.*<br>- *Finalising the construction of the incinerators in Tirana and Fier.* |
| **Budget (source of budgeting)** | *The costs foreseen for the 2018-2022 for the investments in Fier and Tiranë moving grate incineration plants are respectively 25.5 and 76 MEur.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; National Agency for Water Supply and Sewerage and Waste Infrastructure; Municipalities*<br>*National Agency for Water Supply and Sewerage and Waste Infrastructure; National Environmental Agency; Municipalities* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Waste Management* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory; Financial* |
| **Title of PaM (Coding)** | *Increase of Wastewater Treatment Plants and their related coverage (G-W3)* |
| **Timeframe** | *2020 – 2040* |
| **Legal basis and planning documents** | *National Master Plan for the Water and Sewage Sector (2013 – 2040); National Water Supply and Sewerage Strategy 2020-2030 (draft); Law No. 9115 of 24.07.2003 "on Environmental Treatment of Waste Water", amended; DCM No. 177 of 31.03.2005 "on Discharge Limits of Wastewater and Localization Criteria of Sensitive Areas"* |
| **Actions taken to date** | *Sewerage coverage at the national level has reached 56.3%. Detailed by type of service area, the sewerage coverage is 79.5% in urban areas and 16% in rural areas. Only 14.3% of the urban population is connected to wastewater treatment. There are 12 Wastewater treatment plants already in operation in Albania.* |

| | |
|---|---|
| **Main Objective of PaM** | *Increase the number of the wastewater treatment plants in Albania and the percentage of the population connected to wastewater treatment in Albania.* |
| **Results to be achieved** | - *The objective of Wastewater Treatment Coverage from WWTP is as follows:*<br>*Year — Percentage*<br>*2021 — 14*<br>*2022 — 17*<br>*2023 — 20*<br>*2024 — 24*<br>*2025 — 28*<br>*2026 — 32*<br>*2027 — 39*<br>- *Sludge management strategy is expected to be approved in 2024.*<br>- *Establishment of a laboratory for the sludge analysis in Albania is expected to be approved in 2025.* |
| **Measures to be implemented** | - *Full alignment with the Urban Wastewater Treatment Directive*<br>- *Extend sewerage networks, license and apply tariffs for all waste-water treatment plants and build new ones, in particular in urban and coastal areas and those popular with tourists*<br>- *State Funding for direct interventions in the wastewater treatment infrastructure, Foreign Donors (mainly IPA III and bilateral donors) and Private companies (through the Public Private Partnerships.) and the project IPA (III) 2022 support to Water Sector in Albania*<br>- *Wastewater tariff collection from citizens* |
| **Budget (source of budgeting)** | *The (draft) Water Supply and Sewerage National Strategy 2019-2030 costs approximately 1,500 MEur, with infrastructure representing 99.2% of the total and technical assistance 0.8%.*<br>*According to National Agency for Water Supply and Sewerage and Waste Infrastructure the forecasted budget for (WS, WWC and WWT) is:*<br>*Year — State Budget — Foreign Investments — **Total***<br>*2021 — 36.35 — 46.82 — **83.17 MEur***<br>*2022 — 44.35 — 40.18 — **84.53 MEur*** |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; National Agency for Water Supply and Sewerage and Waste Infrastructure; Municipalities*<br>*National Agency for Water Supply and Sewerage and Waste Infrastructure; ERRU; Municipalities.* |
| **Relation with other dimensions (if any)** | |

## *Land-Use Change and Forestry*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Land-use change and forestry* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Increasing the natural carbon sink capacity of forestry and pastures (G-LF1)* |
| **Timeframe** | *2020 – 2030* |
| **Legal basis and planning documents** | *DCM No. 814 of 31.12.2018 "on the Approval of Forestry Policy Document for Albania for the period 2019–2030"; Law No. 57/2020 of 30.4.2020 "On Forests"* |
| **Actions taken to date** | *No report available on the progress of the measures.* |
| **Main Objective of PaM** | *Reforestation of areas within the forest fund, focusing on areas with fire damage and mass deforestation, expansion with new areas oriented mainly on agroforestry, urban and road greenery, that will lead to a regeneration of forests and the increase of their carbon sink capacity.* |
| **Results to be achieved** | - *Financial support (mainly through IPARD instrument)* |

| | |
|---|---|
| | - *Improvement of the legislative framework related to organic farming*<br>- *Drafting, publishing, and disseminating the Code Best Practice in Agriculture (BPA)*<br>- *Training of farmers in implementation of the Code of BPA* |
| **Measures to be implemented** | - *National planting plan in areas damaged by illegal logging and in burned areas within the forest fund*<br>- *Afforestation with new species with high growth for wood products, using bare areas, barren lands, etc. and in partnership with the individual and the enterprise*<br>- *Promotion of Agroforestry and with fruit trees, financial or land incentives, seedlings (fruit trees / National Agency for the Rural and Agricultural Development - AZHBR), etc.*<br>- *Promotion of street and urban greenery in parks, water resources and sensitive areas, to increase the area covered with trees / greenery and prevent natural risks* |
| **Budget (source of budgeting)** | *6.5 MEur (annually for the forest sector although not specified by measures) State funds* |
| **Implem. Entity (Monitoring Entity)** | *National Agency of Forests*<br>*National Agency of Protected Areas; National Agency for the Rural and Agricultural Development (all are involved in implementing and monitoring)* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.1. GHG emissions and removals* |
| **Sector** | *Land-use change and forestry* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Environmentally friendly forest management*<br>*(G-LF2)* |
| **Timeframe** | *2019 – 2030* |
| **Legal basis and planning documents** | *DCM No. 814 of 31.12.2018 "on the Approval of Forestry Policy Document for Albania for the period 2019–2030"; Law No. 57/2020 of 30.4.2020 "On Forests"; DCM No. 466 of 3.7.2019 "on the Approval of the Strategic Document and National Plan for the Mitigation of Greenhouse Gas Effects and Adaptation from Climate Change"; National Determined Contribution (2021 draft)* |
| **Actions taken to date** | *No report available on the progress of the measures.* |
| **Main Objective of PaM** | *Improved sustainable forest management to enhance carbon sequestration and protect biodiversity.* |
| **Results to be achieved** | - *One of the calculations made is that improving forestry management, applied progressively on 5000ha per year, allows a higher growth rate for the tree biomass in these areas.*<br>- *In 2030, the application of this measure allows a reduction of the annual emission estimated at -18 kt CO2e compared to the BAU scenario.*<br>*(Source National Determined Contribution 2021 (draft version), Table 4)* |
| **Measures to be implemented** | - *Financial support though the state budget and international funding*<br>- *Improvement of the legislative framework related to forestry.*<br>- *Some of the measures included:*<br>*Maintenance and improvement of forest resources and their contribution to global carbon cycles*<br>*Maintenance of vitality and health of forest ecosystems*<br>*Maintenance and promotion of productive forest functions (timber and non-timber).*<br>*Proper maintenance, conservation and improvement of biological diversity in forest ecosystems*<br>*Maintenance and improvement of protective functions in forest management (especially land and water)* |
| **Budget (source of budgeting)** | *6.5 MEur (annually for the forest sector although not specified by measures) State funds* |

| | |
|---|---|
| | *(There is no financial calculation in the Policy Document for the implementation cost for the measures but in the Climate Change there is a calculated cost of 1.22 MEur based also on the ISARD and other sources for L14)* |
| **Implem. Entity (Monitoring Entity)** | *National Agency of Forests; National Agency of Protected Areas; National Agency for the Rural and Agricultural Development*<br>*National Agency of Forests; National Agency of Protected Areas; National Agency for the Rural and Agricultural Development* |
| **Relation with other dimensions (if any)** | |

### 2.1.1. Renewable Energy

In the tables below are the Policies and Measures divided by the sectors they are related to.

*Electricity, Heating and Cooling*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Electricity, Heating & Cooling* |
| **Modelling Scenario Considered** | *WEM and WAM (see results section)* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Mechanism of Feed-in-Tariff for small renewable capacity (R-E1)* |
| **Timeframe** | *2021 -2030* |
| **Legal basis and planning documents** | *DCM No. 580 of 28.8.2019 "on the Approval of the National Consolidated Action Plan for the RES 2019-2020"; DCM No. 369 of 26.4.2017 "on the Methodology Approval for the Establishing the Purchasing price of the Electric Energy produced by solar and wind small renewable sources"* |
| **Actions taken to date** | *According to the Strategy, as of 2019, eleven contracts according to this scheme have already been signed.* |
| **Main Objective of PaM** | *The objective is to increase the renewable energy capacity by providing a support scheme (FiT) to small renewable energy capacity.* |
| **Results to be achieved** | - *The objective is to promote the increase of energy production from renewable sources to ensure a sustainable development in the Republic of Albania, in accordance with the obligations under the Energy Community Treaty.*<br>- *This measure also contributes to the National Target on RES till 2030 (42%) related to the share of renewable sources compared with the Gross Final Energy Consumption and specifically to reach the target for renewable energy for electricity generation (RES-E - 239 ktoe).*<br>*For the WEM:*<br>- *Additional Small hydropower plants would be constructed as parts of permits already attributed earlier. It is expected that 40 MW per year would be added during the period 2021-2028, or 320 MW in total.*<br>*For the WAM:*<br>- *It is expected that 30 MW per year of additional PV would be added to the grid during the period 2021-2030, which is totalling 300 MW by 2030. No substantial increase for other technologies.* |
| **Measures to be implemented** | - *All renewable energy capacity below 2 MW (or 3 MW for wind energy) and showcase pilot projects can benefit from a FIT tariff.*<br>- *The tariffs are calculated by ERE to ensure a sufficient return on investment for all renewable energy operators.*<br>- *The Energy Regulatory Entity approves the purchase price of electricity produced from small renewable sources from the sun and wind, in accordance with the average price for 2017, according to the forecasts of the methodology set in the DCM No. 369.* |

| | |
|---|---|
| | - *As of 2019, the ERE price that is included in the strategy is 100 €/MWh for sun and 76 €/MWh for wind.* |
| **Budget (source of budgeting)** | *No state budget foreseen because the cost of scheme would be covered by the electricity tariffs. Nevertheless, there is an impact for the budget of the offtaker, which is finally owned by the government.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; Energy Regulatory Entity; Private Operators*<br>*Ministry of Infrastructure and Energy; Energy Regulatory Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Electricity, Heating & Cooling* |
| **Modelling Scenario Considered** | *WEM and WAM (see results section)* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Auctions for new renewable capacity (wind and solar) and contract-for-difference (R-E2)* |
| **Timeframe** | *2017 ongoing* |
| **Legal basis and planning documents** | *DCM No. 580 of 28.8.2019 "on the Approval of the National Consolidated Action Plan for the RES 2019-2020"; Law No. 7/2017 of 2.2.2017 "on the Promotion of Energy use from Renewable Sources"* |
| **Actions taken to date** | *Karavasta and Spitalla auctions have already been signed.* |
| **Main Objective of PaM** | *The objective is to increase the renewable energy capacity (wind and PV) by organizing auctions and proposing a contract-for-difference support scheme (CfD).* |
| **Results to be achieved** | - *The objective is to promote the increase of energy production from renewable sources to ensure a sustainable development in the Republic of Albania, in accordance with the obligations under the Energy Community Treaty.*<br>- *This measure also contributes to the National Target on RES for 2030 (42%) related to the share of renewable sources compared with the Gross Final Energy Consumption.*<br>*For the WEM:*<br>- *Karavasta and Spitalla auctions to be constructed by 2023 (240 MW PV in total)*<br>- *150 MW of wind capacity to be added by 2024*<br>*For the WAM:*<br>- *70 MW of PV to be added per year from 2024 to 2030 (total of 490 MW)*<br>- *60 MW of wind capacity to be added from 2026 to 2030 (total of 300 MW)* |
| **Measures to be implemented** | - *The auctions would be on competition (market-based).*<br>- *The selected bidder from the auctions would receive a CfD contract. With this CfD contract, the bidder would be certain to receive a sliding premium (the sum of the electricity sold on the market and the premium would stay constant).*<br>- *A special entity, called Renewable Energy Operator, would be charged to pay the sliding premium to the selected bidders. This entity would be financed by a charge to all electricity suppliers.* |
| **Budget (source of budgeting)** | *No state budget foreseen because the cost of scheme would be covered in a Renewable Energy Obligation that would be paid by each supplier and ultimately by each electricity consumer.* |
| **Implem. Entity (Monitoring Entity)** | *Council of Ministers; Energy Regulatory Entity; Private Operators*<br>*Ministry of Infrastructure and Energy; Energy Regulatory Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Electricity, Heating & Cooling* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Mechanism of net metering for installations up to 500 kW (R-E3)* |
| **Timeframe** | *2017 ongoing* |
| **Legal basis and planning documents** | *DCM No. 580 of 28.8.2019 "on the Approval of the National Consolidated Action Plan for the RES 2019-2020"; DCM No. 369 of 26.4.2017 "on the Methodology Approval for the Establishing the Purchasing price of the Electric Energy produced by solar and wind small renewable sources"; Guideline of the Minister of Infrastructure and Energy No. 3 of 20.6.2019 "on the Approval of the Simplified Authorisation Procedure for the Connection with the Distribution Grid of Small Renewable Projects of Self producers of Electric Energy from Solar Sources"* |
| **Actions taken to date** | *OSHEE has already included in its website the standards applicable to the meter but does not have a database of the projects already implemented.* |
| **Main Objective of PaM** | *The objective is to encourage households and consumers (up to an installation of 500 kW) to install renewable capacity and to promote self-consumption.* |
| **Results to be achieved** | - *Increase of energy production from renewable sources to ensure a sustainable development in the Republic of Albania, in accordance with the obligations under the Energy Community Treaty*<br>- *This measure also contributes to the National Target on RES till 2030 (42%) related to the share of renewable sources compared with the Gross Final Energy Consumption and specifically to reach the target for renewable energy for electricity generation (RES-E - 239 ktoe).*<br>- *The increase of renewable capacity, mostly PV, is not presented separately for this measure but the total capacity is supposed to be reflected in the R-E1.* |
| **Measures to be implemented** | - *Transparent and simple procedure to register a plant with OSHEE, information easily accessible.*<br>- *According to the metering scheme, a small or medium-sized company or a household customer can install a total capacity of up to 500 kW to generate electricity from wind or solar to cover some or all of the energy needed for the needs and inject the excess energy produced in the distribution network.*<br>- *Customers, according to the net energy metering scheme, must install at their own expense a two-way meter.*<br>- *Net balance and billing are done on a monthly basis for each metering point. Surplus electricity greater than monthly consumption is sold to the universal service provider, charged with the public service obligation, according to the price set by the ERE, based on the methodology approved by the Council of Ministers, on the proposal of the Minister.* |
| **Budget (source of budgeting)** | *No state budget foreseen because the cost of scheme is indirectly covered by the electricity tariff. There is no payment towards producers, only a reduction in their electricity bills.* |
| **Implem. Entity**<br>**(Monitoring Entity)** | *OSHEE, Private companies*<br>*OSHEE; Ministry of Infrastructure and Energy; Energy Regulatory Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Electricity, Heating & Cooling* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Financial* |

| | |
|---|---|
| **Title of PaM (Coding)** | *Robust power grid to accommodate increased renewable energy capacity (R-E4)* |
| **Timeframe** | *2017 ongoing* |
| **Legal basis and planning documents** | *DCM No. 580 of 28.8.2019 "on the Approval of the National Consolidated Action Plan for the RES 2019-2020"; Law No. 7/2017 of 2.2.2017 "on the Promotion of Energy use from Renewable Sources"* |
| **Actions taken to date** | *Ongoing investments* |
| **Main Objective of PaM** | *The objective is to increase the capacity of the electricity grid, both transmission and distribution, to cater for more renewable energy sources. This is especially important for the distribution grid, as the FiT and net metering support schemes have a large impact on the distribution grid.* |
| **Results to be achieved** | *Same as the main objective* |
| **Measures to be implemented** | - *Reconstruction and rehabilitation of electrical substations*<br>- *Reconstruction of power transmission lines*<br>- *Implementation of Network Analysis System through PMU (Phasor Measuring Unit).*<br>- *Creating new connecting nodes*<br>- *Improving the process of management, control, measurement*<br>- *Access and guarantee of transmission and distribution of electricity from renewable sources in the transmission network* |
| **Budget (source of budgeting)** | *According to some preliminary estimates, some EUR 40 to 80 MEur investments are required in order to refurbish the distribution network to better handle variable renewable energy injection in the immediate term.* |
| **Implem. Entity (Monitoring Entity)** | *Council of Ministers; Energy Regulatory Entity*<br>*Ministry of Infrastructure and Energy; Energy Regulatory Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Electricity, Heating & Cooling* |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory* |
| **Title of PaM (Coding)** | *Facilitate regulatory and physical connection to the electricity grid (R-E5)* |
| **Timeframe** | *2017 ongoing* |
| **Legal basis and planning documents** | *DCM No. 580 of 28.8.2019 "on the Approval of the National Consolidated Action Plan for the RES 2019-2020"; Law No. 7/2017 of 2.2.2017 "on the Promotion of Energy use from Renewable Sources"; Law No. 43/2015 of 30.4.2015 "On power sector", amended* |
| **Actions taken to date** | *No information on the action taken to date* |
| **Main Objective of PaM** | *Facilitate the increase of new renewable energy capacity* |
| **Results to be achieved** | *Transmission and distribution system operators shall, upon the request of a producer of energy from renewable sources, and in accordance with codes and regulations approved by ERE, propose as connection point to their network the one point which meets the most favourable conditions for the renewable energy producer from point of view of cost and distance to the grid.* |
| **Measures to be implemented** | *All regulatory actions required to reach the objective.* |
| **Budget (source of budgeting)** | *No budget foreseen since it mainly related to the regulatory action.* |
| **Implem. Entity (Monitoring Entity)** | *Council of Ministers; Energy Regulatory Entity*<br>*Ministry of Infrastructure and Energy; Energy Regulatory Entity* |

| | |
|---|---|
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Electricity, Heating & Cooling* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Demand side management and electricity storage systems for power grid flexibility (R-E6)* |
| **Timeframe** | *Not determined yet* |
| **Legal basis and planning documents** | *Law No. 7/2017 of 2.2.2017 "on the Promotion of Energy use from Renewable Sources"; Law No. 43/2015 of 30.4.2015 "On power sector", amended* |
| **Actions taken to date** | *No action taken to date* |
| **Main Objective of PaM** | *Achieve greater operability of the distribution grid to be able to cater for more distributed renewable capacity.* |
| **Results to be achieved** | - *Preliminary studies to understand the potential for DSM and storage*<br>- *Link with net metering scheme*<br>- *Link with the installation of smart meters (metering strategy)* |
| **Measures to be implemented** | *The distribution company, together with the ministry and the regulator, will undertake studies in order to see the true potential for DSM and storage in Albania. Based on such studies, some implementation actions would be undertaken.* |
| **Budget (source of budgeting)** | *To be determined* |
| **Implem. Entity (Monitoring Entity)** | *Council of Ministers; Energy Regulatory Entity*<br>*Ministry of Infrastructure and Energy; Energy Regulatory Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Electricity, Heating & Cooling* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Metering strategy and digitalization of the power sector (R-E7)* |
| **Timeframe** | *Not determined yet* |
| **Legal basis and planning documents** | *Law No. 7/2017 of 2.2.2017 "on the Promotion of Energy use from Renewable Sources"; Law No. 43/2015 of 30.4.2015 "On power sector", amended* |
| **Actions taken to date** | *For the moment the actions taken are: (i) Drafting a metering strategy; and (ii) Pilot phase for smart meters.* |
| **Main Objective of PaM** | *To create a metering strategy and to move towards a more digitalized power sector* |
| **Results to be achieved** | - *Establish a metering strategy*<br>- *Install smart meters according to the metering strategy*<br>- *Ensure a proactive management of the distribution grid by the use of adequate informatics tool and smart metering data (digitalization)* |
| **Measures to be implemented** | - *Drafting of a metering strategy*<br>- *Implementation of the metering strategy and installation of smart meters*<br>- *Capacity building of the operators to manage the smart meters and the associated equipment and data* |

| | |
|---|---|
| **Budget (source of budgeting)** | *To be determined* |
| **Implem. Entity (Monitoring Entity)** | *Council of Ministers; Energy Regulatory Entity, private companies*<br>*Ministry of Infrastructure and Energy; Energy Regulatory Entity* |
| **Relation with other dimensions (if any)** | |

### *Transport Sector*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Electrification of the transport sector*<br>*(R-T1)* |
| **Timeframe** | *2021-2030* |
| **Legal basis and planning documents** | *Law No. 7/2017 of 2.2.2017 "on the Promotion of Energy use from Renewable Sources"* |
| **Actions taken to date** | *Renewable energy for the transport sector (RES-T) in 2020 remains in the range of 20.3 ktoe from the expected 62 ktoe.* |
| **Main Objective of PaM** | *Increase the electrification in the transport sector* |
| **Results to be achieved** | *10% of electric vehicles (all fleet) by 2030* |
| **Measures to be implemented** | - *Establish legal obligations towards economic operators including their enforcement. Certification ensuring the compliance of economic operators with the sustainability requirements is another.*<br>- *Further key policy elements need to be established in order achieve the 2030 RES-T target: (i) strategy and support mechanisms for electricity in transport; (iii) the setup of obligations of certain subjects such as public parking or public garages to have electric vehicle charging stations; (iv) incentives or simplified procedures for construction/licensing of electricity charging stations for road vehicles, or for construction/licensing of hydrogen refuelling stations; (v) new vehicles with zero-km electric engine, not previously registered in any other country, is entirely exempted from VAT; (vi) reduced fossil fuel imports, job creation, national value creation, etc. (vii) policies should be revised and possibly adjusted in around 2025 based on a policy and results evaluation.* |
| **Budget (source of budgeting)** | *To be determined* |
| **Implem. Entity (Monitoring Entity)** | *National Agency of Natural Resources; Ministry of Infrastructure and Energy*<br>*National Agency of Natural Resources; Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory; Fiscal* |
| **Title of PaM (Coding)** | *Sustainable / Advanced biofuels*<br>*(R-T2)* |
| **Timeframe** | *2021-2030* |

| | |
|---|---|
| **Legal basis and planning documents** | *Draft Law "On the production, transport and trading of biofuels and other renewable combustibles for transport"; Law No. 7/2017 of 2.2.2017 "on the Promotion of Energy use from Renewable Sources"* |
| **Actions taken to date** | *The actions taken up to date are: (i) Zero level of the excise tax for clean biodiesel until 2018; (ii) Machinery and equipment to be used for the construction of biofuel production plants are exempt from customs duties. Exemption from customs duties and VAT for: - equipment and machinery that convert manure in organic soil improvers, which can be used for the cultivation of plants for the purpose energy; agricultural equipment, materials and machinery that will be used by local farmers for cultivation of plants for energy purposes; technological equipment and machinery, main and auxiliary, of production plants of biofuels and other fuels, of renewable; (iii) MEI publishes through legal vehicle dealers and the Automobile Club in the Republic of Albania data on the efficiency of existing engines in accordance with the quality of fuel used; (iv) The supervision of biofuels quality from the Technical State Inspectorate and the Offices of the assessment of sustainability criteria; (v) Tax exemptions for the use of biofuels; (vi) Criteria for biofuels verification; (vii) The holders of the "production license" for the production plants of biofuels and other renewable fuels are obliged to report to the Ministry of Infrastructure and Energy the production costs (ex-factory) of these products; (viii) The reimbursed of excise for biofuels used in the transport sector and stored in the territory of the Republic of Albania for the value of excise duty paid up to 5%. Reimbursement for the quantity of biofuels is made until 2020; (ix)The excise rate is calculated based on the unit of measurement, and for some of the most important energy products is differentiated.* |
| **Main Objective of PaM** | *The aim of the policy is to promote the production and use of biofuels and other renewable fuels that meet the sustainability criteria.* |
| **Results to be achieved** | - *Options for renewable fuels production beyond the 2030 target may provide opportunities for exports, e.g., by producing and exporting biofuels based on used cooking oil and tallow, or by producing liquid fuels from renewable electricity (RFNBO).*<br>- *Biofuels are anticipated to contribute most to the target, including crop-based, waste-based and advanced biofuels.*<br>- *Target of 10% of biofuel by 2025* |
| **Measures to be implemented** | - *Determining the minimum annual amount of biofuels and other renewable fuels to be marketed in the transport sector*<br>- *Promotion of raw materials for the production of biofuels by applying sustainability criteria*<br>- *Organizing the market of biofuels and other renewable fuels. Each company holding a license for "Wholesale trade of oil, gas, by-products, including bio, as well as fuels, with code VIII.1.A". for wholesale trade in the market must take measures to ensure the placement on the market of the minimum quantity of biofuels and other renewable fuels. These quantities must meet the sustainability criteria.*<br>- *Determining the requirements related to the verification of biofuel sustainability criteria*<br>- *Blending obligation*<br>- *Setting Tariffs for required certificates and permits*<br>- *Carrying out inspections by the responsible State Inspectorate*<br>- *Imposition of fines for retailers of fuel products if it is not published that biofuels of other renewable fuels, as well as oil or petroleum, mixed with bio-oil and bioethanol in the amount of 5%*<br>- *Penalties for fuel suppliers that do not fulfil their obligations*<br>- *The setup of the support measures available to purchasers of alternative-fuelled vehicles, and provisions in respect of the compatibility of vehicles with various alternative fuel types* |
| **Budget (source of budgeting)** | *124,000.00 Euro (Source: National Action Plan for Renewable Energy Resources in Albania 2015-2020)*<br>*The monetary value of the costs and benefits of the potential impacts could not be determined due to limited data and information.* |
| **Implem. Entity (Monitoring Entity)** | *National Agency of Natural Resources; Ministry of Infrastructure and Energy; Ministry of Finance and Economy; General Directorate of Taxes; General Customs Directorate.*<br>*State Industry Inspectorate; Ministry of Infrastructure and Energy* |

| | |
|---|---|
| **Relation with other dimensions (if any)** | |

*Industry sector*

| | |
|---|---|
| **Energy Dimension** | *1. Decarbonisation*<br>*1.2. Renewable Energy* |
| **Sector** | *Industry Sector-SMEs* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Investment, Financial; Information; Educational* |
| **Title of PaM (Coding)** | *Supporting the deployment of small-scale renewable energy applications in the non-food industrial sector*<br>*(R-I1)* |
| **Timeframe** | *2025 and ongoing* |
| **Legal basis and planning documents** | *Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended; DCM No. 369 of 36.4.2017 "on the Methodology Approval for the Establishing the Purchasing price of the Electric Energy produced by solar and wind small renewable sources"; Guideline of the Minister of Infrastructure and Energy No. 3 of 20.6.2019 "on the Approval of the Simplified Authorisation Procedure for the Connection with the Distribution Grid of Small Renewable Projects of Self producers of Electric Energy from Solar Sources"* |
| **Actions taken to date** | - *Drafting of the legal acts*<br>- *There are some initiatives from industries for the development and implementation of small-scale renewable energy applications.* |
| **Main Objective of PaM** | *To develop the "Green Industry" concept by promoting and supporting the deployment of small-scale renewable energy applications in the non-food industrial sector and to develop technical capacities and business skills to encourage entrepreneurship.* |
| **Results to be achieved** | - *Enhanced local manufacturing SMEs capacities for accelerated deployment of small-scale renewable energy applications*<br>- *Policy and regulatory frameworks conducive to development and implementation of small-scale renewable energy applications*<br>- *Enhanced financing mechanisms* |
| **Measures to be implemented** | - *Pilot SMEs to implement renewable energy small-scale demonstration projects*<br>- *Expanded capacity of local supply chain and service market for demonstration of renewable energy technologies (technology transfer, project developers, installation, operation and maintenance, service providers, etc.)*<br>- *Training materials developed for SMEs*<br>- *Development of participatory platforms for the promotion (raise awareness), development and implementation of small-scale renewable energy applications*<br>- *Draft policies and regulations to support selected small scale renewable energy technologies*<br>- *Project monitoring and evaluation*<br>- *Increased understanding of local financing institutions about renewable energy* |
| **Budget (source of budgeting)** | *Indicative Budget: 2 MEur* |
| **Implem. Entity (Monitoring Entity)** | *Non-food industry operators; Albanian Energy Efficiency Agency*<br>*Ministry of Infrastructure and Energy; Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation; Energy Efficiency; Research, Innovation & Competitiveness* |

## 3.2 Dimension Energy Efficiency

### 3.2.1 Overarching legal framework

The main legal acts (including strategies and plans) related to this dimension are listed below:

1. **Law No.155/2020 of 17.12.2020 "on Climate Change"**
2. **Law No. 7/2017 of 2.2.2017 "on the Promotion of the Use of Energy from Renewable Sources"**
3. **Law No. 116/2016 of 10.11.2016 "on Energy Performance in Buildings"**
4. **Law No. 124/2015 of 12.11.2015 "On Energy Efficiency"**
5. **Law No. 43/2015 of 30.4.2015 "on Power Sector", amended**
6. **Law No. 9463 of 20.11.2006 "on Public procurements", amended**
7. **DCM No. 580 of 28.8.2019 "on the Approval of the National Consolidated Action Plan for the RES 2019-2020"**
8. **DCM No. 466 of 3.7.2019 "On the Approval of the Strategic Document and National Plan for the Mitigation of Greenhouse Gas Effects and Adaptation from Climate Change"**
9. **DCM No. 407 of 19.6.2019 "On the approval of procedure, categories, conditions, qualifications and professional experience requirements for the person who will be the holder of the energy auditor certificate"**
10. **DCM No. 342 of 22.05.2019 "On the approval of categories, conditions and requirements of qualification for energy manager"**
11. **DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"**
12. **DCM No. 709 of 1.12.2017 "on the Approval of the second and third Action Plan for the Energy Efficiency 2017 – 2020"**
13. **DCM No. 369 of 26.4.2017 "on the Methodology Approval for the Establishing the Purchasing price of the Electric Energy produced by solar and wind small renewable sources"**
14. **DCM No. 811 of 16.11.2016 "On approval the sectorial transport strategy and action plan 2016-2020" (TSSAP)**
15. **DCM No. 619 of 07.09.2011 "Approval of NEEAP 2011 – 2018**
16. **Guideline of the Minister of Infrastructure and Energy No. 3 of 20.6.2019 "on the Approval of the Simplified Authorization Procedure for the Connection with the Distribution Grid of Small Renewable Projects of Self producers of Electric Energy from Solar Sources"**
17. **Sectoral strategy of transport & action plan 2016 – 2020** (2019 Monitoring report)
18. **Law "On the production, transport and trading of biofuels and other renewable combustibles for transport"** (draft version)
19. **Sustainable Transport Plan** (draft version)

In the Tables below are the Policies and Measures divided by the sectors they are related to.

### 3.2.2 Energy efficiency obligation schemes and alternative policy measures

| | |
|---|---|
| **Energy Dimension** | *1. Energy Efficiency* |
| **Sector** | *Energy efficiency obligation schemes and alternative policy* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Energy efficiency obligation scheme and alternative measures for Albania (EE-O1)* |
| **Timeframe** | *2023-2030* |
| **Legal basis and planning documents** | *Law No. 124/2015 of 12.11.2015 "On Energy Efficiency" amended by the Law No. 28/2021 "On some amendments and additions of Law No.124/2015 on energy efficiency".*<br>*Obligation under Article 7 of the EE Directive transposed in the Law No.124/2015 as amended* |
| **Actions taken to date** | *Law No. 28/2021 "On some amendments and additions of Law No.124/2015 on energy efficiency has created the basis for implementation of the obligation schemes and alternative measures for distributors, operators and/or suppliers on the energy markets in the Republic of Albania for achieving savings in final energy consumption.* |
| **Main Objective of PaM** | *Setting targets for end-use energy savings, which distribution system operators and / or suppliers energy markets are obliged to apply.*<br>*From a rough calculation based on benchmark the expected savings will be 37 ktoe in 2030.* |
| **Results to be achieved** | - *Rational use of energy sources at national level*<br>- *Achievement of the cumulative energy savings objectives of total final energy demand at national level up to 31 December 2030*<br>- *Reaching the target from obligation parties (OP) approximately 1,5 % of the annual energy sales to final customers of all energy distributors or all retail energy sales companies averaged over the three-year period; (EED, Article7)*<br>- *Regulatory framework for establishment of obligation scheme* |
| **Measures to be implemented** | - *A DCM for establishing an energy efficiency obligation scheme should be adopted by the Government (by the end of 2022), that will set up targets for end-use energy savings, which distribution system operators and / or suppliers energy markets are obliged to apply*<br>- *A detailed methodology for the setting the Energy efficiency obligation schemes*<br>- *Approved EE measures to be implemented by the end users with support of distributor operators and/or suppliers on the energy markets* |
| **Budget (source of budgeting)** | *Since this is a regulatory instrument, the budget is more related to the technical assistance needed (first evaluation is 10-20 kEur).* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; Albanian Energy Efficiency Agency; Obligation Parties (OP), Consumers*<br>*Ministry of Infrastructure and Energy; Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Energy Security, Decarbonisation* |

### 3.2.3 Long-term renovation strategy and stimulating cost-effective deep renovation

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Energy Efficiency in Buildings* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Implementation of the Minimum Energy Performance Requirements in buildings (EE-L1)* |
| **Timeframe** | *2020 and ongoing* |

| | |
|---|---|
| **Legal basis and planning documents** | *Law No. 116/2016 of 10.11.2016 "on Energy Performance in Buildings"* |
| **Actions taken to date** | - *Adopted the relevant legislation for Implementation of the Minimum Energy Performance Requirements in buildings and issuing the EPC*<br>- *2000 pre-EPC are issued* |
| **Main Objective of PaM** | *Implementation of this PaM is a very important driver to achieve the optimal (technically, functionally and economically feasible) energy consumption levels of buildings and building units.* |
| **Results to be achieved** | *Sets out the minimum energy performance requirements for:*<br>- *Evaluation of energy savings in the newly constructed residential buildings and non-residential building using thermal envelope*<br>- *Evaluation of energy saving in (existing) renewed (reconstructed) residential and non-residential buildings using the thermal envelope without changing the heat system*<br>- *Overall reconstruction of the thermal envelope of existing buildings residential and non-residential and reconstruction of heating system*<br>- *Thermal efficiency improvement through special interventions in single building elements*<br>- *Energy Performance Certificate issued* |
| **Measures to be implemented** | - *Implementation of the DCM No.1049, of 24.12.2020 "On the National Methodology of calculating energy performance in buildings" through the approved software.*<br>- *Implementation of the DCM No.958, of 02.12.2020 "On the procedures and conditions of energy certificate performance of buildings and the model, content, conditions of registration of "Energy Certificate Performance":*<br>  o *Issuing the Energy performance certificates for buildings (EPC) for: (i) all buildings or building units, which will be sold or leased; (ii) all buildings, which will be constructed or subject to significant renovation; (iii) all buildings that are in use by a public authority or by institutions that provide a service to the public and that are frequently frequented by the public, which have a usable area over 250 m$^2$; (iv) When a building or building unit is sold or leased before it is built, the building owner must, at the design stage, provide these buildings or building units with temporary energy performance certificates.*<br>  o *Implementation of the DCM No.934, of 25.11.2020 "On the Criteria and procedures of selection and the amount of certificates to be verified, as well as the process of supervising the energy performance certificates of buildings" (independent control system)*<br>  o *Capacity building for the competent authority and energy auditors on implementation of the legislation and using the software for issuing the EPC* |
| **Budget (source of budgeting)** | *State budget, private sector*<br>*There is no overall calculated budget, but some funds dedicated are: (i) State Aid for "New Green Businesses" in Tirana with a total value of the fund for two years approx. 0.3 MEur; and (ii) 6.5 MEur "For Energy Efficiency for the Student City" from KfW bank* |
| **Implem. Entity (Monitoring Entity)** | *Albanian Energy Efficiency Agency; Local Government*<br>*Albanian Energy Efficiency Agency; Local Government* |
| **Relation with other dimensions (if any)** | *Energy Security; Decarbonisation* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Energy Efficiency in Buildings* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Financial; Information* |
| **Title of PaM (Coding)** | *Long-term renovation strategy (for public and private buildings)*<br>*(EE-L2)* |

| | |
|---|---|
| **Timeframe** | *2022 and ongoing* |
| **Legal basis and planning documents** | *Law No. 116/2016 of 10.11.2016 "on Energy Performance in Buildings"; Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended* |
| **Actions taken to date** | *Law No. 28/2021 "On some amendments and additions of Law No.124/2015 on energy efficiency" defined the target for renovation public buildings:*<br>- *Target defined on 3% of central government building stock each year to be renovated.*<br>- *Target defined on 2% of public building stock each year to be renovated.*<br>*Minimum energy requirements for energy performance in building (new and existing one) are defined, including the NZEB.*<br>*The methodology of "minimum requirements for energy performance of buildings and building elements" has been approved.*<br>*Relevant software for the calculation of the energy performance of buildings, owned by the National Energy Agency, has been prepared and approved.*<br>*The energy constructions codes are set.*<br>*The SLED Study on the typology of the public building stock is available: energy consumption by fuel and services, $CO_2$ emissions calculation, introducing EE measures due to energy consumption reduction, analysis of the costs and benefits of the thermal efficiency retrofitting of Albanian public buildings.* |
| **Main Objective of PaM** | *Long-term renovation strategy will be the main policy document for renovation of the private and public building stock:*<br>- *To reach the target defined on 3% of central government building stock each year to be renovated.*<br>- *To reach the target defined on 2% of public building stock each year to be renovated.*<br>- *After 31.12.2028 all the new building must meet the requirements of the NZEB* |
| **Results to be achieved** | - *Long-term renovation strategy (LTRS) and stimulating cost-effective deep renovation measures prepared*<br>- *Through the implementation of the (LTRS)*<br>  o *3% of central government building stock each year to be renovated.*<br>  o *2% of public building stock each year to be renovated.*<br>  o *All the new building must meet the requirements of the NZEB.*<br>- *Set a good example from the government side for EE that can be used to motivate the general public.*<br>- *Encourage the EE&RES associated investments on public building renovation based on optimal costs to attain the energy consumption reduction, emission reduction, increase the comfort and reducing energy bill.* |
| **Measures to be implemented** | - *A long-term action plan (LTRS) for mobilizing investment in the renovation of the national stock of residential, public and commercial buildings, both public and private shall be established and shall encompass: (i) an overview of the national building stock based, as appropriate, on statistical sampling; (ii) identification of cost-effective approaches to renovations relevant to the building type and climatic zone; (iii) policies and measures to stimulate cost-effective renovations of buildings; (iv) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions; and (v) an evidence-based estimate of expected energy savings and wider benefits.*<br>- *Secondary legislation that designates: (i) a specific methodology that is going to be used for setting the stocks surface and calculating the relevant rate of public buildings; and (ii) the total area of the public buildings*<br>- *Evaluation of national building stock*<br>- *Energy demand for building stock and evaluation based on minimum energy requirements*<br>- *Financing mechanisms to be defined and provided for EE investments for building stock renovation*<br>- *Defining targets for building sector according to typology*<br>- *Deadlines*<br>- *Measurable progress indicators* |

| | |
|---|---|
| **Budget (source of budgeting)** | *1 MEur for implementation of the above measures from sources such as KfW bank, EU funds, state budget, private sector.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; Albanian Energy Efficiency Agency, Municipalities*<br>*Albanian Energy Efficiency Agency; Local Government* |
| **Relation with other dimensions (if any)** | *Energy Security; Decarbonisation; Research, Innovation & Competitiveness*<br>*PaMs EE-L2, EE-L3 and EE L4 are related.*<br>*EE-L2: Strategy for public and private buildings*<br>*EE-L3: Investment in retrofitting central government buildings; regulatory instruments needed*<br>*EE-L4: Investment in retrofitting all other public buildings; regulatory instruments needed* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Building sector* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Investment; Regulatory* |
| **Title of PaM (Coding)** | *Retrofitting of the existing central governmental building (excluding other public buildings owned by municipalities, etc.)*<br>*(EE-L3)* |
| **Timeframe** | *2022 - 2030* |
| **Legal basis and planning documents** | *Law No. 116/2016 of 10.11.2016 "on Energy Performance in Buildings"; Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended*<br>*According to SLED Study, the Area of all public buildings is 6.6 million m$^2$. 75% of this area is for educational buildings; 13% offices; 11% hospitals. 57% are located in the climate zone A; 26% are located in the climate zone B and 17% are located in the climate zone C.* |
| **Actions taken to date** | Law No. *28/2021 "On some amendments and additions of Law No.124/2015 on energy efficiency" defined the target for renovation public buildings: 3% of central government building stock each year to be renovated.*<br>*Minimum energy requirements for energy performance in building (new and existing one) are defined, including the NZEB.*<br>*The methodology of "minimum requirements for energy performance of buildings and building elements" has been approved.*<br>*Relevant software for the calculation of the energy performance of buildings, owned by the National Energy Agency, has been approved.*<br>*The energy construction codes are set.*<br>*The SLED Study on the typology of the public building stock is available: energy consumption by fuel and services, $CO_2$ emissions calculation, introducing EE measures due to energy consumption reduction, analysis of the costs and benefits of the thermal efficiency retrofitting of Albanian public buildings.* |
| **Main Objective of PaM** | *To reach the target defined on 3% of central government building stock each year to be renovated.* |
| **Results to be achieved** | - *3% of central government building stock each year to be renovated*<br>- *Set a good example from the government side for EE that can be used to motivate the general public* |
| **Measures to be implemented** | *Some financial schemes which can be and are ongoing implementation:*<br>- *State budget*<br>- *Application of energy efficiency obligation schemes*<br>- *International financing institutions/donors* |
| **Budget (source of budgeting)** | *Total investment costs for central government building retrofits are 500 MEur for the 2020-2030 period.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; Albanian Energy Efficiency Agency, Central Government*<br>*Albanian Energy Efficiency Agency; Central Government* |

| | |
|---|---|
| **Relation with other dimensions (if any)** | *Decarbonisation*<br>*PaMs EE-L2, EE-L3 and EE L4 are related.*<br>*EE-L2: Strategy for public and private buildings*<br>*EE-L3: Investment in retrofitting central government buildings; regulatory instruments needed*<br>*EE-L4: Investment in retrofitting all other public buildings; regulatory instruments needed* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Building sector* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Investment: Regulatory* |
| **Title of PaM (Coding)** | *Retrofitting of the public building stock (all public buildings except central government buildings)*<br>*(EE-L4)* |
| **Timeframe** | *2021 - 2030* |
| **Legal basis and planning documents** | *Law No. 116/2016 of 10.11.2016 "on Energy Performance in Buildings"; Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended*<br>*According to SLED Study, the Area of all public buildings is 6,6 million m$^2$. 75% of this area is for educational building; 13% office; 11% hospitals. 57% are located in the climate zone A; 26% are located in the climate zone B and 17% are located in the climate zone C.* |
| **Actions taken to date** | Law No. *28/2021 "On some amendments and additions of law No.124/2015 on energy efficiency" defined the target for renovation public buildings: 2% of public building stock each year to be renovated.*<br>*Minimum energy requirements for energy performance of buildings (new and existing one) are defined, including the NZEB.*<br>*The methodology of "minimum requirements for energy performance of buildings and building elements" has been approved.*<br>*Relevant software for the calculation of energy performance of buildings, owned by the National Energy Agency, has been approved.*<br>*The energy construction codes are set.*<br>*The SLED Study on the typology of the public building stock is available: energy consumption by fuel and services, $CO_2$ emissions calculation, introducing EE measures due to energy consumption reduction, analysis of the costs and benefits of the thermal efficiency retrofitting of Albanian public buildings.* |
| **Main Objective of PaM** | *To reach the target defined on 2% of public building stock each year to be renovated.* |
| **Results to be achieved** | - *Improvement of the energy efficiency in buildings in Albania*<br>- *2% of public building stock each year to be renovated*<br>- *Set a good example from the government side for EE that can be used to motivate the general public*<br>- *Encourage the EE&RES associated investments on public building renovation based on optimal costs to attain the energy consumption reduction, emission reduction, increase the comfort and reducing energy bill* |
| **Measures to be implemented** | *Some financial schemes which can be and are ongoing implementation:*<br>- *State budget: State allocate to the local government a yearly budget amount to fulfil their objectives. Except that local government by collecting a different kind of taxes define the objectives and targets and deliver/invest a part of their total budget for energy efficiency investments to the building renovation.*<br>- *Private sector contribution to the public sector*<br>- *Application of energy efficiency obligation schemes*<br>- *Combination of EE and RES investments in buildings benefiting from "green" funds related to energy consumption and GHG reduction*<br>- *Residential buildings credit line and grants*<br>- *Fiscal/taxes deductions, VAT reduction; carbon tax and creation a fund dedicated for financing EE investments promoting the EE investments*<br>- *International financing institutions/donors* |

| | |
|---|---|
| | - *Public subsidies constitute only a partial response to the needs of project developers, which range from technical assistance to the financial structuring of the project* |
| **Budget (source of budgeting)** | *Total investment costs for public buildings retrofits are 1800 MEur for the 2015- 2030 period.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; Albanian Energy Efficiency Agency, Central and Local Government*<br>*Albanian Energy Efficiency Agency; Central and Local Government* |
| **Relation with other dimensions (if any)** | *Decarbonisation*<br>*PaMs EE-L2, EE-L3 and EE L4 are related.*<br>*EE-L2: Strategy for public and private buildings*<br>*EE-L3: Investment in retrofitting central government buildings; regulatory instruments needed*<br>*EE-L4: Investment in retrofitting all other public buildings; regulatory instruments needed* |

| | |
|---|---|
| **Energy Dimension** | *3. Energy Efficiency* |
| **Sector** | *Building Sector* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Financial; Fiscal* |
| **Title of PaM (Coding)** | *Financial support schemes for improving energy efficiency in buildings (private sector) (EE-L5)* |
| **Timeframe** | *2022 and ongoing* |
| **Legal basis and planning documents** | *Law No. 116/2016 of 10.11.2016 "on Energy Performance in Buildings"; Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended* |
| **Actions taken to date** | *There is a legal framework (draft amendment of the EE law) referring to ESCOs that has started to be completed by secondary legislation.*<br>*Energy performance contract prepared according to targets.*<br>*Municipality of Tirana: Infrastructure and rehabilitation investment projects, in the framework of donor/private support have consisted of interventions carried out for school reconstructions.*<br>*Measures identified in the SEAP (Tirana municipality action plan) has included a target to provide insulation and high efficiency windows to 100 public buildings by 2020.* |
| **Main Objective of PaM** | *Combination of finance, fiscal incentives, ESCOs, Obligation Scheme with a regulatory framework could bring possibilities for financing investments in energy savings in the building stock.* |
| **Results to be achieved** | - *Financial support schemes in place for improvement of the energy efficiency in buildings in Albania* |
| **Measures to be implemented** | *Some financial schemes:*<br>- *State budget: State allocate to the local government a yearly budget amount to fulfil their objectives. Except that local government by collecting a different kind of taxes define the objectives and targets and deliver/invest a part of their total budget for energy efficiency investments to the building renovation.*<br>- *Private sector contribution to the public sector*<br>- *Application of energy efficiency obligation schemes*<br>- *Private investments through ESCOs*<br>- *Combination of EE and RES investments in buildings benefiting from "green" funds related to energy consumption and GHG reduction*<br>- *KfW programmes, soft loans schemes to public funding decreases the cost of loans, which are usually distributed by private banks.*<br>- *Residential buildings credit line and grants*<br>- *Fiscal/taxes deductions, VAT reduction; carbon tax and creation a fund dedicated for financing EE investments and promoting EE investments*<br>- *International financing institutions/donors* |

| | |
|---|---|
| | - *Public subsidies constitute only a partial response to the needs of project developers, which range from technical assistance to the financial structuring of the project.* |
| **Budget (source of budgeting)** | *Administrative costs (staff cost from the state budget)*<br>*Total investment costs for building retrofits need to be estimated.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Finance and Economy, Ministry of Infrastructure and Energy, Albanian Energy Efficiency Agency, Municipalities, building sector operators.*<br>*Albanian Energy Efficiency Agency; Ministry of Infrastructure and Energy; Local Government* |
| **Relation with other dimensions (if any)** | *Decarbonisation* |

### 3.2.4 Uptake of energy performance contracting and other EE service models

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Building sector* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Uptake of ESCO models*<br>*(EE-S1)* |
| **Timeframe** | *2022 and ongoing* |
| **Legal basis and planning documents** | *Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended* |
| **Actions taken to date** | *There are existing ESCOs but not specifically and not certified specifically for energy efficiency.*<br>Article 18 of the Law No. *28/2021 "On some amendments and additions of Law No.124/2015 on energy efficiency" has created the basis for establishing ESCOs.* |
| **Main Objective of PaM** | *The objective of this PaM is to promote investments in the EE in the public and private sector through ESCO mechanism. Under an energy performance contract, an ESCO undertakes a project to deliver energy efficiency improvements in the premises of the client and uses the stream of income from the cost savings to repay the costs of the project. For economic reasons, it should be possible to combine EE measures with RES measures.* |
| **Results to be achieved** | - *Introducing and establishment of ESCOs will enable the high-quality services for EE investments and may serve as financing, taking the risk bringing out the energy savings and energy cost and emission reduction* |
| **Measures to be implemented** | - *Preparation of the Contract model by the Order of the Minister*<br>- *Subject matter of the Contract is the implementation of Energy Conservation Measures (ECMs) for improving the efficient use of Energy and corresponding reduction of $CO_2$ emissions and reducing the Operating Costs in the Contracted Facility.*<br>- *The Contractor takes upon itself to implement such ECMs, through which he will ensure Operational Cost Savings in the Contracted Facility during the Guarantee Period, in accordance with this Contract (including all the Appendices).*<br>- *All ECMs applied under this Contract must be in accordance with applicable regulations and required standards in Republic of Albania.*<br>- *The Agency responsible for Energy Efficiency publishes on its website: (i) best practices for energy performance contracting, guidelines, model contracts including provisions to be included in such contracts to guarantee energy savings and end-user rights; (ii) the list of qualified / registered energy service providers, which must be updated regularly; and (iii) information on any available financial instruments, incentives, grants, and loans to support energy efficiency service projects.* |
| **Budget (source of budgeting)** | *No budget calculated for the moment but later on, AEE will run a process of monitoring and verification of the energy savings, costs, etc. which in the future could bring other extra budget* |

| | |
|---|---|
| | *needed for AEE due to the increase of the job and their duties (more employees, more technical and IT programs support will be needed).* |
| **Implem. Entity (Monitoring Entity)** | *ESCOs, energy consumption end users*<br>*Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation* |

### 3.2.5 Exemplary role of public buildings and energy-efficient public procurement

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Public buildings including products and services* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Energy efficiency measures related to purchasing by public authorities (EE-P1)* |
| **Timeframe** | *2021 and ongoing* |
| **Legal basis and planning documents** | *Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended; Law No. 9463 of 20.11.2006 "on Public procurements", amended* |
| **Actions taken to date** | *Article 9 of the Law No. 28/2021 "On some amendments and additions of Law No.124/2015 on energy efficiency" has created the basis for adoption of secondary legislation on public procurement.* |
| **Main Objective of PaM** | *The objective of this PAM is that public authorities should spend the public funds in a more efficient way by obtaining better energy performance of products and services, promoting a low-carbon and efficient energy consumption and competitive one.* |
| **Results to be achieved** | - *DCM which will include in the public procurement rules provisions that oblige the public contracting authorities to give priority during the procurement, to those products and services that have a high energy efficiency.*<br>- *Catalogue, book, or website for technical specifications/EE standards for commonly purchased products*<br>- *Training and guidance for public authorities*<br>- *Guidance for public authorities on EE Public Procurement* |
| **Measures to be implemented** | - *Approval of the (draft) amended EE law and*<br>- *Preparation of the secondary legislation* |
| **Budget (source of budgeting)** | *No budget calculated for the moment.* |
| **Implem. Entity (Monitoring Entity)** | *Public Procurements Agency and related institutions*<br>*Albanian Energy Efficiency Agency; Public Procurements Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Public building sector* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory; Educational* |
| **Title of PaM (Coding)** | *Municipalities Energy Efficiency Action Plans, implementation, and reporting (EE-P2)* |
| **Timeframe** | *2022 and ongoing* |

| | |
|---|---|
| **Legal basis and planning documents** | *Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended; DCM No. 709 of 1.12.2017 "on the Approval of the second and third Action Plan for the Energy Efficiency 2017 – 2020"* |
| **Actions taken to date** | *Smart Energy Municipalities is an ongoing project financed by the Switzerland Embassy. The objective of this bilateral Project is to support selected Albanian municipalities to manage energy in a sustainable manner and to implement the national energy policy at a local level. To this end, it will pilot and institutionalize an energy management system that is based on the European Energy Award (EEA) and incorporates the requirements of the national energy legislation.* |
| **Main Objective of PaM** | *Involvement of municipalities by establishment of their own EE action plans as a driving force by monitoring the implementation of measures to reduce energy consumption, reduce emissions and increasing the quality of life.* |
| **Results to be achieved** | - *Increasing the capacity building to the employees of the municipalities in the EE field*<br>- *Detailed plan on EE measures for municipalities in accordance with National EE action Plan different sectors*<br>- *Providing EE investments financing sources*<br>- *Monitoring the implementation of the EE measures*<br>- *Collecting data on energy consumption and monitor the savings realized.* |
| **Measures to be implemented** | - *Involvement of municipalities in the processes of preparation of EEAPs according to the national EE plan and taking all the responsibilities to implement EE measures and providing investments funds.*<br>- *Engagement of the municipalities to monitor the implementation of the EE measures due to targets achievements.* |
| **Budget (source of budgeting)** | *A preliminary budget of 45 kEur as technical assistance has been calculated.* |
| **Implem. Entity (Monitoring Entity)** | *Municipalities, ESCOs, energy managers, end-users*<br>*Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation* |

### 3.2.6 Promoting energy audits and energy management systems

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Industry Sector* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Organizational* |
| **Title of PaM (Coding)** | *Energy audits for large energy consumers with focus on industrial activities (EE-E1)* |
| **Timeframe** | *2023 and ongoing* |
| **Legal basis and planning documents** | *Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended; DCM No. 407, of 19.6.2019 "On the approval of procedure, categories, conditions, qualifications and professional experience requirements for the person who will be the holder of the energy auditor certificate"* |
| **Actions taken to date** | *Some industries have started on voluntary base to do energy audits. However, no reports have been submitted.* |
| **Main Objective of PaM** | *Implementation of energy audits for industry operators to evaluate the energy consumption, losses, EE potentials, issue the energy certificates and the obligation of the industries to undertake EE measures and to fulfil energy savings targets.* |
| **Results to be achieved** | - *Setting up by legal acts the obligation of energy audits in industry, aiming at using energy more efficiently.*<br>- *Energy auditors will be engaged in industry activities related to 2 key elements: production processes and supporting processes (energy services) defining the* |

| | |
|---|---|
| | *energy consumption, making reports and issue the proposals for industry what measures they need to undertake in the future for energy consumption reduction.*<br>- *Industry activities are obliged to prepare their EE action plans in order to invest for EE measures (in cases needed) within 2 months from energy audit.*<br>- *Within 2 years based on energy audits reports they are obliged to make investments to reduce energy consumption and reporting to AEE.*<br>- *Reducing high cost of energy services and energy production in cases they are not competitive.*<br>- *Energy management system in industry is improved.*<br>- *After energy audits submitted, large consumers should undertake investments to achieve 4% energy savings of the total equivalent energy consumed by them.* |
| **Measures to be implemented** | - *Identification of Industry activities (energy consumers with an annual energy consumption of more than 1 MWh will be subject to energy audit), establishment of a database for them by registering, plans to start energy audits and all steps foreseen for energy audits described in law and DCM.*<br>- *Industry activities based on audit reports will start the preparation of EE action plan.* |
| **Budget (source of budgeting)** | *Costs for Energy audits expected to be evaluated.* |
| **Implem. Entity (Monitoring Entity)** | *Industry sector- large consumers; Albanian Energy Efficiency Agency*<br>*Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES; Research, Innovation & Competitiveness* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Industry Sector-SME-s* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Organizational* |
| **Title of PaM (Coding)** | *Energy management systems for SMEs*<br>*(EE-E2)* |
| **Timeframe** | *2021 and ongoing* |
| **Legal basis and planning documents** | *Law No. 124/2015 of 12.11.2015 "on Energy Efficiency", amended; DCM No. 342, of 22.05.2019 "On the approval of categories, conditions and requirements of qualification for energy manager"* |
| **Actions taken to date** | *Started the process for the certification of energy auditors, certification of the energy managers and the process of energy audits for large consumers together with the appointments of energy managers.* |
| **Main Objective of PaM** | *The obligation of the large energy consumers according to EE law to appoint energy managers and promoting ISO 50001 will lead to a rational use of energy, avoiding losses and increasing the industry performance.* |
| **Results to be achieved** | - *Enhanced policy, regulatory and institutional support for the introduction of Energy Managements Systems standards*<br>- *Progressive increased penetration of energy efficiency and energy management systems standards in Albanian industrial SMEs*<br>- *Establishment of trainings in energy management*<br>- *Development of innovative financing mechanisms (including carbon financing) for investments in industrial energy efficient and low carbon technologies*<br>- *Better application of revised Law 124/2015 in relation to the part of the Energy Auditing Schemes* |
| **Measures to be implemented** | - *Promote ISO 50001 as a national voluntary Energy Management System (EnMS) standard*<br>- *Pilot application of energy auditing in 10 largest energy consumers*<br>- *Working manual for energy auditing application*<br>- *Pilot industrial SMEs implement EnMS in compliance with ISO 50001* |

| | |
|---|---|
| | - *Promotion of Industrial Energy Efficiency (IEE) best-practice policies and promotion of sector specific energy efficient innovative technologies*<br>- *Established national program of IEE with quantified emission reduction*<br>- *National relevant institutions and the energy efficiency service sector provide the quality training and expert advisory services*<br>- *Design of an innovative IEE financing mechanism*<br>- *Increased understanding of local financing institutions about different IEE and greater capacity to appraise IEE investment proposals and benefits from International Financial Institutions' credit programs.* |
| **Budget (source of budgeting)** | *Indicative Budget: of 3 MEur (considering the multiannual support) has been calculated.* |
| **Implem. Entity (Monitoring Entity)** | *Industry sector- large consumers; Albanian Energy Efficiency Agency*<br>*Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES; Research, Innovation & Competitiveness* |

### 3.2.7 Consumer information and training measures

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Industry Sector (Consumer information & training measures)* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Information* |
| **Title of PaM (Coding)** | *Introducing the Energy labelling and Eco-design requirements (EE-C1)* |
| **Timeframe** | *2022 - 2030* |
| **Legal basis and planning documents** | *DCM No. 709 of 1.12.2017 "on the Approval of the second and third Action Plan for the Energy Efficiency 2017 – 2020"; DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"* |
| **Actions taken to date** | *National Plan on European Integration 2021-2023 foresees transposing the following EU legislation during 2022-2023: (i) Regulation (EU) 2017/1369 of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU; and (ii) Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of eco-design requirements for energy-related products* |
| **Main Objective of PaM** | *Developing and implementation of the legislation on Energy labels and/or the eco-design for products: Informative labels affixed to manufactured products indicating energy performance that provides consumers with the necessary information to make informed purchase decisions at the point of sale.* |
| **Results to be achieved** | - *It is expected that by 2030 the share of energy efficient technologies will be 5% in the overall stock.*<br>- *Predicted by 2020 about 3 ktoe energy savings.* |
| **Measures to be implemented** | - *Transposition and adoption of the Energy labels and/or the eco-design for products*<br>- *Adapting (and updating) the individual product related legislation, for example to follow the EU legislation and its changes, and introduction of energy labels for new product categories, or to reflect on market developments*<br>- *Check the technical documentation of regulated products*<br>- *Test products for compliance with regulations*<br>- *Monitoring the use of energy labels within stores*<br>- *Increasing the technical capacities of the staff dedicated to market surveillance of the energy label and eco-design related legislations*<br>- *Developing guides on requirements for professionals or guidelines for consumers, support in preparing internal guidelines and procedures*<br>- *Increasing public awareness through information from government, municipalities for issues concern and from civil society* |

| | |
|---|---|
| | - *Release of print, video and audio advertisements for consumer campaigns including monitoring of activity related to campaign website and social media sites* |
| **Budget (source of budgeting)** | *70 MEur* |
| **Implem. Entity (Monitoring Entity)** | *Producers, Importers, Suppliers, local retailers and dealers of products*<br>*The structure responsible for market surveillance (State Market Inspectorate)* |
| **Relation with other dimensions (if any)** | *Research, Innovation & Competitiveness* |

### 3.2.8 Energy Efficiency in transport

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Information; Educational* |
| **Title of PaM (Coding)** | *Energy labelling of new cars*<br>*(EE-T1)* |
| **Timeframe** | *2022 - ongoing* |
| **Legal basis and planning documents** | *DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"; DCM No. 619 of 07.09.2011 "Approval of NEEAP 2011 – 2018 (Measure 4.4 – Measures for the improvement of Energy Efficiency in the Transport Sector / Measures for Personal Cars / Energy Labelling of new cars)* |
| **Actions taken to date** | *So far there are two similar practices in place, but not directly related to the purpose of this directive: (i) a list of prices of new passenger cars according to fuel type, fuel economy, cylinder and $CO_2$ emissions is published to assist custom clearance procedures and calculation of financial obligations; and (ii) $CO_2$ emissions are part of the checklist for the annual technical control of each vehicle.* |
| **Main Objective of PaM** | *Setting a regulatory framework ensuring transparent information relating to the fuel economy (efficiency) and $CO_2$ emissions of new passenger cars offered for sale or lease.* |
| **Results to be achieved** | - *Make available to consumers to make their choice and having its impact on energy consumption reduction and less emissions.* |
| **Measures to be implemented** | - *Transposition and adoption of the Directive 1999/94/EU, Directive 2003/73/EU, Commission Recommendation 2003/217/EC and Commission Recommendation (EU) 2017/948.*<br>- *Technical assistance will be provided for the transposition of the above-mentioned directives and recommendations.*<br>- *Training will be provided to competent authorities and stakeholders for implementation of the requirements on ensuring availability of consumer information on fuel economy and $CO_2$ emissions.* |
| **Budget (source of budgeting)** | *2 MEur* |
| **Implem. Entity (Monitoring Entity)** | *Private (concessionaires as selling imported cars)*<br>*Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation; Research, Innovation & Competitiveness* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory; Financial, Fiscal* |
| **Title of PaM (Coding)** | *Increase the share of Electrical Vehicles in the national car fleet (EE-T2)* |
| **Timeframe** | *2023 - 2030* |
| **Legal basis and planning documents** | *Law No.155/2020 of 17.12.2020 "on Climate Change"; DCM No. 466 of 3.7.2019 "On the Approval of the Strategic Document and National Plan for the Mitigation of Greenhouse Gas Effects and Adaptation from Climate Change", National Transport Strategy, NDC (2016-2030)* |
| **Actions taken to date** | *On national level, to promote electric vehicle there are some incentives: (i) No "first-time registration fee" on new vehicles; (ii) No vehicle tax for the first 5 years; (iii) VAT exemption (20%) for Electric Vehicles; (iv) Exemption from VAT of new vehicles only with electric motor, in order to encourage individuals and businesses to orient towards the purchase of these vehicles; and (v) Free travel on toll roads* |
| **Main Objective of PaM** | *Establishing the electrical charging stations to improve overall sustainability of the Road and Urban Mobility System and reduction of GHG emissions coming from the transport sector through deploying charging infrastructure.* |
| **Results to be achieved** | - *Reduce fossil-based energy consumption and establishment of the sustainable public/ private transport, through development of the electric car charging towers infrastructures*<br>- *Establishment of 200-300 electric car charging towers throughout Albania by 2025*<br>- *Meeting Albania's commitments under the Sustainable Mobility Directive*<br>- *Reducing air pollution by promoting electric cars to European standards*<br>- *In terms of expected impact on transport $CO_2$ emission, an overall reduction of about 2.5-3% of total $CO_2$ emission by 2025 (given the target 5% share in total energy use, and the expected reduction of 50-60% in $CO_2$ emission per vehicle*km compared to fossil fuels) and up to 5-6% in 2030 (given the target 10% share in total energy use) as corresponds to NDC proposal.* |
| **Measures to be implemented** | - *Development of the electric car charging towers infrastructures*<br>- *Upgrade to taxi fleet with hybrid or electric models* |
| **Budget (source of budgeting)** | *Approx. 5 MEur CAPEX (capital expenses) of charging towers infrastructures; Upgrade to taxi fleet with hybrid or electric models with a capital cost approx. 0.5 MEur* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, Ministry of Finance and Economy, Municipality of Tirana, Albanian Energy Efficiency Agency*<br>*Ministry of Infrastructure and Energy, Ministry of Finance and Economy, Albanian Energy Efficiency Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory; Financial; Fiscal* |
| **Title of PaM (Coding)** | *Support mechanisms for EE and clean vehicles (EE-T3)* |
| **Timeframe** | *2023 – ongoing* |
| **Legal basis and planning documents** | *DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"; DCM No. 580 of 28.8.2019 "On approval of the consolidated national action plan for renewable energy sources, 2019–2020"* |

| | |
|---|---|
| **Actions taken to date** | *Applying the Instruction No. 6527 of 24.12.2004 "Permissible values of air pollutants in the environment from gas emissions and noise caused by road vehicles, and ways to control them", amended. Carbon tax is set at 1.5 lek per liter for gasoline, 3 lek per liter for oil (Law No.9975, dated 28.7.2008 "For national taxes", (changed)).*<br>*DCM No. 633 of 26.10.2018 "On measures against air pollution from emissions of motor vehicles and reduction of emissions into the air of gaseous pollutants and suspended solids from engines with positive ignition and those with compression ignition that burn natural gas or liquid for use in vehicles" (for new vehicles to meet at least the EURO 5 engine standard, and for used vehicles to meet at least the EURO 4 engine standard, and they must have been produced not more than 10 years before the date of first registration in Albania).*<br>*Imported vehicles are subject to the customs rate of 0%. However, the imported vehicle owners are obliged to pay VAT of 20%, while the supply of new vehicles with zero-km electric engine, not previously registered in any other country, is entirely exempted from VAT.*<br>*Excise is reimbursed for biofuels used in the transport by the customs authority, up to 5%.*<br>*Railway: There are a number of projects under development which envisage rehabilitation including electrification and connection with neighbouring countries.*<br>*EV and EV charging points have been introduced to the market in Tirana.*<br>*Electric and low emissions buses have been introduced in Tirana.* |
| **Main Objective of PaM** | *The promotion and supporting the use of alternative/clean fuels and energy efficiency vehicle as the ways to produce the most significant effects by reducing energy consumption and mainly the reduction of GHG emission through supporting schemes of efficient vehicles and green ones.* |
| **Results to be achieved** | - *Share of renewable energy sources in transport was planned to be 10% in 2020 and 10% in every year afterwards until 2030*<br>- *Target for renewables in transport of 14% to be achieved by 2030*<br>  o *Liquid crop-based biofuel in road transport and liquid fuel produces from Annex IX B feedstock and advanced liquid biofuels based on Annex IX A feedstock road transport 13.4% by 2030 to RES-T: Target 98.4 ktoe amount of renewable fuel used by 2030*<br>  o *Electric public transport will contribute to RES-T: Target 0.014% and 0.1 ktoe amount of renewable fuel used by 2030*<br>  o *Electric road vehicles (passenger cars, trucks) will contribute to RES-T: Target 0.49% and 1.2 ktoe amount of renewable fuel used by 2030*<br>  o *Hydrogen in rail will contribute to RES-T: Target 0.005% and 0.1 ktoe amount of renewable fuel used by 2030*<br>  o *Hydrogen (urban buses and long distances and coach) will contribute to RES-T: Target 0.005% and 0.1 ktoe amount of renewable fuel used by 2030*<br>  o *Hydrogen road vehicles (passengers' cars and trucks) will contribute to RES-T: Target 0.12% and 1.2 ktoe amount of renewable fuel used by 2030*<br>- *No "first-time registration fee" on new vehicles*<br>- *No vehicle tax for the first 5 years*<br>- *VAT exemption (20%) for Electric Vehicles*<br>- *Exemption from VAT of new vehicles only with electric motor, in order to encourage individuals and businesses to orient towards the purchase of these vehicles*<br>- *Free travel on toll roads*<br>- *Replacement of buses with low emission buses (Municipality of Tirana)* |
| **Measures to be implemented** | - *Legal framework to impose the objectives, targets, obligations, deadlines, stakeholders, etc.*<br>  o *Set up by legal framework the targets of RES for biofuel and hydrogen which are to be used in transport sector as well as the including of the provision for electricity used specifically for transport.*<br>  o *Set up by legal framework the obligation of producers/importers/retailers regarding the quantities and qualities (Certification) of RES specific for transport market and for importers/retailers and users of vehicle concern to the energy efficiency.*<br>  o *Updating action plan related to the EE in transport sector defining targets including the ways to increase the market of EE and clean vehicles.*<br>  o *Green procurement to be addressed for public sector in favour of increasing the fleet of clean vehicles except energy efficiency criteria* |

| | |
|---|---|
| | *(established by amended EE law) due to increase the number of green vehicles vs conventional fuels.*<br>- *Financial supports/incentives for manufactures of vehicles, for retailers and for consumers*<br>  o *Grants, soft loans for the purchase of green vehicles*<br>  o *Rebates/vehicle purchase price subsidy: financial benefit received when purchasing a qualifying vehicle*<br>  o *Feebate: financial measure where a qualifying vehicle receive a purchase rebate, while a surcharge or fee is placed on certain vehicle types linked to the $CO_2$ emissions of vehicles*<br>  o *Scrappage scheme: measure which promotes the replacement of older vehicles with newer, less polluting models and higher efficiency*<br>  o *Charges, penalties or bans for most pollutant vehicles*<br>  o *Exemption from or reduction of annual vehicle taxes (for some years)*<br>  o *Exemption from or reduction of motor fuel taxes*<br>  o *Reduced roadway taxes*<br>  o *Discounted or free parking*<br>  o *Tax exemptions and deductions for import vehicle, purchase or registration tax*<br>  o *There is a planned incentive ranging from 5% to 10% of the purchasing cost for a new electric car; free maintenance and ancillary services for electric car owners; and incentives and discounts offered also to hybrid car owners.*<br>  o *Free parking on all public parking spaces.*<br>- *Technical measures*<br>- *Upgrade to taxi fleet with hybrid or electric models* |
| **Budget (source of budgeting)** | *To achieve the target of 15.5% for EE by 2030 (460 ktoe compared with BaU scenario-Fig 4, NSE) there is an estimation about 228 MEur to be invested.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, Ministry of Finance and Economy, Municipalities; Albanian Energy Efficiency Agency; General Directorate of Customs; Private Sector*<br>*Ministry of Infrastructure and Energy, Ministry of Finance and Economy, Albanian Energy Efficiency Agency; National Agency of Natural Resources* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES* |

| | |
|---|---|
| **Energy Dimension** | *2. Energy Efficiency* |
| **Sector** | *Transport* |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory* |
| **Title of PaM (Coding)** | *Increasing the share of public transport for passengers and freight (roads, railways and waterways)*<br>*(EE-T4)* |
| **Timeframe** | *2021 – ongoing* |
| **Legal basis and planning documents** | *DCM No. 811 of 16.11.2016, "The approval of the Transport Strategy and Action Plan 2016-2020"; Sectoral strategy of transport & action plan 2016 – 2020 (2019 Monitoring report)* |
| **Actions taken to date** | *Revision of the current PT fare structure (tickets/card types and pricing) short term.*<br>*Tirana – Elbasan road segment planned in the strategy completed in June 2019.*<br>*Construction of Fier by-pass completed June 2020.*<br>*The project for the Traffic Management Centre for the primary road network of Albania is being prepared and implemented with the World Bank.*<br>*New Bus Terminal completed.*<br>*There are identified the railway development projects and included these in the Single Sector Project Pipeline (SSPP) for transport sector.* |

| | |
|---|---|
| | *Ongoing effort for Establish and implement the Albanian Vessel Traffic Monitoring and Information System.*<br>*Develop quantified and integrated operational and strategic action plan for port growth and modernization.* |
| **Main Objective of PaM** | *Supporting by regulatory framework, technical, financial mechanisms the increase of the share of public transportation due to environmentally and economically issues.* |
| **Results to be achieved** | - *Increasing the number of busses, frequency, road qualities and access, dedicated lanes, transport intelligent system, railway infrastructure, transit interchanges, increasing the load factor, competitive prices vs private transport, improving coordination between modes of transport - buses, trains, ships.*<br>- *Increase shift to public and active transport: Achieve 70% mode split for public and active transport modes for Tirana municipality.*<br>- *Reform the rail system setting up an open market for public and private investors in terms of market regulation, infrastructure management or rail operations.*<br>- *Modernization of port infrastructure through investments.*<br>- *Strengthening the Maritime Administration in line with EU standards.*<br>- *An increase in the specialization of port functions in order to increase their intermodally, especially for port-rail connection.* |
| **Measures to be implemented** | - *Improving public transport infrastructure across the city by upgrading the local public transport network, providing dedicated bus lanes, etc.*<br>- *Reconstruction of roads that has already begun on a large scale and has already improved the image of public transport via increase in density and frequency of electric buses in the network.*<br>- *Construction of the Tirana Public Transport Terminal, and the Bus Rapid Transport system (BRT) Tirana - Rinas*<br>- *Tirana Ring (2016 – 2018) (South – West side to be completed -delayed)*<br>- *Improve public transportation (new fleet (electric and labelled included)) and construction of dedicated 10km cycling lanes* |
| **Budget (source of budgeting)** | *Not a single value because there are several projects related to several interventions for the transport system* |
| **Implem. Entity (Monitoring Entity)** | *MIE, MFE, Municipalities; Energy Efficiency Agency; National Road Authority, General Directorate of Road Transport Services, General Maritime Directorate, Port Authority Durrës.*<br>*Ministry of Infrastructure and Energy, Ministry of Finance and Economy, Albanian Energy Efficiency Agency; Donors* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES* |

## 3.3 Energy Security

### 3.3.1 Overarching legal framework

The main legal acts (including strategies and plans) related to this dimension are listed below:

1. **Law No. 102/2015 of 23.9.2015 "On the natural gas sector", amended**
2. **Law No. 43/2015 of 30.4.2015 "on Power Sector", amended**
3. **Law No.7746 of 28.7.1993 "on Hydrocarbons", amended**
4. **DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"**
5. **DCM No. 87 of 14.2.2018 "Natural gas sector development master plan in Albania and identification of priority projects"**
6. **DCM No. 417 of 10.5.2017 "Natural gas emergency plan, in compliance with minimum supply security standards, as well as rules to guarantee safe and effective supply of natural gas"**
7. **Law "On the establishment, maintenance and management of security minimum stocks of crude oil and petroleum products"** (draft version)

In the Tables below are the Policies and Measures divided by the sectors they are related to.

### 3.3.2 Power sector

| **Energy Dimension** | *3. Energy Security* |
|---|---|
| **Sector** | *Power* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Financial; Technical* |
| **Title of PaM (Coding)** | *Gas supply for Vlora Thermal Power Plant (ES-P1)* |
| **Timeframe** | *2021 – ongoing* |
| **Legal basis and planning documents** | *DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"; DCM No. 87 of 14.2.2018 "Natural gas sector development master plan in Albania and identification of priority projects"* |
| **Actions taken to date** | *Preparation and approval of the process.* |
| **Main Objective of PaM** | *Restart operation of Vlora thermal power plant with the supply of natural gas via Trans Adriatic Pipeline (TAP) and Vlora pipeline branch of it.* |
| **Results to be achieved** | - *Reduction of electrical energy imports*<br>- *TPP Vlore could cover 20 % of Albanian electricity deficit* |
| **Measures to be implemented** | - *Through approval of concession* |
| **Budget (source of budgeting)** | *Approx. 58 MEur* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, Energy Regulator Entity, Albanian Power Corporation (KESH)*<br>*Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | |

| Energy Dimension | 3. Energy Security |
|---|---|
| **Sector** | *Power* |
| **Modelling Scenario Considered** | *WEM and WAM (see results section)* |
| **Type of Instrument** | *Regulatory* |
| **Title of PaM (Coding)** | *New construction of power plants – Skavica, Vau Dejes, Moglice (ES-P2)* |
| **Timeframe** | *2021 – ongoing* |
| **Legal basis and planning documents** | *DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"; DCM No. 87 of 14.2.2018 "Natural gas sector development master plan in Albania and identification of priority projects"* |
| **Actions taken to date** | - *HPP Moglice*<br>- *Floating PV plant in Vau Dejes*<br>- *Skavica Hydro Power Plant (Joint Action Plan started in October 2020 with Bechtel)* |
| **Main Objective of PaM** | *Construction of Skavica hydro power plant* |
| **Results to be achieved** | *Increase energetic independence by increasing capacity and have a larger reservoir.* |
| **Measures to be implemented** | *For the WEM:*<br>- *HPP Moglice (182.5MW in 2021)*<br>- *floating PV plant in Vau Dejes (12.9MW in 2022)*<br>*For the WAM:*<br>- *Skavica Hydro Power Plant* |
| **Budget (source of budgeting)** | *To be checked* |
| **Implem. Entity (Monitoring Entity)** | *Council of Ministers; Ministry of Infrastructure and Energy, Local Government Units*<br>*Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES* |

### 3.3.3 Oil & Gas Sector

| Energy Dimension | 3. Energy Security |
|---|---|
| **Sector** | *Oil and Gas Sector* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory* |
| **Title of PaM (Coding)** | *Fully functional legal framework for a reliable and safe gas supply to customers (ES-O1)* |
| **Timeframe** | *2018 -2040* |
| **Legal basis and planning documents** | *Law No. 102/2015 of 23.9.2015 "On the natural gas sector", amended; DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"; DCM No. 87 of 14.2.2018 "Natural gas sector development master plan in Albania and identification of priority projects"* |
| **Actions taken to date** | *The regulatory framework established so far in Albania is at a much higher level than its infrastructure development progress. However, there is group of bylaws to be approved which are legal, technical and regulatory.*<br>*Two transmission system operators were unbundled and certified. The Trans Adriatic Pipeline (TAP) is operational.* |

| | |
|---|---|
| | *Albgaz and TAP adopted network codes, which were approved by ERE. ERE transposed the Gas Network Codes in Albania. Third party access to the transmission system is regulated by tariffs adopted in line with an entry/exit methodology. All customers are eligible. Supply and customer protection legislation is developed. The gas emergency rules are in place.* |
| **Main Objective of PaM** | *A reliable and stable natural gas supply to customers, through the creation of a market that is competitive and integrated with regional and European markets, and offering a high-quality service, reasonable costs, in compliance with environmental protection requirements.* |
| **Results to be achieved** | - *Through approval of a group of sub-laws for implementation of legal and technical requirements of the law to create a functional legal framework for a reliable and safe gas supply, creation of natural gas wholesale market.*<br>- *The sub-laws are identified and submitted.* |
| **Measures to be implemented** | - *Through approval of legal framework, regulatory rules and technical, transmission, distribution codes.* |
| **Budget (source of budgeting)** | *The master plan foreseen three development terms: short, medium, long.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, ALBGAZ*<br>*Ministry of Infrastructure and Energy, ALBGAZ* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *3. Energy Security* |
| **Sector** | *Oil and Gas Sector* |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Implementation of priority projects identified in the Gas Master Plan (ES-O2)* |
| **Timeframe** | *2018 -ongoing* |
| **Legal basis and planning documents** | *Law No. 102/2015 of 23.9.2015 "On the natural gas sector", amended; DCM No. 87 of 14.2.2018 "Natural gas sector development master plan in Albania and identification of priority projects"* |
| **Actions taken to date** | *The Steering Committee of WBIF in its meeting of 6 December 2018 approved a grant of 1.1 MEur for the preparation of the "Fieri – Vlora gas pipeline: Detailed Design and Tender documents". The consultant Hill International – IPF 7 Consortium, in January 2020 delivered for comments the document "Methodology for Fieri – Vlora gas pipeline: Detailed Design and Tender documents".*<br>*"Pre-feasibility Study for Albania to Kosovo Gas Pipeline" (ALKOGAP project), implemented by IPF4 TA, financed by the WBIF with a grant 0.3 MEur. The prefeasibility Study was completed at the end of 2018, under the WB15-REG-ENE-01.*<br>*Preliminary project for Ionian Adriatic Pipeline (Albania and Montenegro track) – WBIF has given a grant of 2.5m of Euros.* |
| **Main Objective of PaM** | *A complete new and functional gas transmission and distribution system.* |
| **Results to be achieved** | - *Penetration of the natural gas (ktoe) vs. total primary energy sources supply 0,37% in 2020, 5.1% in 2025 and 8.5% in 2030, as targeted from National Strategy for Energy.*<br>- *In 2040, the potential consumption of natural gas for electricity generation could be around 770 million m³, while the projected consumption at the country's refineries could be around 89.2 million m³.*<br>- *85 out of 376 local administrative units have been selected for having sufficient potential for development of the gas distribution network.* |
| **Measures to be implemented** | - *Through projects development and investments in transmission and distribution. TAP, Ionian Adriatic Pipeline – IAP, etc. as defined in strategic plan.* |
| **Budget (source of budgeting)** | *New gas transmission line budget is foreseen from 150 MEur until 185 MEur, from which 67 MEur for 168km are for Ionian Adriatic Pipeline (IAP)* |

| | |
|---|---|
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, ALBGAZ*<br>*Ministry of Infrastructure and Energy, ALBGAZ; Energy Regulator Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *3. Energy Security* |
| **Sector** | *Oil and Gas Sector* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Linking Albania with the international gas network (ES-O3)* |
| **Timeframe** | *2018 -ongoing* |
| **Legal basis and planning documents** | *DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"; DCM No. 87 of 14.2.2018 "Natural gas sector development master plan in Albania and identification of priority projects".* |
| **Actions taken to date** | - *Approval of necessary legal framework. Albania has been developing natural gas by-laws since the adoption of the Gas Law in 2015. The regulatory framework established so far in Albania is at a much higher level than its infrastructure development progress.*<br>- *Albgaz network code for future transmission system and the adoption of the TAP network code, the latter in line with the exemption decision of ERE and Italian and Greek national authorities.*<br>- *The regulatory authority ERE transposed the Network Codes for gas in Albania.*<br>- *Approval of Gas Sector Development Plan*<br>- *Identification and approval of priority projects*<br>- *Preliminary project for Ionian Adriatic Pipeline (Albania and Montenegro track) – WBIF*<br>- *Pre-feasibility Study for Albania to Kosovo Gas Pipeline (ALKOGAP) project* |
| **Main Objective of PaM** | *Linking Albania with the international gas network according to the best option (Eurasia Gas Corridor and Energy Community Gas Ring, TAP, IAP, Albania Kosovo Gas Pipeline" (ALKOGAP project)).* |
| **Results to be achieved** | *Albania linked with the international gas network according to the best option for the development of a regional gas market and increase of gas supply security.* |
| **Measures to be implemented** | - *Through approval of legal framework, regulatory rules and technical and transmission codes*<br>- *Regional and international agreements*<br>- *Financing and implementation of approved priority projects* |
| **Budget (source of budgeting)** | *"Pre-feasibility Study for Albania to Kosovo Gas Pipeline" (ALKOGAP project), implemented by IPF4 TA, financed by the WBIF with a grant 0.3MEur (was completed at the end of 2018). 67 MEur for 168km are for Ionian Adriatic Pipeline (IAP)* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, ALBGAZ*<br>*Ministry of Infrastructure and Energy, ALBGAZ; Energy Regulator Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *3. Energy Security* |
| **Sector** | *Oil and Gas Sector* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory; Financial* |

| | |
|---|---|
| **Title of PaM (Coding)** | *Increasing hydrocarbons exploration and production (ES-O4)* |
| **Timeframe** | *2018 -ongoing* |
| **Legal basis and planning documents** | *Law No.7746 of 28.7.1993 "on Hydrocarbons", amended* |
| **Actions taken to date** | *Final draft of Law "On the establishment, maintenance and management of security minimum stocks of crude oil and petroleum products" is submitted.* |
| **Main Objective of PaM** | *The rehabilitation of Ballsh and Fier refineries to European norms and standards, including adoption of environmental norms for refinery products and technology, increasing refinery processing capacity to 1.5 Mt/year, modernization of Vlora terminal, and modernization of transport infrastructure from Vlora to Ballsh.* |
| **Results to be achieved** | - *Approximation of the Council Directive 2009/119/EC of 14 September 2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products.*<br>- *Establishment of stockholding body, plans to release stocks in the case of an emergency, definition of storage capacity and purchase of stocks depend on the approval and provisions of the draft Law.*<br>- *A system for fuel quality control is in place and specified in legislation.*<br>- *Fuel quality monitoring is ensured through Annual Monitoring Programmes.* |
| **Measures to be implemented** | - *Through approval of legal framework, regulatory rules and technical and codes*<br>- *Studies for rehabilitation and modernization of the two refineries*<br>- *Ministry of Infrastructure and Energy also is considering the option of building new refineries with 3.2 Million tons capacities.* |
| **Budget (source of budgeting)** | *No budget assessed since Investment costs for rehabilitation and modernization studies of the two refineries depends directly on the actual situation of installations, equipment and environment pollution level. Ministry of Energy and Industry also is considering the option of building new refineries with 3.2 Million tons capacities.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, ALBPETROL*<br>*Ministry of Infrastructure and Energy, ALBPETROL; Energy Regulator Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *3. Energy Security* |
| **Sector** | *Oil and Gas Sector* |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Emergency plan for natural gas (ES-O5)* |
| **Timeframe** | *2017 -ongoing* |
| **Legal basis and planning documents** | *Law No.102/2015 of 23.9.2015 "On the natural gas sector", amended; DCM No. 417 of 10.5.2017 "Natural gas emergency plan, in compliance with minimum supply security standards, as well as rules to guarantee safe and effective supply of natural gas"* |
| **Actions taken to date** | *Albgaz, has been unbundled and certified under the ownership model.*<br>*Albgaz network code for its future transmission system and the adoption of the TAP network code, the latter in line with the exemption decision of ERE and Italian and Greek national authorities.*<br>*The regulatory authority ERE transposed the Network Codes for gas in Albania.*<br>*Albania has two coastal oil and gas terminals: Porto Romano in Durres, and Petrolifera in Vlora.*<br>*The project "Underground Gas Storage Dumrea (UGS Dumrea)" is proposed to the Energy Community Secretariat to be included in the Projects of Energy Community Interest (PECI list). The Steering Committee of WBIF in its meeting of 6 December 2018 approved a grant of 1 million euro for the preparation of the Feasibility Study and ESIA for this project. The ToR* |

| | |
|---|---|
| | *for the preparation of the Feasibility Study and ESIA for the project WB20-ALB-ENE-01 "Albania, Dumrea Underground Natural Gas Storage" are prepared by the consultant and submitted to the WBIF and EBRD for further procedures.* |
| **Main Objective of PaM** | *The definition of the standards related to the minimum requirements suitable for the security of natural gas supply in the Republic of Albania, the mandatory criteria for ensuring reliable and efficient supply of natural gas as well as the duties and responsibilities of institutions for managing emergency situations in gas supply to customers.* |
| **Results to be achieved** | - *Determine standards for minimal requirements for safety supply.*<br>- *Instruments and measures to guarantee an adequate and clearly defined supply of gas for protected customers, in accordance with supply safety standards.*<br>- *Instruments for prediction and assessment of potential risks, which clearly set out actions to prevent these risks and measures to mitigate possible damages related to them.*<br>- *A program to reduce or stop the supply of natural gas to specific categories of customers in the event of a crisis situation.*<br>- *Definitions of the role and responsibilities of gas provider companies and non-household consumers, taking into account the various impact measures in case of a crisis in the natural gas sector.*<br>- *Criteria regarding storage plants, in order to meet supply safety standards, as well as possible contributions for storage plants located either in the Republic of Albania or in another contracting party in the Energy Community, or member country of the Union European.*<br>- *Important measures and actions to be taken to eliminate or mitigate the impact of a natural gas supply outage, in accordance with different levels of crisis.* |
| **Measures to be implemented** | - *Through approval of legal framework, regulatory rules and technical codes*<br>- *Interconnection in regional and international gas pipelines*<br>- *Financing gas storage projects* |
| **Budget (source of budgeting)** | *No budget assessed* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, Albgaz, Energy Regulator Entity*<br>*Ministry of Infrastructure and Energy, Energy Regulator Entity* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *3. Energy Security* |
| **Sector** | *Oil and Gas Sector* |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Approval of Law "On the establishment, maintenance and management of the minimum reserves of crude oil security and its products"*<br>*(ES-O6)* |
| **Timeframe** | *2010 -ongoing* |
| **Legal basis and planning documents** | *New Law "On the establishment, maintenance and management of security minimum stocks of crude oil and petroleum products" transposing Council Directive 2009/119 in Albanian Legislation* |
| **Actions taken to date** | *The representatives of the ministries are discussing the final draft of Law "On the establishment, maintenance and management of security minimum stocks of crude oil and petroleum products", which is submitted to the Council of Ministers for approval.* |
| **Main Objective of PaM** | *The new draft Law establishes the necessary procedures for intervention in case of a serious shortage of petroleum products in the market. In the event of difficulties in supply, the release of the stocks is decided by the Government, upon the proposal of the minister in charge of energy and approval of the crisis management committee of the Government.* |

| | |
|---|---|
| **Results to be achieved** | *New Law "On the establishment, maintenance and management of security minimum stocks of crude oil and petroleum products" transposing Council Directive 2009/119 in Albanian Legislation.* |
| **Measures to be implemented** | *Through approval by Albanian government and Albanian Parliament of the new law.* |
| **Budget (source of budgeting)** | *N/A* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy*<br>*Ministry of Infrastructure and Energy, Energy Regulator Entity* |
| **Relation with other dimensions (if any)** | |

### 3.3.4 Regional Cooperation

| **Energy Dimension** | *3. Energy Security* |
|---|---|
| **Sector** | *Regional Cooperation* |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Ionian Adriatic Pipeline & Albania Kosovo Gas Pipeline (ES-R1)* |
| **Timeframe** | *2018 -ongoing* |
| **Legal basis and planning documents** | *DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"; DCM No. 87 of 14.2.2018 "Natural gas sector development master plan in Albania and identification of priority projects".* |
| **Actions taken to date** | - *Approval of necessary legal framework. Albania has been developing natural gas by-laws since the adoption of the Gas Law in 2015. The regulatory framework established so far in Albania is at a much higher level than its infrastructure development progress.*<br>- *Albgaz network code for future transmission system and the adoption of the TAP network code, the latter in line with the exemption decision of ERE and Italian and Greek national authorities. The regulatory authority ERE transposed the Network Codes for gas in Albania.*<br>- *Approval of Gas Sector Development Plan*<br>- *Identification and approval of priority projects*<br>- *Preliminary project for Ionian Adriatic Pipeline (Albania and Montenegro track) – WBIF*<br>- *Pre-feasibility Study for Albania to Kosovo Gas Pipeline (ALKOGAP) project* |
| **Main Objective of PaM** | *Linking Albania new transmission pipelines with the regional gas network according to the best option IAP and ALKOGAP project* |
| **Results to be achieved** | - *The preparation of the necessary legal frame for open market and liberalization technical codes and regulatory rules*<br>- *Accelerate the approved Gas Development Plan*<br>- *Financing and implementation of approved priority projects, etc.* |
| **Measures to be implemented** | - *Through approval of legal framework, regulatory rules and technical and transmission codes*<br>- *Regional and international agreements*<br>- *Financing and implementation of approved priority projects* |
| **Budget (source of budgeting)** | *67 MEur for 168km are for Ionian Adriatic Pipeline* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy*<br>*Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | |

## 3.4 Internal Energy Market

### 3.4.1 Overarching legal framework

The main legal acts (including strategies and plans) related to this dimension are listed below:

1. **Law No. 7/2017 of 2.2.2017 "For the promotion of the use of energy from renewable sources"**
2. **Law No. 116/2016 of 10.11.2016 "On energy performance of buildings"**
3. **Law No. 43/2015 of 30.4.2015 "on Power Sector", amended**
4. **DCM No. 480 of 31.7.2018 "on the Approval of the National Energy Strategy 2018 – 2030"**
5. **DCM No.16 of 11.01.2017 "On the approval of requirements and procedures for authorization of construction of new interconnectors"**
6. **DCM No. 718 of 12.10.2016 "Rules and procedures for the construction of new generating capacities"**
7. **ERE Decision No. 186 of 10.11.2017 "Transmission Network Code"**
8. **ERE Decision No. 180 of 08.11.2017 "Methodology for transmission network tariffs"**
9. **ERE Decision No. 135 of 06.09.2017 "Rules of Procedure for submission and approval of development plans (DSO, TSO)"**
10. **Order of the Minister of Infrastructure and Energy No. 27 of 18.01.2021 "For the approval of the strategy of transformation of Feed-In tariff support to Contract for Difference"**

In the Tables below are the Policies and Measures divided by the sectors they are related to.

### 3.4.2 Electricity Infrastructure

| **Energy Dimension** | *4. Energy Market* |
|---|---|
| **Sector** | *Electricity Infrastructure* |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory; Financial* |
| **Title of PaM (Coding)** | *Electricity interconnectors (EM-I1)* |
| **Timeframe** | *2017 -ongoing* |
| **Legal basis and planning documents** | *DCM No.16 of 11.01.2017 "On the approval of requirements and procedures for authorization of construction of new interconnectors"* |
| **Actions taken to date** | *The DCM No.16 of 11.01.2017 is part of group of PaMs connected with the development of electricity market: (i) DCM No. 718 of 12.10.2016 "Rules and procedures for the construction of new generating capacities"; (ii) ERE Decision No. 186 of 10.11.2017 "Transmission Network Code"; (iii) ERE Decision No 180 of 08.11.2017 "Methodology for transmission network tariffs"; (iv) ERE Decision "Regulation on the certification of the transmission system operator for electricity"; and (v) ERE Decision No 135 of 06.09.2017 "Rules of Procedure for submission and approval of development plans (DSO, TSO)"* |
| **Main Objective of PaM** | *Define the requirements and procedures needed to obtain the permission for construction of new high voltage (110 kV and up) interconnection lines from Albanian Transmission System Operator or private investors.* |
| **Results to be achieved** | - *Develop the network to respond to increases in demand for transmission capacity*<br>- *Supporting market transactions in the territory of the state and the region so that the transmission network does not represent a constraint on competitiveness*<br>- *Timely realization of investment plans, in particular capital investments*<br>- *Accelerated integration of variable RES into the power system, and increased availability to balance their production* |

| | |
|---|---|
| **Measures to be implemented** | *Through approval of legal framework, regulatory rules and technical and energy efficiency codes.* |
| **Budget (source of budgeting)** | *N/A* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy*<br>*Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *4. Energy Market* |
| **Sector** | *Electricity Infrastructure* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WEM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Electric Energy Sector Reform*<br>*(EM-I2)* |
| **Timeframe** | *2018 -ongoing* |
| **Legal basis and planning documents** | *Law No. 43/2015 of 30.4.2015 "On the electric energy sector", amended; Law No. 7/2017 of 2.2.2017 "For the promotion of the use of energy from renewable sources"; DCM No. 742 of 12.12.2018 "On the approval of the strategic plan for the reform of the energy sector in Albania"* |
| **Actions taken to date** | *It is important to highlight that Albania is currently undertaking some reform steps already which the herein suggested reform builds on. These reform steps include, amongst others, a first step towards the unbundling of OSHEE, Albania's sole Universal Supplier and Distribution System Operator, the establishment of a power exchange (APEX, now ALPEX), and a gradual opening of the retail market together with the establishment of a competitive wholesale market.* |
| **Main Objective of PaM** | *The objective of this PAM is to create an electric energy market that is organized according to the EU model, and led by the principles of transparency, non-discrimination and sustainability in the long term, based also on the formation of a competitive and free energy price formation.* |
| **Results to be achieved** | - *Agreement on arrears and improving of public entities' payment morale*<br>- *Unbundling and Restructuring of OSHEE*<br>- *Adoption of a metering and forecast process*<br>- *Enforce market- opening and price deregulation*<br>- *Establishment of a power exchange*<br>- *Implementation of market-based balancing mechanism and rules*<br>- *Establish RES operator and transform Feed-in-Tariffs*<br>- *Competitive bidding for renewable electricity generation capacity*<br>- *Adoption and Implementation of a Support Scheme for Society's Vulnerable Customers*<br>- *Finalise secondary acts in compliance with EnC Acquis*<br>- *Increase powers and independence of ERE*<br>- *New tariff scheme(s)*<br>- *Market coupling of day-ahead market.*<br>- *Adopt clear strategic outlook for KESH*<br>- *Adopt TYNDP*<br>- *Integrated procurement of all losses*<br>- *ERE achieving observer status in ACER*<br>- *Adopt clear strategic outlook for OSHEE* |
| **Measures to be implemented** | *Through technical assistance from different sources, legal and regulatory changes will be approved and implemented to implement the reform and achieve the results.* |
| **Budget (source of budgeting)** | *Indicative budget: 2 MEur* |

| | |
|---|---|
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy, ERE, OSHEE, KESH*<br>*Ministry of Infrastructure and Energy; KfW and AFD (for technical assistance)* |
| **Relation with other dimensions (if any)** | |

| | |
|---|---|
| **Energy Dimension** | *4. Energy Market* |
| **Sector** | *Electricity Infrastructure* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Establish RES operator and transform Feed-in-Tariffs.*<br>*(EM-I3)* |
| **Timeframe** | *2021-2023* |
| **Legal basis and planning documents** | *Law No. 43/2015 of 30.4.2015 "On the electric energy sector", amended; Law No. 7/2017 of 2.2.2017 "For the promotion of the use of energy from renewable sources"; DCM No. 742 of 12.12.2018 "On the approval of the strategic plan for the reform of the energy sector in Albania"; Order of the Minister of Infrastructure and Energy No. 27 of 18.01.2021 "For the approval of the strategy of transformation of Feed-In tariff support to Contract for Difference"* |
| **Actions taken to date** | - *Approval of the Order of the Minister of Infrastructure and Energy No. 27 of 18.01.2021 "For the approval of the strategy of transformation of Feed-In tariff support to Contract for Difference"*<br>- *Draft creation of RES operator that expected to be approved during February 2021*<br>- *Creation of ALPEX* |
| **Main Objective of PaM** | - *To achieve a more transparent support scheme for RES producers*<br>- *Increase ALPEX liquidity*<br>- *Reduce the FiT scheme impact on the actual purchaser of the electricity (OSHEE, FTL)* |
| **Results to be achieved** | - *Approve the DCM on the creation of the RES operator*<br>- *Establish the structure, hire staff, set up technical capacities*<br>- *Implement the strategy of switching from FiT to CfD*<br>- *Calculate RES obligation for the first 3 years of the functioning of the RES operator*<br>- *Create the model for CfD contract* |
| **Measures to be implemented** | *Through technical assistance from different sources, legal and regulatory changes will be approved and implemented to implement the reform and achieve the results.* |
| **Budget (source of budgeting)** | |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy*<br>*Ministry of Infrastructure and Energy; KfW and AFD (for technical assistance)* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES* |

### 3.4.3 Energy Poverty

| | |
|---|---|
| **Energy Dimension** | *4. Energy Market* |
| **Sector** | *Electricity Infrastructure* |
| **Modelling Scenario Considered**<br>**Type of Instrument** | *WAM*<br>*Regulatory* |
| **Title of PaM (Coding)** | *Eradicate energy poverty*<br>*(EM-P1)* |
| **Timeframe** | *Not determined* |

| | |
|---|---|
| **Legal basis and planning documents** | *Law No. 43/2015 of 30.4.2015 "On the electric energy sector", amended; Law No. 116/2016 of 10.11.2016 "On energy performance of buildings"* |
| **Actions taken to date** | *No data* |
| **Main Objective of PaM** | *The objective is defining the energy poverty and establish a national system for systematically monitoring it and recommending measures to eradicate energy poverty.* |
| **Results to be achieved** | *Complete the requirement to define energy poverty and protect consumers of energy.* |
| **Measures to be implemented** | - *Clearly define the energy poverty.*<br>- *Establish a national system for systematically monitoring it and recommending measures for eradicating energy poverty based on EU countries experience.*<br>- *Study for estimation the number of people experiencing energy poverty in the country and the reasons behind it.* |
| **Budget (source of budgeting)** | *No budget calculated for this PaM* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Infrastructure and Energy; local government units*<br>*Ministry of Infrastructure and Energy* |
| **Relation with other dimensions (if any)** | *Decarbonisation, RES; Energy Efficiency; Research, Innovation & Competitiveness* |

## 3.5 Research, Innovation and Competitiveness

### 3.5.1 Overarching legal framework

The main legal acts (including strategies and plans) related to this dimension are listed below:

1. **Law No. 80/2015 of 22.7.2015 "On the Higher Education and Scientific Research in the Higher Education Institutions in the Republic of Albania"**
2. **DCM No. 710 of 1.12.2017 "on the Approval of National Strategy for Science, Technology and Innovation (NSSTI) for the period 2017–2022"**
3. **DCM No. 607 of 31.08.2016, "On establishment, structure, organization and performing of the National Agency of Scientific Research and Innovation" (NASRI)**

In the Tables below are the Policies and Measures divided by the sectors they are related to.

### 3.5.2 Research

| **Energy Dimension** | *5. Research, Innovation and Competitiveness* |
|---|---|
| **Sector** | |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Regulatory; Informational; Educational; Financial* |
| **Title of PaM (Coding)** | *Improvement of the regional and international collaboration in the scientific research related to the energy sector (RIC-E1)* |
| **Timeframe** | *2018-2022* |
| **Legal basis and planning documents** | *DCM No. 710 of 1.12.2017 "on the Approval of National Strategy for Science, Technology and Innovation (NSSTI) for the period 2017–2022"; Law No. 80/2015 of 22.7.2015 "On the Higher Education and Scientific Research in the Higher Education Institutions in the Republic of Albania"* |
| **Actions taken to date** | *No report available on the progress* |
| **Main Objective of PaM** | *Improvement of the cooperation at Regional, European and global level in the energy sector. Among others, participation of Albanian researchers and innovators in the SET plan will increase their chances in European programs addressing research organisations and SME: The ETIPs and fora constitute the 'industry/innovation' community of the SET-Plan, while the European Energy Research Alliance (EERA) represents the 'research' community.* |
| **Results to be achieved** | - *Increase the number of bilateral and multilateral scientific cooperation agreements by 2022 (e.g. EERA participation and ETIP participation)*<br>- *20% increase (compared to 2018) of the financing for the regional and international collaboration projects by 2022*<br>- *Establishment of a Coordination Committee for the follow-up programs of H2020, Erasmus and COSME programs (Horizon Europe, Erasmus plus, EISMEA programs) by 2022*<br>- *20% Increase in the winning projects of these initiatives by 2027*<br>- *Implementation of activities related to Open Science: publication of all publicly funded national research projects (free access to projects results)* |
| **Measures to be implemented** | - *Financial support for the initiatives.*<br>- *Grants for research and innovation actors to participate in Forums such as EERA and ETIP*<br>- *Grants to research and innovation actors for project preparation / proposal submission*<br>- *Financing the enabling environment (database, meetings, trainings, etc.)*<br>- *Improvement of the legislative framework related to business climate*<br>- *Facilitating the creation of a start-up company from a university spin-off*<br>- *Promoting the innovation and scientific research at national and regional level* |

| | |
|---|---|
| | - *Publication of opportunities, good examples and success stories on Social Media and relevant Websites and Portals* |
| **Budget (source of budgeting)** | *Budget forecast is approx. 8.24 MEur.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Education, Sports and Youth; National Agency for Scientific Research and Innovation*<br>*Ministry of Education, Sports and Youth; National Agency for Scientific Research and Innovation* |
| **Relation with other dimensions (if any)** | *Decarbonisation; Energy Efficiency*<br>*The planned budget is additional to the budget of RIC-E2.* |

| | |
|---|---|
| **Energy Dimension** | *5. Research, Innovation and Competitiveness* |
| **Sector** | |
| **Modelling Scenario Considered** | *WEM* |
| **Type of Instrument** | *Financial* |
| **Title of PaM (Coding)** | *National program of R&D (RIC-E2)* |
| **Timeframe** | *2017 ongoing* |
| **Legal basis and planning documents** | *DCM No. 607 of 31.08.2016, "On establishment, structure, organization and performing of the National Agency of Scientific Research and Innovation" (NASRI)* |
| **Actions taken to date** | *Compared with 2018 the yearly budget of 2020 is increased with 60%.* |
| **Main Objective of PaM** | *Increase year by year the public expenditures for scientific research delivered to Higher Education Institutions.*<br>*This PaM addresses (1) the shortages in budget, staff and working conditions and (2) the need for strengthening research and innovation actions in 6 priority areas including Agriculture, Environment, Water and Energy, IT.* |
| **Results to be achieved** | - *Increase year by year the public expenditures for scientific research delivered to Higher Education Institutions.*<br>- *The final goal is that annual expenditures for scientific research and innovation reach 2% of GDP by 2022.* |
| **Measures to be implemented** | - *Financial support for dedicated research and innovation initiatives related with energy and climate:*<br>  o *Applied research (TRL 6-7)*<br>  o *Demonstration projects (TRL8-9)*<br>  o *Market introduction activities*<br>  o *Awareness creation campaigns Business to Business and Business to Consumer* |
| **Budget (source of budgeting)** | *0.6 MEur (foreseen for 2021)* |
| **Implem. Entity (Monitoring Entity)** | *National Agency for Scientific Research and Innovation and Universities*<br>*Ministry of Finance and Economy; Ministry of Education, Sports and Youth* |
| **Relation with other dimensions (if any)** | *Decarbonisation; Energy Efficiency* |

### 3.5.3 Innovation and Competitiveness

| | |
|---|---|
| **Energy Dimension** | *5. Research, Innovation and Competitiveness* |
| **Sector** | |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Regulatory* |
| **Title of PaM (Coding)** | *Business Investment Development Strategy (BIDS)*<br>*(RIC-E3)* |
| **Timeframe** | *2021 - 2027* |
| **Legal basis and planning documents** | *National Strategy on Development and Integration, Pillar 2: Economic growth through the increased competitiveness and innovation.*<br>*In process of drafting the templates according to IPSIS formats.* |
| **Actions taken to date** | *The Ministry of Finance and Economy plans to design the new Business and Investment Development Strategy (BIDS) and Action Plan 2021 –2027 with the support of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).* |
| **Main Objective of PaM** | *A competitive, more innovation-driven and knowledge-based Albanian economy that creates new and higher-quality jobs tapping the potentials of the digital transition and the transformation of international value chains and emphasising sustainable development, EU and regional integration.*<br>*The BIDS addresses five main challenges: a) an incomplete institutional framework for SME policy; b) limited access to finance for SMEs; c) a skills mismatch in the labour market and low job creation; d) limited export activity by Albanian SMEs; and e) limited innovation activities and research and development expenditure.*<br>- *BIDS is supposed to outline the desired structural transformation and economic development trajectory.*<br>- *BIDS will be aligned to relevant development strategies and programmes at the national and international level.*<br>- *BIDS will form a central link unlocking potential at the interfaces within the strategic framework.*<br>- *BIDS will provide guidance for future regional / sectorial strategies initiating exemplary priority actions with a high impact that can be taken up by complementary measures.* |
| **Results to be achieved** | - *Targeted training programs available by 2023*<br>- *One-stop-shop for SMEs fully functional by 2023* |
| **Measures to be implemented** | - *Complete the institutional framework for SME policy*<br>- *Improve access to finance for SMEs*<br>  o *One-stop-shop for SMEs*<br>- *Match the skills in the labour market and address low job creation*<br>  o *Needs assessment to identify focal aeras of intervention, such as building renovation*<br>  o *Development of curricula for all educational levels, including skilled and unskilled labour*<br>  o *Institutional anchoring of the training programs, including the necessary training infrastructure*<br>- *Improve export activity by Albanian SMEs* |
| **Budget (source of budgeting)** | *Not assessed* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Finance and Economy; Albanian Investment Development Agency*<br>*Ministry of Finance and Economy; Albanian Investment Development Agency* |
| **Relation with other dimensions (if any)** | *Decarbonisation; Energy Efficiency*<br>*Improvement of innovation activities and research and development expenditure is addressed by RIC-E1 and RIC-E2.* |

| | |
|---|---|
| **Energy Dimension** | *5. Research, Innovation and Competitiveness* |
| **Sector** | |
| **Modelling Scenario Considered** | *WAM* |
| **Type of Instrument** | *Financial* |
| **Title of PaM (Coding)** | *Demonstrating Innovation and Competitiveness (RIC-E4)* |
| **Timeframe** | *2021-2025* |
| **Legal basis and planning documents** | *Smart specialisation Strategy Albania (policy concept for priority-setting where a region can benefit from specialising in a particular area of science and technology)* |
| **Actions taken to date** | *A Smart Specialisation Strategy was initiated supported by Fraunhofer ISI. Priority areas identified for Albania which are relevant for the NECP: Water & energy, Agriculture, food & biotechnology, Biodiversity & Environment, ICT.* |
| **Main Objective of PaM** | *Overall objective: To achieve growth and employment by enabling Albanian regions to identify and develop their specific competitive advantages in the areas of Water & energy, Agriculture, food & biotechnology, Biodiversity & Environment, ICT.*<br>*Specific Objective: Demonstrate how local authorities, universities, businesses and civil society in a specific region work together to develop their specific competitive advantage in a priority area and the benefits this brings.* |
| **Results to be achieved** | - *Feasibility study for demonstration project available by 2022*<br>- *Demonstration project including setting up the regional innovation and training infrastructure (shared workshops, test labs, maker spaces, etc.) carried out by 2025* |
| **Measures to be implemented** | - *In a bottom-up approach, local authorities, universities, businesses and civil society work in partnership to implement long-term growth strategies.*<br>  o *Needs assessment: Identification of the region and the focal topic for the intervention*<br>  o *Feasibility study: ToR, Procurement, Implementation*<br>  o *Implementation of Demonstration project* |
| **Budget (source of budgeting)** | *Feasibility study: cost estimation 150 000 EUR; suggestion for donor funded project.*<br>*Cost and financing of demonstration project to be determined by feasibility study.* |
| **Implem. Entity (Monitoring Entity)** | *Ministry of Education, Sports and Youth, Ministry for Entrepreneurship, Ministry of Finance and Economy, Business Community*<br>*Ministry of Education, Sports and Youth; National Agency for Scientific Research and Innovation* |
| **Relation with other dimensions (if any)** | *Decarbonisation; Energy Efficiency*<br>*RIC-E1 and RIC-E2 address targeted research as such, while RIC-E4 focuses on the collaboration of the actors of the value chain and the enabling environment.*<br>*RIC-E3 addresses regulatory aspects with regard to the institutional framework, access to finance, and skills.* |

# SECTION B: ANALYTICAL BASIS

## 4 CURRENT SITUATION AND PROJECTIONS WITH EXISTING POLICIES AND MEASURES

### 4.1. Projected evolution of main exogenous factors influencing energy system and GHG emission developments

*i. Macroeconomic forecasts (GDP and population growth)*

The macroeconomic drivers underlying this analysis are based on the most up-to-date available projections. GDP projection is based on calculations of the International Monetary Fund (IMF 2021). This includes impacts of the COVID-19 pandemic on economic development starting in 2020 with a decrease of 7.7% in GDP. The recovery starts in 2021 with 6.5% of GDP growth, which then gradually decreases to 3.4% p.a. in 2025 maintaining the same annual growth until 2040. Figure 18 shows the real GDP development (monetary value of 2015).

The population development is aligned with the official data of the Albanian statistics office INSTAT in the medium scenario (Statistical Database 2021). Population will decrease slightly from 2.87 Million in 2018 to 2.76 Million in 2030 and 2.60 Million in 2040. Figure 19 shows the population development.

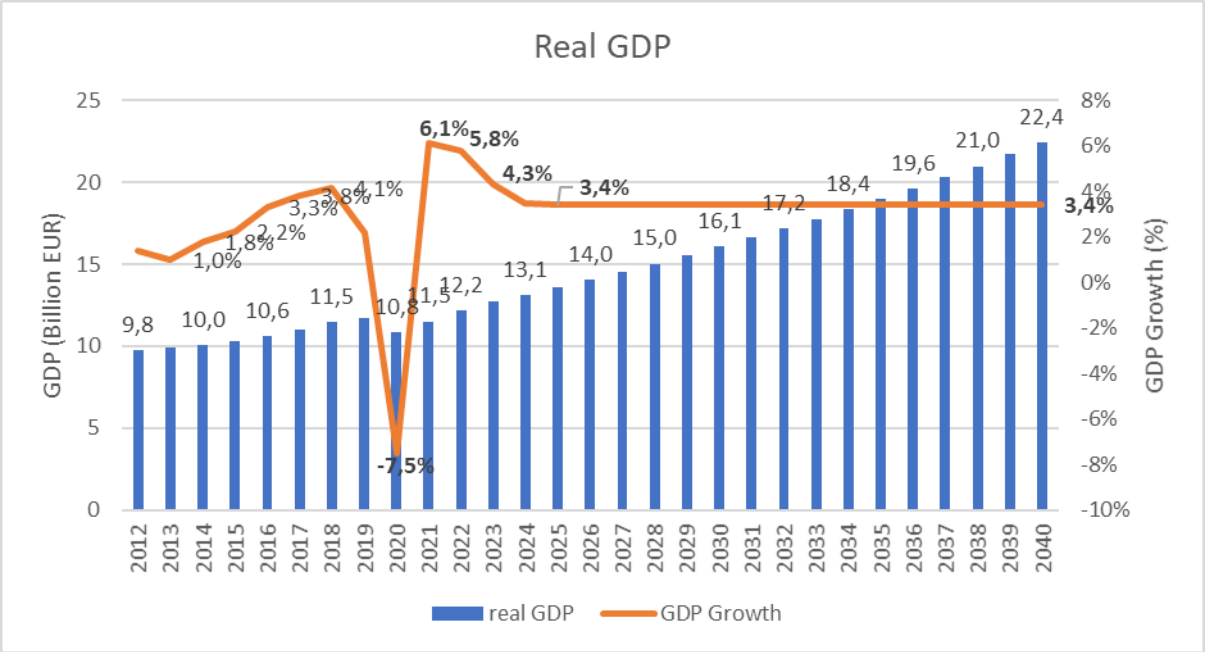



**Figure 18: Real GDP development 2012 - 2040**

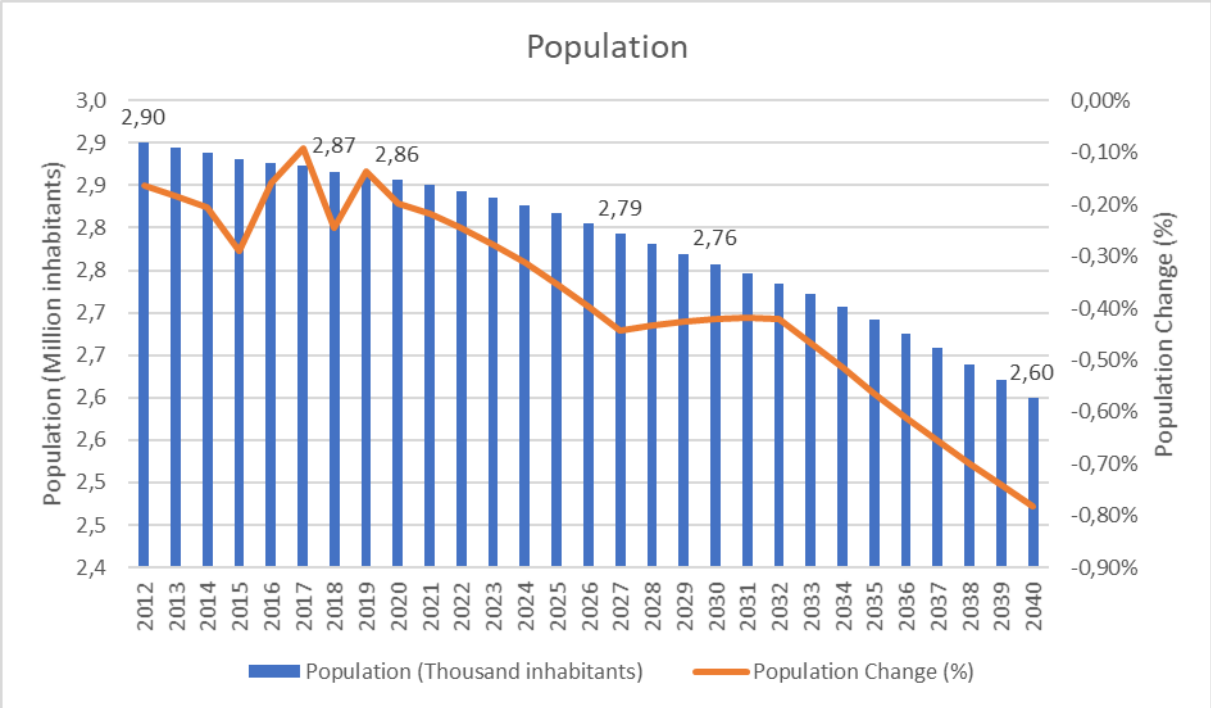



**Figure 19: Population development 2012-2040**

### *ii. Sectoral changes expected to impact the energy system and GHG emissions*

Apart from GDP and Population, the distribution of value added among energy demand sectors plays an important role in energy consumption. Figure 20 shows the share of the industrial, services and agricultural sector between 1995 and 2018. The value added shares between sectors are assumed to continue existing trends. The growth dynamic of the services sector is expected to continue increasing its relative value added share.

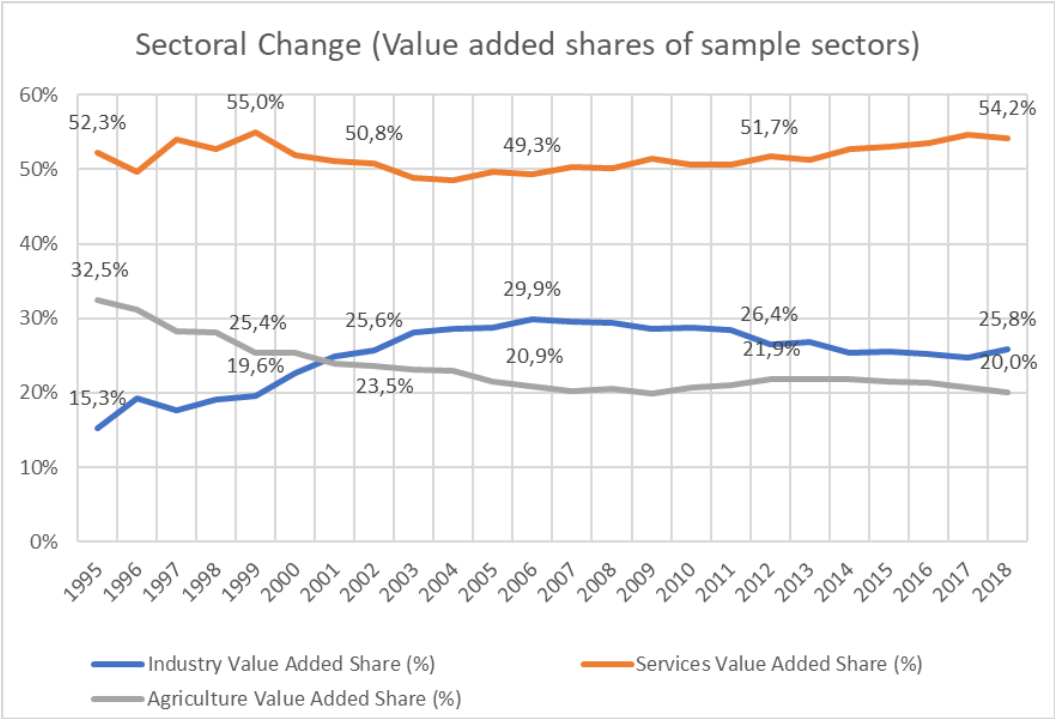



**Figure 20: Value added share of energy demand sectors explicitly analysed in the model from 1995 to 2018**

Apart from macroeconomic impacts, different structural changes affect energy consumption on sectoral level. The most important effects are presented subsequently ordered by sector.

## Residential sector

The household size is decreasing from on average 3.9 persons per household in 2012 to 3.4 persons per household in 2030 and then decreasing further to 3.2 in 2040 (Statistical Database 2021). The floor area per person is considered to increase from 43.4m² in 2012 to 46.6 m² in 2018 and 52.6 m³ in 2030. It further increases to 59.2m² in 2040. Overall, total floor area increases from 125.7 Million m² in 2012 to 145 Million m² in 2030 and further to 154 Million m² in 2040 despite the decrease in population. Figure 21 shows the development of building age classes based on SLED (2015), which is assumed as projection here. The reconstruction rate is high, leading to a share of 37% of floor area by 2040 that is built or refurbished after 2015. The strongest deconstruction is seen in buildings built between 1961 and 1990.

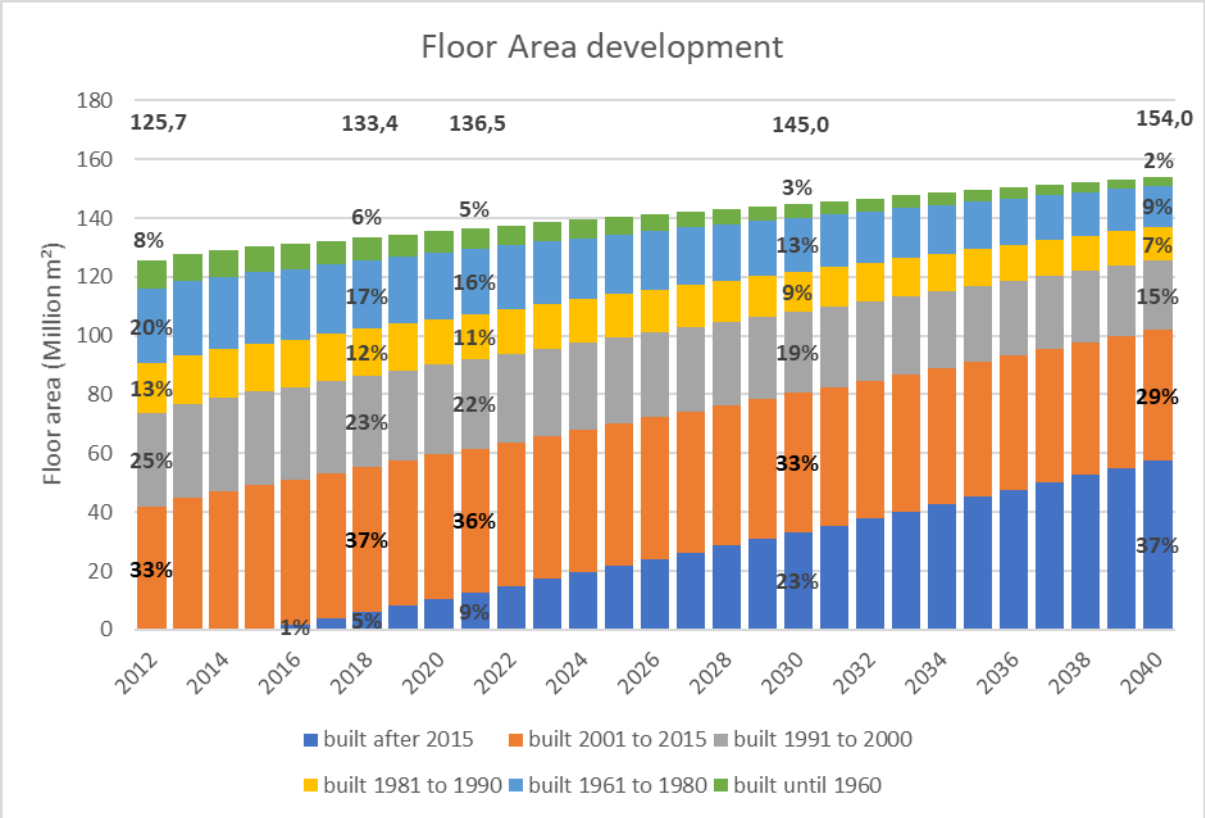



**Figure 21: Floor area development by year of construction. Source: SLED 2015, own representation**

Notable as well is the change in distribution of floor area over different building types. Table 12 defines these building classes.

| Building type | Number of dwellings per building |
|---|---|
| Detached houses | 1 |
| Semidetached houses | 2 |
| Row houses | 3 to 4 |
| Apartment buildings | >4 |

Table 12: Definition of building types

With the share of detached houses in terms of floor area remaining relatively constant (decreasing from 56.3% in 2012 to 56.2% in 2040), semidetached houses and row houses see the highest change in share, dropping from 11.8% to 8.2% and 3.9% to 3.1%, respectively. The strongest increase is seen in apartment buildings, rising from 28.1% in 2012 to 32.5% in 2040.

The impact of the change in housing composition decreases energy intensity due to lower energy consumption per floor area in apartment buildings than in smaller building types. Figure 22 shows the development of floor area by building type. Furthermore, newer and larger buildings tend to use a lower share of fuel wood for space heating and water heating, giving way for electric heating and increasingly heat pumps. A rebound effect depending on building type for higher usage of space heating due to the improved energy performance is expected. Equally, the prevalence of space cooling devices in households is expected to increase strongly from 45% in 2012 in Zones A and B to 71% in Zone A and 74% in Zone B in 2040. In Zone C, the prevalence is expected to increase from 15% in 2012 to 37% in 2040. This leads to an increase in energy consumption for space cooling that is not offset by the improved energy performance. The reconstruction rate of buildings therefore has the largest share in decreasing energy intensity and a changing fuel split in the residential sector. Wood usage in space heating decreases from 33.2% in 2012 to 26.7% in 2040 when not accounting for any policies and measures. In the same timeframe the use of electricity rises from 41.4% to 45.5%. The rest is covered by LPG.

Energy Intensity for space heating and space cooling is determined by heating degree days (HDD) and cooling degree days (CDD). Values are taken for three climate zones. Zone A being the coastal region with the warmest climate, Zone B the central area including the capital Tirana with intermediate climate and Zone C being the mountainous east of the country with the coolest climate.

| Degree Days | Zone A | Zone B | Zone C |
|---|---|---|---|
| HDD (17.5°C) | 1330 | 1534 | 2600 |
| CDD (18.5°C) | 870 | 760 | 350 |

Table 13: Heating and Cooling degree days (HDD base temperature: 17.5°C, CDD base temperature 18.5°C) Source: SLED 2015

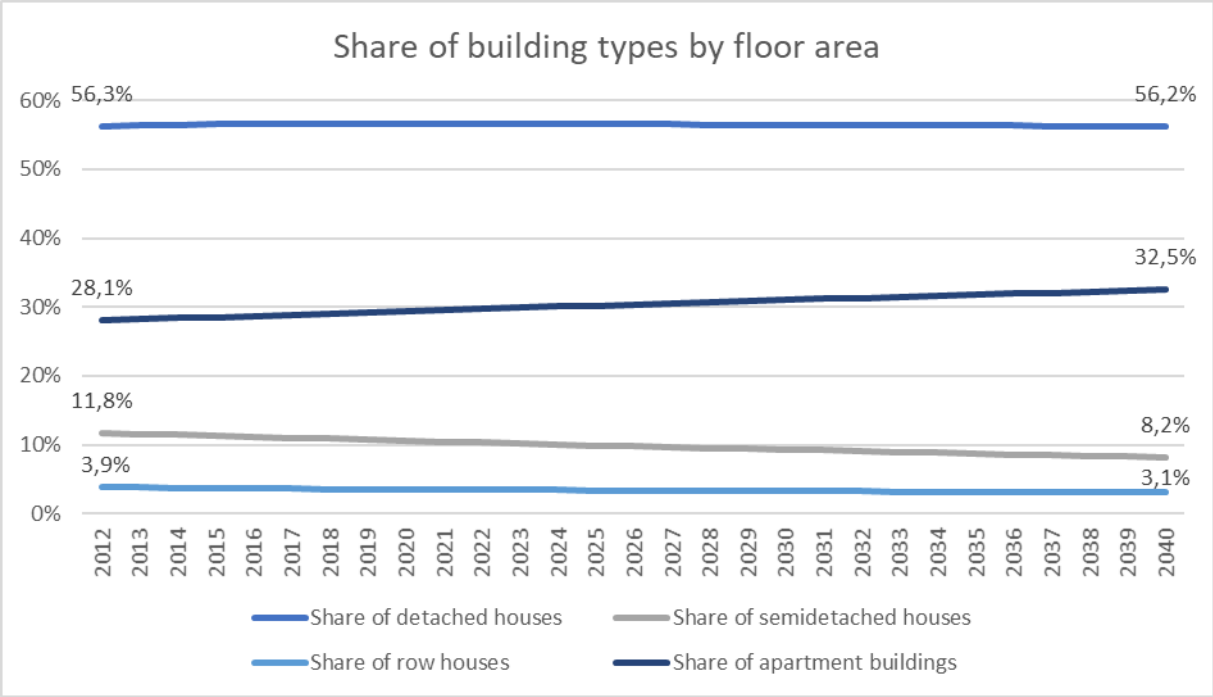
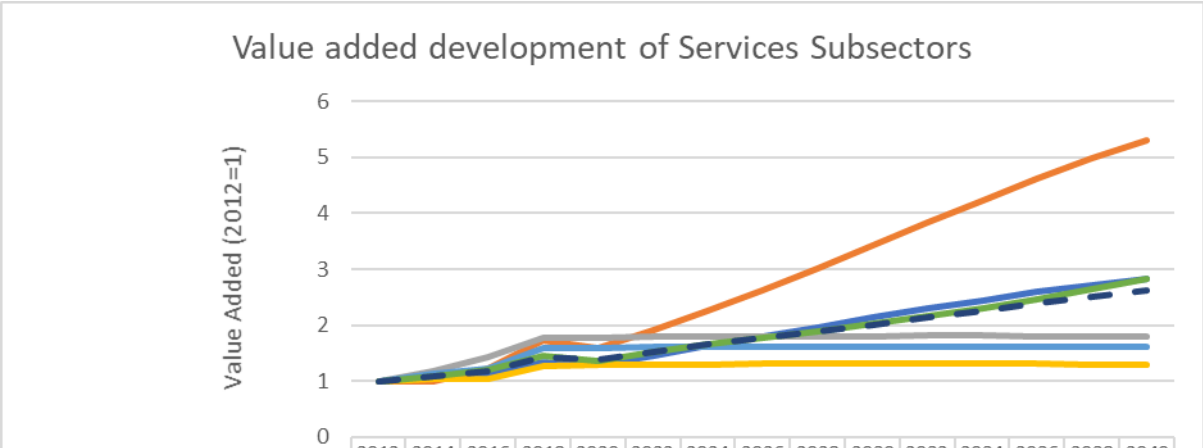



**Figure 22: Share of building types by floor area. Source: SLED 2015, own representation**

## Services Sector

In the services sector, the most important driver is the strong growth performance in value added as was shown in the sectoral development of the economy in Figure 20. In 2040, the sector reaches a value added of 2.6 times that of the 2012-base value (in constant Euros). The strongest growth performance originates from the accommodation and food subsector, increasing 5.3-fold between 2012 and 2040.




| | 2012 | 2014 | 2016 | 2018 | 2020 | 2022 | 2024 | 2026 | 2028 | 2030 | 2032 | 2034 | 2036 | 2038 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trade | 1,0 | 1,1 | 1,1 | 1,3 | 1,3 | 1,5 | 1,6 | 1,8 | 2,0 | 2,1 | 2,3 | 2,4 | 2,6 | 2,7 | 2,8 |
| Accomodation and Food | 1,0 | 1,0 | 1,2 | 1,7 | 1,6 | 1,9 | 2,3 | 2,6 | 3,0 | 3,4 | 3,8 | 4,2 | 4,6 | 5,0 | 5,3 |
| Public Administration | 1,0 | 1,2 | 1,4 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| Education | 1,0 | 1,0 | 1,0 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 |
| Health | 1,0 | 1,1 | 1,2 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 |
| Other Services | 1,0 | 1,1 | 1,2 | 1,4 | 1,4 | 1,5 | 1,7 | 1,8 | 1,9 | 2,0 | 2,2 | 2,3 | 2,5 | 2,6 | 2,8 |
| all subsectors | 1,0 | 1,1 | 1,2 | 1,4 | 1,4 | 1,5 | 1,7 | 1,8 | 1,9 | 2,0 | 2,1 | 2,3 | 2,4 | 2,5 | 2,6 |

**Figure 23: Value added of subsectors to the Services sector, normalized to the year 2012**

## Industry

In industry, the energy demand is determined by production volumes, which in turn are projected to increase with GDP growth. The value-added split between subsectors is projected to remain constant. The most important sector in terms of energy demand is the Minerals sector, which is dominated by cement production. There is also some production of ferro-chromium in the country and limited production of recycled aluminium and lead. Processing of food, drink and tobacco plays only a minor role in terms of energy consumption. The demand for energy increases in all sectors with production volumes, which grow according to GDP growth projections. This is in part compensated by an efficiency gain of 0.1% p.a.

## Transport

The main driver of the transport sector is the demand for mobility, seen in a rising annual demand for person km, as given in Figure 24. This variable has seen a strong growth in the past and is projected to continue to grow with historic growth rate. Transport of freight is projected to undergo growth with GDP.

In addition to total demand for transport, the share between transport modes is an important factor to consider, see Figure 25 for numbers on passenger transport. The largest share of passenger transport happens by passenger cars, with motorcycles and navigation taking small shares. Shared and public transport is an important factor. Rail transport is negligible, so transport by busses is the only shared road transport mode. This has seen a decrease from 15.4% in 2015 to just below 11% in 2018. This share is projected to recover to 13.7% by 2030 and remain stable after. This still corresponds to an increase in total bus km even after 2030 due to the overall increase in transport. Another important factor to regulate energy demand in passenger transport is the load of vehicles, but this is not projected to change with existing measures. Freight transport is delivered by trucks and to a small share by rail and through navigation. Freight transport is projected to increase with GDP. The shares between these modes do not see a change until 2040.

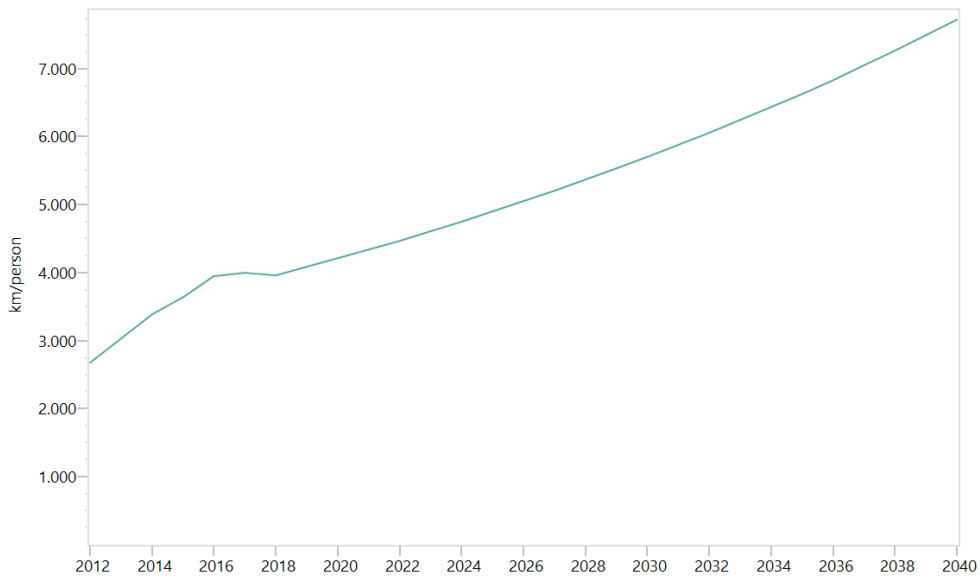



**Figure 24: Annual demand for passenger transport in Albania, giving historic values and the future growth**

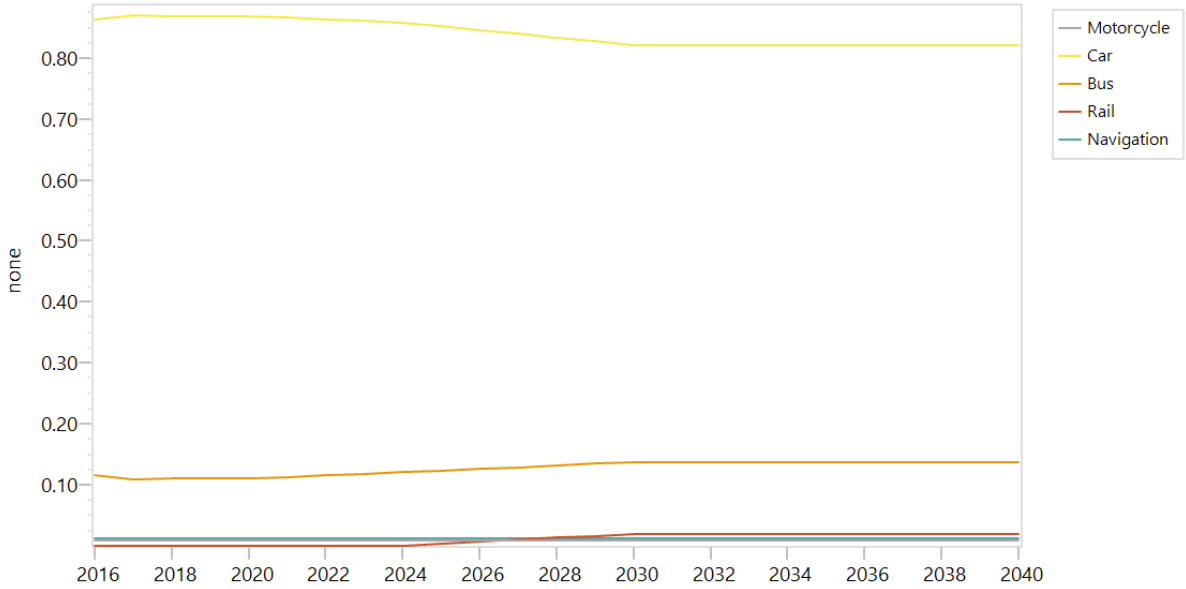



**Figure 25: Shares of transport modes in passenger transport in Albania projected with existing measures until the year 2040**

The energy demand in the transport sector is also determined by the technology used for propulsion and respective fuels. As has been discussed above, passenger transport and notably by car is the main driver of energy demand. Figure 26 shows how novel technologies are projected to penetrate the vehicle stock of passenger cars in Albania. A notable increase of gasoline-gas hybrid vehicles is projected to continue. As the vehicle market is dominated by used cars and the average age of cars is around 14 years, the penetration with novel technologies like electric vehicles is not completed by 2040.

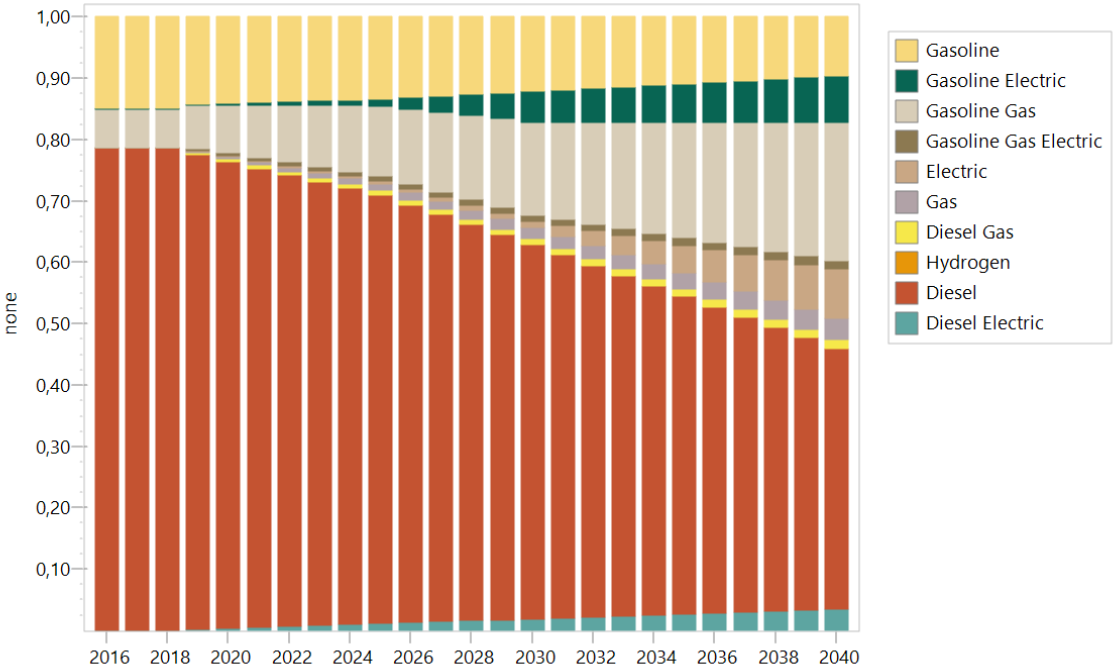


**Figure 26: Technology shares in passenger transport by cars as given for historic vehicle statistics in 2016 to 2018 and as projected under consideration of existing measures until the year 2040**

| Motorcycles | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Gasoline | 16.0% | 16.0% | 16.0% | 15.8% | 15.4% | 14.9% | 14.2% | 13.5% |
| Gasoline Electric | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| Gasoline Gas | | | | | | | | |
| Gasoline Gas Electric | | | | | | | | |
| Electric | 0.1% | 0.1% | 0.1% | 0.2% | 0.5% | 1.0% | 3.3% | 5.5% |
| Gas | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| Diesel Gas | | | | | | | | |
| Hydrogen | | | | | | | | |
| Diesel | 83.9% | 83.9% | 83.9% | 83.0% | 80.8% | 78.4% | 74.6% | 70.7% |
| Diesel Electric | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| **Cars** | | | | | | | | |
| Gasoline | 15.0% | 15.0% | 15.0% | 14.1% | 13.4% | 12.7% | 11.7% | 10.6% |
| Gasoline Electric | 0.1% | 0.1% | 0.1% | 0.4% | 1.1% | 1.9% | 2.7% | 3.5% |
| Gasoline Gas | 6.3% | 6.3% | 6.3% | 7.7% | 11.5% | 15.2% | 18.9% | 22.6% |
| Gasoline Gas Electric | | | | 0.5% | 0.7% | 1.0% | 1.2% | 1.4% |
| Electric | | | | 0.2% | 0.5% | 1.0% | 3.3% | 5.5% |
| Gas | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| Diesel Gas | | | | 0.5% | 0.7% | 1.0% | 1.2% | 1.4% |
| Hydrogen | | | | | | | | |
| Diesel | 78.7% | 78.7% | 78.7% | 76.0% | 69.9% | 63.6% | 55.8% | 48.1% |
| Diesel Electric | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| **Busses** | | | | | | | | |
| Gasoline | 16.0% | 16.0% | 16.0% | 16.0% | 15.0% | 15.0% | 14.0% | 13.0% |
| Gasoline Electric | - | - | - | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| Gasoline Gas | | | | | | | | |
| Gasoline Gas Electric | - | - | - | | | | | |
| Electric | - | - | - | 0.1% | 0.5% | 1.0% | 3.3% | 5.5% |
| Gas | | | | | 1.0% | 2.0% | 3.0% | 3.0% |
| Diesel Gas | - | - | - | | | | | |
| Hydrogen | - | - | - | - | - | - | - | - |
| Diesel | 84.0% | 84.0% | 84.0% | 83.0% | 81.0% | 78.0% | 74.0% | 71.0% |
| Diesel Electric | - | - | - | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |

| Trucks | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Gasoline | 15.9% | 15.9% | 15.9% | 15.6% | 15.0% | 14.5% | 13.9% | 13.4% |
| Gasoline Electric | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| Gasoline Gas | 0.7% | 0.7% | 0.7% | 0.8% | 1.2% | 1.6% | 1.9% | 2.3% |
| Gasoline Gas Electric | | | | | | | | |
| Electric | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| Gas | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |
| Diesel Gas | | | | | | | | |
| Hydrogen | | | | | | | | |
| Diesel | 83.4% | 83.4% | 83.4% | 82.3% | 79.4% | 76.5% | 73.5% | 70.6% |
| Diesel Electric | | | | 0.3% | 1.1% | 1.9% | 2.7% | 3.4% |

**Table 14: Technology shares in passenger transport as given for historic vehicle statistics in 2016 to 2018 and as projected under consideration of existing measures until the year 2040**

## Other energy demand

Other energy demand sectors are distinguished as in the energy balance of Albania, splitting along the agriculture and fisheries sectors. Energy demand in the agricultural sector is driven by the production volume, which has been increasing over the past years and is seen to continue to increase (39% increase in 2030, 83% increase in 2040, relative to 2018). Fisheries production is driven by GDP growth (40% increase in 2030, 95% increase in 2040, relative to 2018). The efficiency gain is projected at 0.1% p.a. for fisheries and agriculture.

Non-energy use of energy carriers is associated with production in the chemical sector (growing with GDP, less than 1% of non-energy demand) and with the total demand for transport.

## Energy transformation

The energy transformation sector includes oil extraction, refinery, electricity production and transmission and distribution.

Albania had proven oil reserves of about 220 Million Barrels in 2018. It is extracted in one main site and refined by two aged refineries. Due to the limited refining capacity, a large part of the crude oil is exported and oil products are imported.

Electricity production is almost exclusively based on hydropower and is therefore renewable. Aspects of energy security play an increasing role with changing climate conditions and diminishing rainfall. Dry years with low hydroelectric output can currently not be compensated by other production technologies. Possible solutions are an increased electricity interconnection with neighbouring countries, combined with the expansion of other renewable sources like solar power or wind energy that are subject to different temporal variations than hydropower. Solar PV sees an increase in power generation with existing measures. Further, considerations are made to refurbish the Vlora thermal power plant to be fuelled with natural gas. The Transadriatic Pipeline (TAP) recently entered into operation in late 2020 and brings gas from Azerbaijan. Gas has a very flexible character in energy generation but will increase the GHG emissions of the electricity production sector. Relying on imported gas does not necessarily improve the situation of energy security.

Finally, while transmission networks are rather solid and do not incur very high losses, distribution networks incur high losses of almost 20%. These losses are projected to be reduced by existing measures in the coming years.

## Industrial processes and product use

The largest share of IPPU emissions (10.9% of total emissions in 2018 in terms of CO2eq) stem from cement production (85.6% of IPPU emissions) and these will continue to rise as cement production continues to grow. This growth is projected to continue with GDP growth, which is broadly in line with the reconstruction in the residential sector and the demand in other sectors. The production of ferro-chromium (growing with GDP) also leads to a small share of emissions (4.7% of IPPU emissions), as do the production of steel (1.8%) and lime (1.1%). The emission trends of refrigerating agents used in place of ozone depleting substances are projected to continue to rise until the year 2024 with historic trends (HFC 134a reaching 60 tonnes p.a., HFC 227ea reaching 15 tonnes p.a. as the by far dominant substances). After 2024, emissions of these substances see no further increase in line with the Kigali amendment of the Montreal protocol.

## Agriculture

The development of non-energy emissions in the agricultural sector (28.4% of total emissions) is determined by the livestock population and agricultural practices. The population of all livestock species has been relatively constant over the past years, except for poultry and pigs. The number of the respective species is therefore seen to continue in this increasing trend. Manure management practices are not projected to change.

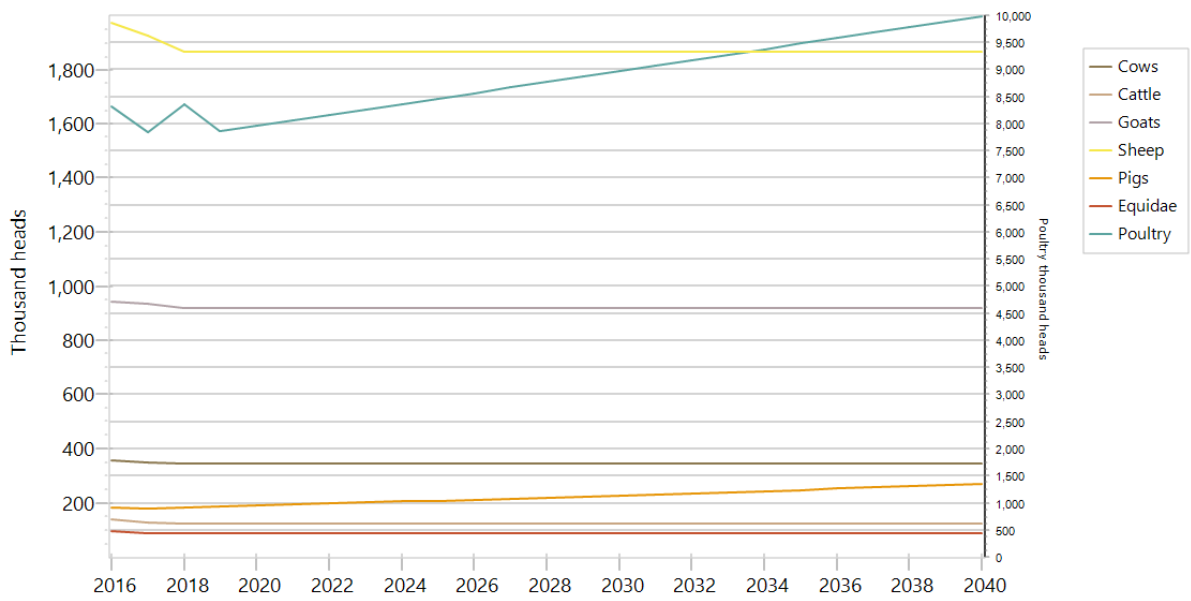



Figure 27: Livestock historically and until the year 2050

In addition to livestock, agricultural emissions stem from field management practices. The share of organic farming is projected to increase to 10% in 2030, from 1% in 2018, but a further increase is not projected to happen after 2030. The practice of residue burning is projected to stop by 2025. The application of urea will be cut in half by 2030, with no further decline afterwards.

## LULUCF

Currently, the LULUCF sector is a source of emissions (12.1% of total emissions), as the natural sink capacity cannot compensate for emissions from forest management. This is not projected to change with existing measures. Forest fires are another source of emissions, which can become a dominant factor in the overall GHG balance. Improved forest management can also help to reduce the impact and spread of forest fires, however, an increase to median fire area (4.8kha) is still projected (increase of 50% until 2050), with no large fire episodes considered.

## Waste

Emissions from the waste sector (10.8% of total emissions, considering solid waste and waste water treatment) are projected to continue to increase.

The emissions of solid waste management are driven by the overall generation of waste per capita, which is projected to increase from 584 kg/cap in 2018 with an annual growth rate of 1.5% to close to 700 kg/cap in 2030 and 811 kg/cap in 2040. Waste management then determines the amount of emissions generated. Currently, solid waste remains largely unmanaged, disposed of in open, unmanaged dumpsites. By determined policies already adopted by way of the Integrated Waste Management Strategy, this practice is overturned until the year 2030. Full management of solid waste disposal is achieved by 2030. In addition, the share of waste going to landfills is reduced to 45% in 2030 and 24% in 2035 (from 81% in 2018), with an increasing share of recycling (increased from 14% in 2018 to 38% in 2030 and 46% in 2035) and an increase in combustion in waste incineration plants with energy recovery (2.2% in 2018, 4.4% in 2025, 17% in 2030 and 30% in 2035). There is currently a small share of uncontrolled incineration (1.8% in 2018); the practice is projected to be reduced in the coming years and ultimately stopped in 2035.

Wastewater is currently mainly untreated in Albania, but an existing policy set also considered in modelling aims to achieve a connection rate to wastewater treatment plants of 39% by 2027. The model projects full connection in 2050.

## Policies reflected in the model

The following tables provides an overview of those policies listed as relevant for the existing measures scenario. It shows how the policies have been reflected in the modelling activity underlying this document. Main effects have been described in the previous paragraphs.

| Abbr | Name | Effect on variable |
|---|---|---|
| ES-O3 | Linking Albania with the international gas network | implicit |
| ES-R1 | Ionian Adriatic Pipeline & Albania Kosovo Gas Pipeline | implicit |
| ES-P2 (WEM) | New construction of power plants | Policy partly in WEM scenario (actions decided until 2019) and partly in WAM scenario (actions decided from 2020). This listing includes the WEM part:<br>• SPP Floating PV Vau Dejës (12.9 MW from 2022)<br>• HPP Moglicë (182.5 MW from 2021) |

| | | |
|---|---|---|
| **G-B1** | Policies to support RES in Heating and Cooling Sector | Solar thermal share in water heating increase by 12%-age points until 2030 and by 20%-age points by 2050.<br>Heat pumps substituting 50% of electric space heating until 2050 lowering energy intensity of space heating. |
| **EE-T3** | Support mechanisms for EE and clean vehicles | Shares of vehicle usage as follows, departing from autonomous WEM[17] in 2023; hydrogen use starts 2030<br>Car: Hybrid gasoline (starting from autonomous WEM growth, which reaches 5% in 2050): 2030 5%; 2050 10%<br>Bus: EV: 2030 3.5%, 2050 7%; Hybrid gasoline: 2030 5%; 2050 30%; Hydrogen: 2050 15%<br>Truck: Hybrid gasoline: 2030 4% 2050 10%; Hydrogen: 2030 0% 2050 15%<br>All fossil fuel powered cars see a decrease of final energy intensity by 10% between 2023 and 2033 |
| **EE-T4** | Increasing the share of public transport for passengers and freight (roads, railways and waterways) | Share of bus transport in person km increases (approx. 10% in 2018) by 25% in 2030 starting in 2019 (corresp. 12,5% in total share, which is the 2012 value).<br>Share of rail passenger rail transport increases after 2024, reaching 2% in 2030. It remains diesel powered.<br>WEM also sees a considerable increase in the demand for mobility. |
| **G-T3** | Efficiency-based car fees and incentives for fleet renewal | Not explicitly implemented. Autonomous WEM sees a considerable increase in hybrid cars. |
| **EM-I1** | Electricity interconnectors | implicit |
| **EM-I2** | Electric Energy Sector Reform | implicit |
| **ES-O4** | Increasing hydrocarbons exploration and production | Increase of refining capacity from 1000 to 1500 ktoe of crude oil input per year from 2025. Reduction of NOx, $SO_2$ and dust emissions to the levels of the EU industrial emissions directive |
| **ES-O5** | Emergency plan for natural gas | Implicit |
| **R-E1 (WEM)** | Mechanism of Feed-in-Tariff for small renewable capacity | 40 MW HPP (run of river) added from 2021 each year until reaching 320 MW in 2028 |
| **R-E2 (WEM)** | Auctions for new renewable capacity (wind and solar) and contract-for-difference | SPP Spitalla (100 MW from 2023)<br>SPP Karavasta (140 MW from 2023)<br>WPP Lezhë: 150MW goes online in 2024 |
| **R-E3** | Mechanism of net metering for installations up to 500 kW | Capacity increase is part of R-E1 |

[17] The autonomous WEM sceario is the technical baseline without any policies.

| | | |
|---|---|---|
| **R-E4** | Robust power grid to accommodate increased renewable energy capacity | Gradual decrease of transmission losses from 23.7% in 2014 to 12% in 2030 |
| **R-E5** | Facilitate regulatory and physical connection | implicit |
| **R-E7** | Metering strategy and digitalization of the power sector | implicit |
| **G-A1** | Promotion of Organic Agriculture | Increases the share in organic farming, which affects N2O emissions from managed soils. Increases organic farming share from 1% in 2012 to 4% in 2020, trend continues as PaM continues until 2030, reaching 8%.<br>Urea application reduced by 50% between 2019 and 2030.<br>Specific emissions of non-organic fields are reduced by 10% between 2019 and 2030 to reflect better fertilization.<br>5848ha organic farming in 2012, 6,9kha cropland in 2012. |
| **G-A2** | Agricultural monitoring | Not modelled. |
| **G-A3** | Agricultural burning | The area of agricultural burning is reduced to 0 in 2025, starting in 2020. |
| **G-W1** | Emission reduction from waste | Recycling share increased to 40% in 2035 (14,6% in 2018), reducing the total going to landfills, retaining composition.<br>Closing all uncategorized and unmanaged landfills by 2035 (linear decline), replaced by managed landfills<br>Incineration and open burning declines to zero by 2035.<br>Methane recovery is implemented starting in 2025, recovering 10% of CH4 emissions from landfills in 2030<br>Regulation passed in May, 2020, making this a close candidate for WAM. |
| **G-W2** | Waste Incineration Plants | The share of waste going to incineration is doubled by 2025 from 2.2% today.<br>Incineration reaches 30% in 2035, which corresponds to 55% of the sum going to landfills and incineration.<br>Regulation passed in May, 2020, making this a close candidate for WAM. |
| **G-W3** | Wastewater treatment | Connection to wastewater treatment plant is increased as in PaM description, reaching 39% connection rate in 2027. The trend continues to reach 100% in 2050.<br>In order not to increase emissions, the wastewater system must be aerobic and well managed, which is assumed in the model (CH4 emissions are 0 in the model for this category). |
| **ES-O6** | Approval of Law "On the establishment, maintenance and management of the minimum reserves of crude | Not implemented. Reserve stocks of imported crude oil are not modelled explicitly. |

| | | |
|---|---|---|
| | oil security and its products". | |
| **RIC-E1** | Improvement of the regional and international collaboration in the scientific research related to the energy sector | Not implemented, is not in scope of modelling. |
| **RIC-E2** | National program of R&D | Not implemented, is not in scope of modelling. |
| **ES-P1** | Gas supply for Vlora Thermal Power Plant | Availability of Vlora Power plant at 8000 hours per year (from 0) and switch to natural gas as feedstock fuel from 2025. Capacity of 97.17 MW |

**Table 15: The implementation in modelling of policies and measures listed in Chapter 3 as relevant to the scenario with existing measures**

### *iii. Global energy trends, international fossil fuel prices, EU ETS carbon price*

The oil price in the model is assumed to incur a drop in 2020 due to the COVID-19 pandemic.

Figure 28 displays the development. This plays into the final energy consumption in the residential sector. The gas assumed gas price development is shown in Figure 29.

EU ETS Carbon prices are not considered in the existing measures scenario up to 2040. An introduction of carbon pricing is considered as part of an additional policy, the effect of which is described in Section 5. A carbon border adjustment mechanism is under development in the EU, but this is not modelled to affect the development.

Finally, the progression of climate change leads to changes in availability of renewable energy. With Albania producing almost 100% of electric energy from hydroelectric sources, related changes in the water cycle are of crucial impact. According to a study by the World Bank (World Bank ESMAP 2009), output from reservoir hydroelectric plants is expected to decrease by 15% until 2050. Run-of-river hydroelectric plants are expected to see a 20% drop in output. Photovoltaics output is expected to increase by 5% until 2050. To study the effect of years with low hydro availability, the modelling exercise underlying this document considers years with reduced hydro availability every five years (starting in 2022). In these years, the availability of hydro power plants is considered to be only 60% that of other years. The effects of this exercise are visible in some of the figures shown in the following chapters.

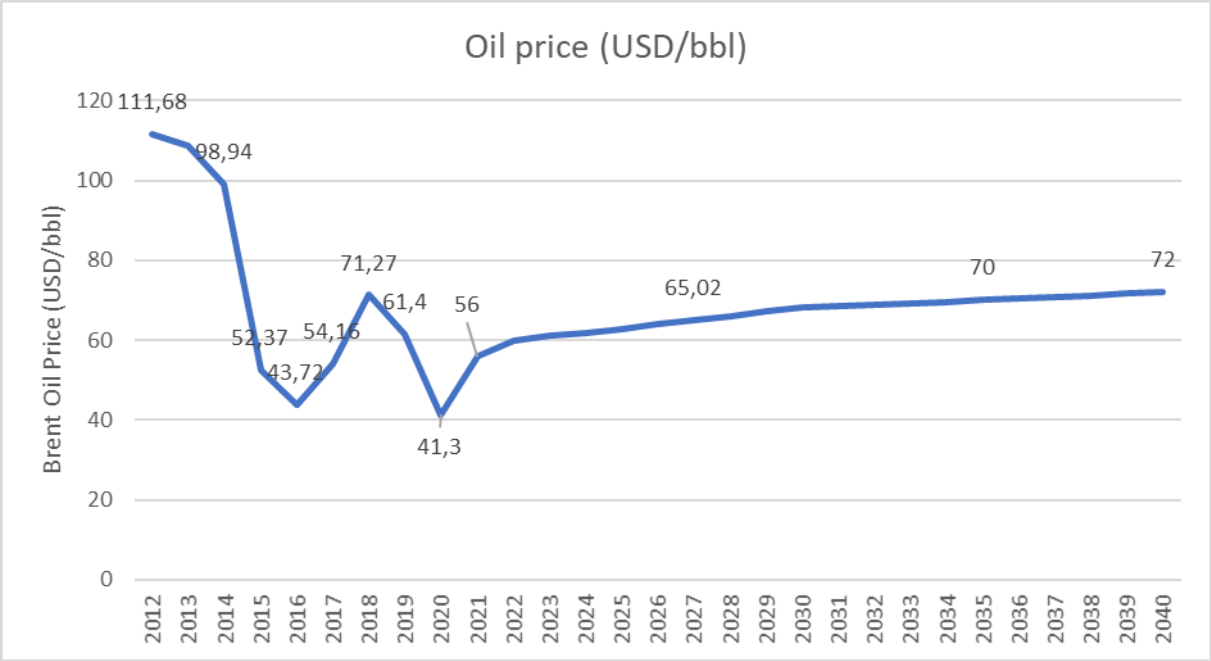



**Figure 28: Oil Price (USD/bbl). Historical data Brent Source: Enerdata Projection data world average. Source: World Bank 2021**

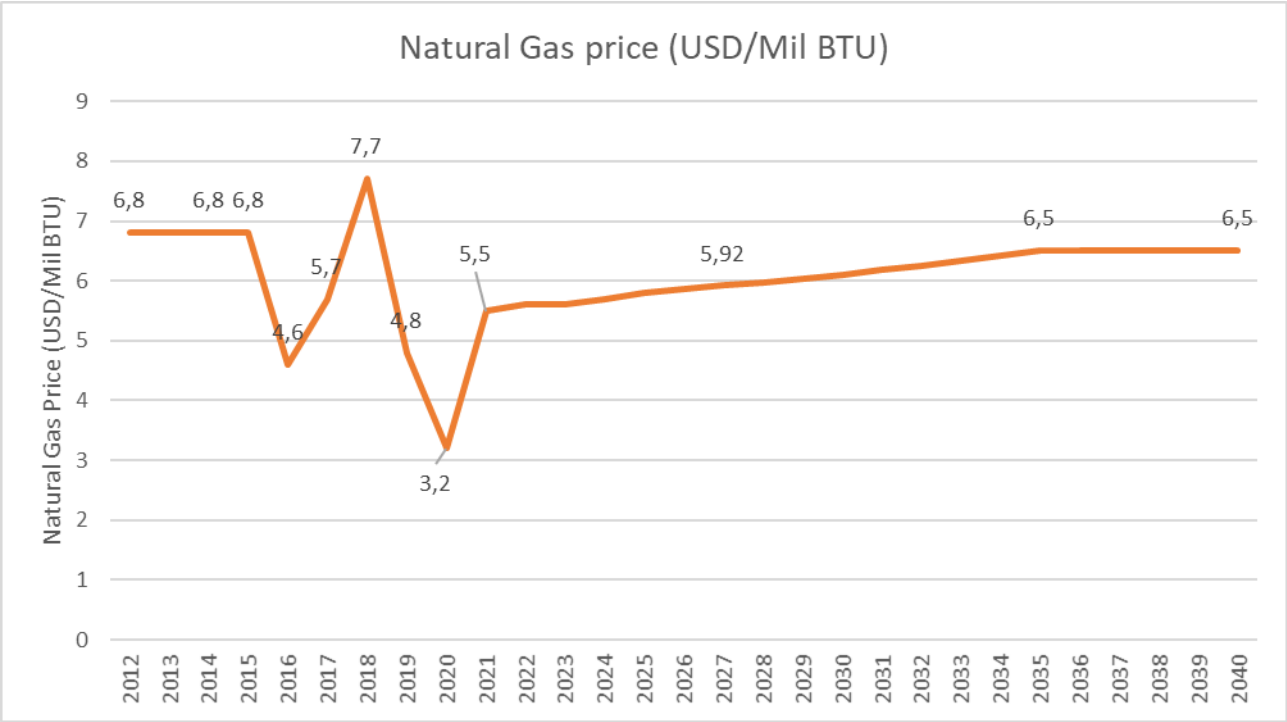



**Figure 29: Natural Gas Price (USD/Mil BTU). Source: World Bank 2021**

### *iv. Technology cost developments*

In electricity production, the most important technologies used are reservoir hydroelectric plants, followed by run-of-river hydroelectric plants and in a growing manner photovoltaic power. The thermal power plant Vlora was completed in 2011 but has never been operational. Originally powered by oil, a

revitalisation of the plant using natural gas is planned after completion of the Trans-Adriatic Pipeline (TAP) for natural gas.

Cost assumptions are given in Table 16. The table gives those costs relevant for dispatch. In addition, the total system costs are also determined by the capital costs of investments. While conventional power systems are not expected to see a decrease in investment costs, wind and solar power plants will continue to be subject to a substantial decrease in investment costs. Note that these costs currently do not influence dispatching in the Albanian electricity system.

| Electricity Production Technology | 2019 | 2040 |
|---|---|---|
| Hydroelectric **Fixed** OM Cost (USD/$MW_{el}$ Capacity) | 60 000 | 60 000 |
| Photovoltaic power **Variable** OM Cost (USD/$MWh_{el}$ Output) | 10 | 10 |
| Wind power Onshore **Variable** OM Cost (USD/$MWh_{el}$ Output) | 15 | 15 |
| Thermal power Oil **Variable** OM Cost (USD/$MWh_{el}$ Output)* | 89 | 113 |
| Thermal power Natural Gas **Variable** OM Cost (USD/$MWh_{el}$ Output)* | 60 | 85 |

* considers a process efficiency of 48.06%

**Table 16: Electricity Production Costs by technology. Source: IEA Global Energy Outlook 2020, IRENA Cost analysis for Hydropower**

## 4.2. Dimension Decarbonisation

### 4.2.1 GHG emissions and removals

#### *i. Trends in current GHG emissions and removals in the EU ETS, effort sharing and LULUCF sectors and different energy sectors*

Long time trends in GHG emissions are difficult to assess for Albania, due to limited statistics available, particularly in the non-energy sectors. Several in part contrasting data sources have been assessed and compiled to best of knowledge, mostly building on Statistical Database 2021 (2021), complemented by data provided by local experts, the Biennial Update Report (Ministria e Turizmit dhe Mjedisit 2021). The detailed documentation of the model can be made available. The energy balance by subsector is only available since 2016.

For these reasons, historic trends are only shown here starting from the year 2016. Current trends are given until and including the year 2018. The modelling activity underlying this document starts the projection in 2019. For a better overview of historic developments and future projections considering existing measures, figures and tables are given here only once, in the following section.

#### *ii. Projections of sectoral developments with existing national and Union policies and measures at least until 2040 (including for the year 2030)*

Considering the measures classified as WEM in Chapter 3 and summarized in Table 15, the following figures and tables show GHG emissions for different sectors. Where appropriate, the emissions are broken down to subsectors, showing an increasing level of sectoral detail.

For better readability, these figures show values for historic trends from the year 2016 to 2018, followed by projections for the years up to 2040. Table 17 lists the historic values shown in the figures as well as projections for 2020, 2025, 2030, 2035 and 2040.

The overall trend in emissions is increasing (Figure 30), with limited emissions coming from the transformation sector. In dry years (every five years on two and seven), the emissions increase as the use of the thermal power plant increases. Figure 31 shows the direct emissions from energy demand sectors. Main driver is the transport sector, followed by industry. Note that these industry emissions are only the energy related emissions.

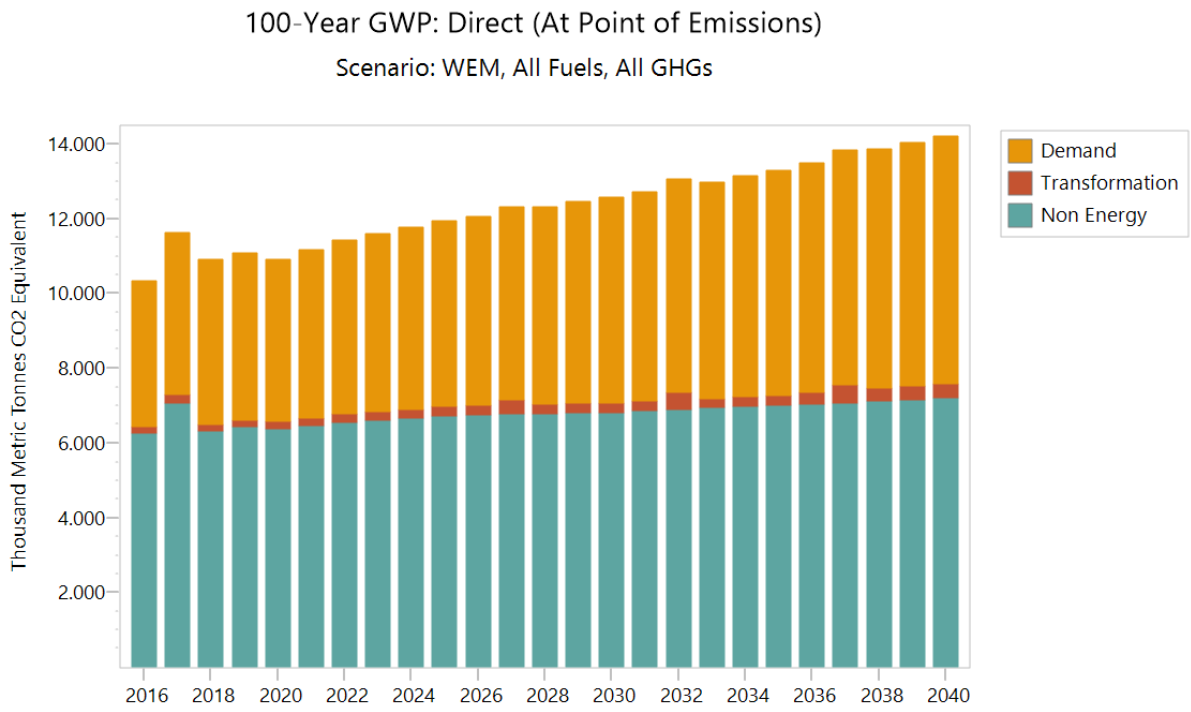



**Figure 30: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019- to 2040**

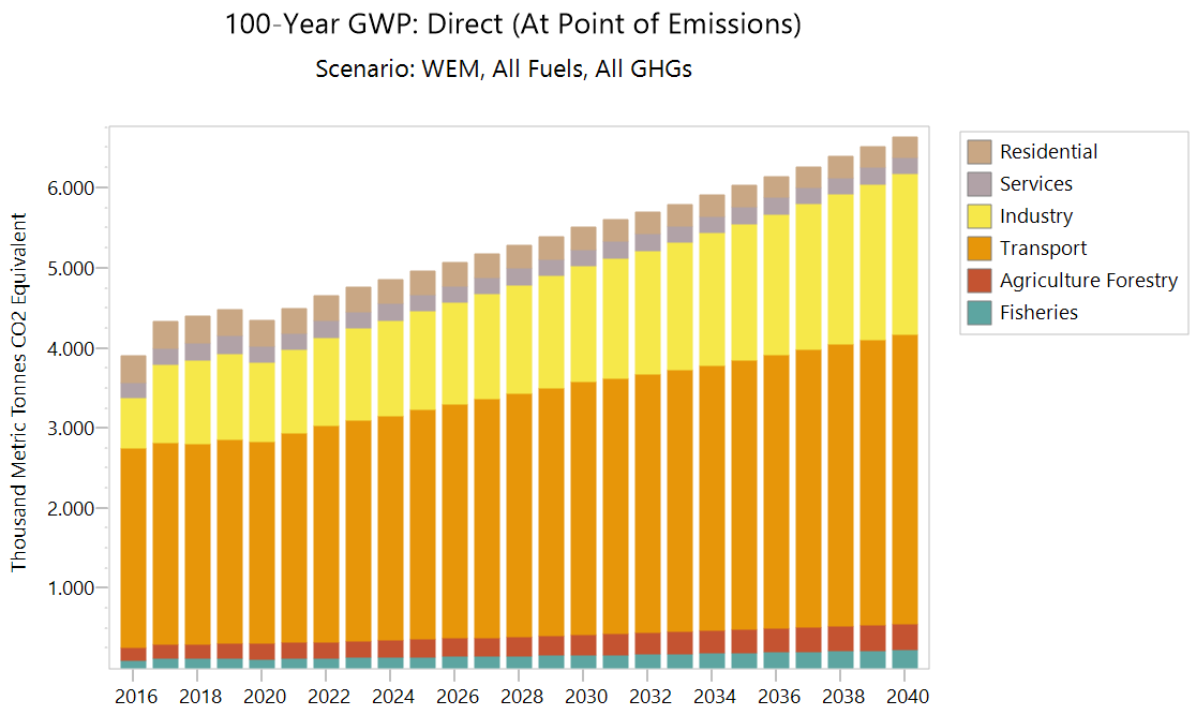



**Figure 31: Direct GHG emissions ($CO_2$eq) for energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040**

The following figures (Figure 32 to Figure 36) show the emissions from the different subsectors. In residential sector, a change in the housing structure and technology switch in heating and hot water leads to a modest reduction of emissions. In the services sector, the total emissions are relatively constant, changes happening in subsectors. As the energy demand in industry (driven by an increase in production) sees an increase with GDP, the emissions rise dramatically, with the Minerals sector, i.e. cement production, remaining by far the largest source of emissions. Note that this subsector is particularly hard to decarbonise and sees little electrification, different to other subsectors such as the production of ferro-alloys which happens in electric arc furnaces without local energy related emissions. Emissions from the transport sector continue to rise, as the electrification of road transport cannot offset the growth in demand for mobility.

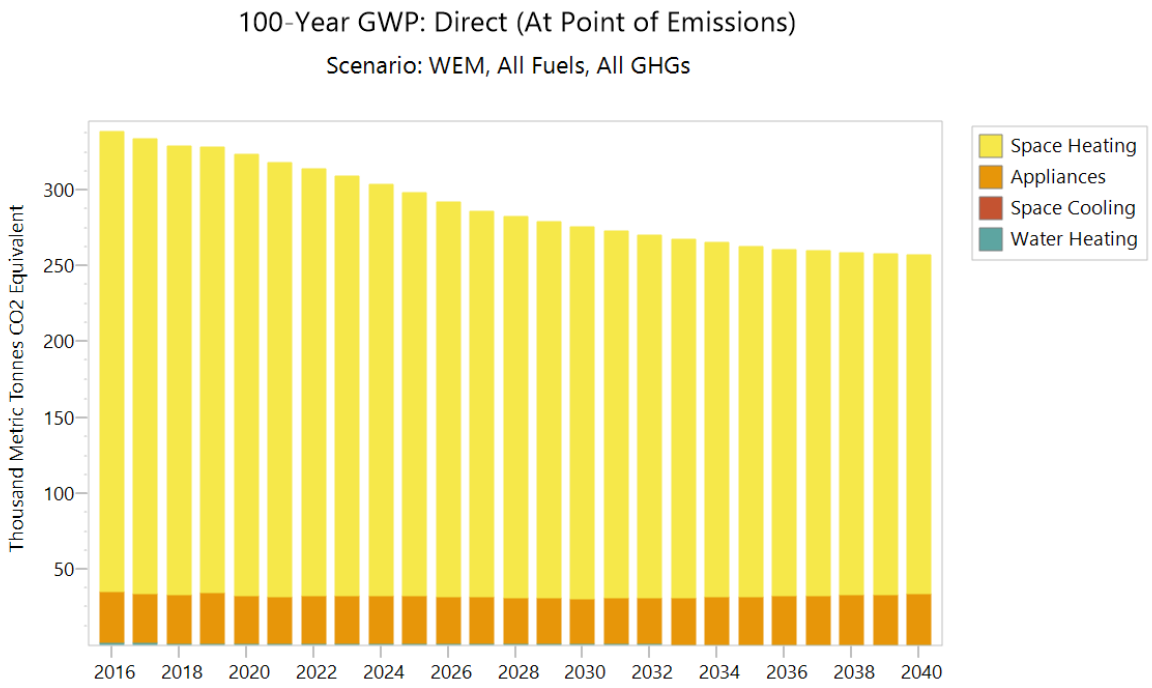



**Figure 32: Direct GHG emissions ($CO_2$eq) for the residential sector for the historic years 2016-2018 and as projected for 2019-2040**

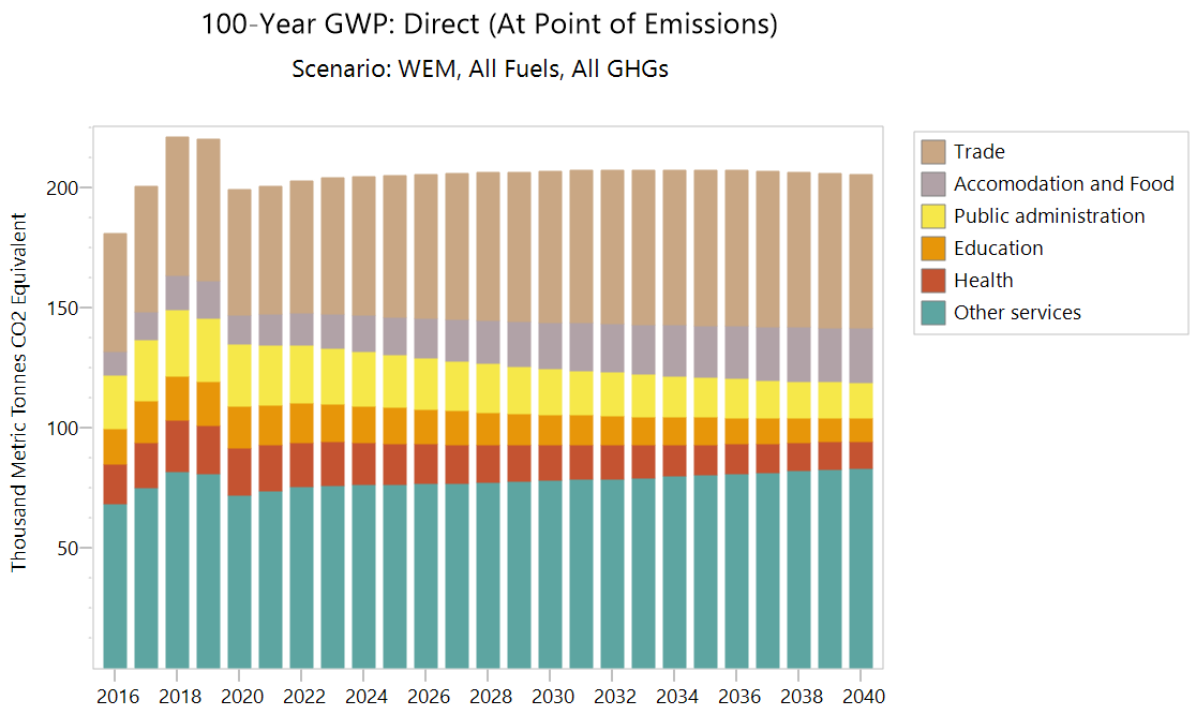



**Figure 33: Direct GHG emissions ($CO_2$eq) for the services sector for the historic years 2016-2018 and as projected for 2019-2040**

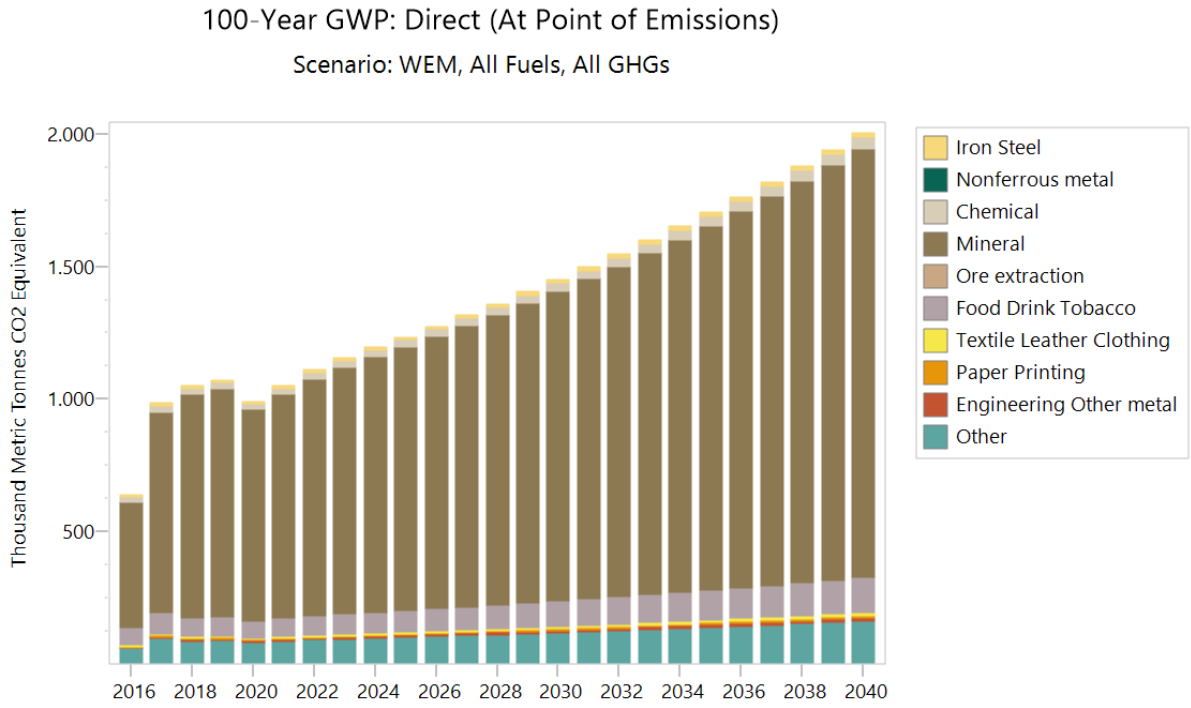



**Figure 34: Direct GHG emissions ($CO_2$eq) for industry (energy demand) for the historic years 2016-2018 and as projected for 2019-2040**

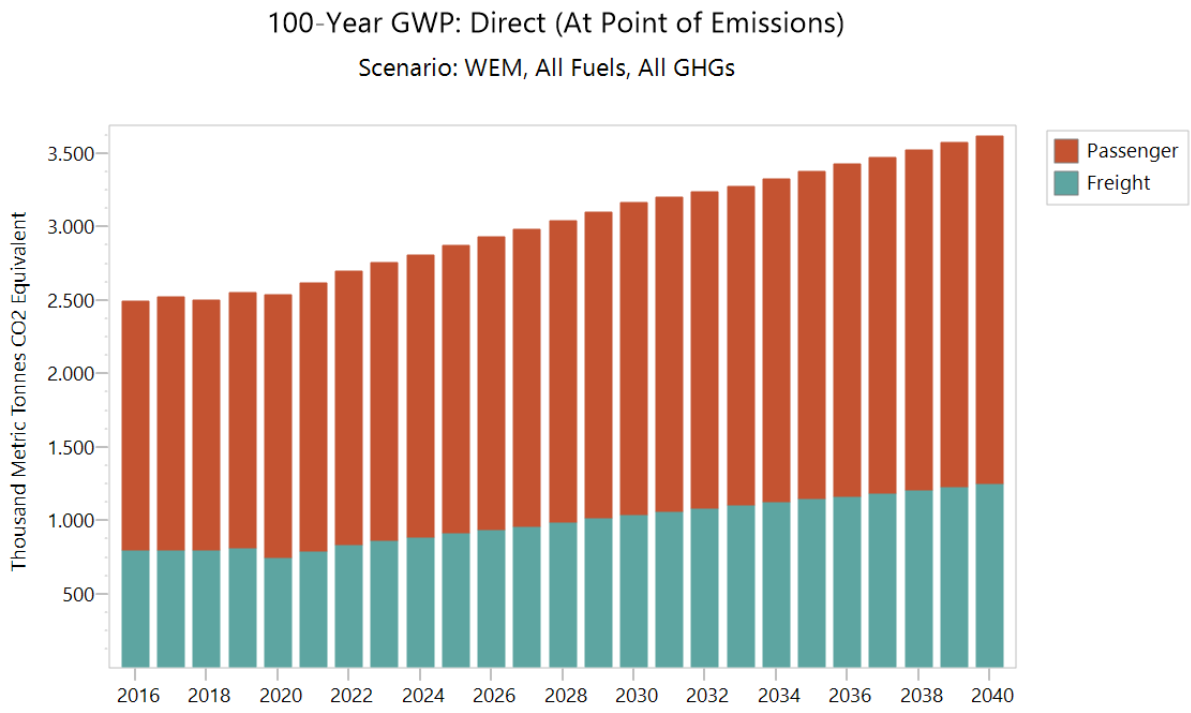



**Figure 35: Direct GHG emissions ($CO_2$eq) for the transport sector for the historic years 2016-2018 and as projected for 2019-2040**

Emissions from the transformation sector are partially determined by emissions from electricity production in the thermal power plant Vlora, which sees a repowering with natural gas. However, with the existing hydro power plants and respective plans, the use of this power plant is limited to dry years

with limited hydro availability. Only in the second half of the 2030's does electricity demand rise to such levels that the power plant is used every year. In addition to power generation, the emissions from the transformation sector are determined by the oil extraction and refinery activity, which is relatively constant in the WEM scenario except for a slight increase in 2025.

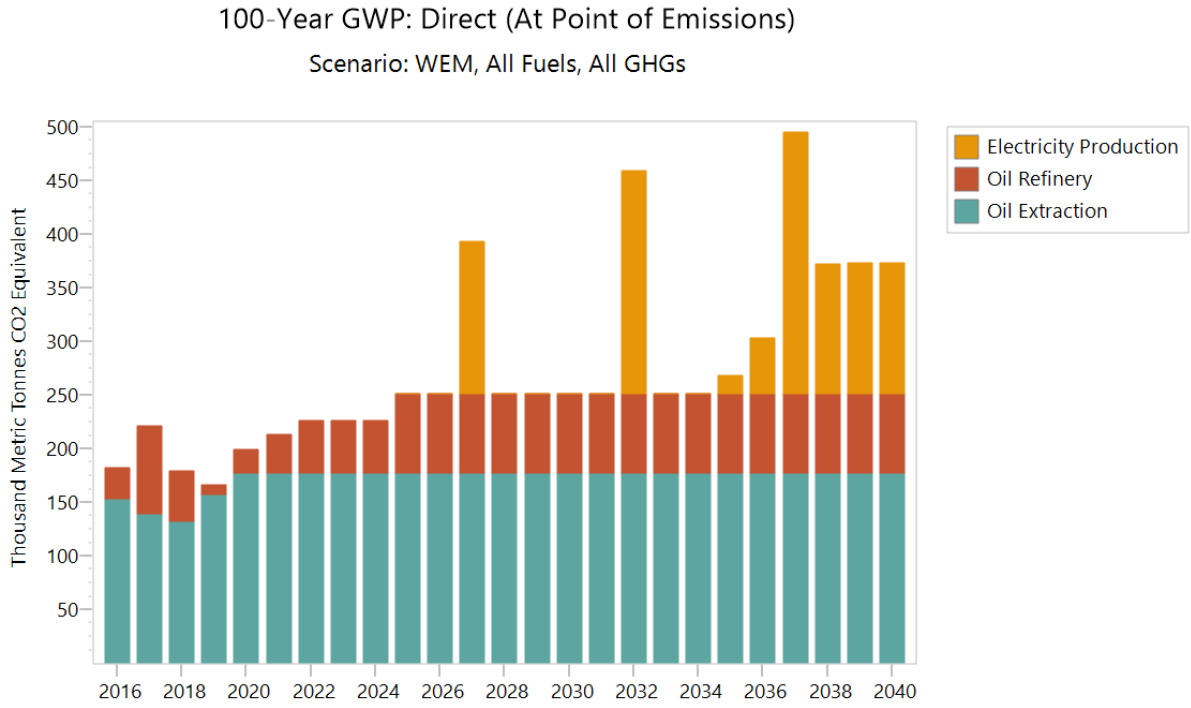



**Figure 36: Direct GHG emissions ($CO_2eq$) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040**

The following Figure 37 shows non-energy emissions. While agriculture emissions remain constant, the LULUCF sector remains a source of emissions. Waste sector emissions decline after 2025 while IPPU emissions continue to rise even after 2030. These sectors are discussed in more detail in the following.

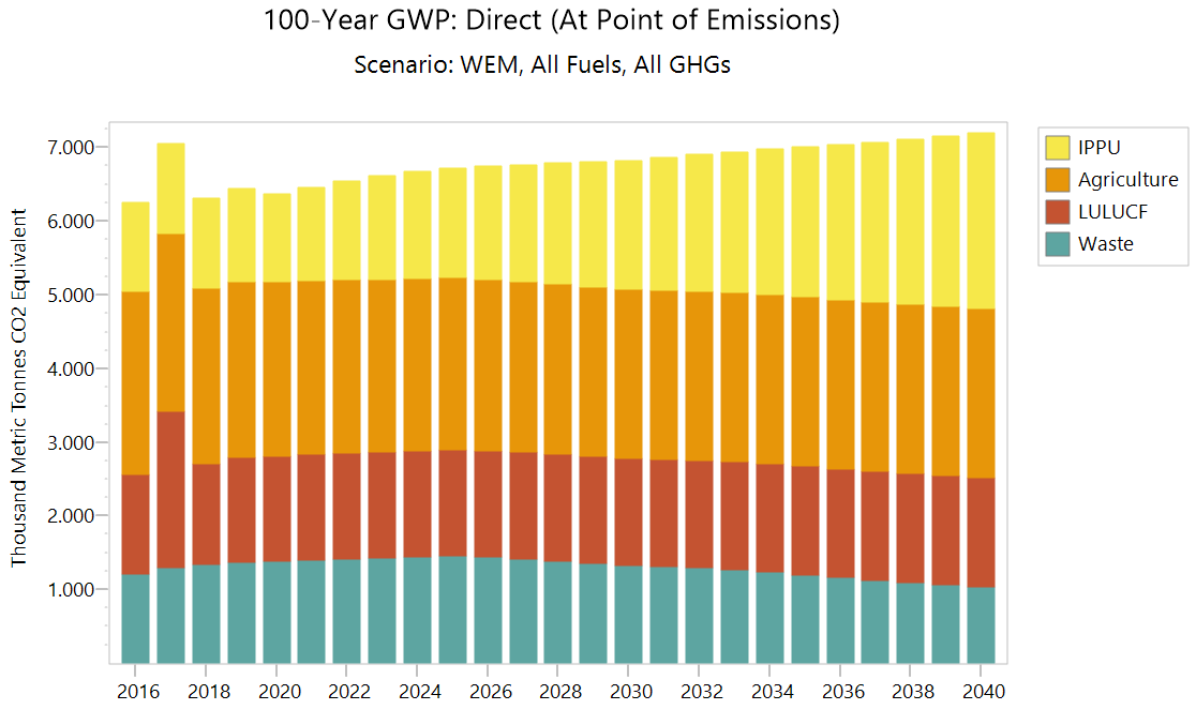



**Figure 37: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019- 2040**

From Figure 38, it is clear that the cement production is also the main driver of IPPU emissions, as for the energy related emissions. Of note: While the other industrial sectors play only a minor role, it is necessary to regulate emissions of refrigerants used in place of ozone depleting substances, the second largest source of emissions in the IPPU sector. Main share of agriculture emissions (Figure 39) is taken by enteric fermentation, which is not projected to change as livestock numbers stay close to constant. A small reduction in the sector is achieved by a reduction of urea application. LULUCF emissions (Figure 40) are projected to remain net positive. The natural sink capacity of the forest cannot outweigh the emissions due to forest management. Large episodes of forest fires are not considered in the model, but the median area affected by forest fires is projected to increase. Waste sector emissions (Figure 41) see a decline due to a change in management practices of solid waste disposal, changing recycling shares and disposal site management. This does not lead to a complete drop in emissions, as existing waste disposal sites continue to emit. Emission reductions are also achieved by a change in wastewater management practices, essentially moving away from direct river discharge to well managed sites without methane emissions.

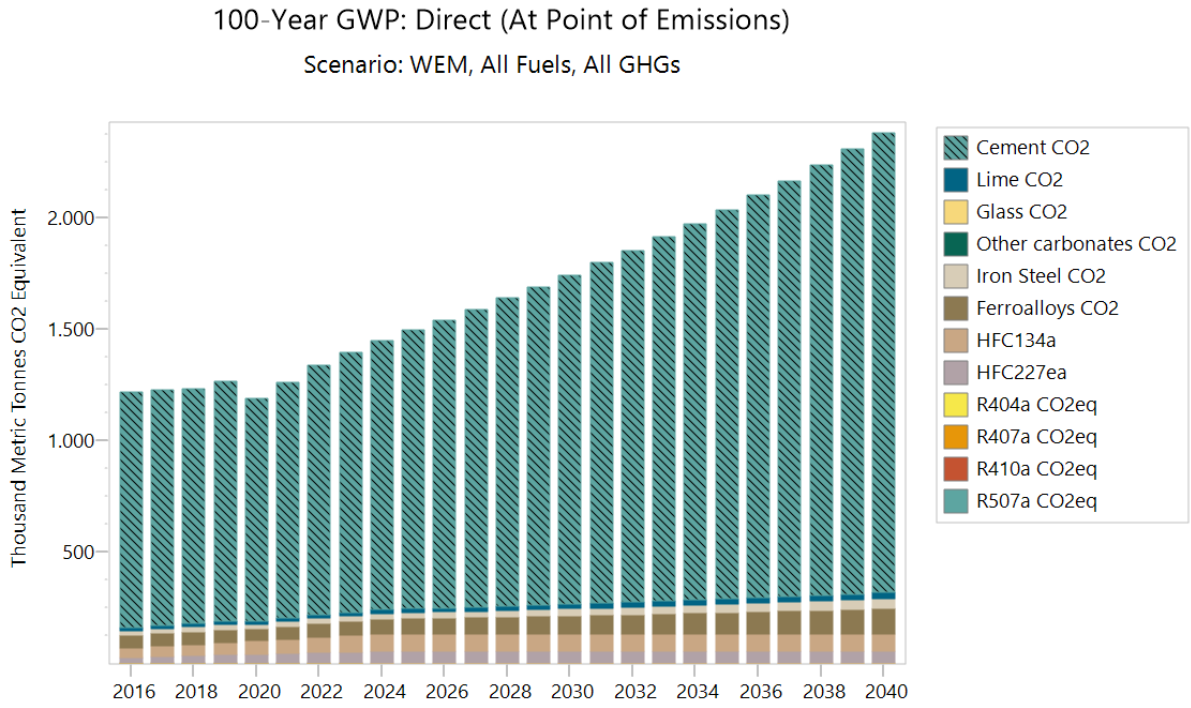



**Figure 38: GHG emissions ($CO_2$eq) from industrial processes and product use for the historic years 2016-2018 and as projected for 2019-2040**

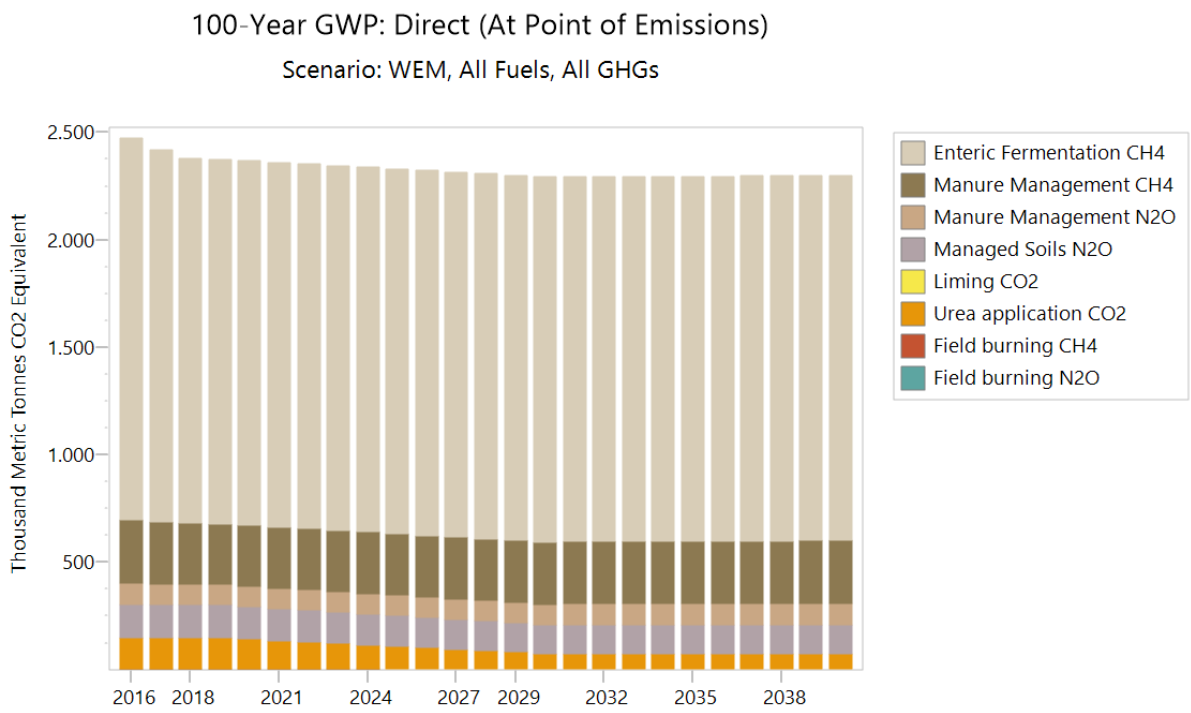



**Figure 39: Non-energy related GHG emissions ($CO_2$eq) from agricultural activities for the historic years 2016-2018 and as projected for 2019- 2040**

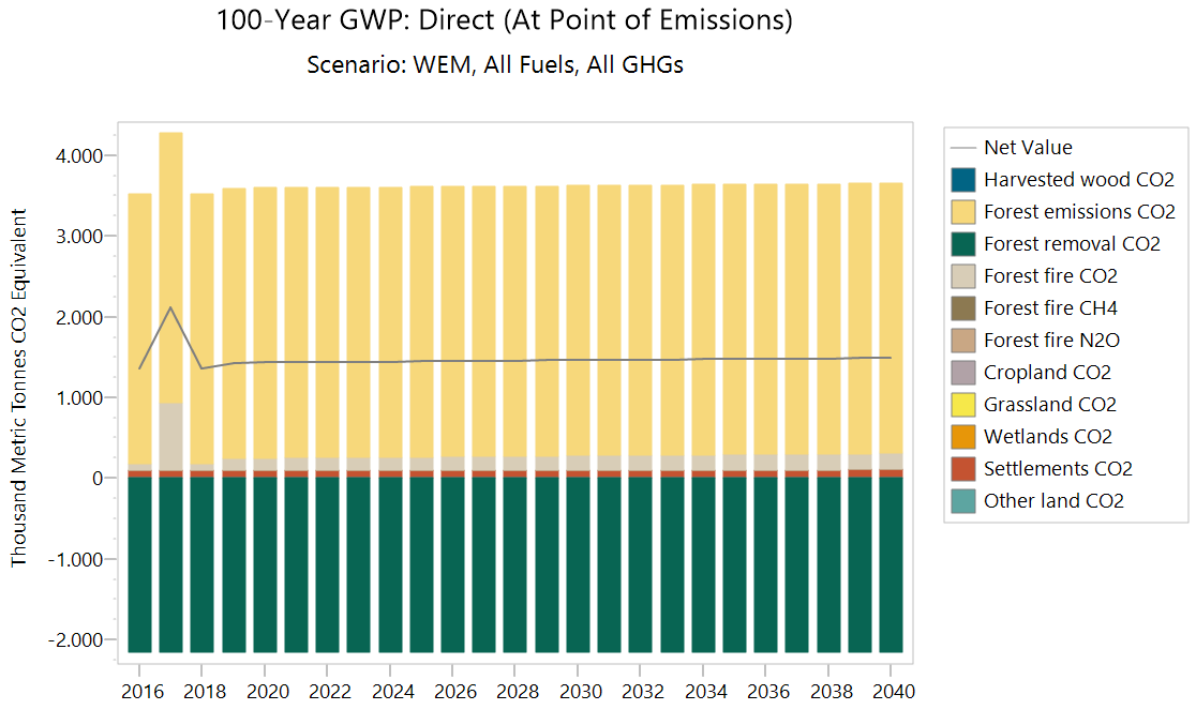



**Figure 40: Non-energy GHG emissions ($CO_2$eq) from land-use, land-use change and forestry (LULUCF) for the historic years 2016-2018 and as projected for 2019-2040**

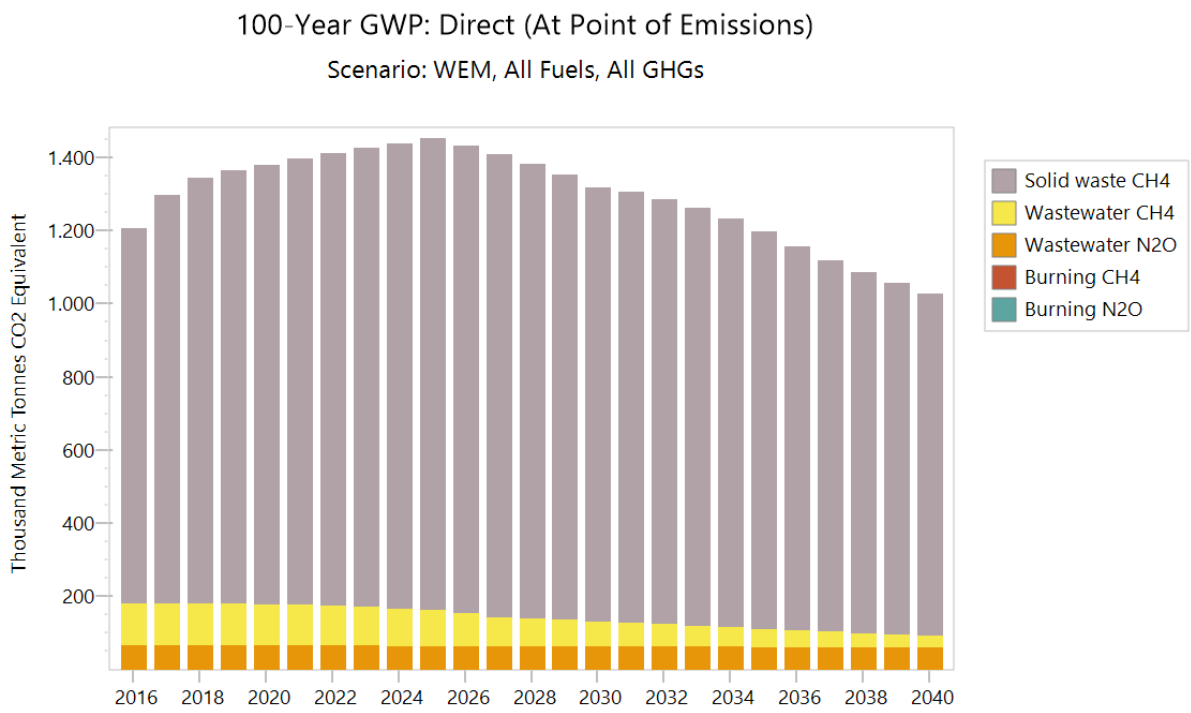



**Figure 41: Non-energy GHG emissions ($CO_2$eq) from the waste sector for the historic years 2016-2018 and as projected for 2019-2040**

The following table gives the emissions of different sectors, subsectors and branches of the Albanian energy system as projected with existing measures, in terms of kt CO2eq (100 year global warming potential).

| Branch [kt$CO_2$eq] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Demand | 3903.9 | 4331.4 | 4396.3 | 4346.4 | 4963.6 | 5507.8 | 6025.9 | 6636.8 |
| Transformation | 181.7 | 220.4 | 179.0 | 199.2 | 250.8 | 250.8 | 267.8 | 372.7 |
| Non Energy | 6253.7 | 7056.3 | 6314.6 | 6365.2 | 6721.6 | 6811.3 | 7001.3 | 7196.2 |
| Total | 10339.3 | 11608.1 | 10889.9 | 10910.9 | 11936.0 | 12569.9 | 13295.0 | 14205.7 |
| Demand | | | | | | | | |
| Residential | 338.4 | 333.8 | 328.9 | 323.6 | 297.7 | 275.6 | 262.6 | 257.0 |
| Services | 180.9 | 200.7 | 221.2 | 199.2 | 205.0 | 206.8 | 207.4 | 205.5 |
| Industry | 637.3 | 985.9 | 1047.8 | 988.6 | 1232.5 | 1449.5 | 1704.7 | 2004.8 |
| Transport | 2487.4 | 2518.7 | 2497.4 | 2530.6 | 2869.2 | 3160.9 | 3371.8 | 3615.5 |
| Agriculture Forestry | 171.0 | 174.5 | 184.4 | 194.4 | 222.1 | 253.7 | 289.7 | 330.9 |
| Fisheries | 88.9 | 117.7 | 116.6 | 110.0 | 137.2 | 161.3 | 189.7 | 223.1 |
| Total | 3903.9 | 4331.4 | 4396.3 | 4346.4 | 4963.6 | 5507.8 | 6025.9 | 6636.8 |
| **Demand - Residential** | | | | | | | | |
| Space Heating | 303.6 | 300.1 | 296.4 | 291.2 | 265.8 | 245.3 | 231.0 | 223.8 |
| Appliances | 33.6 | 32.6 | 31.6 | 31.5 | 31.4 | 29.8 | 31.3 | 32.9 |
| Space Cooling | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water Heating | 1.2 | 1.1 | 1.0 | 0.9 | 0.6 | 0.4 | 0.3 | 0.3 |
| Total | 338.4 | 333.8 | 328.9 | 323.6 | 297.7 | 275.6 | 262.6 | 257.0 |
| **Demand - Services** | | | | | | | | |
| Trade | 48.9 | 52.3 | 57.7 | 52.3 | 58.8 | 62.9 | 64.7 | 64.0 |
| Accommodation and Food | 10.0 | 11.8 | 14.2 | 12.1 | 15.8 | 19.2 | 21.6 | 22.7 |
| Public administration | 22.1 | 25.4 | 27.5 | 25.7 | 22.1 | 19.1 | 16.7 | 14.5 |
| Education | 15.1 | 17.3 | 18.6 | 17.4 | 14.9 | 12.9 | 11.2 | 9.8 |
| Health | 16.5 | 18.8 | 21.2 | 19.8 | 17.0 | 14.7 | 12.8 | 11.2 |
| Other services | 68.2 | 75.1 | 81.9 | 71.9 | 76.5 | 78.0 | 80.3 | 83.3 |
| Total | 180.9 | 200.7 | 221.2 | 199.2 | 205.0 | 206.8 | 207.4 | 205.5 |
| **Demand - Industry** | | | | | | | | |
| Iron Steel | 10.2 | 15.9 | 9.5 | 9.0 | 11.2 | 13.1 | 15.5 | 18.2 |
| Nonferrous metal | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Chemical | 21.5 | 22.9 | 22.2 | 21.0 | 26.1 | 30.8 | 36.2 | 42.5 |
| Mineral | 470.0 | 758.0 | 847.3 | 799.4 | 996.6 | 1172.1 | 1378.4 | 1621.1 |
| Ore extraction | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Food Drink Tobacco | 68.0 | 79.3 | 68.8 | 64.9 | 80.9 | 95.1 | 111.9 | 131.5 |
| Textile Leather Clothing | 5.8 | 6.6 | 6.6 | 6.2 | 7.8 | 9.1 | 10.8 | 12.6 |

| Branch [kt$CO_2$eq] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Paper Printing | 3.8 | 4.3 | 4.3 | 4.1 | 5.1 | 5.9 | 7.0 | 8.2 |
| Engineering Other metal | 3.1 | 6.3 | 6.5 | 6.1 | 7.7 | 9.0 | 10.6 | 12.5 |
| Other | 54.7 | 92.8 | 82.6 | 78.0 | 97.2 | 114.3 | 134.5 | 158.1 |
| Total | 637.3 | 985.9 | 1047.8 | 988.6 | 1232.5 | 1449.5 | 1704.7 | 2004.8 |
| **Demand - Transport** | | | | | | | | |
| Passenger | 1691.4 | 1720.8 | 1697.9 | 1782.4 | 1958.6 | 2122.1 | 2228.7 | 2364.5 |
| Freight | 796.0 | 798.0 | 799.4 | 748.2 | 910.5 | 1038.9 | 1143.1 | 1250.9 |
| Total | 2487.4 | 2518.7 | 2497.4 | 2530.6 | 2869.2 | 3160.9 | 3371.8 | 3615.5 |
| **Transformation** | | | | | | | | |
| Electricity Production | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.0 | 121.9 |
| Oil Refinery | 29.1 | 81.8 | 47.4 | 22.1 | 73.7 | 73.7 | 73.7 | 73.7 |
| Oil Extraction | 152.6 | 138.6 | 131.6 | 177.1 | 177.1 | 177.1 | 177.1 | 177.1 |
| Total | 181.7 | 220.4 | 179.0 | 199.2 | 250.8 | 250.8 | 267.8 | 372.7 |
| **Non-Energy** | | | | | | | | |
| IPPU | 1216.8 | 1224.9 | 1233.1 | 1186.5 | 1494.2 | 1742.1 | 2035.1 | 2381.4 |
| Agriculture | 2472.7 | 2415.0 | 2376.6 | 2366.6 | 2327.7 | 2290.1 | 2294.1 | 2298.4 |
| LULUCF | 1356.7 | 2117.9 | 1361.2 | 1431.6 | 1445.7 | 1459.9 | 1474.1 | 1488.4 |
| Waste | 1207.4 | 1298.4 | 1343.7 | 1380.6 | 1454.0 | 1319.2 | 1198.0 | 1028.0 |
| Total | 6253.7 | 7056.3 | 6314.6 | 6365.2 | 6721.6 | 6811.3 | 7001.3 | 7196.2 |
| **Non-Energy - IPPU** | | | | | | | | |
| Cement $CO_2$ | 1056.3 | 1056.3 | 1056.3 | 998.6 | 1251.2 | 1478.9 | 1748.0 | 2066.1 |
| Lime $CO_2$ | 13.8 | 13.8 | 13.8 | 13.0 | 16.3 | 19.3 | 22.8 | 27.0 |
| Glass $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other carbonates $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Iron Steel $CO_2$ | 22.1 | 22.1 | 22.1 | 20.9 | 26.2 | 31.0 | 36.6 | 43.3 |
| Ferroalloys $CO_2$ | 57.9 | 57.9 | 57.9 | 54.8 | 68.6 | 81.1 | 95.8 | 113.3 |
| HFC134a | 40.5 | 45.2 | 49.9 | 59.2 | 78.0 | 78.0 | 78.0 | 78.0 |
| HFC227ea | 26.1 | 29.5 | 33.0 | 39.8 | 53.6 | 53.6 | 53.6 | 53.6 |
| R404a $CO_2$eq | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R407a $CO_2$eq | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R410a $CO_2$eq | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 |
| R507a $CO_2$eq | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 1216.8 | 1224.9 | 1233.1 | 1186.5 | 1494.2 | 1742.1 | 2035.1 | 2381.4 |
| **Non-Energy - Agriculture** | | | | | | | | |
| Enteric Fermentation $CH_4$ | 1778.2 | 1730.5 | 1697.5 | 1697.7 | 1698.3 | 1698.8 | 1699.4 | 1700.1 |
| Manure Management $CH_4$ | 295.1 | 287.5 | 283.8 | 284.3 | 286.7 | 289.3 | 292.0 | 295.0 |
| Manure Management $N_2O$ | 99.0 | 96.4 | 94.8 | 94.7 | 95.3 | 95.8 | 96.4 | 97.0 |

| Branch [kt$CO_2$eq] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Managed Soils $N_2O$ | 155.8 | 155.8 | 155.8 | 151.6 | 142.9 | 134.3 | 134.3 | 134.3 |
| Liming $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Urea application $CO_2$ | 143.8 | 143.8 | 143.8 | 137.3 | 104.6 | 71.9 | 71.9 | 71.9 |
| Field burning $CH_4$ | 0.7 | 0.7 | 0.7 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Field burning $N_2O$ | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 2472.7 | 2415.0 | 2376.6 | 2366.6 | 2327.7 | 2290.1 | 2294.1 | 2298.4 |
| **Non-Energy - LULUCF** | | | | | | | | |
| Harvested wood $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forest emissions $CO_2$ | 3344.6 | 3344.6 | 3344.6 | 3344.6 | 3344.6 | 3344.6 | 3344.6 | 3344.6 |
| Forest removal $CO_2$ | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 |
| Forest fire $CO_2$ | 80.2 | 841.3 | 84.7 | 154.2 | 165.8 | 177.5 | 189.2 | 200.9 |
| Forest fire $CH_4$ | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forest fire $N_2O$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cropland $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Grassland $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wetlands $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Settlements $CO_2$ | 93.5 | 93.5 | 93.5 | 94.5 | 96.9 | 99.4 | 101.9 | 104.6 |
| Other land $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 1356.7 | 2117.9 | 1361.2 | 1431.6 | 1445.7 | 1459.9 | 1474.1 | 1488.4 |
| **Non-Energy - Waste** | | | | | | | | |
| Solid waste $CH_4$ | 1024.3 | 1115.8 | 1161.4 | 1201.1 | 1289.4 | 1186.4 | 1085.1 | 935.1 |
| Wastewater $CH_4$ | 115.4 | 115.3 | 115.0 | 112.8 | 98.9 | 68.5 | 50.1 | 32.3 |
| Wastewater $N_2O$ | 67.1 | 67.0 | 66.8 | 66.6 | 65.7 | 64.3 | 62.8 | 60.6 |
| Burning $CH_4$ | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Burning $N_2O$ | 0.6 | 0.3 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 1207.4 | 1298.4 | 1343.7 | 1380.6 | 1454.0 | 1319.2 | 1198.0 | 1028.0 |

**Table 17: GHG emissions (kt $CO_2$eq) for different branches of the economy, as determined for historic years (2016-2018) and as projected with existing measures until the year 2040.**

Some of the emissions account for gases other than $CO_2$. As noted above, these are given in terms of their 100-year global warming potential $CO_2$ equivalent. For completeness, the following table gives the factor used to calculate this value from physical emissions of the respective gases. Note that some of the hydrofluorocarbons are reported and projected in terms of $CO_2$eq directly.

| Effect | Abbreviation | 100 year GWP (tCO2eq/t) |
|---|---|---|
| **Carbon Dioxide** | $CO_2$ | 1 |
| **Methane** | $CH_4$ | 30 |
| **Nitrous Oxide** | $N_2O$ | 265 |

| | | |
|---|---|---|
| **HFC-134a** | $CH_2FCF_3$ | 1300 |
| **HFC-227ea** | $CF_3CHFCF_3$ | 3350 |

**Table 18: 100 year global warming potential for those gases considered in the projection.**

### 4.2.2 Renewable Energy

*i. Current share of renewable energy in gross final energy consumption and in different sectors (heating and cooling, electricity and transport) as well as per technology in each of these sectors*

Current values in renewable energy are discussed in conjunction with projections with existing measures in the next section.

*ii. Indicative projections of development with existing policies for the year 2030 (with an outlook to the year 2040)*

Current targets in renewable energy are defined in total primary energy supply (TPES). For reference, the following table gives the current share of renewable energy in TPES and the projection until the year 2040 under consideration of existing measures. Figure 42 and Table 19 give the absolute values of renewable energy sources in net primary supply of energy. shows shares of relevant renewable energy carriers in TPES. More details on TPES, particularly on the fuel split with fossil fuels, are provided in section 4.3.

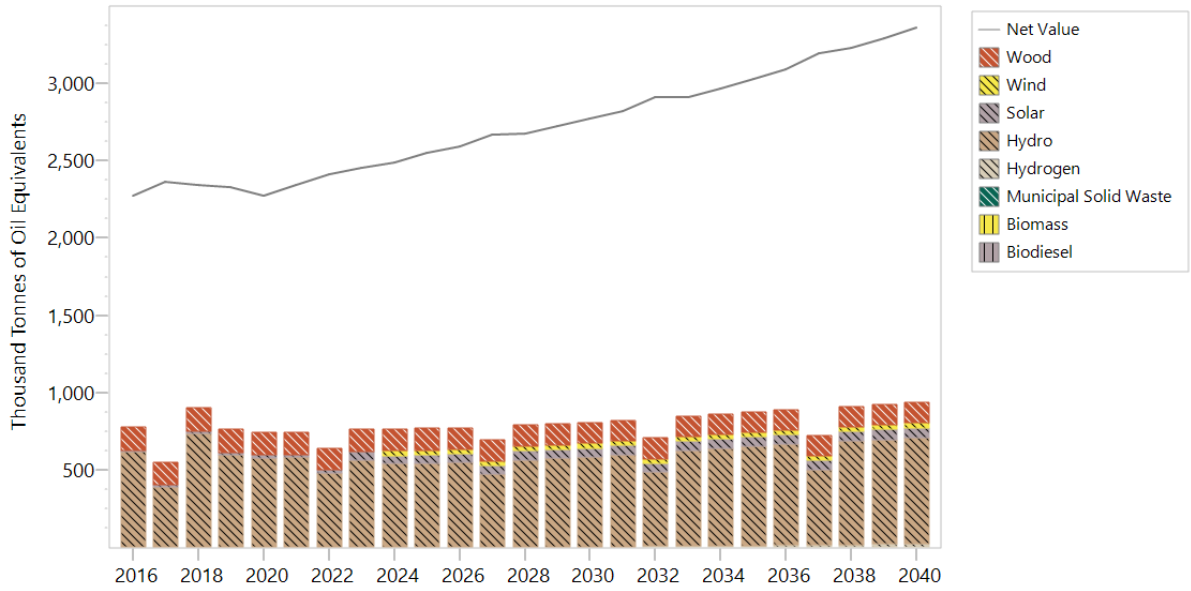



**Figure 42: Renewable sources of primary energy supply and total net consumption for historic years (2016-2018) and as projected with existing measures until the year 2040**

| | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| **Wood** | 154.1 | 149.4 | 150.0 | 146.6 | 141.7 | 136.4 | 131.1 | 132.1 |
| **Wind** | 0.0 | 0.0 | 0.0 | 0.0 | 28.2 | 28.2 | 28.2 | 28.2 |
| **Solar** | 11.1 | 12.0 | 13.2 | 16.5 | 54.7 | 58.9 | 61.7 | 65.0 |
| **Hydro** | 613.6 | 388.7 | 736.1 | 576.2 | 542.2 | 582.1 | 646.0 | 686.8 |
| **Hydrogen** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 19.4 |
| **Municipal Solid Waste** | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.2 | 1.3 |
| **Biomass** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Biodiesel** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total** | **2275.8** | **2361.3** | **2342.7** | **2273.2** | **2552.4** | **2773.8** | **3027.9** | **3358.9** |

**Table 19: Absolute values for selected fuels in TPES given in ktoe, in particular those considered for the renewable share of TPES**

| Branch | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Wood | 6.8% | 6.3% | 6.4% | 6.4% | 5.6% | 4.9% | 4.3% | 3.9% |
| Wind | 0.0% | 0.0% | 0.0% | 0.0% | 1.1% | 1.0% | 0.9% | 0.8% |
| Solar | 0.5% | 0.5% | 0.6% | 0.7% | 2.1% | 2.1% | 2.0% | 1.9% |
| Hydro | 27.0% | 16.5% | 31.4% | 25.3% | 21.2% | 21.0% | 21.3% | 20.4% |
| Hydrogen | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 0.6% |
| Municipal Solid Waste | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Biomass | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Biodiesel | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| **Total** | **34.2%** | **23.3%** | **38.4%** | **32.5%** | **30.0%** | **29.0%** | **28.9%** | **27.8%** |

**Table 20: Shares in TPES for those fuels considered in the renewable share of TPES.**

Renewable shares in final energy consumption are determined according to Directive 2009/28/EC (RED; EU (2009); also see European Commission (2018)). The following figures show historic data in RES share for 2016-2018 and projections with existing measures. For the share in transport (RES-T), this includes the multipliers for the use of electricity in road and rail transport, which explains the strong increase (electricity is used to meet just above 5% of final energy demand in the transport sector in 2040). No advanced biofuels (with increased multipliers) are considered. The share of renewable energy in heating and cooling (RES-HC) falls as the share of wood for heating decreases. The share of renewable electricity (RES-E) is largely determined by hydropower, with increases projected for solar PV. Subsequent figures give technological details on each RES indicator.

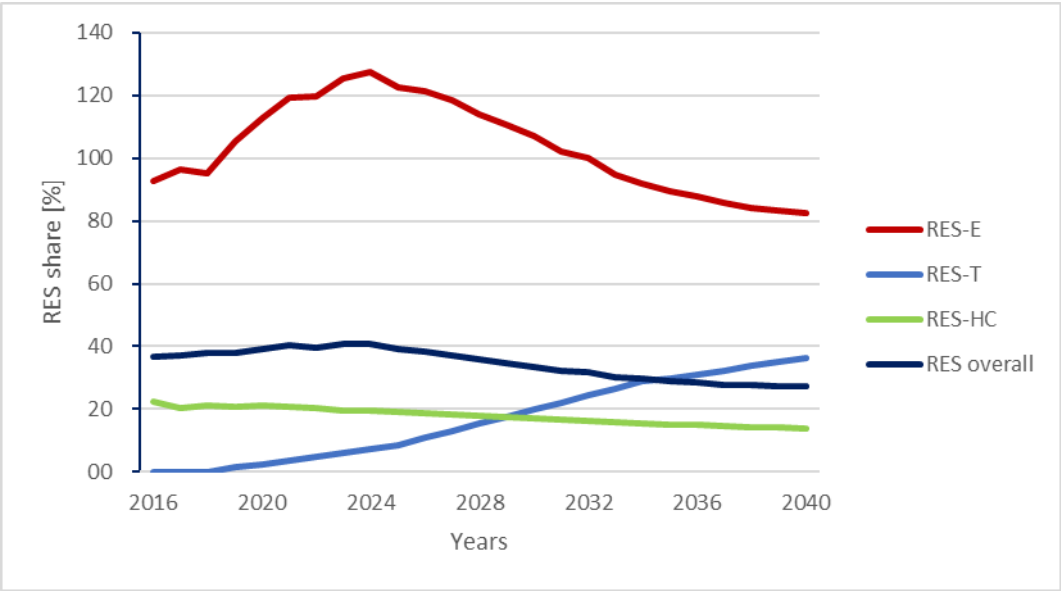



**Figure 43: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures**

| [%] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| RES E | 92.8 | 96.4 | 95.4 | 112.6 | 122.5 | 106.9 | 89.6 | 82.4 |
| RES T | 0.1 | 0.1 | 0.1 | 2.5 | 8.6 | 19.8 | 29.6 | 36.5 |
| RES HC | 22.3 | 20.4 | 21.1 | 21.4 | 19.0 | 17.2 | 15.2 | 14.0 |
| RES | 36.7 | 37.0 | 37.9 | 39.2 | 39.1 | 33.5 | 28.9 | 27.2 |

Table 21: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures

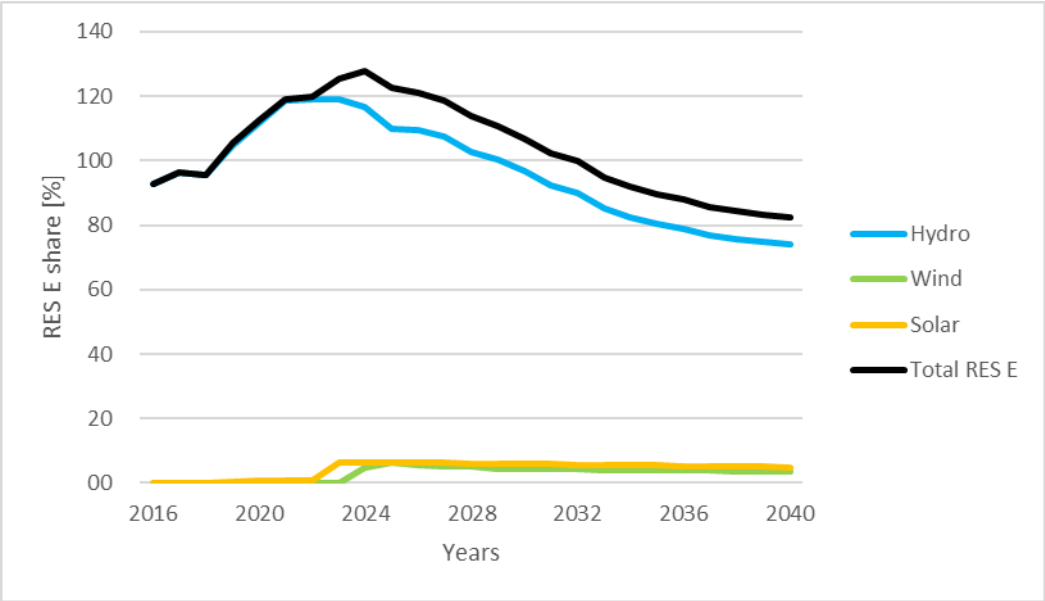



Figure 44: RES-E share (renewable share in electricity generation), calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures

| [%] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Hydro | 92.8 | 96.4 | 95.4 | 112.0 | 110.1 | 96.6 | 80.3 | 74.1 |
| Wind | 0.0 | 0.0 | 0.0 | 0.0 | 6.2 | 4.4 | 3.9 | 3.5 |
| Solar | 0.0 | 0.0 | 0.0 | 0.6 | 6.2 | 5.9 | 5.4 | 4.9 |
| Solid biofuels | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| All other renewables | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total RES E | 92.8 | 96.4 | 95.4 | 112.6 | 122.5 | 106.9 | 89.6 | 82.4 |

Table 22: RES-E share (renewable share in electricity generation), calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures

The following figure shows fuels currently used in the transport sector and projections until 2040. No biodiesel share is considered, and this is not projected to play a role with existing measures. Electricity is used to meet a limited share of energy demand in the transport sector. This is mainly of renewable origin.

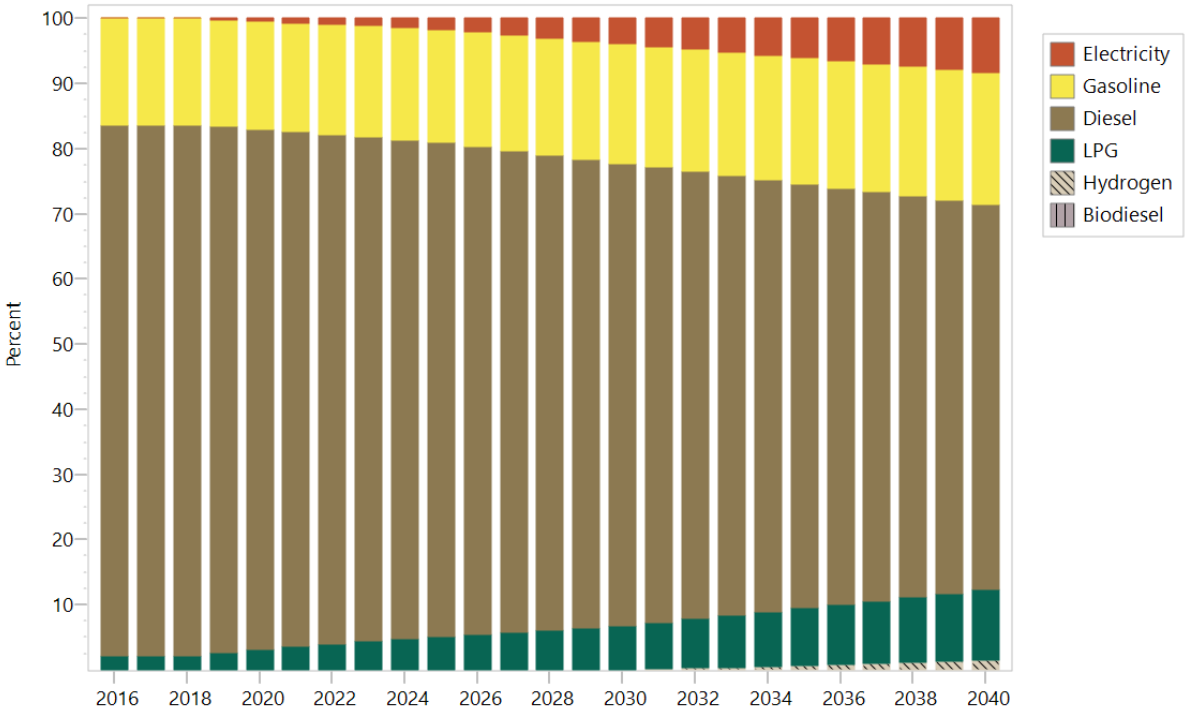



**Figure 45: Energy sources in the transport sector, to accompany and explain the RES-T share given in Figure 43**

| Fuel | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Electricity | 0.0% | 0.0% | 0.0% | 0.5% | 1.7% | 4.0% | 6.1% | 8.3% |
| Gasoline | 16.4% | 16.4% | 16.3% | 16.5% | 17.4% | 18.4% | 19.3% | 20.4% |
| Diesel | 81.6% | 81.5% | 81.6% | 79.7% | 75.8% | 70.9% | 65.1% | 59.0% |
| LPG | 2.1% | 2.1% | 2.1% | 3.2% | 5.1% | 6.8% | 8.8% | 10.9% |
| Hydrogen | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.7% | 1.4% |
| Biodiesel | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| **Total** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** |

**Table 23: Shares of energy sources in the transport sector for historic years 2016-2018 and projected up to year 2040 with existing measures**

The RES-HC share combines all renewable energies other than electricity, heat and bioliquids in sectors other than transport. This concerns the residential, services, industry, agriculture and fisheries sectors and the fuels wind, solar, wood, hydro and biomass. Of these, only solar and wood play a substantial role, both are used for space and water heating as well as some industrial processes. Agriculture and fisheries do not use renewable energies (other than through electricity, which remains unconsidered here). The following table gives the share of wood and solar energy in relation to the total final energy in each of the remaining three sectors.

Note that the RES-HC share reports the share in of renewable energy in relation to the final energy demand other than electricity, which explains the higher percentage in RES-HC compared to the values shown in the following table.

| Fuel | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| **Residential** | | | | | | | | |
| Wood | 24.8% | 24.4% | 24.3% | 23.9% | 23.0% | 21.8% | 19.9% | 18.8% |
| Solar | 1.3% | 1.4% | 1.5% | 1.5% | 2.4% | 3.3% | 3.9% | 4.5% |
| **Services** | | | | | | | | |
| Wood | 6.1% | 6.1% | 6.1% | 6.1% | 6.1% | 6.1% | 6.1% | 6.1% |
| Solar | 2.3% | 2.3% | 2.3% | 2.3% | 2.3% | 2.3% | 2.3% | 2.3% |
| **Industry** | | | | | | | | |
| Wood | 3.3% | 1.7% | 1.9% | 1.9% | 1.9% | 1.9% | 1.9% | 1.9% |
| Solar | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% |
| **Total** | | | | | | | | |
| Wood | 7.6% | 7.1% | 7.1% | 7.1% | 6.1% | 5.4% | 4.7% | 4.3% |
| Solar | 0.5% | 0.6% | 0.6% | 0.6% | 0.7% | 0.8% | 0.8% | 0.8% |

**Table 24: Shares of wood and solar energy in final energy demand of the sectors which make use of these fuels. Note that the shares here do not equal the RES HC share, as the reference in RES HC is not final energy, but final energy other than electricity.**

Figure 46 shows the final energy demand for space heating in the residential sector as the sector with the largest demand in renewable energy other than electricity. The final energy demand decreases over time as a strong renovation scheme is taking place, explained in section 4.1.ii. The renovation and reconstruction lead to an decrease in the final energy intensity for heating. In addition, it is assumed that heat pumps replace electricity for heating if deep renovation takes place, where deep renovation is understood as e.g. replacing windows in line with SLED (2015). The energy contained in the ambient heat is not explicitly reflected in the projection, only the electricity used to run the heat pump. This determines the final energy intensity of space heating, which consequently sees a strong reduction.

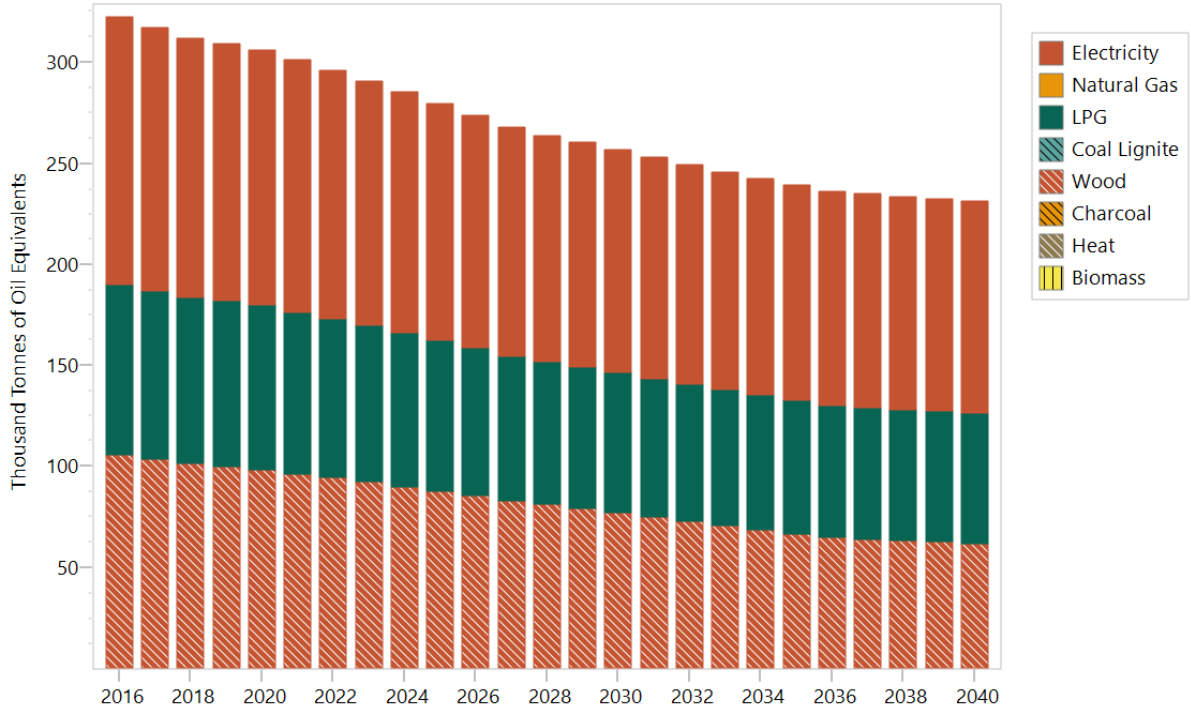



**Figure 46: Final energy and fuels used in the residential sector for space heating across all building classes and geographic zones for historic years 2016-2018 and as projected for up to year 2040 with existing measures**

## 4.3. Dimension Energy Efficiency

### *i. Current primary and final energy consumption in the economy and per sector (including industry, residential, service and transport)*

The current final energy consumption of Albania (2018) is at 2102.1 ktoe, with primary energy consumption at 2342.7 ktoe. The difference is determined by transmission losses and the refining of crude oil to refinery products. Currently, a large share of crude oil is exported and not processed in local refineries. As mentioned above, a detailed energy balance on subsector level of industrial demand is only available since the year 2016. Historic values for the year 2016 to 2018 are shown below in combination with projections considering existing policies and measures.

### *ii. Current potential for the application of high-efficiency cogeneration and efficient district heating and cooling*

The power supply of Albania is currently based exclusively on hydropower, with solar power plants projected with existing measures until the year 2040. There is no fossil-fuelled power plant in operation and no electricity generation from biomass. Cogeneration of heat and electricity is therefore not a possible option. There are currently no district heating networks in operation or planned. The potential for such networks would exist in larger agglomerations. There is limited industry, which could provide a source for district heating (cement, iron and steel, ferro-alloy production). There is a general potential for district heating, as the use of fuel wood for heating is high in older buildings, which are undergoing a strong reconstruction scheme. Corresponding projects are currently not planned or projected to be realized.

*iii. Projections considering existing energy efficiency policies, measures and programmes as described in point 1.2. (ii) for primary and final energy consumption for each sector at least until 2040 (including for the year 2030)*

Net primary energy supply in Albania is currently (2018 value) at 2342.7 ktoe and is projected to increase to 2773.8 ktoe by 2030 and 3358.9 ktoe by 2040. Figure 47 shows primary energy supply for Albania as projected with existing measures up to the year 2040. The figure shows net values of each fuel category. As these values are for primary energy, electricity is only displayed when it is not produced in the country from primary energy sources (mostly hydro), but imported (mostly in years in which the hydro availability has been deliberately reduced to study the effect on the energy system). The total demand for primary energy increases, in particular driven by the demand for transport fuels. The increasing demand for electricity is met by an increasing supply with hydro power. Table 25 gives the values for each fuel considered. Note that negative values stand for an export of the respective fuel.

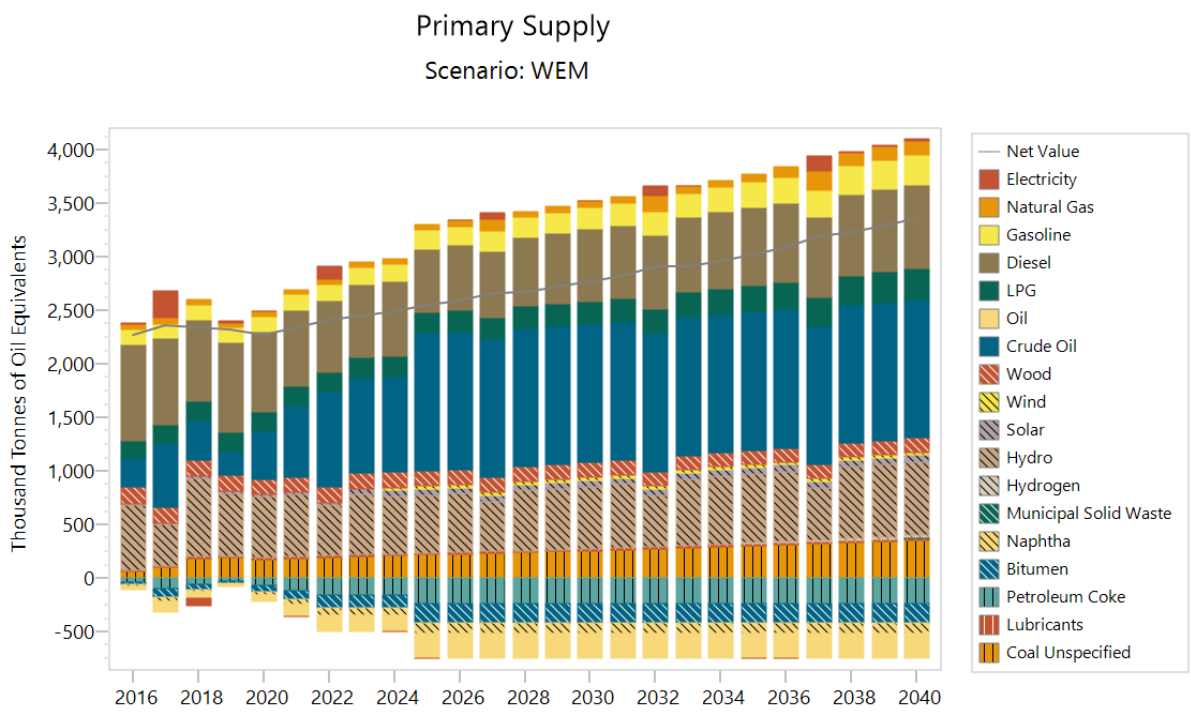



**Figure 47: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040 with existing measures. Negative values indicate exports.**

| Fuel [ktoe] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Electricity | 15.2 | 253.2 | -70.9 | 0.6 | 0.0 | 0.0 | 0.0 | 21.6 |
| Natural Gas | 51.2 | 53.9 | 45.7 | 47.1 | 54.1 | 60.5 | 76.3 | 130.4 |
| Gasoline | 136.7 | 137.5 | 136.2 | 140.7 | 170.6 | 204.2 | 237.6 | 279.3 |
| Jet Kerosene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Kerosene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Diesel | 895.9 | 802.4 | 766.8 | 747.1 | 590.4 | 671.1 | 725.9 | 783.5 |
| Residual Fuel Oil | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Fuel [ktoe] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| LPG | 165.9 | 170.1 | 174.2 | 176.5 | 195.7 | 216.5 | 248.0 | 289.6 |
| Oil | -32.2 | -100.5 | -54.7 | -65.8 | -234.4 | -234.3 | -234.3 | -234.3 |
| Crude Oil | 269.2 | 605.4 | 377.1 | 452.2 | 1292.2 | 1292.2 | 1292.2 | 1292.2 |
| Coal Lignite | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood | 154.1 | 149.4 | 150.0 | 146.6 | 141.7 | 136.4 | 131.1 | 132.1 |
| Charcoal | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wind | 0.0 | 0.0 | 0.0 | 0.0 | 28.2 | 28.2 | 28.2 | 28.2 |
| Solar | 11.1 | 12.0 | 13.2 | 16.5 | 54.7 | 58.9 | 61.7 | 65.0 |
| Hydro | 613.6 | 388.7 | 736.1 | 576.2 | 542.2 | 582.1 | 646.0 | 686.8 |
| Heat | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydrogen | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 19.4 |
| Municipal Solid Waste | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.2 | 1.3 |
| Naphtha | -14.9 | -41.7 | -24.2 | -28.2 | -94.0 | -94.0 | -94.0 | -94.0 |
| Bitumen | -28.5 | -80.0 | -46.3 | -54.0 | -180.0 | -180.0 | -180.0 | -180.0 |
| Petroleum Coke | -33.5 | -100.0 | -59.6 | -70.4 | -242.3 | -241.5 | -240.6 | -239.5 |
| Lubricants | 12.0 | 11.3 | 12.8 | 12.1 | 15.0 | 17.7 | 20.8 | 24.5 |
| Coal Unspecified | 59.8 | 99.6 | 186.3 | 175.6 | 218.1 | 255.9 | 300.3 | 352.5 |
| Biomass | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Biodiesel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total** | **2275.8** | **2361.3** | **2342.7** | **2273.2** | **2552.4** | **2773.8** | **3027.9** | **3358.9** |

**Table 25: Primary energy supply (in ktoe) for historic years 2016-2018 and as projected up to 2040 with existing measures. Negative values indicate exports.**

Final energy consumption is currently (2018 value) at 2102.1 ktoe, projected to increase to 2540.0 ktoe by 2030 and to 3080.5 ktoe by 2040. Final energy consumption is used synonymous to final energy demand and abbreviated by FEC in the following. Table 26 gives the total final energy demand. The ratio of FEC to TPES is also given; it sees a slight increase due to the increased refinery activity from 89.7% today to 92% in 2030 due to a change in refinery activity and falling transmission losses.

| | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Final energy demand [ktoe] | 2039.40 | 2109.70 | 2102.10 | 2076.10 | 2313.60 | 2540.00 | 2782.70 | 3080.50 |
| FEC to TPES | 89.6% | 89.3% | 89.7% | 91.3% | 90.6% | 91.6% | 91.9% | 91.7% |

**Table 26: Final energy demand for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 with existing measures**

Figure 48 and Table 27 show the share of different sectors in final energy demand. The share of energy consumption in the residential sector decreases.

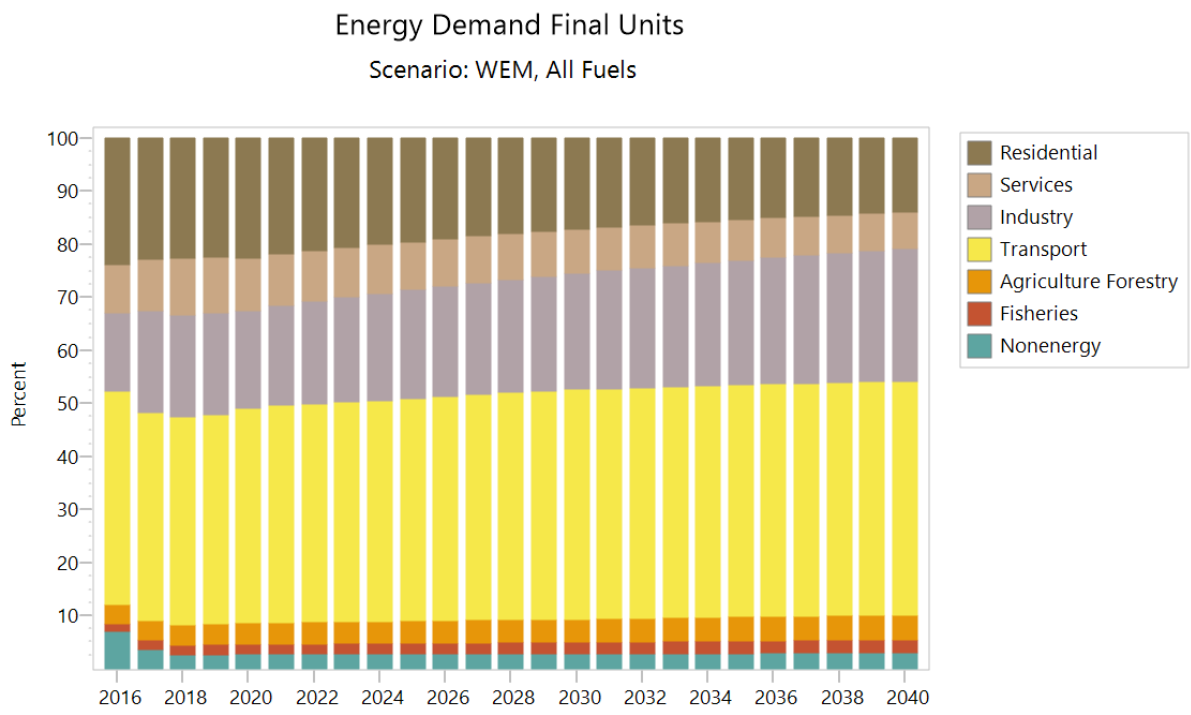



**Figure 48. Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2040 with existing measures.**

| Branch | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Residential | 23.9% | 22.8% | 22.6% | 22.7% | 19.5% | 17.1% | 15.3% | 14.0% |
| Services | 9.1% | 9.7% | 10.8% | 9.8% | 9.1% | 8.3% | 7.6% | 6.8% |
| Industry | 14.8% | 19.1% | 19.2% | 18.3% | 20.5% | 21.9% | 23.6% | 25.0% |
| Transport | 40.2% | 39.3% | 39.1% | 40.5% | 41.9% | 43.3% | 43.7% | 44.0% |
| Agriculture | 3.6% | 3.5% | 3.8% | 4.1% | 4.2% | 4.4% | 4.5% | 4.7% |
| Fisheries | 1.4% | 1.8% | 1.9% | 1.8% | 2.1% | 2.2% | 2.4% | 2.5% |
| Nonenergy | 7.0% | 3.7% | 2.6% | 2.8% | 2.8% | 2.8% | 2.9% | 3.0% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

**Table 27: Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2040 with existing measures.**

The following figures show the final energy demand per sector, broken down to respective subsectors, again for historic values from 2016 to 2018 and projections until the year 2040. As with GHG emissions, this is followed by a table, which gives the values for 2016-2018, 2020, 2025, 2030, 2035 and 2040. Each figure of the energy demand in the subsectors is accompanied by a figure showing the fuel split in the subsector, which is not listed as reference in the following description. The following paragraphs highlight main observations while figures are grouped to maintain readability.

Figure 49 shows the overall energy demand. The largest sector is transport, which also sees an increase in demand until 2040. The same is true for industry at a lower level. The energy demand from the residential sector is sees as slight decline.

Figure 51 shows the residential sector in more detail, pointing towards a decline in energy demand from space heating, countered by an increase in space cooling and from the use of appliances. The services sector (Figure 53) sees only modest changes both in total energy demand and fuel split. The energy demand in industry is projected to increase with GDP (Figure 55) with no fuel split and limited energy efficiency measures. The demand for mobility is projected to increase and the energy demand follows suite (Figure 57) In passenger transport (Figure 59), rail transport is projected to take a small share of the demand towards 2030 already, while electrification happens in road transport. Freight transport (Figure 61) sees less use of rail, with the bulk of transport happening on roads. After 2030, a small share of hydrogen is projected to come into the system.

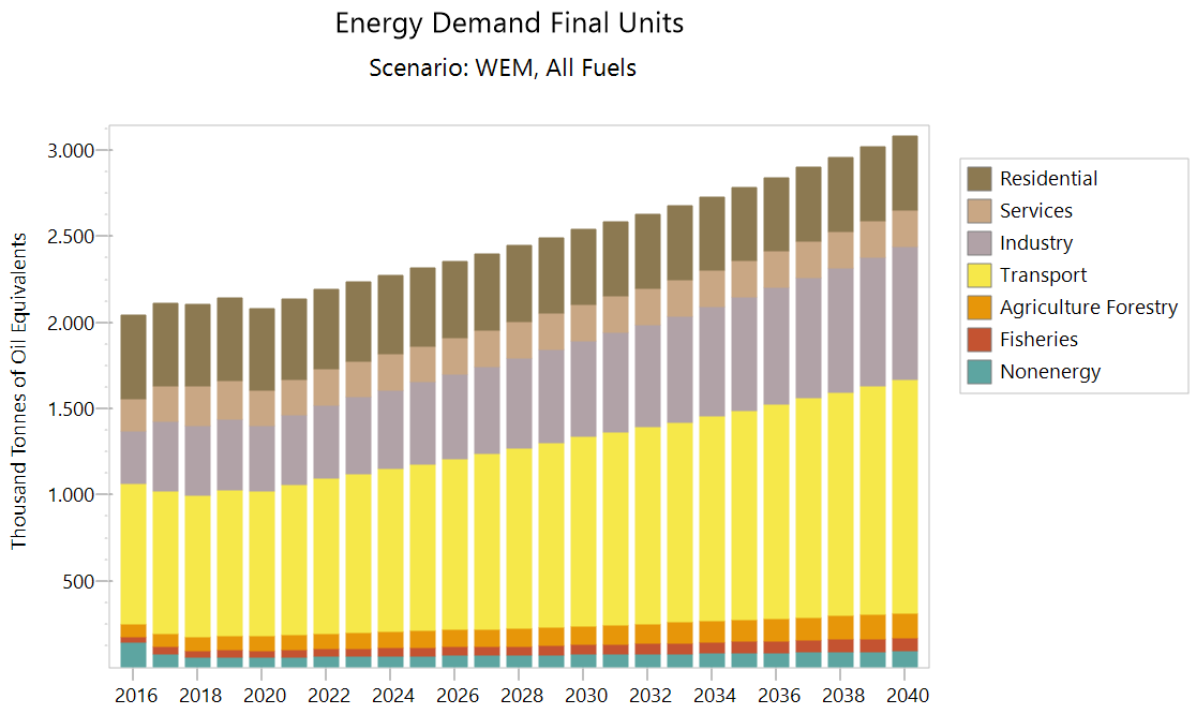



**Figure 49: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected with existing measures until 2040**

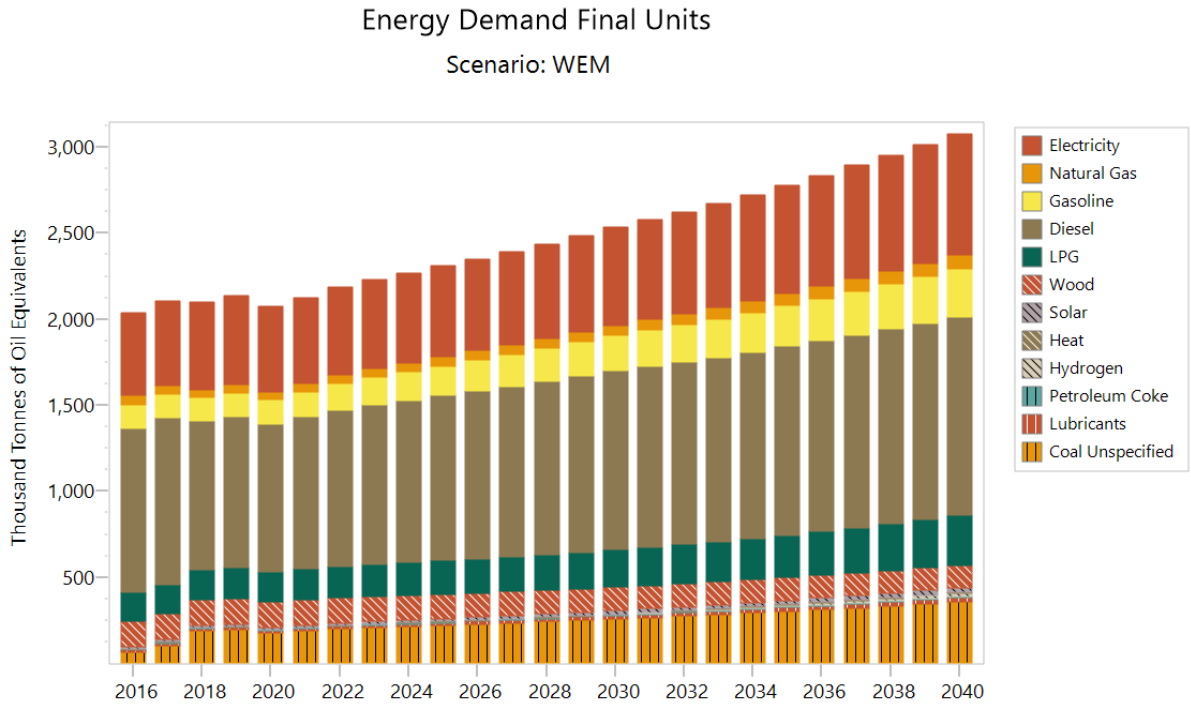



**Figure 50: Fuel split underlying the final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected with existing measures until 2040**

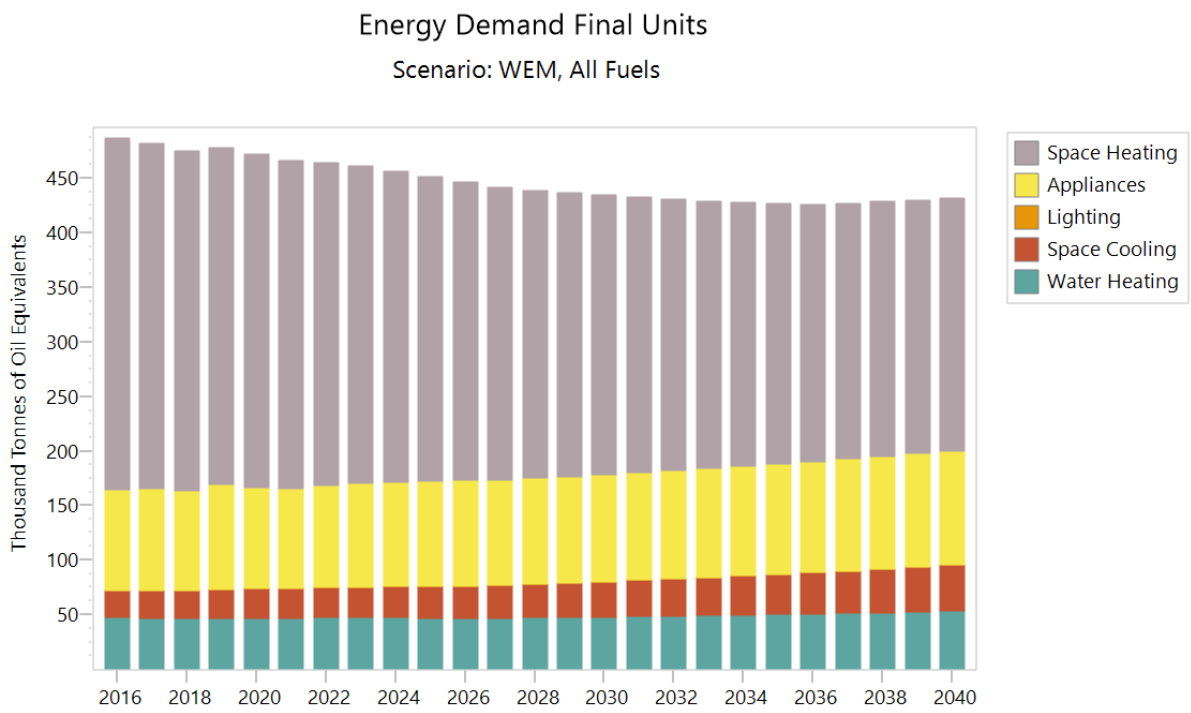



**Figure 51: Final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with existing measures until 2040**

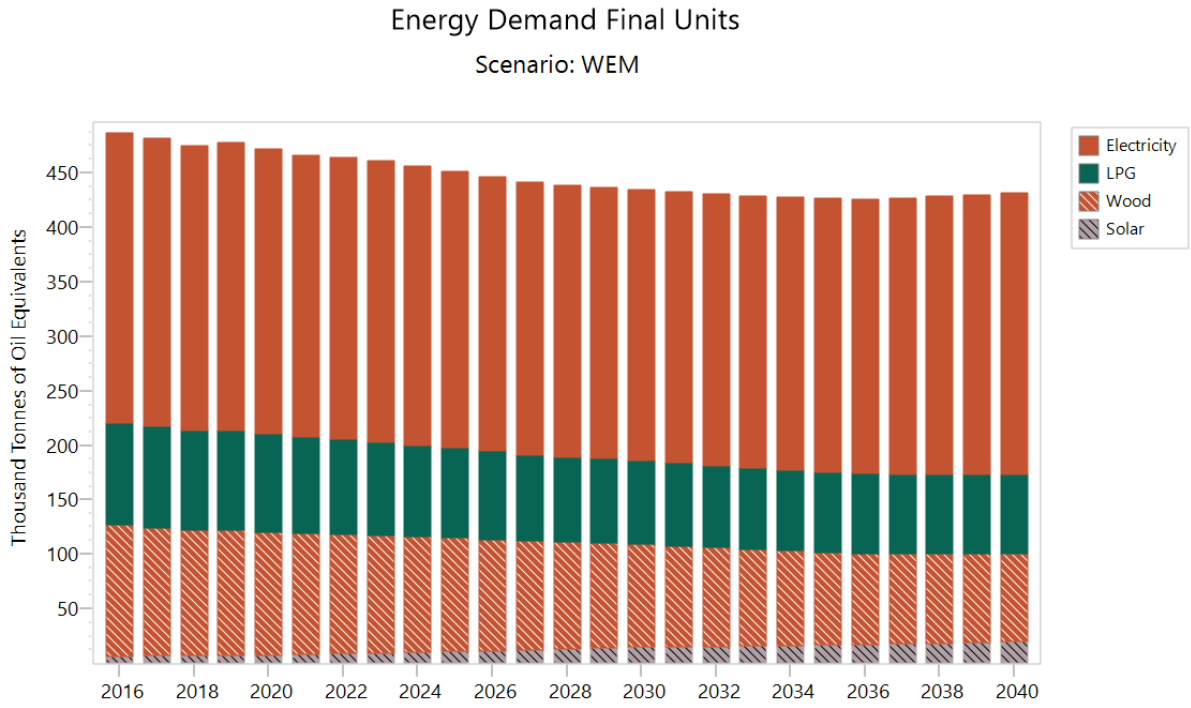



**Figure 52: Fuel split underlying the final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with existing measures until 2040**

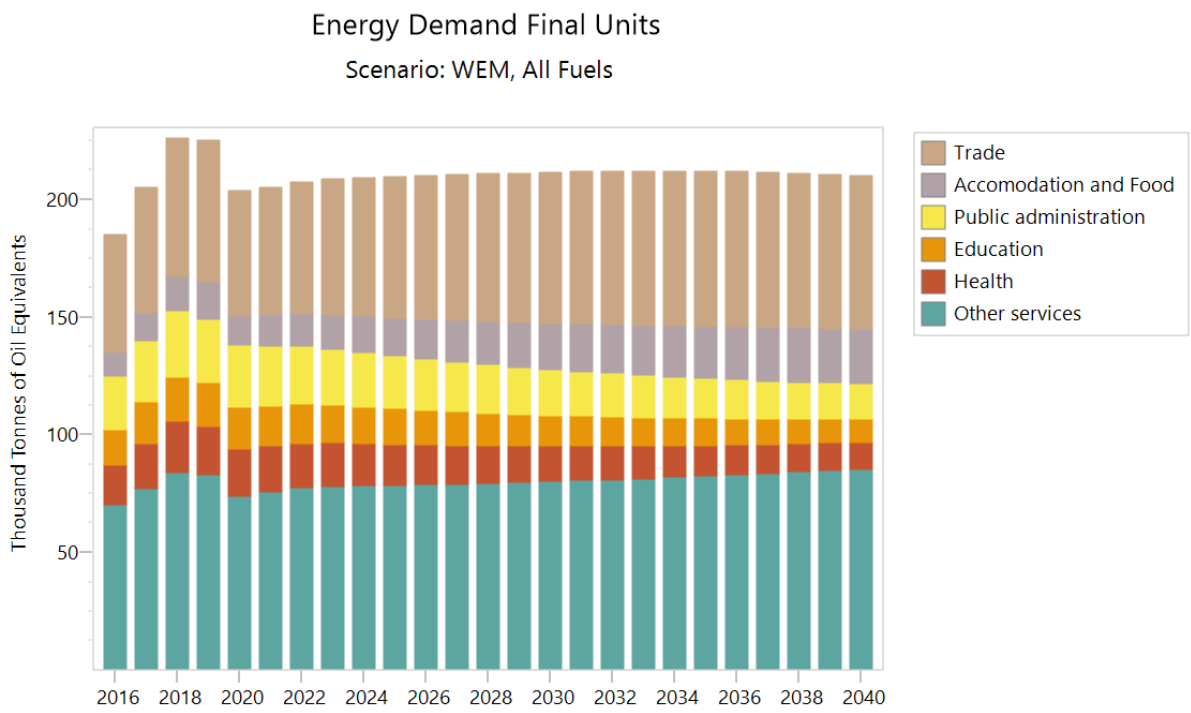



**Figure 53: Final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with existing measures until 2040**

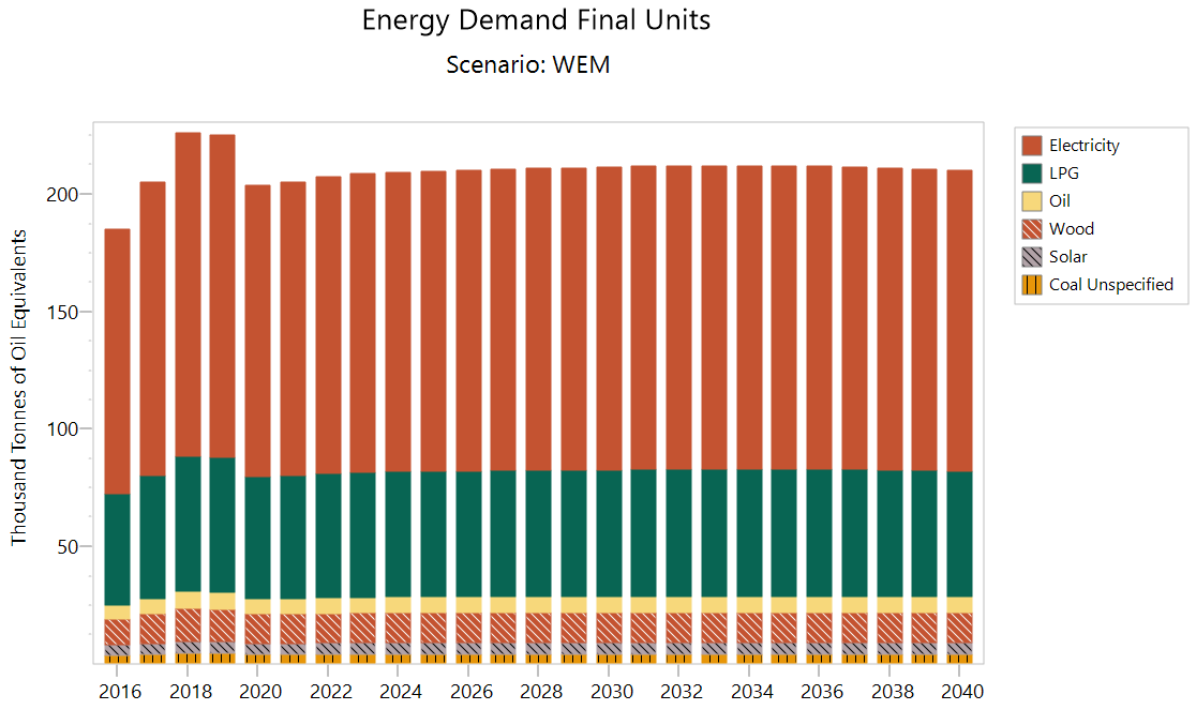



**Figure 54: Fuel split underlying the final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with existing measures until 2040**

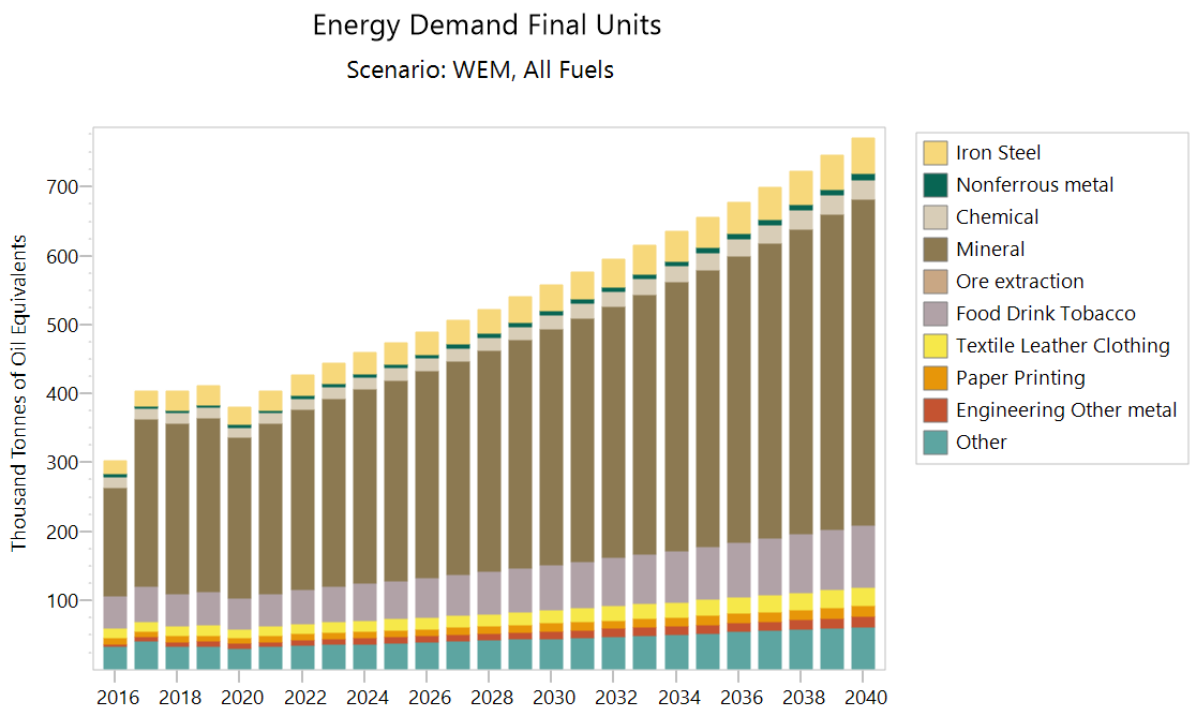



**Figure 55: Final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with existing measures until 2040**

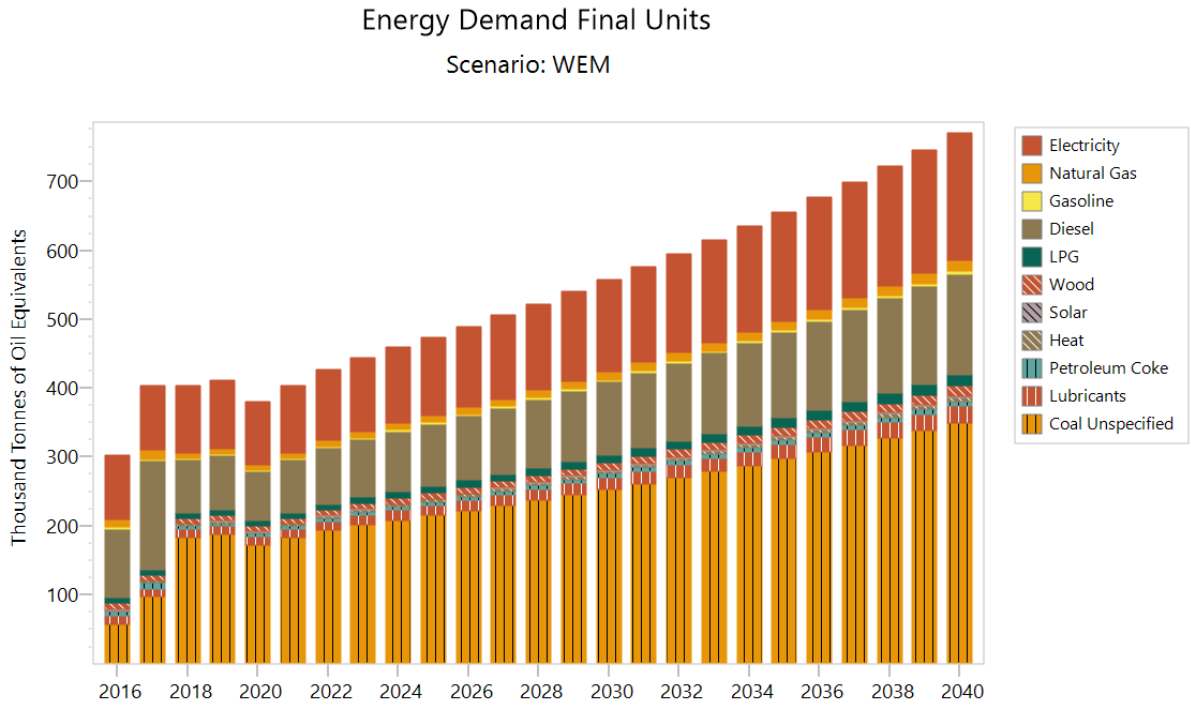



**Figure 56: Fuel split underlying the final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with existing measures until 2040**

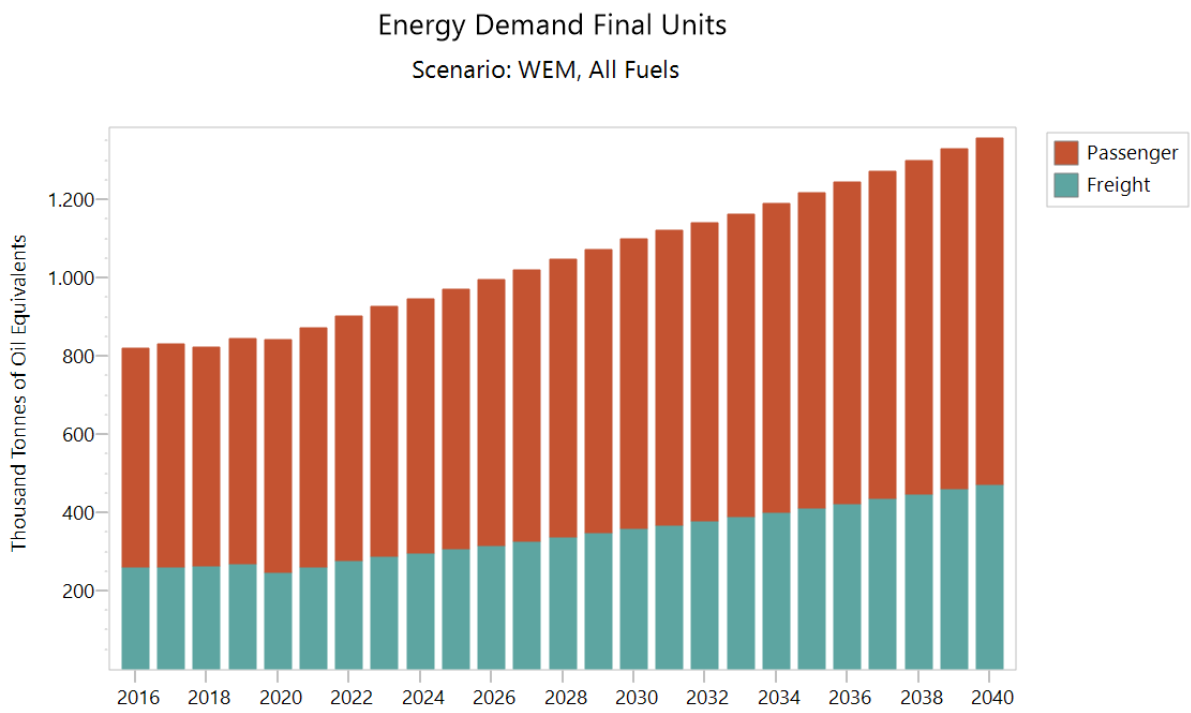



**Figure 57: Final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with existing measures until 2040**

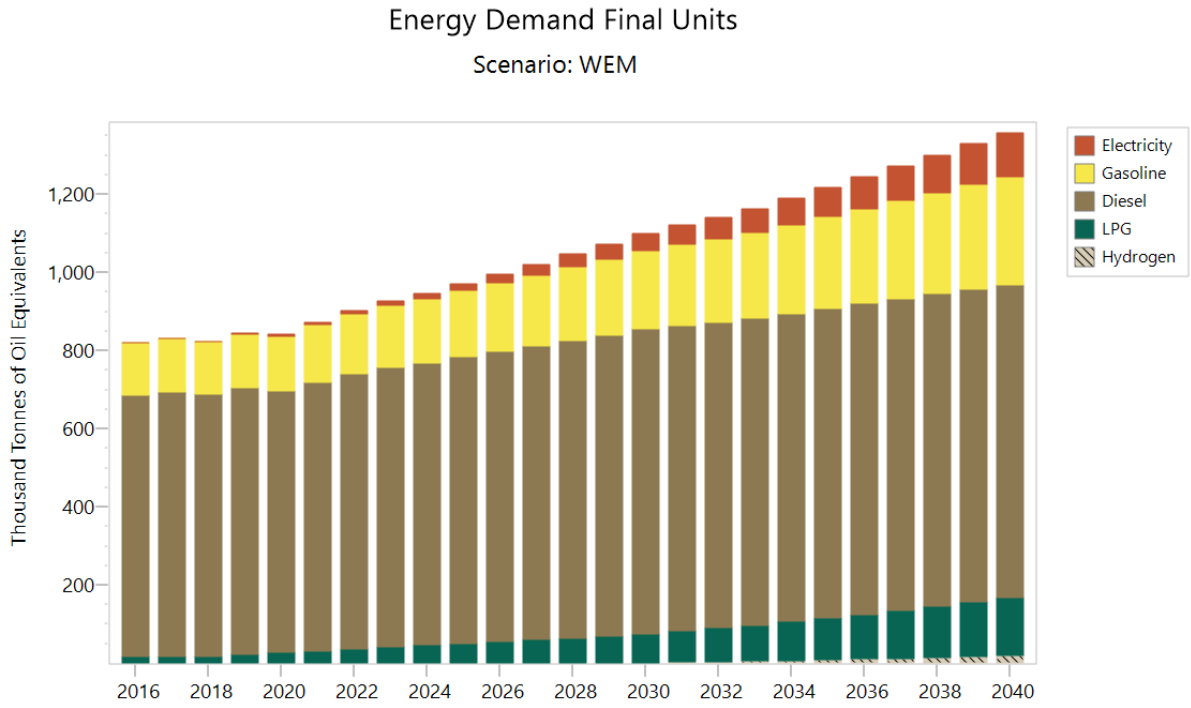



**Figure 58: Fuel split underlying the final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with existing measures until 2040**

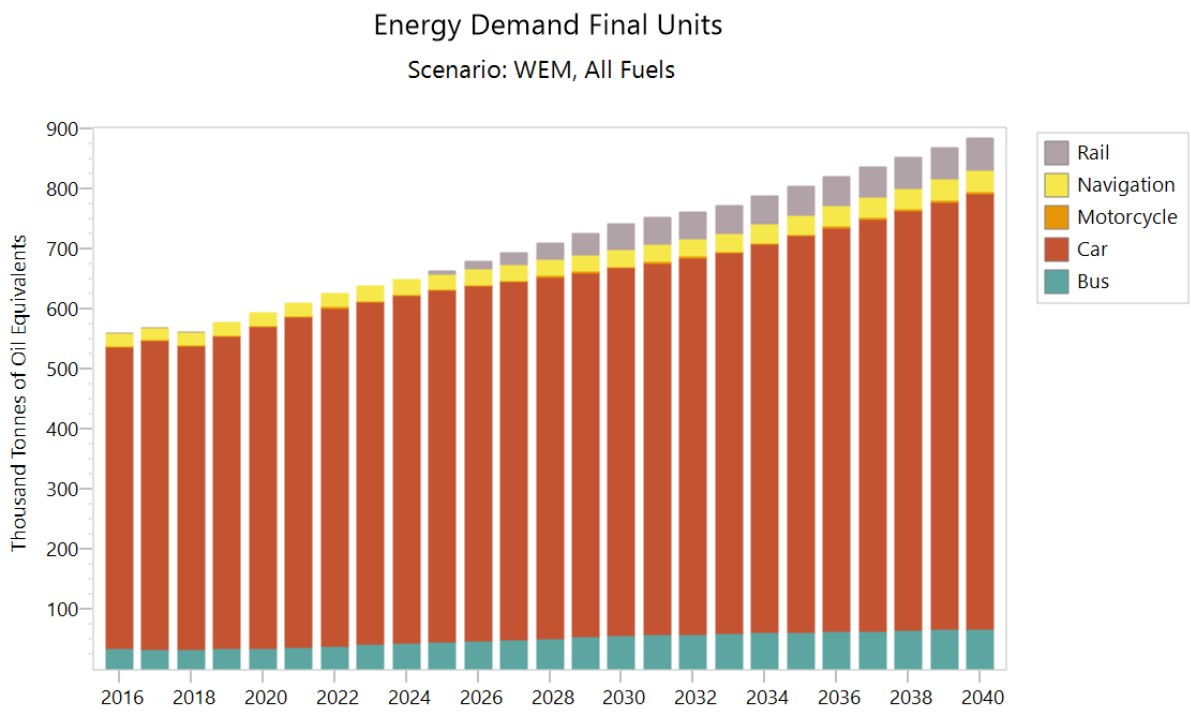



**Figure 59: Final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with existing measures until 2040**

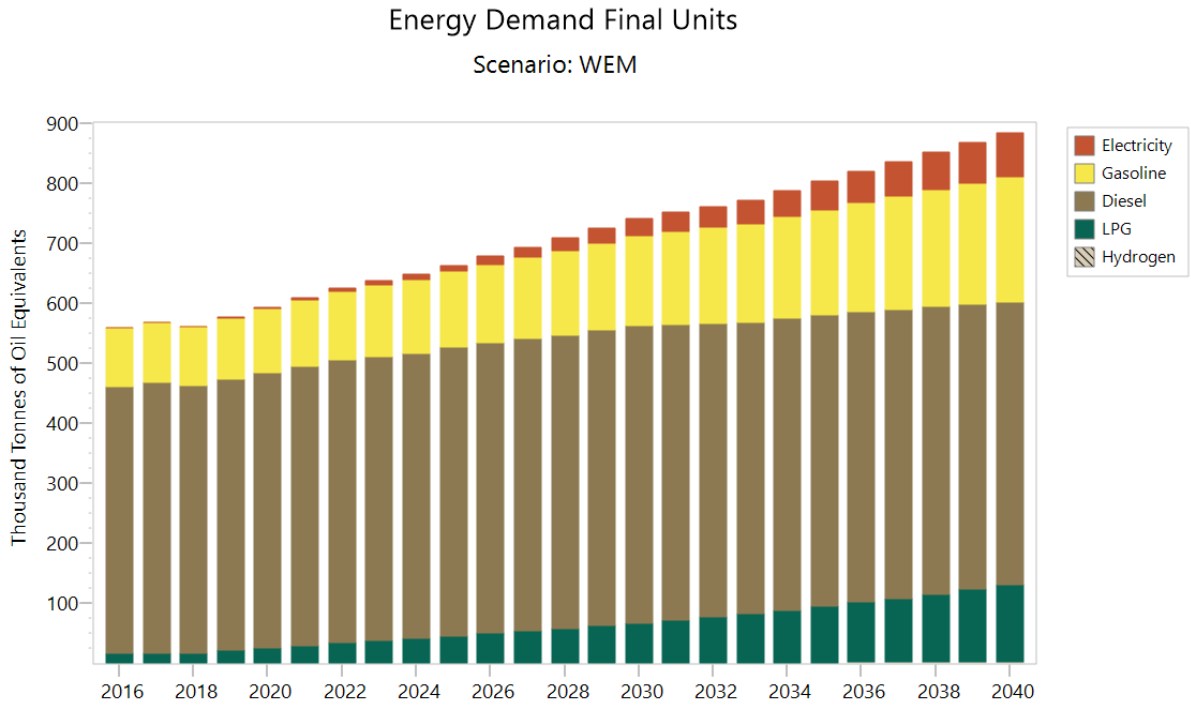



**Figure 60: Fuel split underlying the final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with existing measures until 2040**

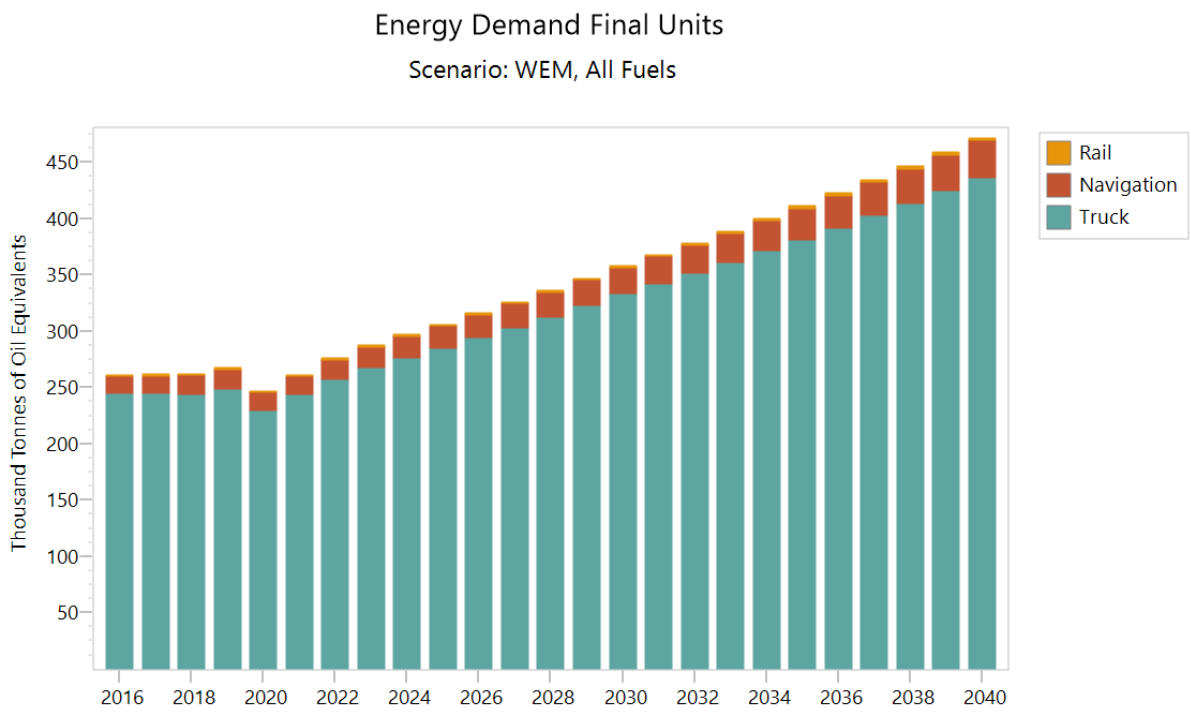



**Figure 61: Final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with existing measures until 2040**

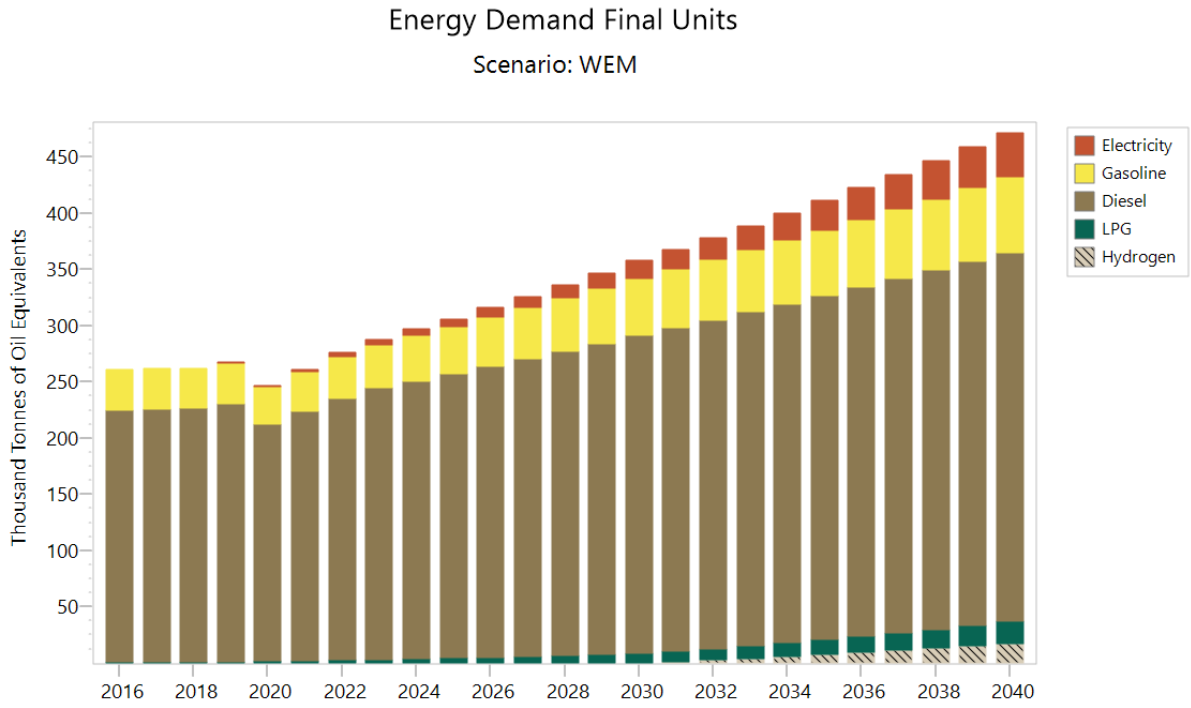



**Figure 62: Fuel split underlying the final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with existing measures until 2040**

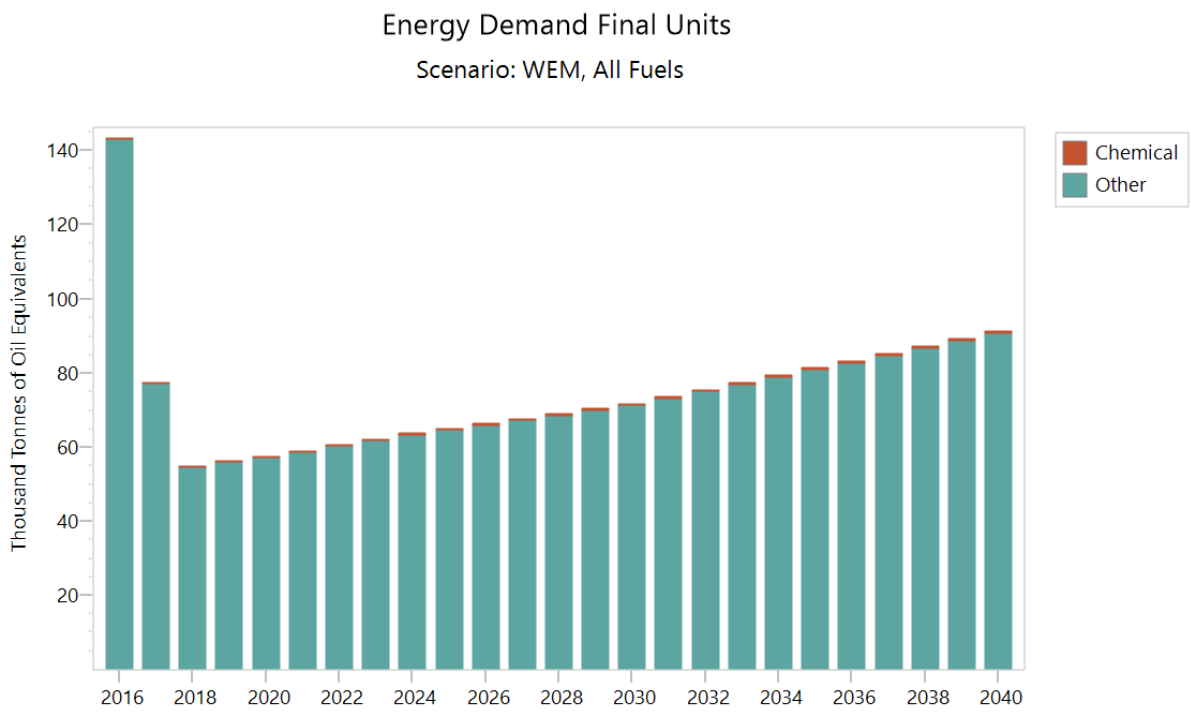



**Figure 63: Final energy consumption (ktoe) for the non-energy demand of energy carriers for historic values from 2016-2018 and as projected with existing measures until 2040**

The following table gives values for the final energy demand (in ktoe) for the demand sectors and subsectors as projected with existing measures.

| Branch [ktoe] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Residential | 486.8 | 481.9 | 474.8 | 471.8 | 451.7 | 434.4 | 427.0 | 431.2 |
| Services | 185.0 | 205.3 | 226.2 | 203.8 | 209.7 | 211.6 | 212.1 | 210.2 |
| Industry | 301.7 | 402.7 | 402.8 | 380.1 | 473.8 | 557.3 | 655.4 | 770.8 |
| Transport | 819.4 | 829.8 | 822.7 | 840.2 | 969.2 | 1098.6 | 1215.0 | 1355.6 |
| Agriculture Forestry | 74.0 | 74.1 | 80.3 | 84.7 | 96.7 | 110.5 | 126.2 | 144.1 |
| Fisheries | 29.1 | 38.5 | 40.5 | 38.2 | 47.6 | 56.0 | 65.8 | 77.4 |
| Nonenergy | 143.3 | 77.4 | 54.7 | 57.3 | 64.9 | 71.6 | 81.2 | 91.2 |
| Total | 2039.4 | 2109.7 | 2102.1 | 2076.1 | 2313.6 | 2540.0 | 2782.7 | 3080.5 |
| **Residential** | | | | | | | | |
| Space Heating | 322.3 | 317.1 | 311.8 | 306.1 | 279.4 | 256.7 | 239.1 | 231.3 |
| Appliances | 92.6 | 92.8 | 91.0 | 92.3 | 96.4 | 97.8 | 101.2 | 104.9 |
| Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Space Cooling | 25.0 | 25.3 | 25.6 | 26.7 | 29.1 | 32.3 | 36.8 | 42.2 |
| Water Heating | 46.9 | 46.7 | 46.4 | 46.6 | 46.7 | 47.6 | 49.8 | 52.8 |
| Total | 486.8 | 481.9 | 474.8 | 471.8 | 451.7 | 434.4 | 427.0 | 431.2 |
| **Services** | | | | | | | | |
| Trade | 50.0 | 53.5 | 59.0 | 53.5 | 60.1 | 64.4 | 66.2 | 65.5 |
| Accomodation and Food | 10.3 | 12.1 | 14.5 | 12.4 | 16.2 | 19.6 | 22.1 | 23.3 |
| Public administration | 22.6 | 26.0 | 28.2 | 26.3 | 22.6 | 19.6 | 17.1 | 14.8 |
| Education | 15.5 | 17.7 | 19.0 | 17.8 | 15.2 | 13.2 | 11.5 | 10.0 |
| Health | 16.9 | 19.2 | 21.7 | 20.3 | 17.4 | 15.1 | 13.1 | 11.4 |
| Other services | 69.8 | 76.9 | 83.8 | 73.6 | 78.2 | 79.8 | 82.1 | 85.2 |
| Total | 185.0 | 205.3 | 226.2 | 203.8 | 209.7 | 211.6 | 212.1 | 210.2 |
| **Industry** | | | | | | | | |
| Iron Steel | 18.9 | 20.5 | 27.2 | 25.7 | 32.0 | 37.6 | 44.2 | 52.0 |
| Nonferrous metal | 4.3 | 4.2 | 4.3 | 4.0 | 5.0 | 5.9 | 6.9 | 8.1 |
| Chemical | 14.9 | 15.3 | 15.0 | 14.2 | 17.7 | 20.8 | 24.4 | 28.7 |
| Mineral | 157.1 | 243.0 | 247.2 | 233.2 | 290.8 | 342.0 | 402.2 | 473.0 |
| Ore extraction | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Food Drink Tobacco | 47.4 | 50.6 | 47.4 | 44.7 | 55.8 | 65.6 | 77.1 | 90.7 |
| Textile Leather Clothing | 14.4 | 14.5 | 13.9 | 13.1 | 16.3 | 19.2 | 22.6 | 26.5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Paper Printing | 8.2 | 8.3 | 8.3 | 7.8 | 9.8 | 11.5 | 13.5 | 15.9 |
| Engineering Other metal | 3.3 | 5.5 | 7.6 | 7.2 | 9.0 | 10.6 | 12.4 | 14.6 |
| Other | 33.2 | 40.8 | 32.0 | 30.2 | 37.6 | 44.2 | 52.0 | 61.2 |
| Total | 301.7 | 402.7 | 402.8 | 380.1 | 473.8 | 557.3 | 655.4 | 770.8 |
| **Transport** | | | | | | | | |
| Passenger | 558.7 | 568.4 | 560.8 | 593.5 | 663.1 | 740.8 | 804.1 | 884.1 |
| Freight | 260.8 | 261.4 | 261.9 | 246.7 | 306.1 | 357.9 | 410.9 | 471.4 |
| Total | 819.4 | 829.8 | 822.7 | 840.2 | 969.2 | 1098.6 | 1215.0 | 1355.6 |
| **Passenger Transport** | | | | | | | | |
| Rail | 0.4 | 0.3 | 0.3 | 0.0 | 6.2 | 42.4 | 48.2 | 54.2 |
| Navigation | 20.5 | 20.5 | 20.5 | 21.7 | 24.8 | 28.3 | 32.2 | 36.1 |
| Motorcycle | 2.0 | 2.0 | 2.0 | 2.1 | 2.4 | 2.7 | 3.0 | 3.3 |
| Car | 501.3 | 513.0 | 505.5 | 535.2 | 585.2 | 612.0 | 659.7 | 724.1 |
| Bus | 34.5 | 32.7 | 32.6 | 34.5 | 44.5 | 55.3 | 61.0 | 66.4 |
| Total | 558.7 | 568.4 | 560.8 | 593.5 | 663.1 | 740.8 | 804.1 | 884.1 |
| **Freight Transport** | | | | | | | | |
| Rail | 0.8 | 1.2 | 1.2 | 1.1 | 1.4 | 1.7 | 2.0 | 2.3 |
| Navigation | 14.9 | 15.8 | 16.7 | 15.8 | 19.8 | 23.4 | 27.6 | 32.7 |
| Truck | 245.1 | 244.5 | 244.0 | 229.8 | 284.9 | 332.8 | 381.3 | 436.4 |
| Total | 260.8 | 261.4 | 261.9 | 246.7 | 306.1 | 357.9 | 410.9 | 471.4 |
| **Non-energy** | | | | | | | | |
| Chemical | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.6 | 0.7 |
| Other | 143.0 | 77.0 | 54.4 | 57.0 | 64.4 | 71.1 | 80.6 | 90.5 |
| Total | 143.3 | 77.4 | 54.7 | 57.3 | 64.9 | 71.6 | 81.2 | 91.2 |

**Table 28: Final energy consumption (ktoe) for different sectors and subsectors for historic values from 2016-2018 and as projected with existing measures until 2040**

*iv. Cost-optimal levels of minimum energy performance requirements resulting from national calculations, in accordance with Article 5 of Directive 2010/31/EU*

Under development

## 4.4. Dimension Energy Security

To be included according to the Governance Regulation: i. Current energy mix, domestic energy resources, import dependency, including relevant risks ii. Projections of development with existing policies and measures at least until 2040 (including for the year 2030).

*i. Current energy mix, domestic energy resources, import dependency including relevant risks*

The current electricity mix of Albania consists almost exclusively of hydropower. At a currently still very low but rising level, solar power is entering the mix. Fossil energy sources, however, are entirely absent from the Albanian electricity generation sector. Although a project for an oil powered thermal power plant in Vlora with 97 MW capacity was completed in 2011, it never entered into operation. A revitalisation of the plant after refurbishment for natural gas usage is planned as part of a policy of the scenario with existing measures.

Critical for energy security is the absence of an electricity production reserve using another technology to hedge for dry years with little hydroelectric output. In the past, this has led to frequent spikes in electricity imports, last observed in 2017 when the net import share in gross energy consumption rose to 39% with net exports of 1% in both 2016 and 2018.

Figure 64 shows the total gross inland consumption, remaining rather constant with a slightly increase. Generation, net imports and the import share (left y-axis) are also shown.

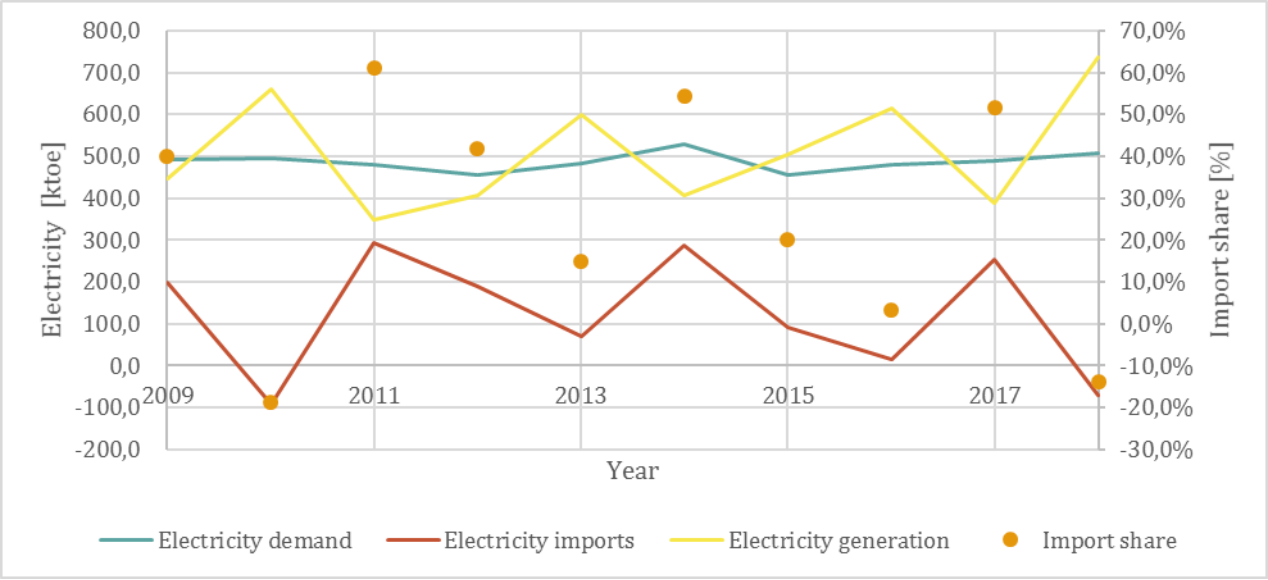



**Figure 64: Electricity import share (historical data 2004 - 2018)**

Apart from the electricity sector, the supply of fossil fuels and fossil fuel products plays a crucial role in Albanian energy security. Despite being a crude oil producer, the country is strongly reliant on import of refined oil products due to low and aging refinery capacities. Figure 65 clearly shows how crude oil production is significantly higher than the production of refined oil products.

Figure 66 shows net imports of fuel products. Negative values mean that exports exceed imports while positive values mean that imports exceed exports. As can be seen, crude oil is largely exported while refined oil products are mainly imported. This corresponds to a strong import dependency.

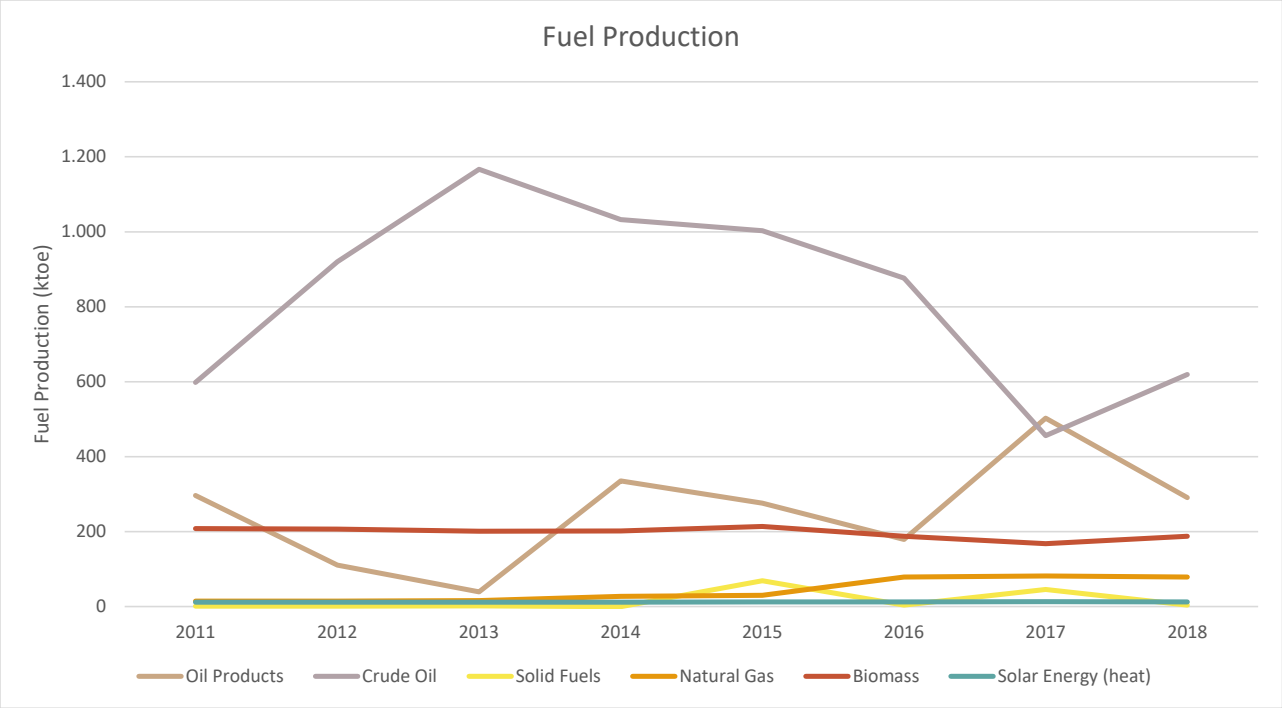



**Figure 65: Fuel Production (historical data 2011 - 2018)**

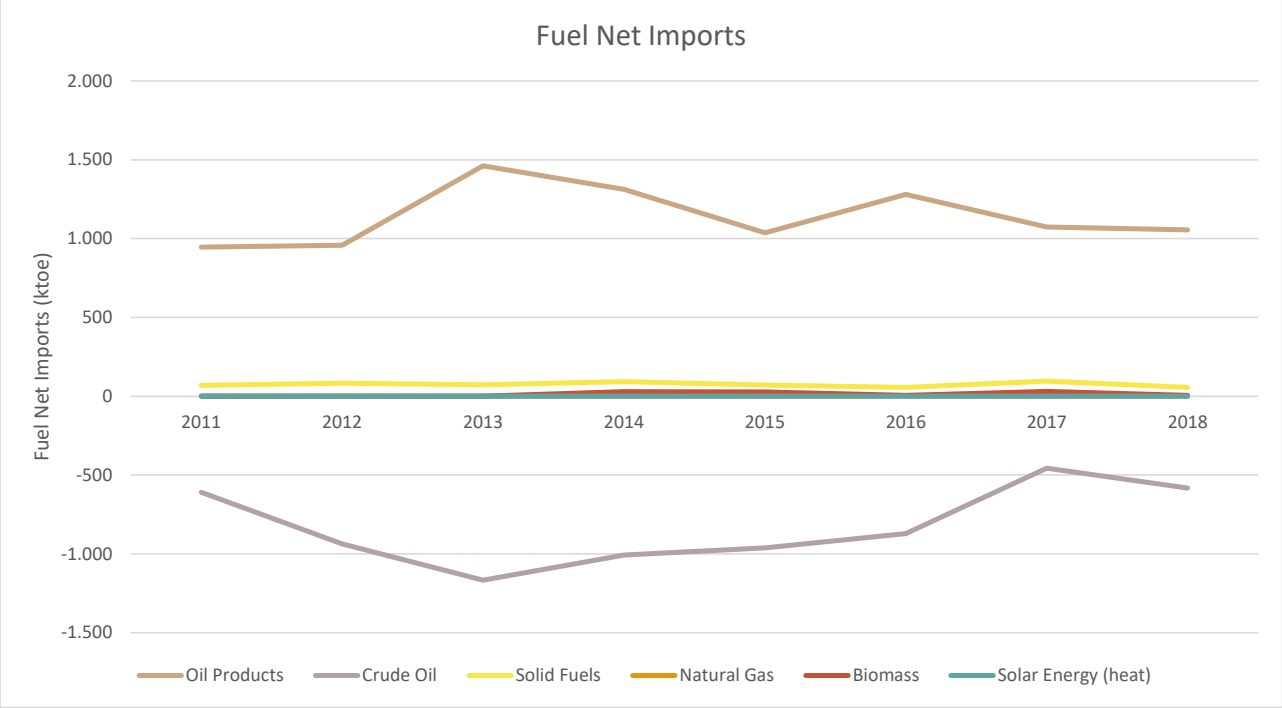



**Figure 66: Fuel Net Imports (historical data 2011 - 2018)**

### *ii. Projections of development with existing policies and measures at least until 2040 (including for the year 2030)*

For projections from 2019 to 2040, the gross inland consumption of electricity is expected to rise continually up to 2040. The import dependency in years with low hydroelectric output is recurring issue in the scenario considering existing measures. In the historic data, years with low hydroelectric output

occurred on average every five years, last in 2017. The model therefore implements such years every five years starting in 2022 as can be seen in Figure 67 by the spikes in net import share (calculated relative to electricity demand). Apart from these years, net imports are zero except towards the end of the 2030s, when the import share is continually rising signifying a lack of production capacity to match the electricity demand. This is also influenced by changes in climate conditions, as the precipitation levels are expected to decrease leading to by 20% in output for run-of-river hydroelectric plants and 15% in reservoir hydroelectric plants under 2010-levels until 2050 (World Bank ESMAP 2009).

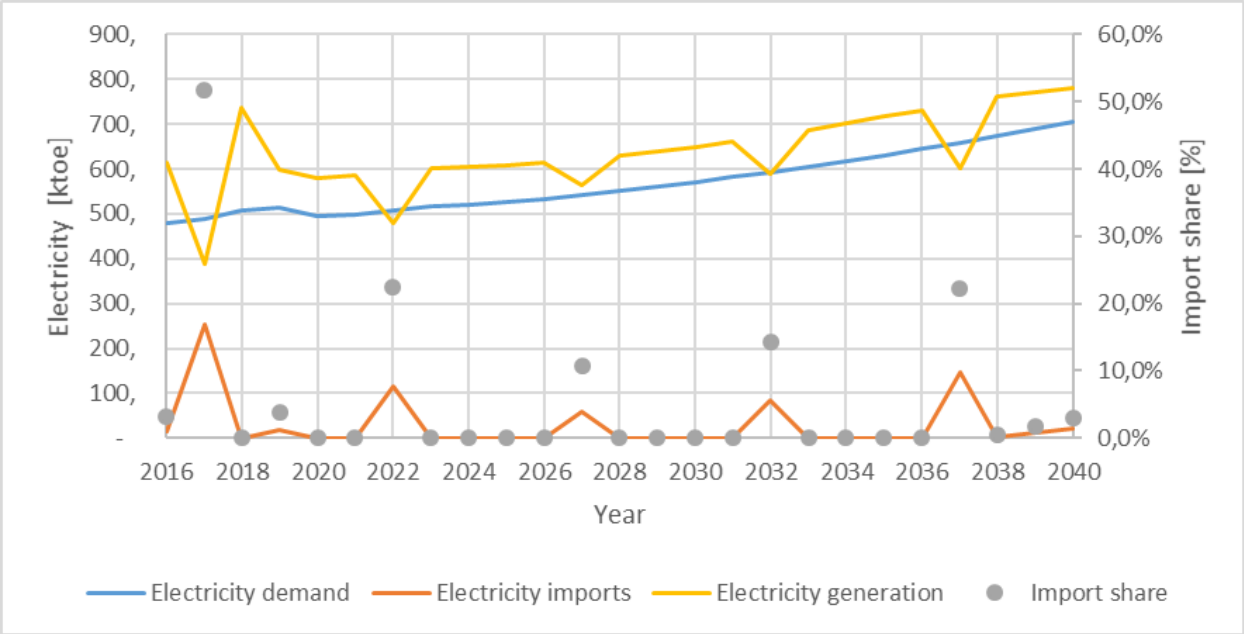



**Figure 67: Electricity generation, demand and imports for the scenario with existing measures.(projection 2019 - 2040)**

| [ktoe] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Electricity demand | 479,9 | 489,9 | 507,6 | 493,5 | 526,4 | 570,8 | 630,4 | 705,1 |
| Electricity generation | 613,6 | 388,7 | 736,1 | 580, | 608,5 | 648,7 | 716,4 | 779,6 |
| Electricity imports | 15,2 | 253,2 | 0,0 | 0,6 | 0,0 | 0,0 | 0,0 | 21,6 |
| Import share | 3,2% | 51,7% | 0,0% | 0,1% | 0,0% | 0,0% | 0,0% | 3,1% |

**Figure 68: Electricity generation, demand, and imports for the scenario with existing measures.**

In fuel production, an existing policy to refurbish the existing oil refineries will increase the refining capacity from one million tonnes of crude oil input per year to 1.5 million tonnes. The policy will take effect in 2025 as shown by an increase in oil products in Figure 69.

This change further leads to changing dynamics in fuel net imports. While historically, large parts of crude oil were exported and oil products imported due to a lack in refining capacity (see Figure 66), the

increased refining capacity decreases crude oil exports to nearly zero from 2025 and significantly decreases oil product imports and the dependency on such, as can be observed in Figure 70.

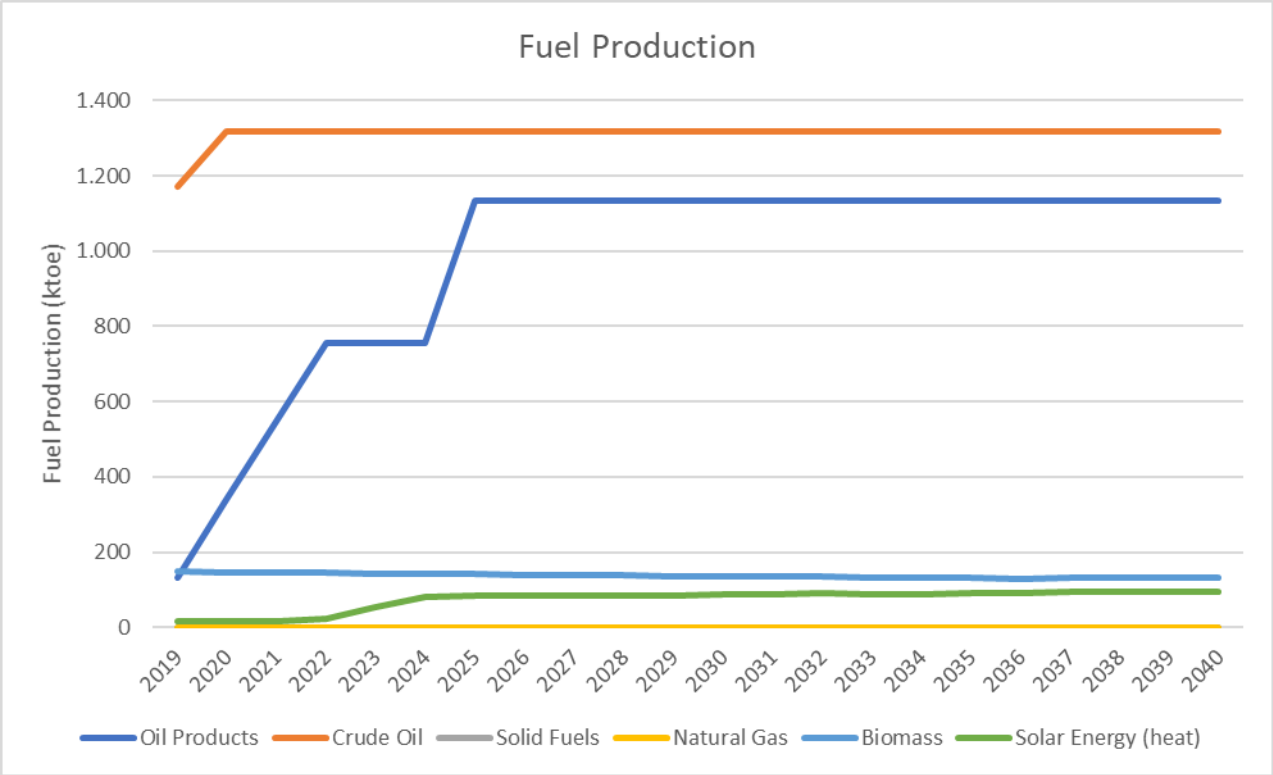



**Figure 69: Fuel production (projection 2019-2040)**

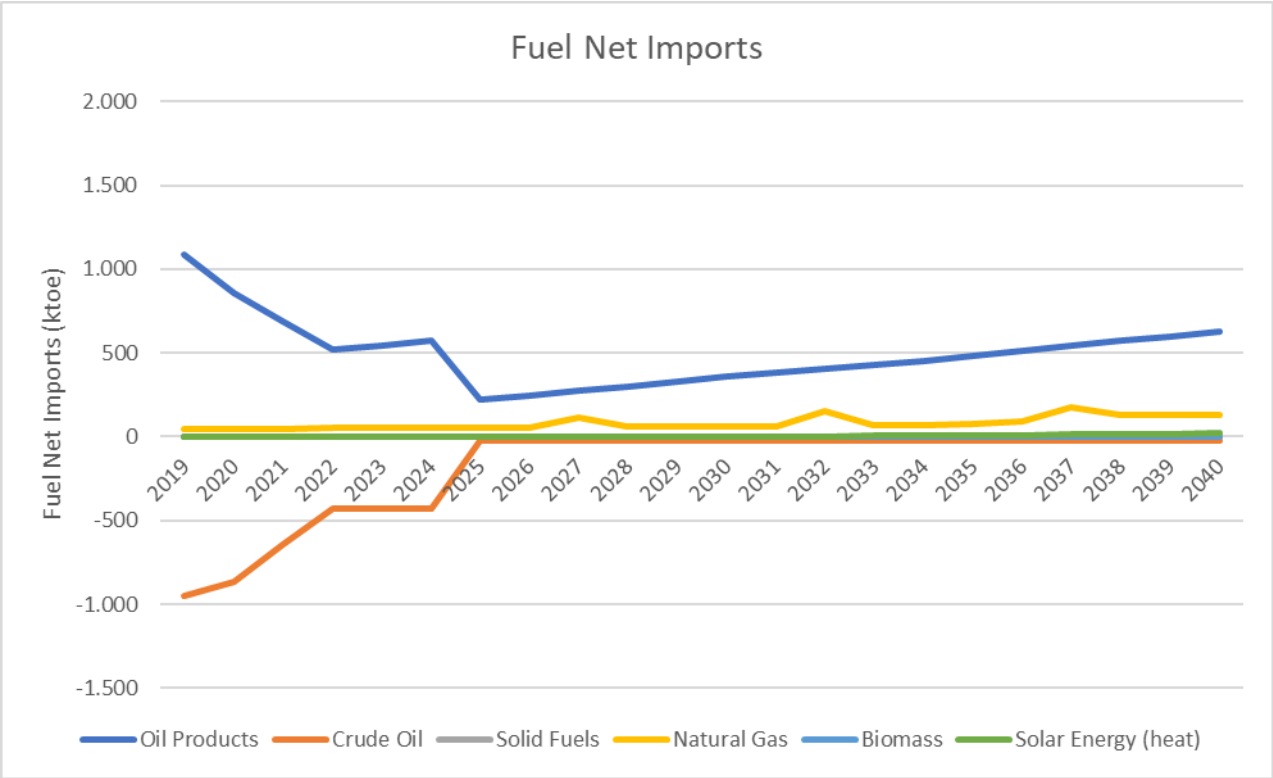



**Figure 70: Fuel Net imports (projection 2019-2040)**

## 4.5. Dimension internal energy market

### 4.5.1 Electricity interconnectivity

*i. Current interconnection level and main interconnectors*

Albania has five interconnection lines with a total installed capacity of 4096 MVA with all neighbouring political entities except North Macedonia (Energy Community Secretariat 2021) as shown in Table 29.

| Voltage Level (kV) | Bus 1 (domestic) | Bus 2 (non-domestic) | From Albania to | Max active power (MW) |
|---|---|---|---|---|
| 400 | Zemblak | Kardia | Greece | 1215 |
| 400 | Tirana 2 | Podgorica | Montenegro | 1197 |
| 400 | Komani | Kosova B | Kosovo | 1185 |
| 220 | Koplik | Podgorica | Montenegro | 270 |
| 220 | Fierzë | Prizreni 2 | Kosovo | 270 |

**Table 29: Existing cross-border interconnectors. Source: (Energy Community Secretariat 2021)**

In the years between 2004 and 2018, electricity imports using these interconnectors varied between 370 GWh in 2005 and 3251 GWh in 2014 (average 1815 GWh). Exports varied between 0 and 2934 GWh (average 325 GWh). The interconnection usage (imports + exports) varied between 42 GWh in 2016 and 4920 GWh in 2010 (average 2140 GWh).

Figure 71 shows the geographic distribution of the main transmission lines and interconnectors.

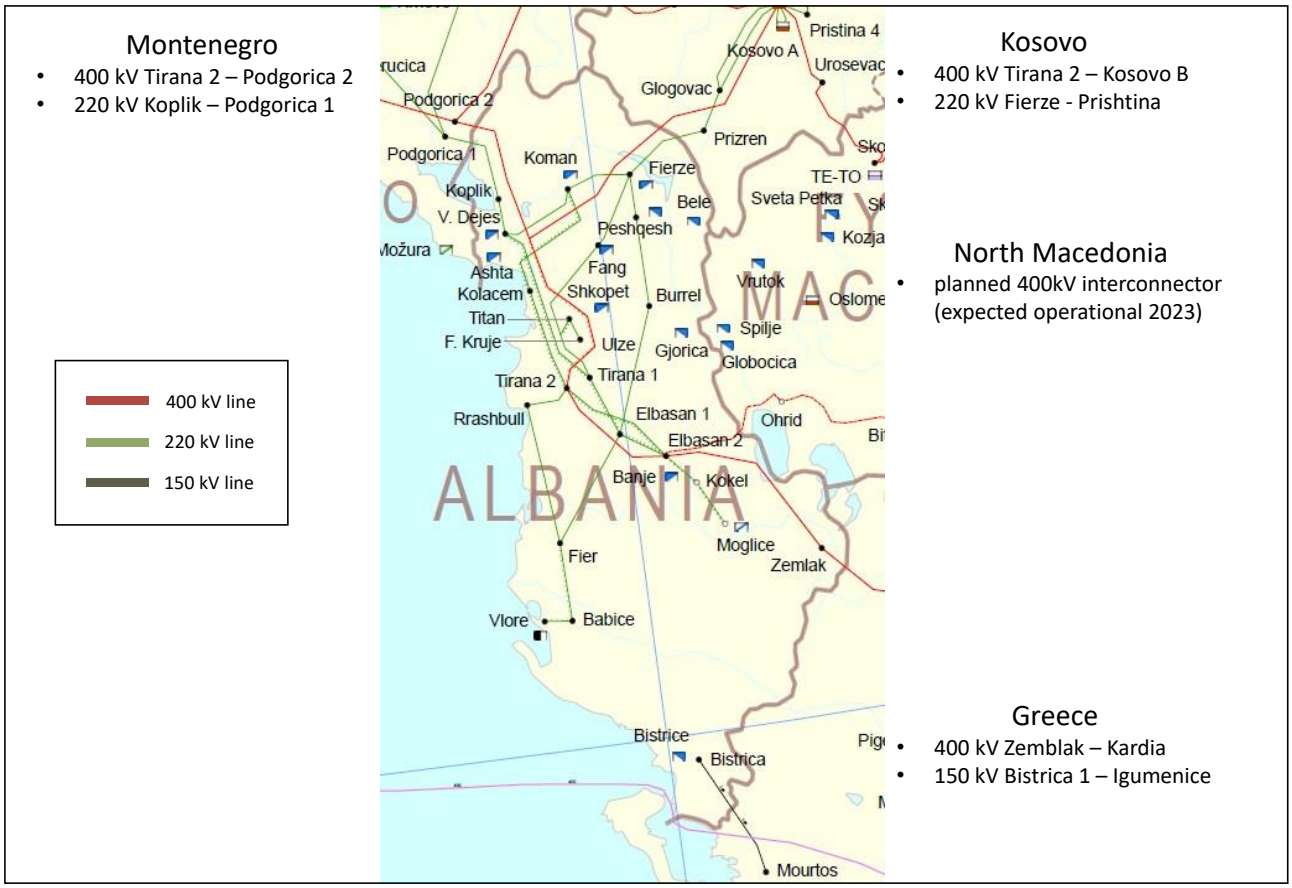



**Figure 71: Map of main transmission lines and interconnectors. Source: own representation based on OST 2018**

Figure 72 shows a scheme of cross-border interconnectors including nominal interconnector transmission capacity (max active Power in MW) and the maximum cross-border capacity given to market participants for commercial use (NTC). Of note is that the start of operation of the 400 kV line Tirana 2 - Komani - Kosovo B in December 2020 allowed the nominal transmission capacities to increase at the borders with Kosovo and Greece from previously 250 MW to 400 MW.

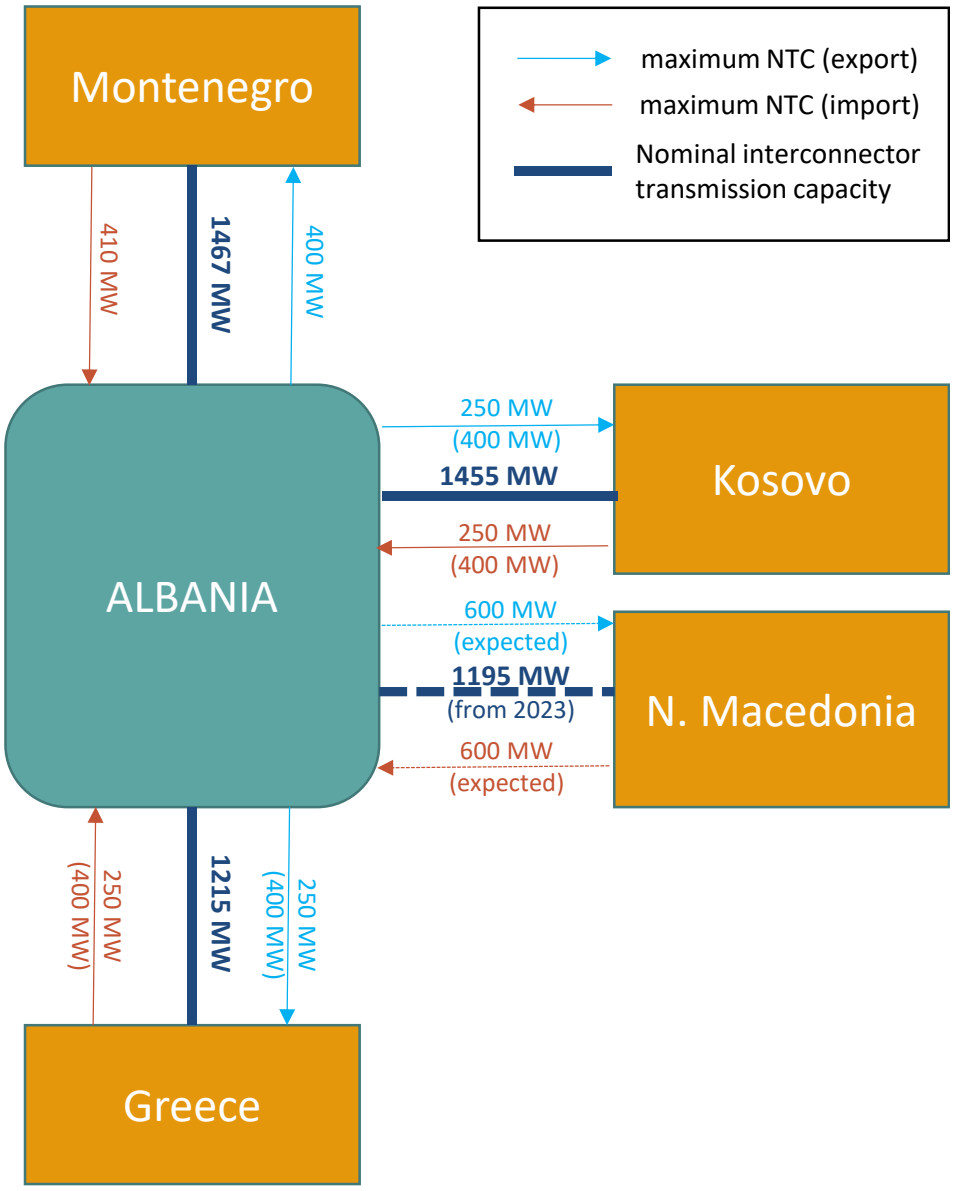



Figure 72: Interconnector capacities. Source: Energy Community Secretariat 2021

For the calculation of the interconnectivity target, the NTC in import direction is put in relation to the renewable power generation capacity. As shown in Table 30, it follows that the interconnection target of 15% until 2030 has been reached already and will continue to be reached at least until 2030 in the scenario with existing measures.

| Year | 2019 | 2021 | 2030 | 2040 |
|---|---|---|---|---|
| Renewable Capacity (MW) | 2 343 | 2 623 | 3307 | 3 307 |
| Max NTC Import (MW) | 910 | 1 210 | 1 810 | 1 810 |
| Interconnection Level | 39% | 46% | 55% | 55% |

Table 30: Interconnection level as calculated for the scenario with existing measures

*ii. Projections of interconnector expansion requirements (including for the year 2030)*

The only neighbouring country currently not connected to the Albanian transmission network via interconnectors is North Macedonia (apart from Italy). In February 2020, an agreement has been signed for the construction of a 400 KV transmission line with a maximum active power of 1195 MW from Fier through Elbasan to Bitola in North Macedonia. The connection will support the potential to build a regional energy market in South East Europe and create trading opportunities with countries between Bulgaria and Italy.

### 4.5.2 Energy transmission infrastructure

*i. Key characteristics of the existing transmission infrastructure for electricity and gas*

To date, Albania does not have a natural gas transmission infrastructure. However, the Transadriatic Pipeline (TAP) has started operation in late 2020 and connects Italy, Albania and Greece to the Trans-Anatolian Pipeline in Turkey and the South Caucasus Pipeline in Azerbaijan and Georgia. This way, the pipeline can deliver up to 10 billion cubic metres of natural gas from Azerbaijani gas fields to Italy, Albania, Greece and (through an additional interconnection point) to Bulgaria. Due to no existing infrastructure, by the time of writing (April 2021), natural gas from the pipeline has not been used in Albania. The following analysis is therefore confined to the electricity transmission infrastructure. Information stems mainly from the Albanian Transmission Network Development Plan by the transmission network operator OST (OST 2018).

The Power Transmission System of Albania operates fifteen Substations (400 kV, 220 kV, and 150 kV) as well as

445.7 km of 400 kV lines,

1250 km of 220 kV lines, 3

4.4 km of 150 kV line and

1606.7 km of 110 kV lines.

The main hydroelectric power plants of “Drin River Cascade” (Fierza, Koman and Vau Dejës) in the Northern part of Albania are connected in the 220 kV transmission network, which is also the main connection to the biggest load in the area of Tirana, Elbasan, Durrës and Fier. The 110 kV network covers all urban areas of the country in order to supply the Distribution System that nowadays is operated by OSHEE and is 100% state owned. (OST 2018)

More than 70% of the total generated installed capacity is connected in the 220 kV network. Autotransformers 220/400 kV have a capacity of 1200 MVA and the 110 kV grid is connected with the 400 kV Rings by two 150 MVA Autotransformers installed in the south-eastern part of the network in Zemblak Substation.

Transmission of electricity from the main sources of generation to the major centres of consumption is done through the 220 kV grid and further through the 220/110 kV transformation (2390 MVA). The 110 kV network that supply all the 110 kV substations previously represented the main load nodes while actually are connected around 20% of the installed generation capacity (OST 2018).

Figure 73 shows the principal structure of the transmission network in Albania.

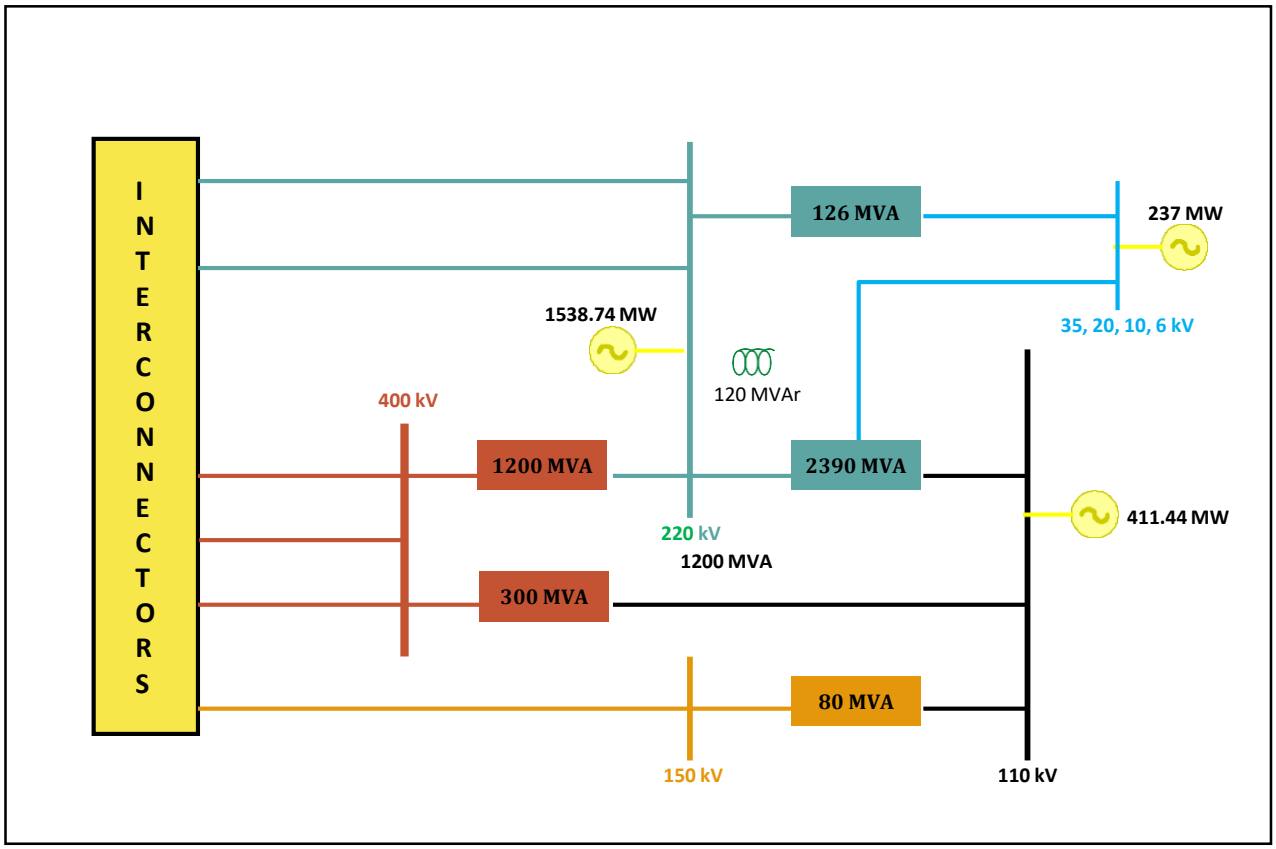



**Figure 73: Albanian Transmission System Structure: Source: OST 2018**

*ii. Projections of network expansion requirements at least until 2040 (including for the year 2030)*

During recent years important projects have been realized that have significantly reduced the share of non-served electricity and the transmission losses. From 2005 to 2017, electricity losses in the transmission networks have fallen from 4.56% to 2.08%. This number does not include distribution grid losses (OST 2018).

According to model calculations from the scenario with existing measures, the annual increase in energy demand amounts to one to two percent between 2019 and 2040. In sum, electricity demand increases from 512 ktoe in 2019 to 533 ktoe in 2030 and 621 ktoe in 2040. At the same time, production capacities increase from 2343 MW in 2019 to 2965 MW in 2030 and 3228 MW.

Transmission networks have to follow the rising load and expansion and further increases in efficiency are necessary. The Albanian Network Development (OST 2018) plan foresees a number of projects for improving transmission networks as presented in Table 30.

| Project | Benefits |
|---|---|
| Extension of Koman Substation, with a new AT-345 MVA 400/220 kV, 400 kV double busbar and two 400 kV line bays. | • This investment is necessary to enable a better balance between the 220 kV and 400 kV grids by distributing the power flows generated by Koman HPP with the lowest losses;<br>• Significant improvement will also be felt in the voltage profile during good hydrology. |

| | |
|---|---|
| New 220 kV Double Circuit Transmission Line Tirana2 – Rrashbull | • This project is crucial for the Albanian transmission system because it relates to the following problems; existing line loaded at maximum, N-1 security criteria not fulfilled, high transmission losses, and significant amounts of non-served electricity.<br>• Will improve the supply of electricity in a very broad geographical area that includes the district of Durres, Kavaja and throughout the southern part of Albania.<br>• The project fulfills the requirements of the Albanian and European legislation regarding the environment protection.<br>• The proposed investment is expected to have a positive impact on the total economy and to improve the quality of life for the Albanian population.<br>• The project will increase opportunities for tourism development due to the improved power supply. |
| Construction of the 400/110 kV Tirana3 Ss and reinforcement of 110 kV Tirana Ring | • Transit of the flow from 400 kV interconnection grid to 220 kV national grid;<br>• Increase the security of system operation;<br>• Transit of the flow from 400 kV interconnection grid to 220 kV national grid;<br>• Increase the security of system operation considerably;<br>• Greater quality of electricity supply as well as a more reliable supply for the Tirana area;<br>• Decrease the losses in the transmission network;<br>• Reduction of the non-served electricity.<br>• The project fulfills the requirements of the Albanian and European legislation regarding the environment protection. |

**Table 31: Ongoing and planned transmission network projects. Source: OST 2018**

### 4.5.3 Electricity and gas markets, energy prices

*i. Current situation of electricity and gas markets including energy prices*

Electricity and gas markets are described in the respective section in chapter 1.

As the power exchange is not yet operational, there is no reference for electricity spot prices. Only bilateral trades are happening for the moment. Concerning the retail market, the electricity price for the vast majority of customers is still regulated under a public service obligation.

Concerning the gas price, there is, for the moment, no retail market for gas.

*ii. Projections of development with existing policies and measures at least until 2040*

Under development

## 4.6. Dimension research, innovation and competitiveness

*i. Current situation in the low-carbon-technologies sector and, to the extent possible, its position on the global market (that analysis has to be carried out at Union or global level)*

Albania participated in Horizon 2020 and participates in Horizon Europe. Based on these agreements, research organisations and companies have been participating successfully in relevant projects.

*ii. Current level of public and, where available, private research and innovation spending on low-carbon-technologies, current number of patents and current number of researchers*

At national level, there is no specific programme on research and development of specific low-carbon technologies. With regard to the private sector, information about private research and innovation spending on low-carbon-technologies, the current number of patents and current number of researchers is not available.

*iii. Breakdown of current price elements that make up the main three prices components (energy, network and taxes/levies)*

The following tables gives the breakdown of energy price components as well the current tariffs. An exchange rate of 1 EUR = 123.8 ALL is used in all tables.

| | | Average electricity prices in EUR/kWh | | | | |
|---|---|---|---|---|---|---|
| **Consumer Type** | **Voltage level** | **Energy and Supply** | **Network Costs** | | **VAT Excluded** | **VAT Included** |
| | | | **Transmission** | **Distribution** | | |
| **Private supplied from Last Resort Supplier** | **35 kV** | 0.071 | 0.006 | 0.012 | 0.090 | 0.108 |
| **Private** | **20 kV** | 0.051 | 0.006 | 0.032 | 0.089 | 0.107 |
| **Private** | **10/6 kV** | 0.044 | 0.006 | 0.039 | 0.089 | 0.107 |
| **Bakeries, wheat production** | **10/6 kV** | 0.013 | 0.006 | 0.039 | 0.057 | 0.069 |
| **Private** | **0.4 kV** | 0.068 | 0.006 | 0.039 | 0.113 | 0.136 |
| **Bakeries, wheat production** | **0.4 kV** | 0.017 | 0.006 | 0.039 | 0.061 | 0.074 |
| **Households** | **LV** | 0.032 | 0.006 | 0.039 | 0.077 | 0.092 |

**Table 32: Energy price components for average electricity prices**

| | | Average electricity prices during peak hours in EUR/kWh | | | | |
|---|---|---|---|---|---|---|
| **Consumer Type** | **Voltage level** | **Energy and Supply** | **Network Costs** | | **VAT Excluded** | **VAT Included** |
| | | | **Transmission** | **Distribution** | | |
| **Private supplied from Last Resort Supplier** | **35 kV** | 0.093 | 0.006 | 0.012 | 0.111 | 0.134 |
| **Private** | **20 kV** | 0.065 | 0.006 | 0.032 | 0.102 | 0.123 |
| **Private** | **10/6 kV** | 0.057 | 0.006 | 0.039 | 0.102 | 0.123 |
| **Bakeries, wheat production** | **10/6 kV** | 0.021 | 0.006 | 0.039 | 0.066 | 0.079 |
| **Private** | **0.4 kV** | 0.085 | 0.006 | 0.039 | 0.130 | 0.156 |
| **Bakeries, wheat production** | **0.4 kV** | 0.026 | 0.006 | 0.039 | 0.071 | 0.085 |
| **Households** | **LV** | 0.032 | 0.006 | 0.039 | 0.077 | 0.092 |

Table 33: Energy price components for electricity during peak demand

| Type of activity: | Approved tariff |
|---|---|
| Electricity transmission service tariff | ALL 0.75/kwh |
| Distribution service tariff at 35 kV voltage level | ALL 1.5 /kwh |
| Distribution service tariff at voltage level 20 kV | ALL 3.9 /kwh |
| Average tariff of the delivery service fee | ALL 4.79 /kwh |
| Sale price for Customers at 20 kV | ALL 11 /kwh<br>at peak load ALL 12.65 /kwh |
| Sales price for Customers at 10/6 kV | 11 ALL/kwh<br>at peak load 12.65 ALL/kwh |
| Tariff for natural gas transmission service | 28 ALL/$m^3$ or 2.64 ALL/kwh |

Table 34: Tariffs approved by ERE, the Albanian Energy Regulatory Authority

### *iv. Description of energy subsidies including fossil fuels*

## Subsidies for fossil fuels

Power generation in Albania relies exclusively on hydropower and this trend shall continue in the short term. There is no dependency on the coal or other fossil fuels on production of the electricity, which means that there is no need for subsidies for fossil fuels.

## Subsidies for renewable energy sources

In this regard, the policies for addressing the support schemes or the subsidy mechanisms are mainly oriented to promotion of the electricity production from RES. This policy is in compliance with the national target of reaching 38% of gross final energy consumption from RES by 2020.

Law 7/2017 "On promoting the use of energy from renewable sources (RES)" provides for the establishment of two types of financial support for RES-E:

- **The "Feed-in-Tariff",** this is the legal financial support scheme for the purchase price of the energy produced by RES with limited generating capacity up to 2 MW for PV plants and up to 3 MW for wind farms. These projects are approved by the Minister according to the procedures of DCM 822/2015, as amended "On the approval of the rules and procedures for construction of the new electricity production capacities, which are not object of concession". The methodology approved by DCM 369, dated 26.4.2017 "On the approval of the methodology for the determining the price of the purchase of the electricity produced from small renewable sources from the sun and wind", provides the approval from ERE of the fixed price that the producer will sell to OSHEE for 15 years.
- Setting the **"Feed-in-Premium"** (FiP tariff) - this is the legal financial support scheme for the purchase price of the energy produced from RES sources with installed generating capacity over 2 MW for PV plants and over 3 MW for wind farms.

The methodology of support schemes, according to the capacity of the RES plant, is approved by DCM 369/2017 based on the law no. 7/2017 "For the promotion of the using of the energy from the renewable sources (RES)".

- For PV plants of a capacity of up to 2MW there are applied the support schemes with adjusted feed-in tariff tariff (FiT). For the year 2017 the price has been 100 € / MWh. For the year 2018 and on this price has been revised at 71.2 Euro/Mwh.
- For the installed capacities of above 2MW the auction support scheme is applied based on CfD (Contracts for Difference) which proved to be attractive for the interested investors. This scheme has proved to be successful and the experience gained shall serve as a base to orient the pricing policies of such technologies in the future.
- For the wind energy plants of a capacity up to 3MW the support schemes are based on an adjusted feed-in-tariff (FiT). For 2017 the price has been set at 76 €/MWh and there is no other decision from the ERE for 2018-2020. For the installed capacities over 3MW the auction support scheme must be applied which and being provided through a CfD. An auction for wind capacity has been launched in the second quarter of 2021.

For small hydropower plants up to 15 MW, the regulator is setting a FiT price each year promote the RES energy production capacities /works, as a direct commitment to subsidize clean energy, versus imports which are considered as energy of fossil origin as a mechanism to reach the target of 38% of net contribution of RES to the final consumption by end of 2020.

According to the INSTAT data for the year 2019 the electricity being produced from PV plants represents approximately 0.43% of the total domestic production or 0.29% of the total electricity consumption for this year. In 2019 there is no contribution from the wind farms despite a considerable number of permissions being approved (the 2019 is the first year the other sources of renewables are contributing to the net domestic production of electricity).

## Subsidies /support schemes in the agriculture sector

In Albania, the subsidies applied for fossil fuels are limited. For the year 2021, a subsidy scheme is going to be applied in the agriculture sector for certain categories of agriculture products. The decision also determines the norms of oil consumption per hectare for all these groups and subgroups that oil will be provided free of charge, which according to the Council of Minister decision consists in:

- exemption from the excise tax (37 ALL /lt) (/eq. 0.299 euro)

- exemption from the turnover tax (27 ALL /lt) (/eq.0.218 euro);
- exemption from the carbon tax (3 ALL /lt); (eq.0.0024 Euro)
- exemption from the VAT (13.4 ALL /lt); (eq. 0.108 Euro).

In total, for 1 litre oil being used in the agriculture sector for the selected categories (field plants, fruit trees and vegetables) it will be paid 67 ALL or 54% less. The total fund that is planned to be used for the financing of the above-mentioned measures is one billion ALL (approx. 809 000 Euro) for the year 2021, of which 950 million ALL will be used for tax subsidy and 50 million ALL for the monitoring of the subsidy scheme.

The reference price for oil that is going to be used in the agriculture sector will be the average annual price 144 lek /liter (eq.1.163 Euro) as it is published by Public Procurement Agency (PPA) in the Bulletin of Public Notices.

# 5 ASSESSMENT OF IMPACTS OF PLANNED POLICIES AND MEASURES

## 5.1 Impacts of planned policies and measures, including comparison to projections with existing policies and measures

This section addresses Impacts of planned policies and measures described in section 3 on energy system and GHG emissions and removals, including comparison to projections with existing policies and measures (as described in section 4).

Albania has a number of planned additional measures in all sectors as described in detail in chapter 3. This chapter presents outcomes of projections with the planned additional measures on an overall and sectoral level.

In analogy to chapter 4, for better readability, these figures show values for historic trends from the year 2016 to 2018, followed by projections for the years up to 2030, as well as projected values for 2035 and 2040. Where appropriate, figures show absolute values, scenario comparisons and breakdowns of subcategories for the differences between the WEM scenario (With Existing Measures) presented in Chapter 4 and the WAM scenario (With Additional Measures, denoted 'WAM RE full capacity' in the following plots) presented in this chapter.

The WAM scenario considers that renewable energy plants run full capacity independently from electricity demand in the country. This builds on a liquid market and a high interconnection level. As renewable electricity comes with no or limited running costs, there is always a buyer for electricity. To analyse the effect of this assumption, this document in some cases also shows the results for an alternative scenario in which renewable power generators run to meet domestic demand only. This scenario is then called 'WAM RE to meet demand'. Note that in most cases, this setup has no influence on results as the surplus electricity is simply exported. The renewable power plants do not lead to emissions and do not influence the energy demand. Main influence of this setup is on the renewable energy share, both in primary and final energy.

*i. Projections of the development of the energy system and GHG emissions and removals as well as, where relevant of emissions of air pollutants in accordance with Directive (EU) 2016/2284 under the planned policies and measures at least until ten year after the period covered by the plan (including for the last year of the period covered by the plan), including relevant Union policies and measures*

*Dimension Decarbonisation*

In terms of GHG emissions, the WEM scenario leads to total emissions of 12.6 Mt CO2eq in 2030, whereas the values in WAM reach 10.2 Mt CO2eq, which corresponds to a reduction of 18.7% relative to WEM values. Table 35 shows an overview of values for WEM and WAM. In comparison with the base year 2018, WAM entails a reduction of emissions of 6.1% in 2030, with an increase of emissions seen in the years after 2030, reaching values just above 2018 in 2040 (plus 4.0%). The WEM scenario sees an increase of emissions by 15.4% in 2030 and an increase by 30.5% in 2040. Table 17 lists the historic values shown in the figures as well as projections for 2020, 2025, 2030, 2035 and 2040.

| Branch | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| **WAM** | | | | | | | | |
| **Demand** | 3903.9 | 4331.4 | 4396.3 | 4344.0 | 4665.0 | 4833.0 | 5138.3 | 5548.7 |
| **Transformation** | 181.7 | 220.4 | 179.0 | 199.2 | 250.8 | 250.8 | 250.8 | 250.8 |
| **Non Energy** | 6253.7 | 7056.3 | 6314.6 | 6365.2 | 5885.4 | 5139.0 | 5329.1 | 5523.9 |
| **Total WAM** | 10339.3 | 11608.1 | 10889.9 | 10908.5 | 10801.2 | 10222.8 | 10718.1 | 11323.4 |
| **WAM reduction relative to 2018 [%]** | | | | 0.17% | -0.81% | -6.13% | -1.58% | 3.98% |
| **WEM** | | | | | | | | |
| **Demand** | 3903.9 | 4331.4 | 4396.3 | 4346.4 | 4963.6 | 5507.8 | 6025.9 | 6636.8 |
| **Transformation** | 181.7 | 220.4 | 179.0 | 199.2 | 250.8 | 250.8 | 267.8 | 372.7 |
| **Non Energy** | 6253.7 | 7056.3 | 6314.6 | 6365.2 | 6721.6 | 6811.3 | 7001.3 | 7196.2 |
| **Total WEM** | 10339.3 | 11608.1 | 10889.9 | 10910.9 | 11936.0 | 12569.9 | 13295.0 | 14205.7 |
| **WEM reduction relative to 2018 [%]** | | | | 0.19% | 9.61% | 15.43% | 22.09% | 30.45% |
| **Relative reduction (WAM minus WEM)** | | | | -0.02% | -9.51% | -18.67% | -19.38% | -20.29% |

**Table 35: GHG emissions ($CO_2$eq) for the whole economy in the WEM and WAM scenarios**

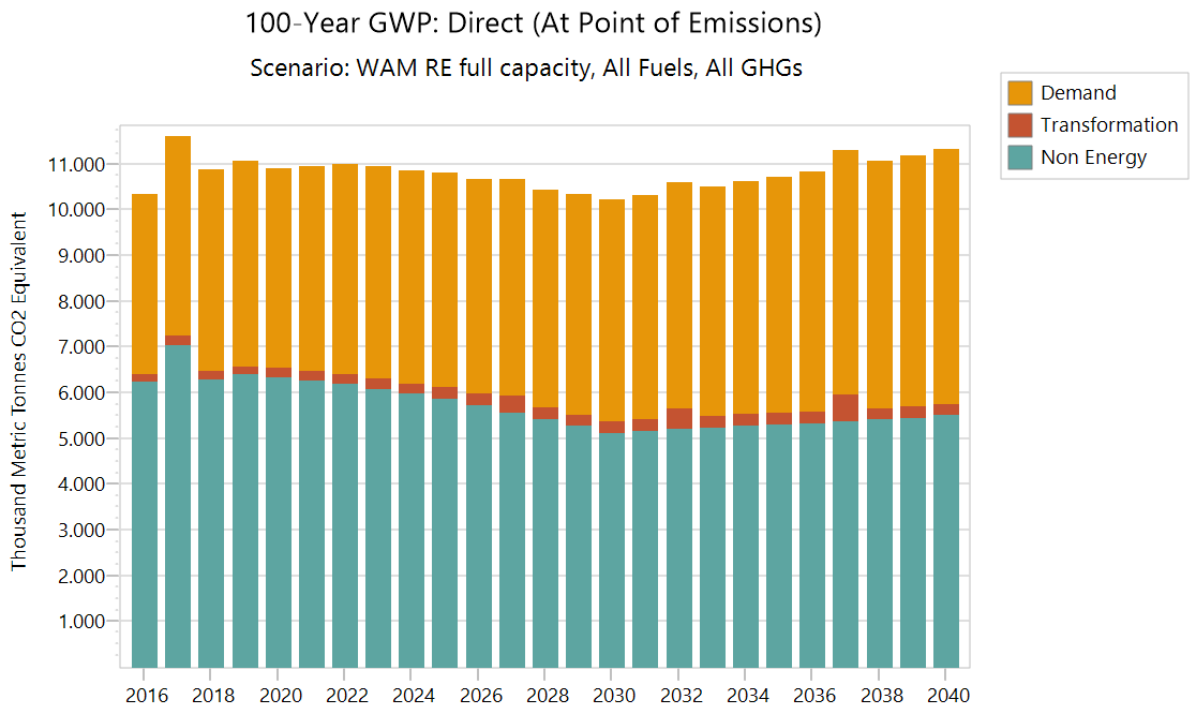



**Figure 74: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019-2040.**

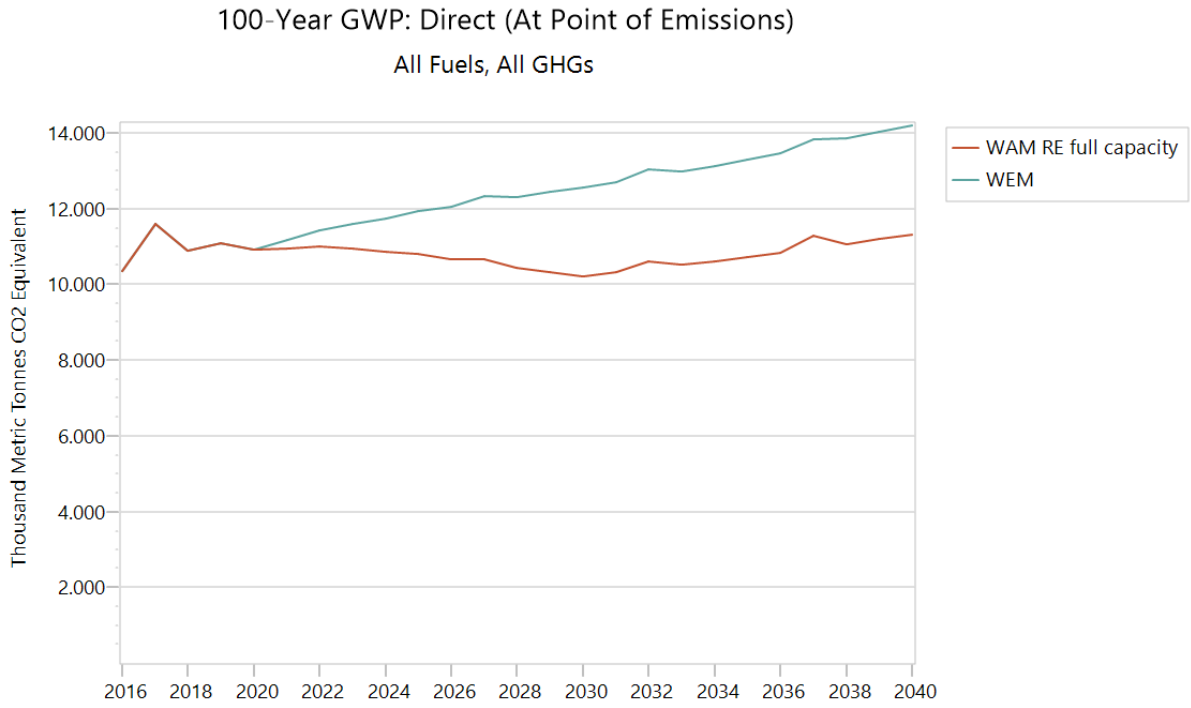



**Figure 75: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019-2040, WAM and WEM**

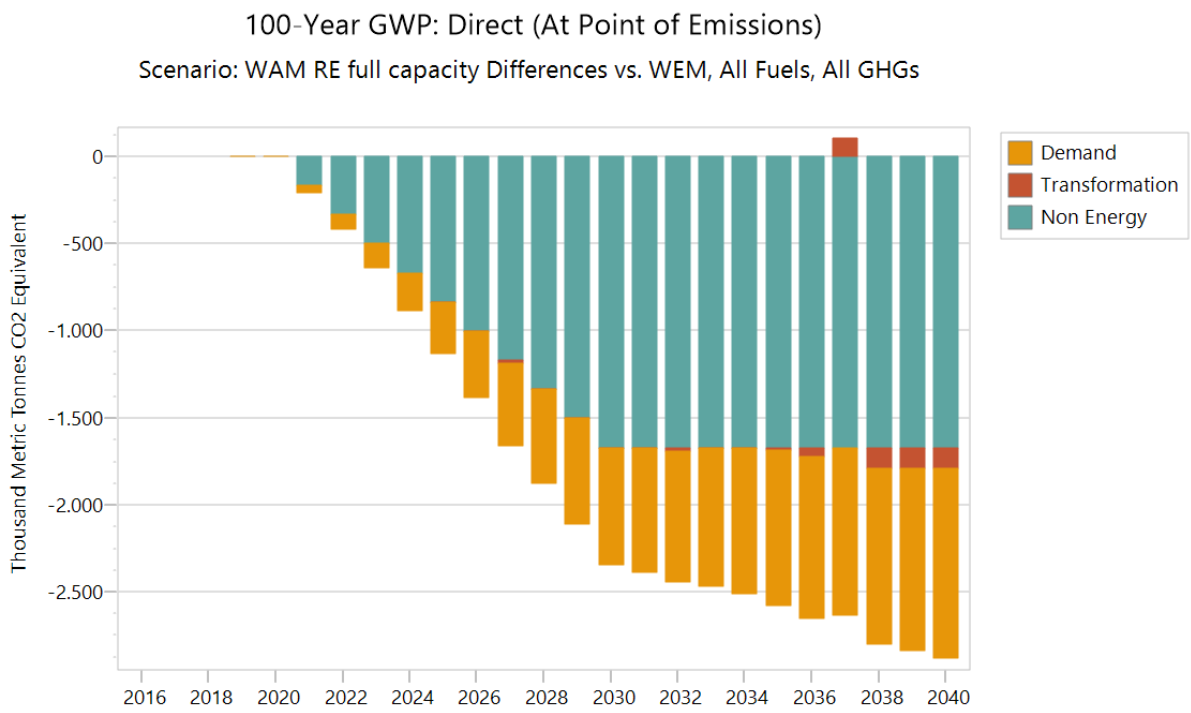



**Figure 76: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM and WEM broken down into subcategories.**

The following figures detail the direct GHG emissions from energy demand sectors. These are the direct emissions from energy use. The process emissions and the emissions due to energy transformation are

reported separately. The main source of direct emissions is the transport sector, which is not fully decarbonised by 2040. An increase in emissions is also seen in industry.

In the residential sector (Figure 80) a change in heating and cooking systems towards a higher electrification (heat pumps and direct electrification) together with a change in demand due to refurbishment and reconstruction lead to a drop in direct emissions. This is similar for the services sector (Figure 81), which sees falling emissions particularly in sectors where space heating is the main source of emissions. Emissions in industry (Figure 82) are lower than in WEM due to an increase in electrification, fuel switch and an increase in energy efficiency. Emissions from the transport sector (Figure 83) continue to rise also in the WAM scenario, though less than in WEM, due an increased electrification and shared transportation modes.

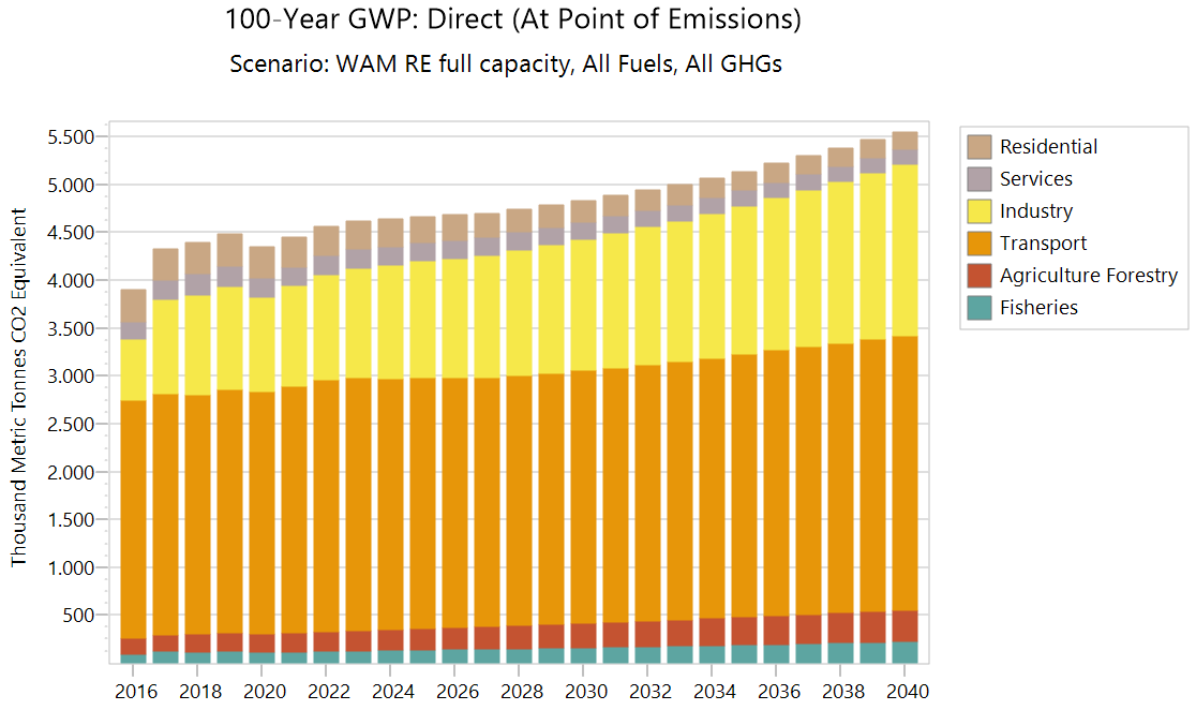



**Figure 77: Direct GHG emissions ($ktCO_2eq$) for energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040 with additional measures**

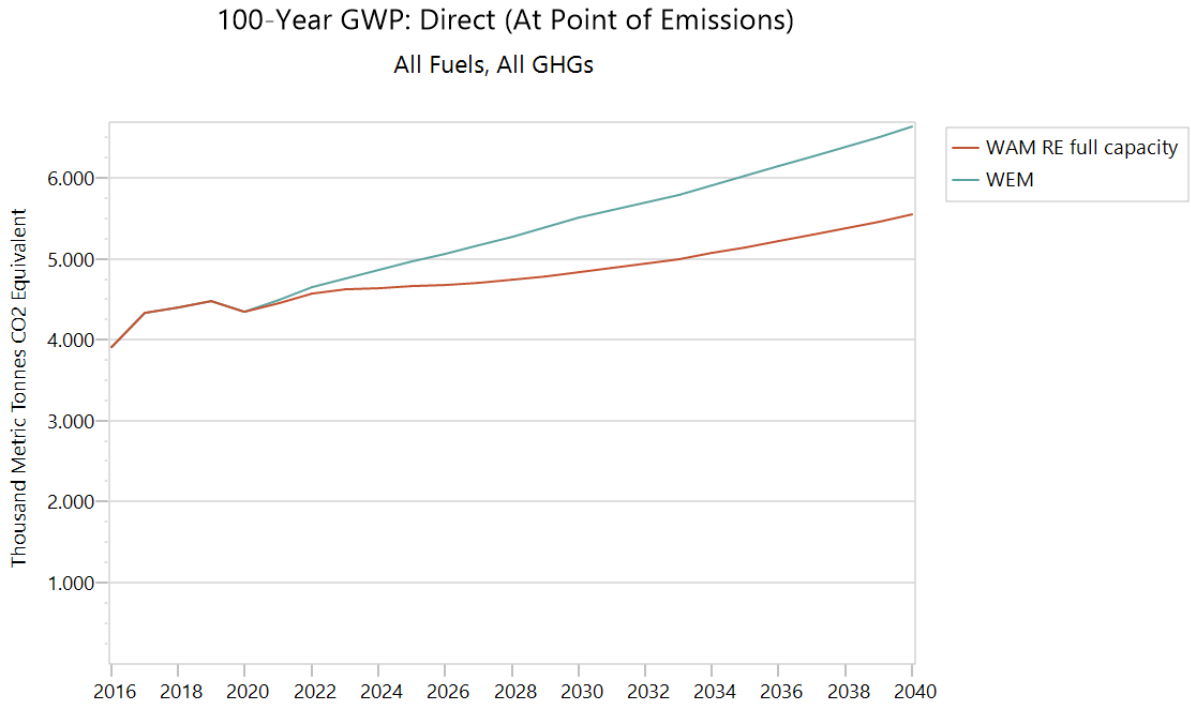



**Figure 78: GHG emissions (kt$CO_2$eq) for energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040 for WAM and WEM**

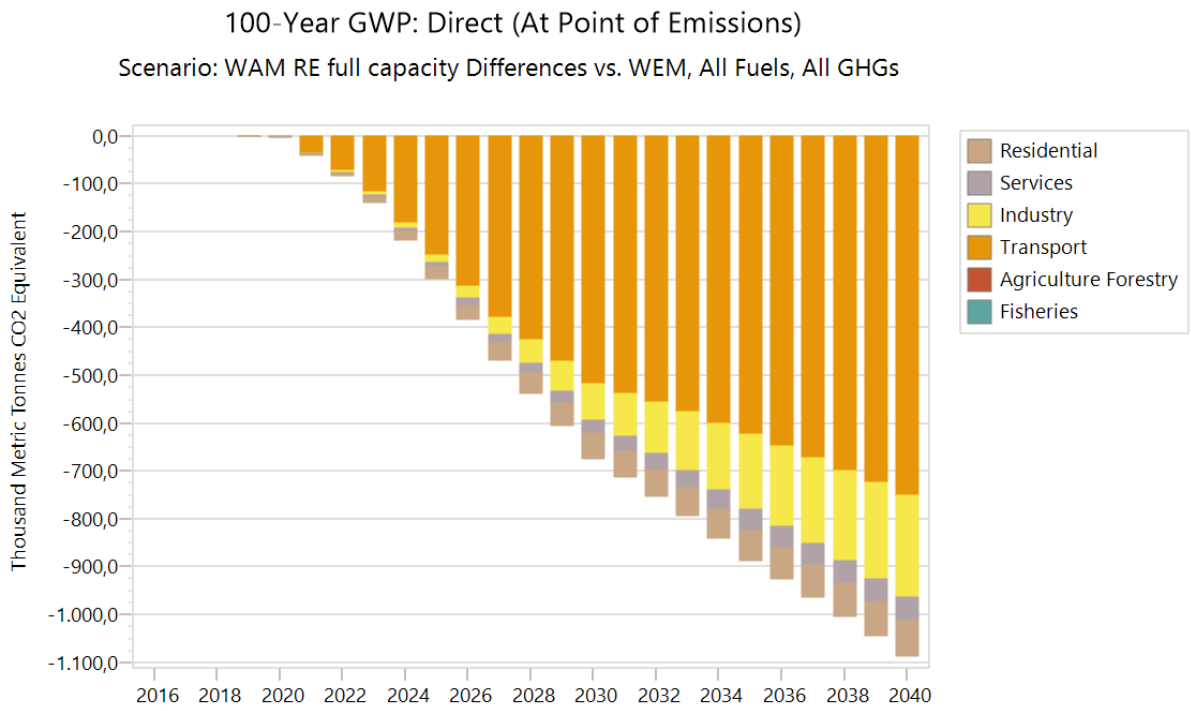



**Figure 79: GHG emissions (kt$CO_2$eq) for the energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM and WEM broken down into subcategories.**

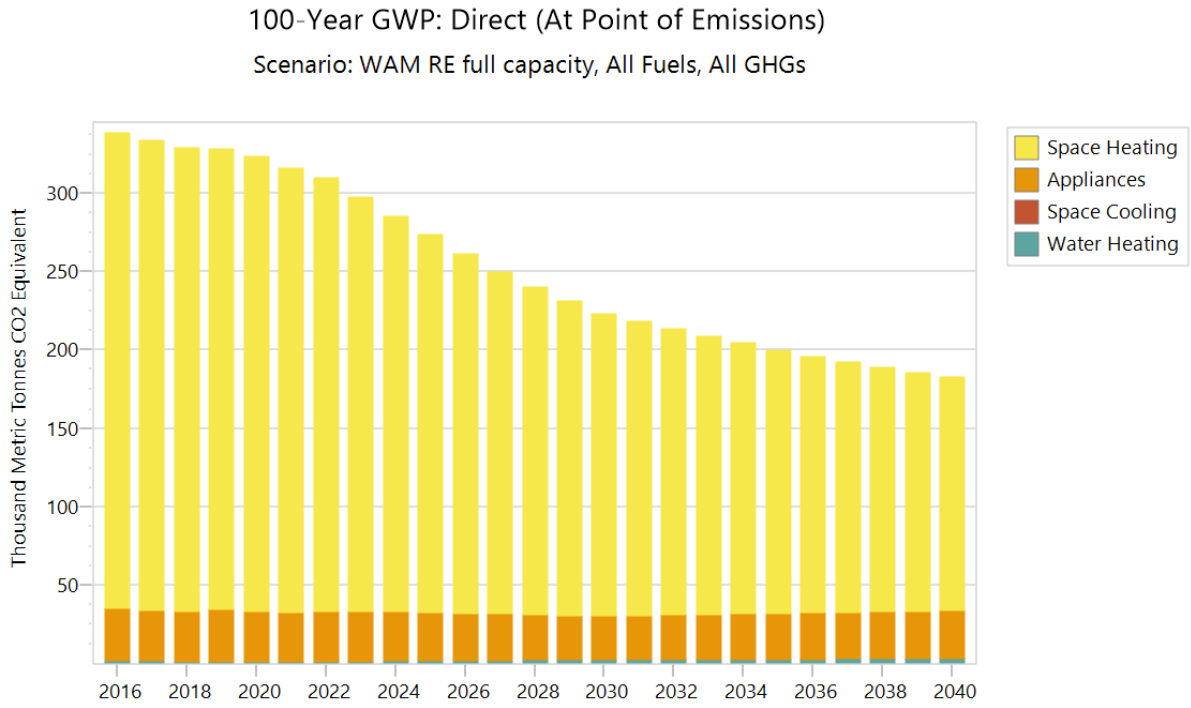



**Figure 80: Direct GHG emissions (kt$CO_2$eq) for the residential sector for the historic years 2016-2018 and as projected for 2019-2040**

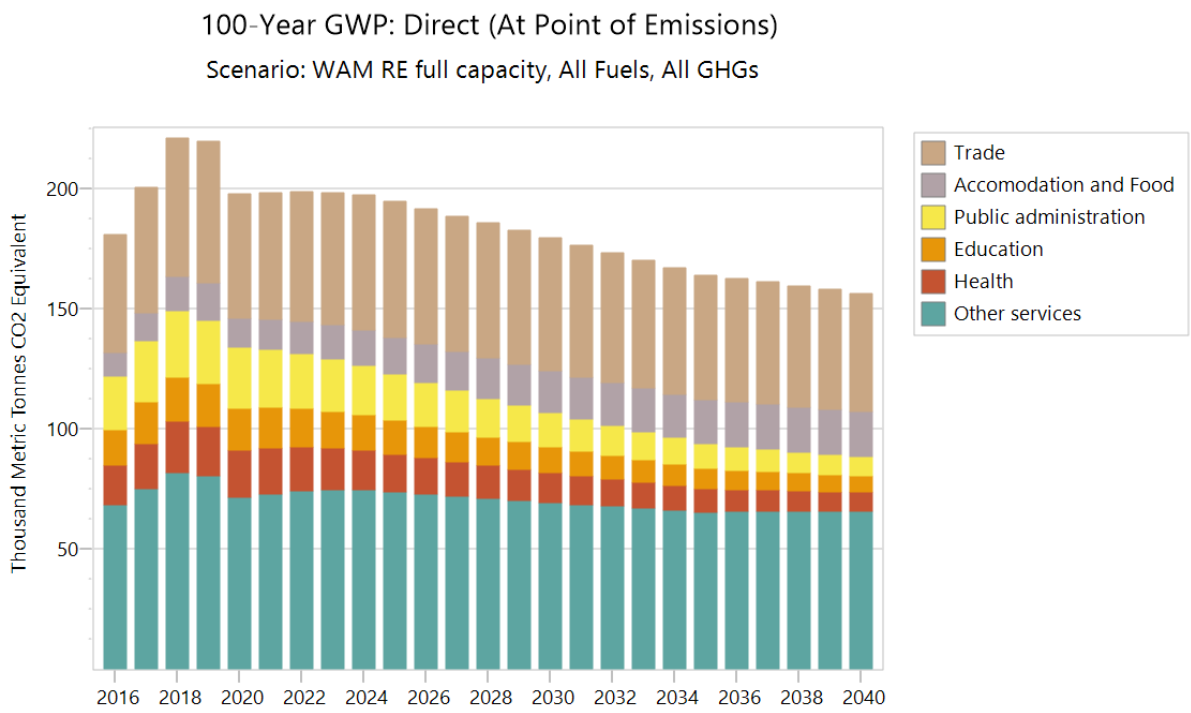



**Figure 81: Direct GHG emissions (kt$CO_2$eq) for the services sector for the historic years 2016-2018 and as projected for 2019-2040**

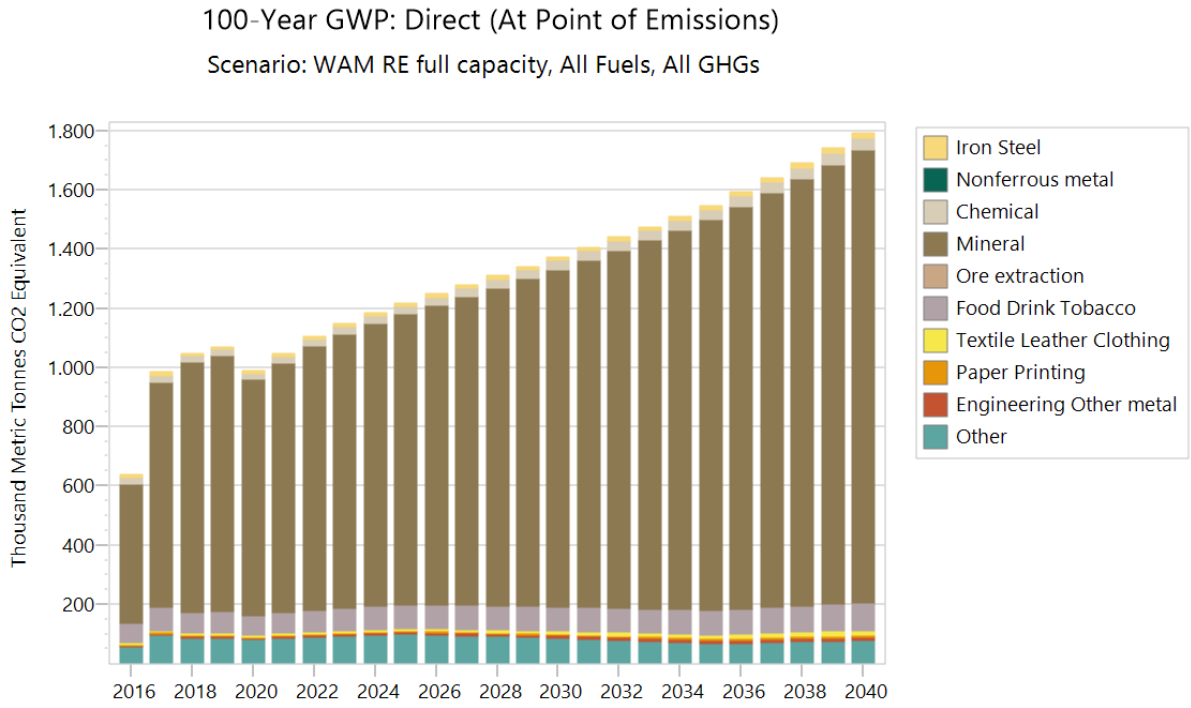



**Figure 82: Direct GHG emissions (kt$CO_2$eq) for industry (energy demand) for the historic years 2016-2018 and as projected for 2019-2040**

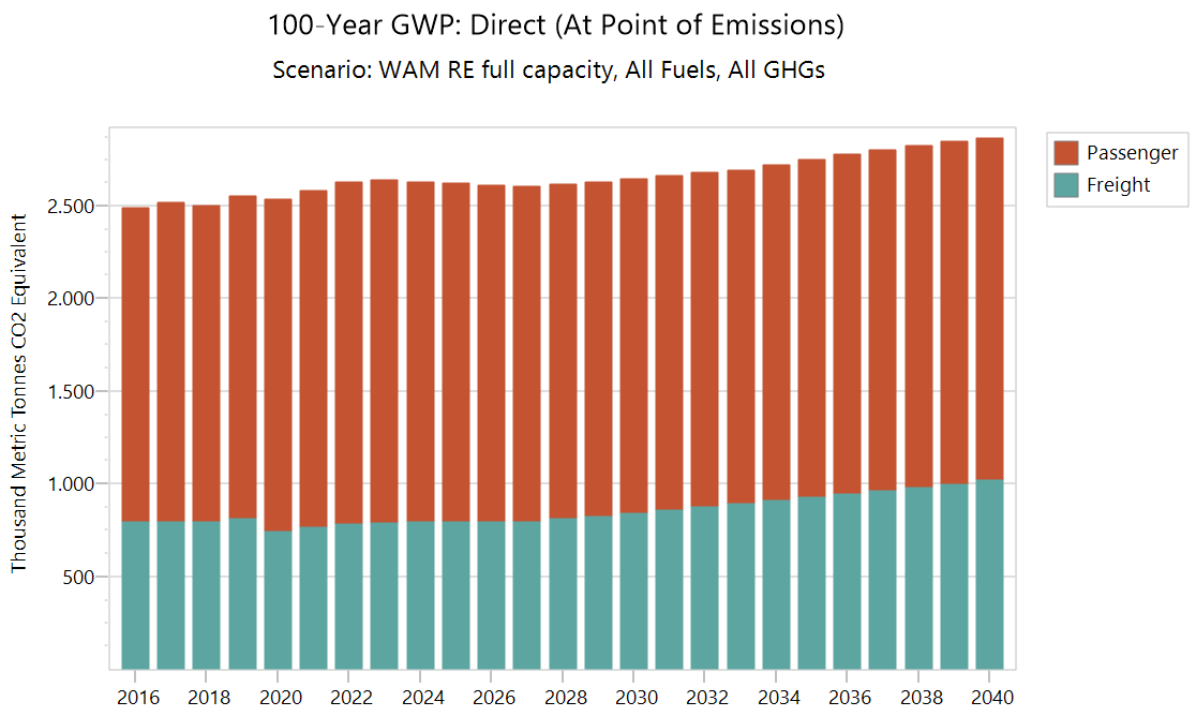



**Figure 83: Direct GHG emissions (kt$CO_2$eq) for the transport sector for the historic years 2016-2018 and as projected for 2019-2040**

The following figures show the direct GHG emissions from the transformation sector. This entails electricity generation from gas fired power plants as well as emissions from refineries. The spikes in emissions from electricity production in 2027 and every five years after can be explained by that these

years are modelled as dry years with low hydroelectric output. The newly commissioned natural gas power plant (WEM) fills the gap and generates the emissions. The emissions are reduced relative to WEM (Figure 85, Figure 86) as additional renewable power plants are commissioned in WAM.

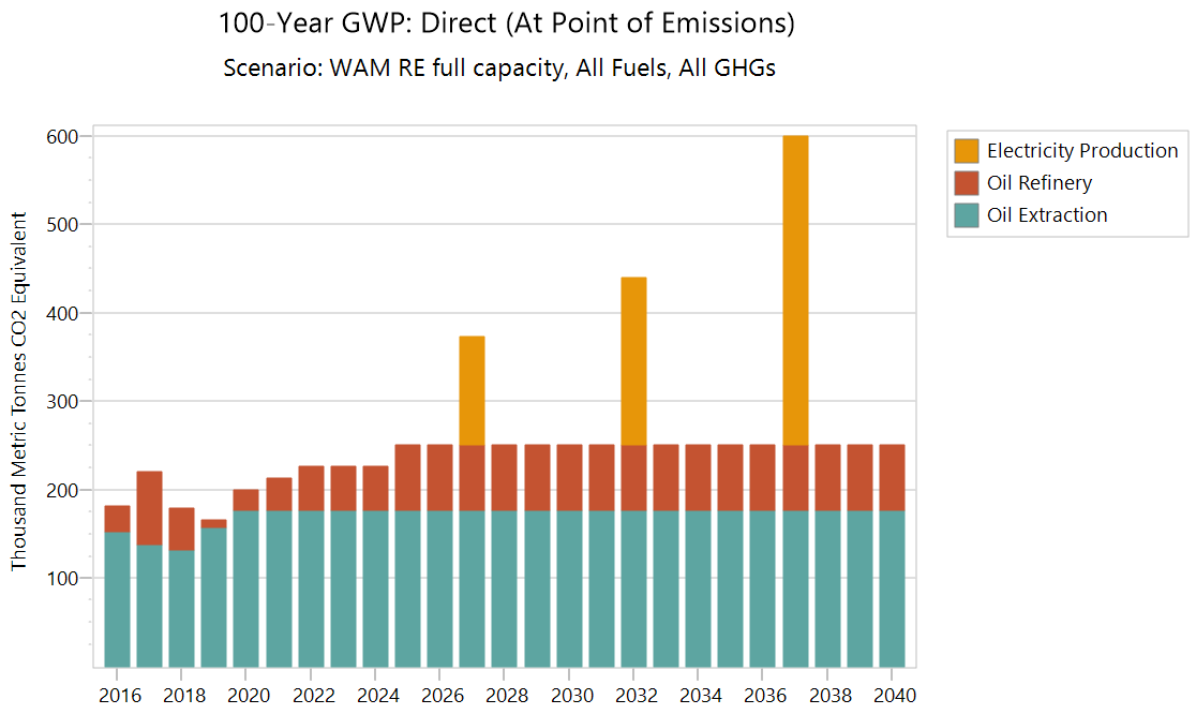



**Figure 84: Direct GHG emissions ($CO_2$eq) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040**

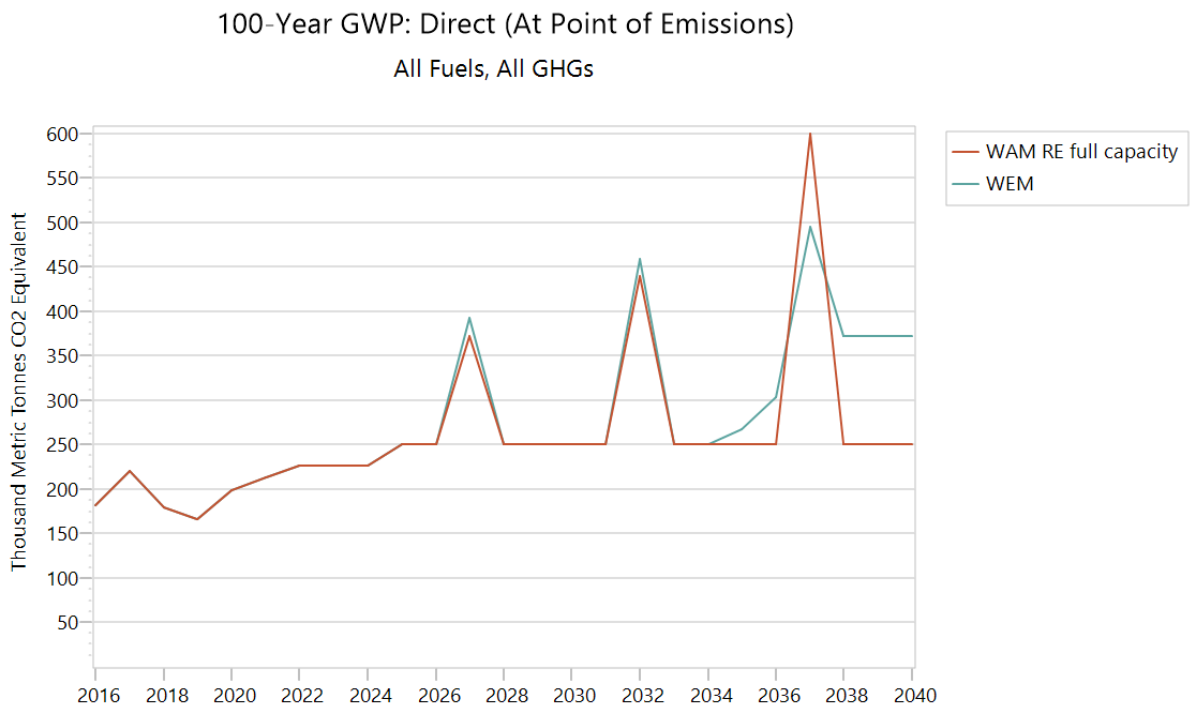



**Figure 85: GHG emissions ($CO_2$eq) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040 (WAM RE full capacity). Scenario comparison with the "with existing measures" scenario presented in Chapter 4.**

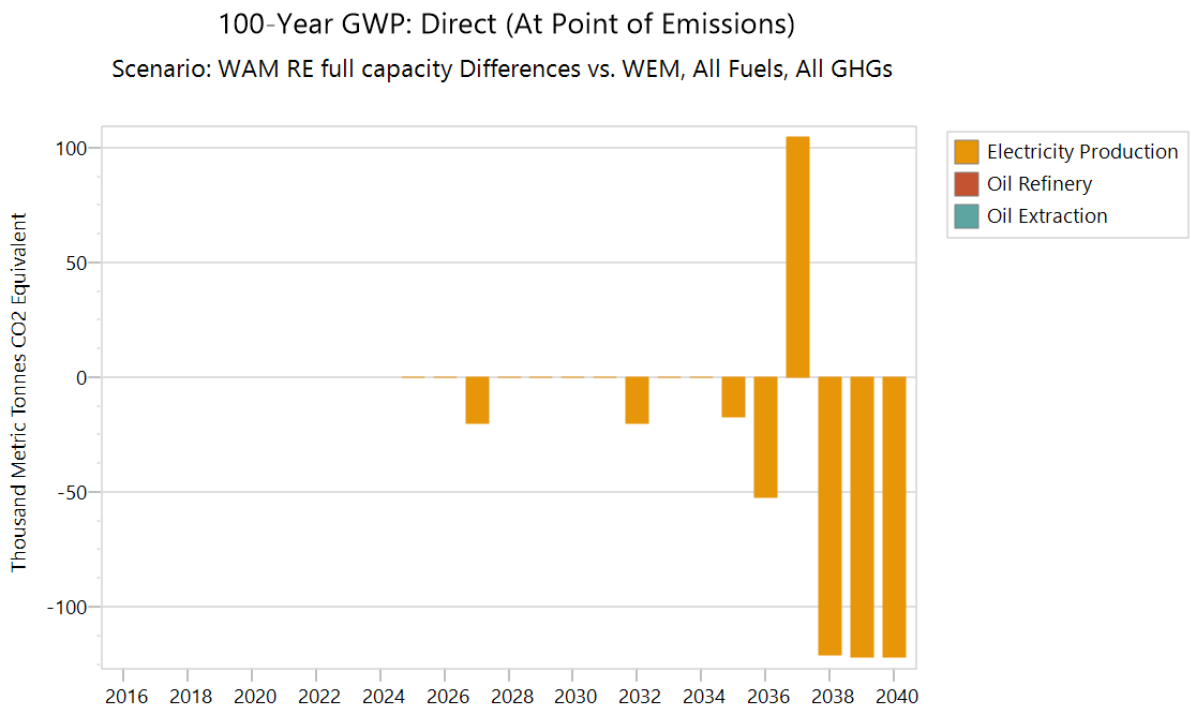



**Figure 86: GHG emissions ($CO_2$eq) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM and WEM broken down into subcategories.**

The figures below show non-energy related GHG emissions. Figure 87 gives an overview over IPPU, agriculture, LULUCF and waste emissions, which are displayed in more detail in the subsequent figures. The difference to WEM is determined by a change in LULUCF management, see also Figure 92. While the actual sink capacity stays constant, the emissions from forest management drop by two ambitious policies. The other subcategories show no difference to WEM emissions. An ambitious waste strategy has recently been adopted and is considered under WEM.

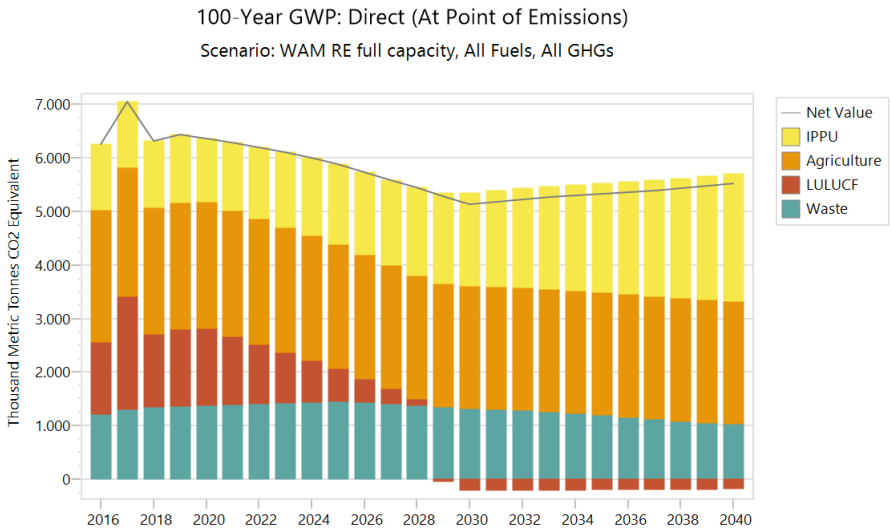



**Figure 87: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019-2040**

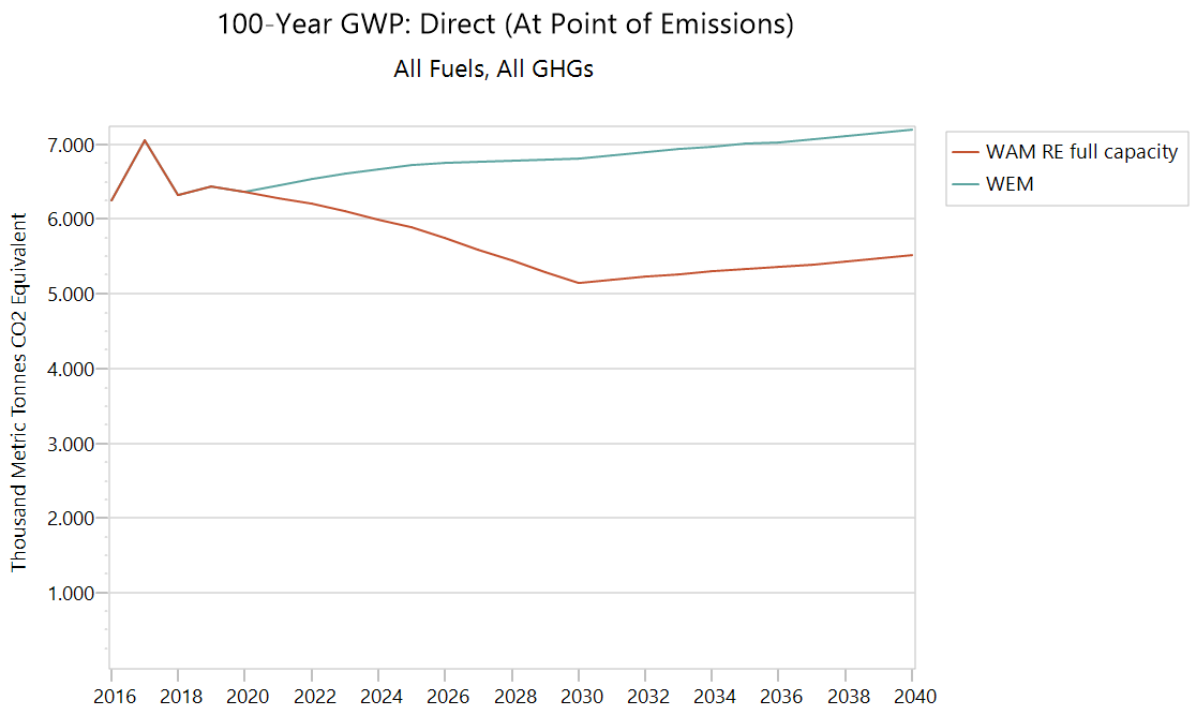



**Figure 88: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019-2040 for WAM and WEM**

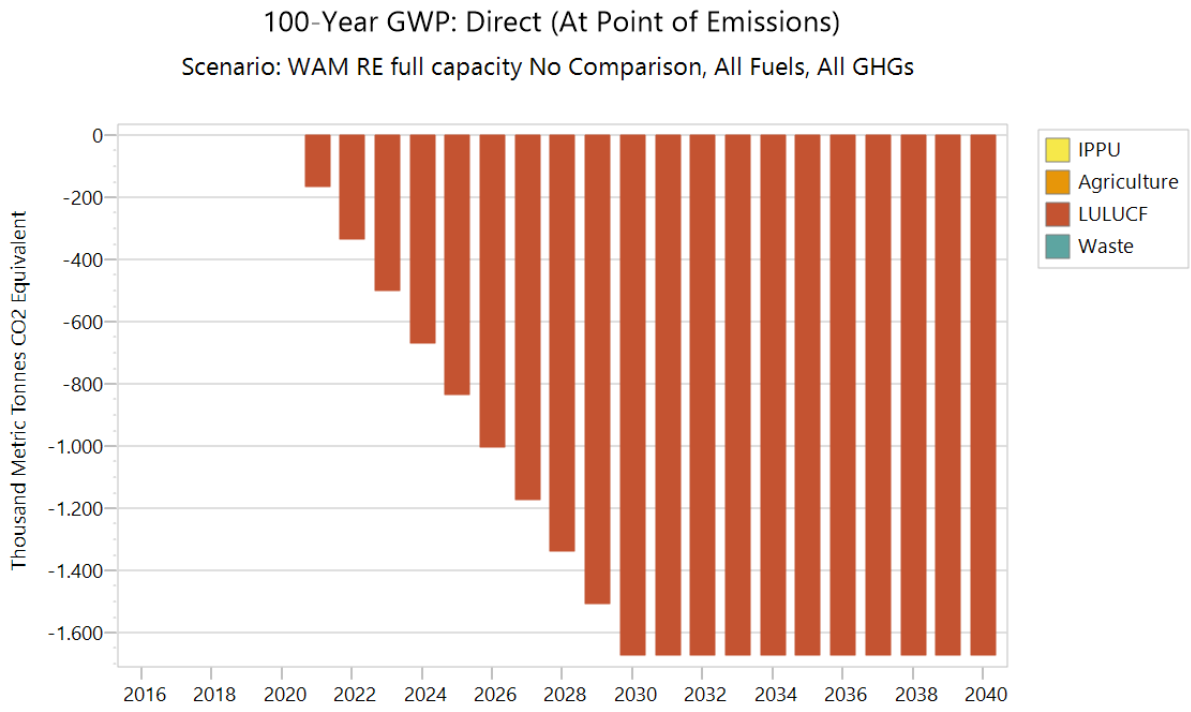



**Figure 89: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM RE full capacity and WEM broken down into subcategories.**

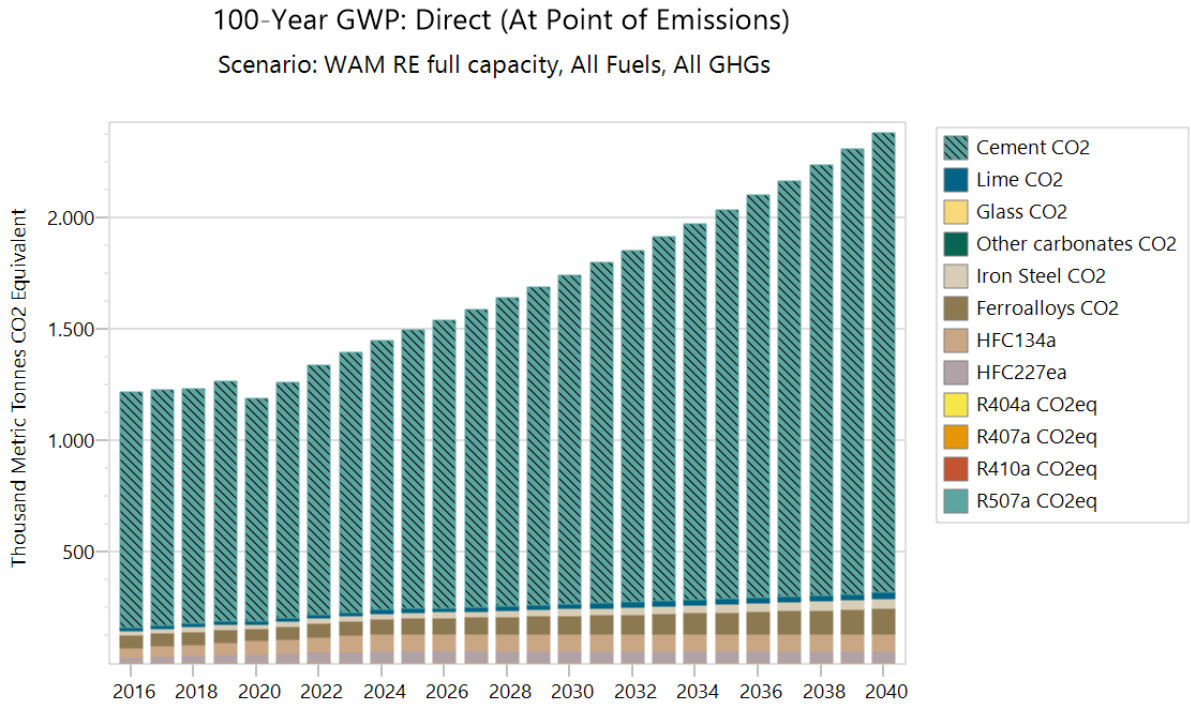



**Figure 90: GHG emissions ($CO_2$eq) from industrial processes and product use for the historic years 2016-2018 and as projected for 2019-2040**

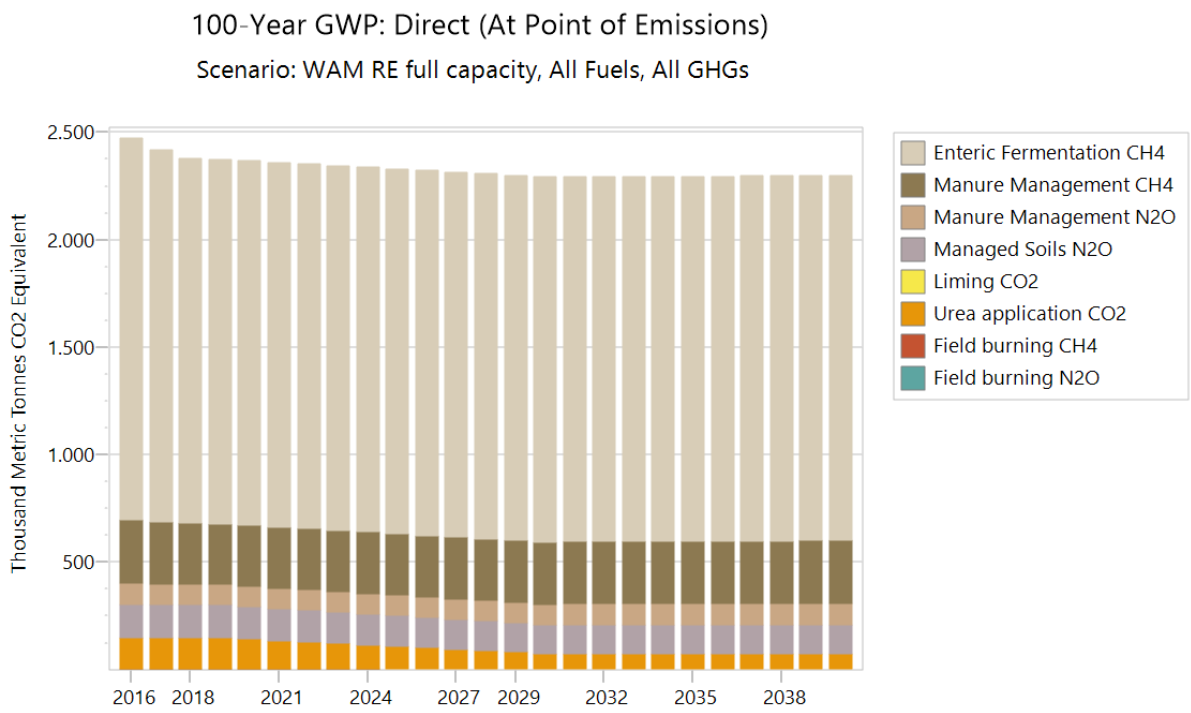



**Figure 91: Non-energy related GHG emissions ($CO_2$eq) from agricultural activities for the historic years 2016-2018 and as projected for 2019-2040**

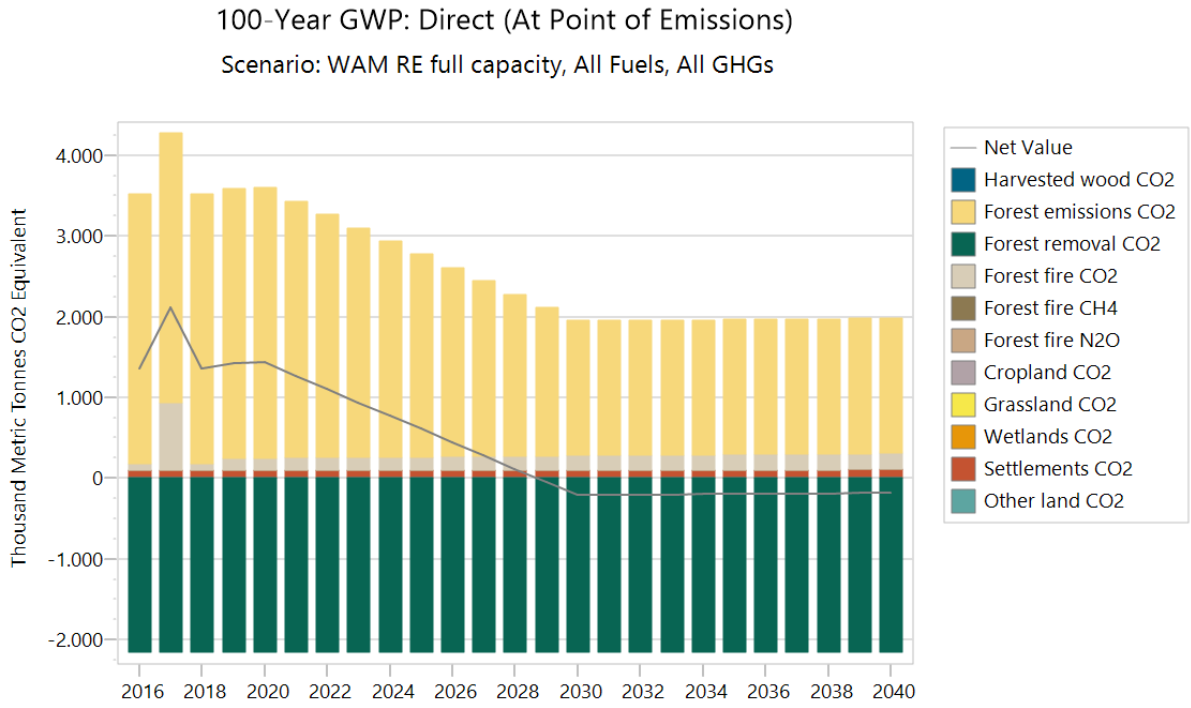



**Figure 92: Non-energy GHG emissions ($CO_2$eq) from land-use, land-use change and forestry (LULUCF) for the historic years 2016-2018 and as projected for 2019-2040**

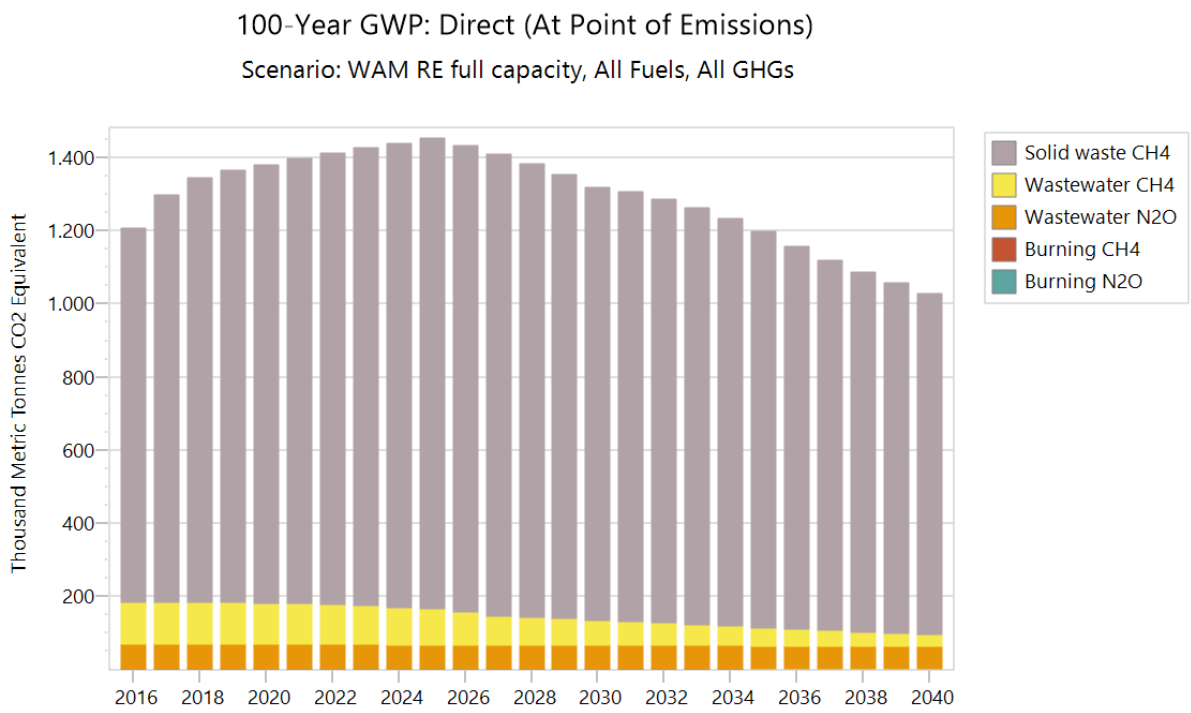



**Figure 93: Non-energy GHG emissions ($CO_2$eq) from the waste sector for the historic years 2016-2018 and as projected for 2019-2040**

The following table gives GHG emissions (kt$CO_2$eq, 100-year global warming potential) for different branches of the economy for the scenario with additional measures. Conversion factors of non-$CO_2$ emissions are given in Chapter 4.

| Branch | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| **WAM RE full capacity** | | | | | | | | |
| **Demand** | 3903.9 | 4331.4 | 4396.3 | 4344.0 | 4665.0 | 4833.0 | 5138.3 | 5548.7 |
| **Transformation** | 181.7 | 220.4 | 179.0 | 199.2 | 250.8 | 250.8 | 250.8 | 250.8 |
| **Non Energy** | 6253.7 | 7056.3 | 6314.6 | 6365.2 | 5885.4 | 5139.0 | 5329.1 | 5523.9 |
| **Total WAM** | 10339.3 | 11608.1 | 10889.9 | 10908.5 | 10801.2 | 10222.8 | 10718.1 | 11323.4 |
| **Demand** | | | | | | | | |
| **Residential** | 338.4 | 333.8 | 328.9 | 323.0 | 273.2 | 222.6 | 199.7 | 182.3 |
| **Services** | 180.9 | 200.7 | 221.2 | 198.1 | 194.7 | 179.5 | 163.9 | 156.5 |
| **Industry** | 637.3 | 985.9 | 1047.8 | 987.6 | 1217.8 | 1373.2 | 1547.2 | 1792.5 |
| **Transport** | 2487.4 | 2518.7 | 2497.4 | 2530.8 | 2620.1 | 2642.7 | 2747.9 | 2863.5 |
| **Agriculture Forestry** | 171.0 | 174.5 | 184.4 | 194.4 | 222.1 | 253.7 | 289.7 | 330.9 |
| **Fisheries** | 88.9 | 117.7 | 116.6 | 110.0 | 137.2 | 161.3 | 189.7 | 223.1 |
| **Total** | 3903.9 | 4331.4 | 4396.3 | 4344.0 | 4665.0 | 4833.0 | 5138.3 | 5548.7 |
| **Residential** | | | | | | | | |
| **Space Heating** | 303.6 | 300.1 | 296.4 | 290.4 | 240.9 | 192.9 | 168.2 | 149.0 |
| **Appliances** | 33.6 | 32.6 | 31.6 | 31.7 | 31.0 | 28.0 | 29.2 | 30.5 |
| **Space Cooling** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Water Heating** | 1.2 | 1.1 | 1.0 | 0.9 | 1.3 | 1.8 | 2.3 | 2.8 |
| **Total** | 338.4 | 333.8 | 328.9 | 323.0 | 273.2 | 222.6 | 199.7 | 182.3 |
| **Services** | | | | | | | | |
| **Trade** | 48.9 | 52.3 | 57.7 | 51.9 | 56.5 | 55.3 | 51.6 | 49.5 |
| **Accomodation and Food** | 10.0 | 11.8 | 14.2 | 12.0 | 15.3 | 17.4 | 18.4 | 18.7 |
| **Public administration** | 22.1 | 25.4 | 27.5 | 25.6 | 19.4 | 14.2 | 10.4 | 7.8 |
| **Education** | 15.1 | 17.3 | 18.6 | 17.4 | 13.9 | 10.8 | 8.5 | 6.8 |
| **Health** | 16.5 | 18.8 | 21.2 | 19.8 | 15.9 | 12.4 | 9.7 | 7.8 |
| **Other services** | 68.2 | 75.1 | 81.9 | 71.4 | 73.7 | 69.4 | 65.4 | 65.8 |
| **Total** | 180.9 | 200.7 | 221.2 | 198.1 | 194.7 | 179.5 | 163.9 | 156.5 |
| **Industry** | | | | | | | | |
| **Iron Steel** | 10.2 | 15.9 | 9.5 | 9.0 | 11.0 | 12.8 | 14.8 | 17.2 |
| **Nonferrous metal** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Chemical** | 21.5 | 22.9 | 22.2 | 21.0 | 25.8 | 29.9 | 34.7 | 40.2 |
| **Mineral** | 470.0 | 758.0 | 847.3 | 798.6 | 984.7 | 1140.8 | 1321.6 | 1531.1 |
| **Ore extraction** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Food Drink Tobacco** | 68.0 | 79.3 | 68.8 | 64.8 | 79.9 | 81.2 | 80.9 | 93.8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Textile Leather Clothing | 5.8 | 6.6 | 6.6 | 6.2 | 7.7 | 10.3 | 13.6 | 15.8 |
| Paper Printing | 3.8 | 4.3 | 4.3 | 4.0 | 5.0 | 5.8 | 6.7 | 7.8 |
| Engineering Other metal | 3.1 | 6.3 | 6.5 | 6.1 | 7.6 | 8.8 | 10.2 | 11.8 |
| Other | 54.7 | 92.8 | 82.6 | 77.9 | 96.0 | 83.6 | 64.7 | 75.0 |
| Total | 637.3 | 985.9 | 1047.8 | 987.6 | 1217.8 | 1373.2 | 1547.2 | 1792.5 |
| Transport | | | | | | | | |
| Passenger | 1691.4 | 1720.8 | 1697.9 | 1782.6 | 1823.9 | 1799.4 | 1817.6 | 1842.5 |
| Freight | 796.0 | 798.0 | 799.4 | 748.2 | 796.2 | 843.3 | 930.3 | 1021.0 |
| Total | 2487.4 | 2518.7 | 2497.4 | 2530.8 | 2620.1 | 2642.7 | 2747.9 | 2863.5 |
| Transformation | | | | | | | | |
| Electricity Production | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Oil Refinery | 29.1 | 81.8 | 47.4 | 22.1 | 73.7 | 73.7 | 73.7 | 73.7 |
| Oil Extraction | 152.6 | 138.6 | 131.6 | 177.1 | 177.1 | 177.1 | 177.1 | 177.1 |
| Total | 181.7 | 220.4 | 179.0 | 199.2 | 250.8 | 250.8 | 250.8 | 250.8 |
| Non-energy | | | | | | | | |
| IPPU | 1216.8 | 1224.9 | 1233.1 | 1186.5 | 1494.2 | 1742.1 | 2035.1 | 2381.4 |
| Agriculture | 2472.7 | 2415.0 | 2376.6 | 2366.6 | 2327.7 | 2290.1 | 2294.1 | 2298.4 |
| LULUCF | 1356.7 | 2117.9 | 1361.2 | 1431.6 | 609.6 | -212.4 | -198.1 | -183.8 |
| Waste | 1207.4 | 1298.4 | 1343.7 | 1380.6 | 1454.0 | 1319.2 | 1198.0 | 1028.0 |
| Total | 6253.7 | 7056.3 | 6314.6 | 6365.2 | 5885.4 | 5139.0 | 5329.1 | 5523.9 |
| IPPU | | | | | | | | |
| Cement $CO_2$ | 1056.3 | 1056.3 | 1056.3 | 998.6 | 1251.2 | 1478.9 | 1748.0 | 2066.1 |
| Lime $CO_2$ | 13.8 | 13.8 | 13.8 | 13.0 | 16.3 | 19.3 | 22.8 | 27.0 |
| Glass $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other carbonates CO2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Iron Steel $CO_2$ | 22.1 | 22.1 | 22.1 | 20.9 | 26.2 | 31.0 | 36.6 | 43.3 |
| Ferroalloys $CO_2$ | 57.9 | 57.9 | 57.9 | 54.8 | 68.6 | 81.1 | 95.8 | 113.3 |
| HFC134a | 40.5 | 45.2 | 49.9 | 59.2 | 78.0 | 78.0 | 78.0 | 78.0 |
| HFC227ea | 26.1 | 29.5 | 33.0 | 39.8 | 53.6 | 53.6 | 53.6 | 53.6 |
| R404a $CO_2$eq | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R407a $CO_2$eq | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R410a $CO_2$eq | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 |
| R507a $CO_2$eq | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 1216.8 | 1224.9 | 1233.1 | 1186.5 | 1494.2 | 1742.1 | 2035.1 | 2381.4 |
| Agriculture | | | | | | | | |
| Enteric Fermentation $CH_4$ | 1778.2 | 1730.5 | 1697.5 | 1697.7 | 1698.3 | 1698.8 | 1699.4 | 1700.1 |
| Manure Management $CH_4$ | 295.1 | 287.5 | 283.8 | 284.3 | 286.7 | 289.3 | 292.0 | 295.0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Manure Management $N_2O$ | 99.0 | 96.4 | 94.8 | 94.7 | 95.3 | 95.8 | 96.4 | 97.0 |
| Managed Soils $N_2O$ | 155.8 | 155.8 | 155.8 | 151.6 | 142.9 | 134.3 | 134.3 | 134.3 |
| Liming $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Urea application $CO_2$ | 143.8 | 143.8 | 143.8 | 137.3 | 104.6 | 71.9 | 71.9 | 71.9 |
| Field burning $CH_4$ | 0.7 | 0.7 | 0.7 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Field burning $N_2O$ | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 2472.7 | 2415.0 | 2376.6 | 2366.6 | 2327.7 | 2290.1 | 2294.1 | 2298.4 |
| LULUCF | | | | | | | | |
| Harvested wood $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forest emissions $CO_2$ | 3344.6 | 3344.6 | 3344.6 | 3344.6 | 2508.4 | 1672.3 | 1672.3 | 1672.3 |
| Forest removal $CO_2$ | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 | -2161.6 |
| Forest fire $CO_2$ | 80.2 | 841.3 | 84.7 | 154.2 | 165.8 | 177.5 | 189.2 | 200.9 |
| Forest fire $CH_4$ | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Forest fire $N_2O$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cropland $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Grassland $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wetlands $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Settlements $CO_2$ | 93.5 | 93.5 | 93.5 | 94.5 | 96.9 | 99.4 | 101.9 | 104.6 |
| Other land $CO_2$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 1356.7 | 2117.9 | 1361.2 | 1431.6 | 609.6 | -212.4 | -198.1 | -183.8 |
| Waste | | | | | | | | |
| Solid waste $CH_4$ | 1024.3 | 1115.8 | 1161.4 | 1201.1 | 1289.4 | 1186.4 | 1085.1 | 935.1 |
| Wastewater $CH_4$ | 115.4 | 115.3 | 115.0 | 112.8 | 98.9 | 68.5 | 50.1 | 32.3 |
| Wastewater $N_2O$ | 67.1 | 67.0 | 66.8 | 66.6 | 65.7 | 64.3 | 62.8 | 60.6 |
| Burning $CH_4$ | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Burning $N_2O$ | 0.6 | 0.3 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 1207.4 | 1298.4 | 1343.7 | 1380.6 | 1454.0 | 1319.2 | 1198.0 | 1028.0 |

**Table 36: GHG emissions (kt $CO_2$eq) for different branches of the economy, as determined for historic years (2016-2018) and as projected with additional measures until the year 2040.**

### *Renewable Energy - Primary energy*

Current targets in renewable energy are defined in total primary energy supply (TPES). For reference, the following table gives the current share of renewable energy in TPES and the projection until the year 2040 under consideration of additional measures. The following figures give the absolute values of renewable energy sources in net primary supply of energy for the WAM scenario (Figure 94) and when only running RE power plants to meet domestic demand (Figure 95). Table 37 shows the absolute values of renewable sources in primary energy supply, while Table 38 lists the shares. More details on the split between fuels in primary energy supply are given in the following section on energy efficiency.

In the WEM scenario, the renewable share in TPES falls from 38.4% in 2018 to 29% in 2030. in the WAM scenario, the renewable energy share in TPES increases to 51.3%. In case of the WAM scenario which considers only domestic electricity demand, the share increases only to 31.3%

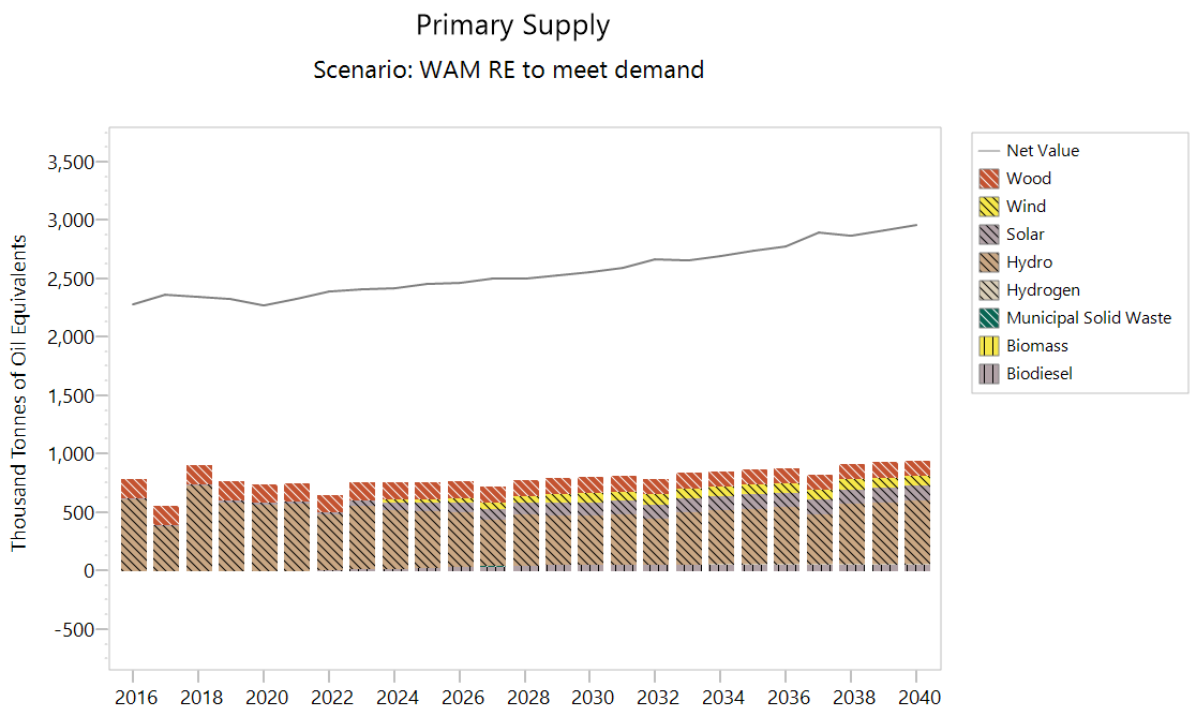



**Figure 94: Renewable primary energy sources and total net demand for historic years (2016-2018) and as projected with additional measures until the year 2040 if RE plants run only to meet local demand**

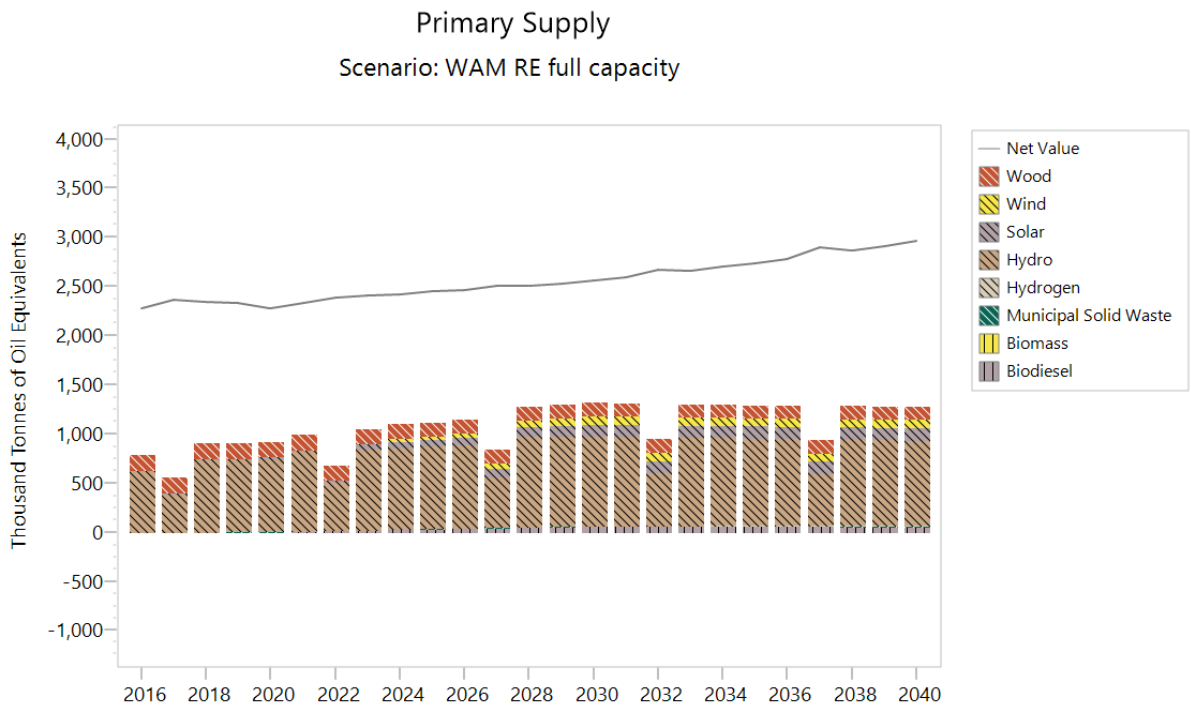



**Figure 95: Renewable primary energy sources and total net demand for historic years (2016-2018) and as projected with additional measures until the year 2040 if RE plants run at full capacity (WAM)**

| Fuel [ktoe] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| WAM RE to meet demand | | | | | | | | |
| Wood | 154.1 | 149.4 | 150.0 | 146.9 | 136.8 | 125.1 | 120.9 | 122.1 |
| Wind | 0.0 | 0.0 | 0.0 | 0.0 | 28.2 | 81.3 | 83.9 | 84.7 |
| Solar | 11.1 | 12.0 | 13.2 | 16.4 | 72.6 | 113.7 | 122.5 | 126.3 |
| Hydro | 613.6 | 388.7 | 736.1 | 573.2 | 487.8 | 418.7 | 473.6 | 538.2 |
| Hydrogen | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.1 | 16.7 |
| Municipal Solid Waste | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Biodiesel | 0.0 | 0.0 | 0.0 | 0.0 | 32.4 | 60.5 | 57.9 | 54.4 |
| Total | 2275.8 | 2361.3 | 2342.7 | 2268.9 | 2447.9 | 2554.6 | 2733.3 | 2952.9 |
| WAM | | | | | | | | |
| Wood | 154.1 | 149.4 | 150.0 | 146.9 | 136.8 | 125.1 | 120.9 | 122.1 |
| Charcoal | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wind | 0.0 | 0.0 | 0.0 | 0.0 | 28.2 | 84.7 | 84.7 | 84.7 |
| Solar | 11.1 | 12.0 | 13.2 | 16.4 | 72.6 | 122.8 | 124.5 | 126.3 |
| Hydro | 613.6 | 388.7 | 736.1 | 745.1 | 839.0 | 913.9 | 888.7 | 863.4 |
| Hydrogen | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.1 | 16.7 |
| Municipal Solid Waste | 0.0 | 0.0 | 0.0 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| Biodiesel | 0.0 | 0.0 | 0.0 | 0.0 | 32.4 | 60.5 | 57.9 | 54.4 |
| Total | 2275.8 | 2361.3 | 2342.7 | 2270.7 | 2449.8 | 2556.5 | 2735.1 | 2954.8 |
| WEM | | | | | | | | |
| Wood | 154.1 | 149.4 | 150.0 | 146.6 | 141.7 | 136.4 | 131.1 | 132.1 |
| Wind | 0.0 | 0.0 | 0.0 | 0.0 | 28.2 | 28.2 | 28.2 | 28.2 |
| Solar | 11.1 | 12.0 | 13.2 | 16.5 | 54.7 | 58.9 | 61.7 | 65.0 |
| Hydro | 613.6 | 388.7 | 736.1 | 576.2 | 542.2 | 582.1 | 646.0 | 686.8 |
| Hydrogen | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 | 19.4 |
| Municipal Solid Waste | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.2 | 1.3 |
| Biodiesel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 2275.8 | 2361.3 | 2342.7 | 2273.2 | 2552.4 | 2773.8 | 3027.9 | 3358.9 |

**Table 37: Absolute values of renewable energy sources and total values of primary energy supply for different scenarios**

| Fuel | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| WAM RE to meet demand | | | | | | | | |
| Wood | 6.8% | 6.3% | 6.4% | 6.5% | 5.6% | 4.9% | 4.4% | 4.1% |
| Wind | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 3.2% | 3.1% | 2.9% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Solar | 0.5% | 0.5% | 0.6% | 0.7% | 3.0% | 4.4% | 4.5% | 4.3% |
| Hydro | 27.0% | 16.5% | 31.4% | 25.3% | 19.9% | 16.4% | 17.3% | 18.2% |
| Hydrogen | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 0.6% |
| Municipal Solid Waste | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Biodiesel | 0.0% | 0.0% | 0.0% | 0.0% | 1.3% | 2.4% | 2.1% | 1.8% |
| Total | 34.2% | 23.3% | 38.4% | 32.5% | 31.0% | 31.3% | 31.7% | 31.9% |
| WAM | | | | | | | | |
| Wood | 6.8% | 6.3% | 6.4% | 6.5% | 5.6% | 4.9% | 4.4% | 4.1% |
| Wind | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 3.3% | 3.1% | 2.9% |
| Solar | 0.5% | 0.5% | 0.6% | 0.7% | 3.0% | 4.8% | 4.6% | 4.3% |
| Hydro | 27.0% | 16.5% | 31.4% | 32.8% | 34.2% | 35.7% | 32.5% | 29.2% |
| Hydrogen | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 0.6% |
| Municipal Solid Waste | 0.0% | 0.0% | 0.0% | 0.2% | 0.1% | 0.1% | 0.1% | 0.1% |
| Biodiesel | 0.0% | 0.0% | 0.0% | 0.0% | 1.3% | 2.4% | 2.1% | 1.8% |
| Total | 34.2% | 23.3% | 38.4% | 40.2% | 45.4% | 51.3% | 47.1% | 43.0% |
| WEM | | | | | | | | |
| Wood | 6.8% | 6.3% | 6.4% | 6.4% | 5.6% | 4.9% | 4.3% | 3.9% |
| Wind | 0.0% | 0.0% | 0.0% | 0.0% | 1.1% | 1.0% | 0.9% | 0.8% |
| Solar | 0.5% | 0.5% | 0.6% | 0.7% | 2.1% | 2.1% | 2.0% | 1.9% |
| Hydro | 27.0% | 16.5% | 31.4% | 25.3% | 21.2% | 21.0% | 21.3% | 20.4% |
| Hydrogen | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 0.6% |
| Municipal Solid Waste | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Biodiesel | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Total | 34.2% | 23.3% | 38.4% | 32.5% | 30.0% | 29.0% | 28.9% | 27.8% |

**Table 38: Shares of renewable energy sources in TPES and total renewable share for different scenarios**

### *Renewable Energy - Final energy*

Renewable shares in final energy consumption are determined according to Directive 2009/28/EC (RED; EU (2009); also see European Commission (2018)). The following figures show historic data in RES share for 2016-2018 and projections with additional measures. For the share in transport (RES-T), this includes the multipliers for the use of electricity in road and rail transport, which explains the strong increase. No advanced biofuels (with increased multipliers) are considered. The share of renewable energy in heating and cooling (RES-HC) falls as the share of wood for heating decreases. The share of renewable electricity (RES-E) is largely determined by hydropower, with increases projected for solar PV. Subsequent figures gives technological details on each RES indicator.

As these indicators (in particular RES-E) is determined by the RES-E generation (numerator) and the net electricity demand (denominator), this is strongly influenced by the choice in assuming renewable power plants run full capacity, exporting all surplus electricity. Figures therefore show both variants of the WAM scenario.

In overall terms, the additional measures increase the share of renewables in final energy from 33.5% (WEM scenario) in 2030 to 54.4% (WAM scenario). Historic values of 2018 reach 37.9%, so the WAM scenario leads to an increase by 20.9%-points. An increase remains also if only domestic electricity demand is considered (WAM RE to meet demand), in which case 42.9% RES overall RES share is achieved.

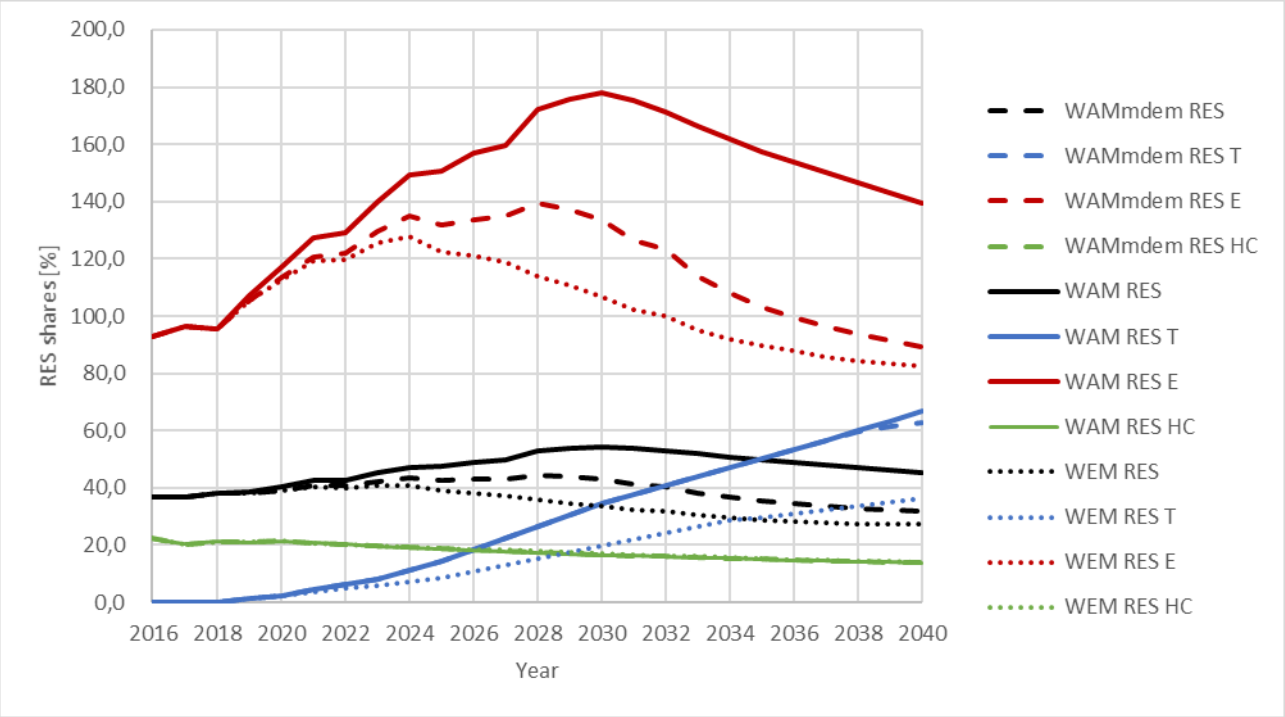



**Figure 96: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures. Values from WEM scenario are also indicated.**

| Values in percent | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| WAM RE to meet demand | | | | | | | | |
| RES | 36,7 | 37,0 | 37,9 | 39,2 | 42,5 | 42,9 | 35,5 | 31,9 |
| RES T | 0,1 | 0,1 | 0,1 | 2,5 | 14,4 | 34,6 | 50,2 | 62,8 |
| RES E | 92,8 | 96,4 | 95,4 | 113,3 | 131,9 | 133,5 | 103,0 | 89,4 |
| RES HC | 22,3 | 20,4 | 21,1 | 21,4 | 18,7 | 16,6 | 15,1 | 13,8 |
| WAM | | | | | | | | |
| RES | 36,7 | 37,0 | 37,9 | 40,3 | 47,4 | 54,4 | 49,9 | 45,4 |
| RES T | 0,1 | 0,1 | 0,1 | 2,5 | 14,4 | 34,6 | 50,2 | 66,8 |
| RES E | 92,8 | 96,4 | 95,4 | 116,9 | 150,8 | 178,1 | 157,4 | 139,5 |
| RES HC | 22,3 | 20,4 | 21,1 | 21,4 | 18,7 | 16,6 | 15,1 | 13,8 |
| WEM | | | | | | | | |
| RES | 36,7 | 37,0 | 37,9 | 39,2 | 39,1 | 33,5 | 28,9 | 27,2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RES T | 0,1 | 0,1 | 0,1 | 2,5 | 8,6 | 19,8 | 29,6 | 36,5 |
| RES E | 92,8 | 96,4 | 95,4 | 112,6 | 122,5 | 106,9 | 89,6 | 82,4 |
| RES HC | 22,3 | 20,4 | 21,1 | 21,4 | 19,0 | 17,2 | 15,2 | 14,0 |

**Table 39: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures (top rows) and existing measures (bottom rows)**

The RES-E share is determined to a larger extent by export dynamics (Figure 97, Table 40). All scenarios achieve values greater than 100% in 2030, the WAM scenario achieving 178.1% RES-E share. In all scenarios, this is largely determined by the RES-E share for hydro power, which by itself achieves 145.8% in the WAM scenario. Note that these values are particularly sensitive to the normalisation under the methodology foreseen by the regulation (Eurostat SHARES), where historic availability determines the accounting.

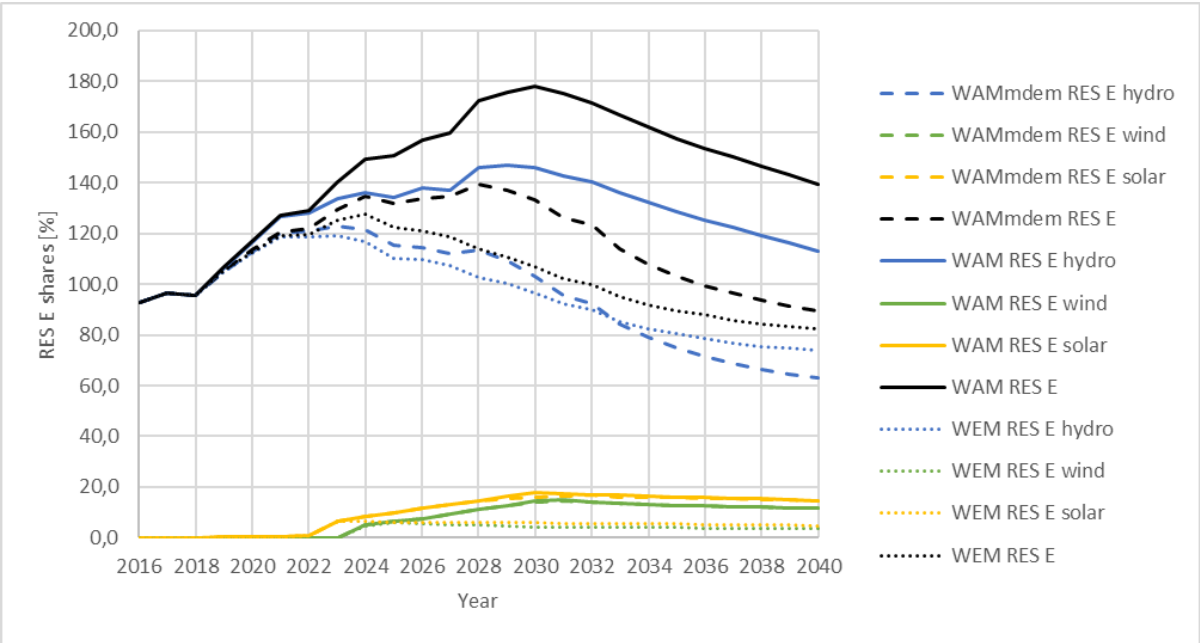



**Figure 97: RES-E share, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures. WEM values are given for reference.**

| Values in percent | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| WAM RE to meet demand | | | | | | | | |
| RES E hydro | 92,8 | 96,4 | 95,4 | 112,7 | 115,3 | 103,0 | 74,6 | 63,2 |
| RES E wind | 0,0 | 0,0 | 0,0 | 0,0 | 6,6 | 14,3 | 12,6 | 11,6 |
| RES E solar | 0,0 | 0,0 | 0,0 | 0,6 | 10,0 | 16,2 | 15,8 | 14,7 |
| RES E | 92,8 | 96,4 | 95,4 | 113,3 | 131,9 | 133,5 | 103,0 | 89,4 |
| WAM | | | | | | | | |
| RES E hydro | 92,8 | 96,4 | 95,4 | 116,3 | 134,2 | 145,8 | 128,5 | 113,2 |
| RES E wind | 0,0 | 0,0 | 0,0 | 0,0 | 6,6 | 14,6 | 12,8 | 11,6 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RES E solar | 0,0 | 0,0 | 0,0 | 0,6 | 10,0 | 17,7 | 16,1 | 14,7 |
| RES E | 92,8 | 96,4 | 95,4 | 116,9 | 150,8 | 178,1 | 157,4 | 139,5 |
| WEM | | | | | | | | |
| RES E hydro | 92,8 | 96,4 | 95,4 | 112,0 | 110,1 | 96,6 | 80,3 | 74,1 |
| RES E wind | 0,0 | 0,0 | 0,0 | 0,0 | 6,2 | 4,4 | 3,9 | 3,5 |
| RES E solar | 0,0 | 0,0 | 0,0 | 0,6 | 6,2 | 5,9 | 5,4 | 4,9 |
| RES E | 92,8 | 96,4 | 95,4 | 112,6 | 122,5 | 106,9 | 89,6 | 82,4 |

**Table 40: RES-E share, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures. WEM total is given for reference**

The following figure shows fuels currently used in the transport sector and projections until 2040 in the scenario with additional measures. No biodiesel share is considered, and this is not projected to play a role with existing measures. Electricity is used to meet a certain share of energy demand in the transport sector. This is mainly of renewable origin.

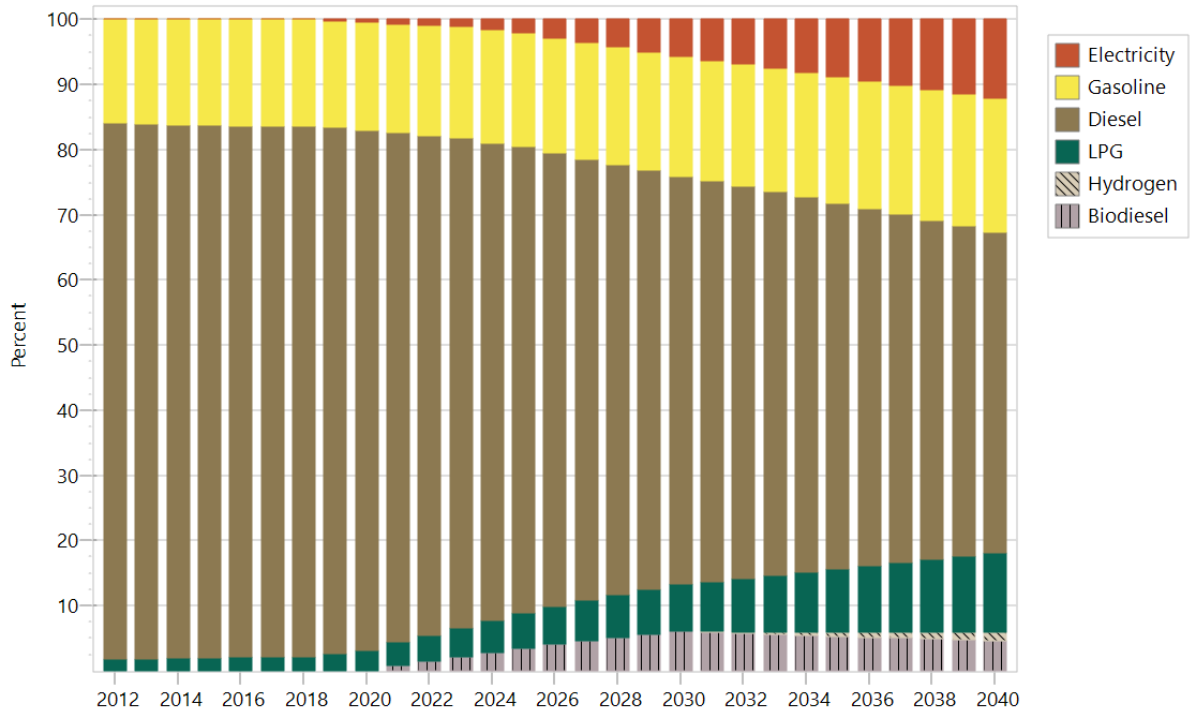



**Figure 98: Energy sources in the transport sector, shown to accompany and explain the RES-T share given in Figure 43**

| Fuel | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Electricity | 0,0% | 0,0% | 0,0% | 0,5% | 2,2% | 5,7% | 8,8% | 12,2% |
| Gasoline | 16,4% | 16,4% | 16,3% | 16,5% | 17,4% | 18,4% | 19,4% | 20,5% |
| Diesel | 81,6% | 81,5% | 81,6% | 79,7% | 71,6% | 62,6% | 56,2% | 49,3% |
| LPG | 2,1% | 2,1% | 2,1% | 3,2% | 5,3% | 7,3% | 9,6% | 12,1% |
| Hydrogen | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,7% | 1,4% |
| Biodiesel | 0,0% | 0,0% | 0,0% | 0,0% | 3,5% | 6,0% | 5,3% | 4,6% |

**Table 41: Shares of energy sources in the transport sector for historic years 2016-2018 and projected up to year 2040 with additional measures**

The RES-HC share combines all renewable energies other than electricity, heat and bioliquids in sectors other than transport. This concerns the residential, services, industry, agriculture and fisheries sectors and the fuels wind, solar, wood, hydro and biomass. Of these, only solar and wood play a substantial role, both are used for space and water heating as well as some industrial processes. Agriculture and fisheries do not use renewable energies (other than through electricity, which remains unconsidered here). The following table gives the share of wood and solar energy in relation to the total final energy in each of the remaining three sectors. Note that the RES-HC share reports the share in of renewable energy in relation to the final energy demand other than electricity, which explains the higher percentage in RES-HC compared to the values shown in the following table.

| | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Residential | | | | | | | | |
| Wood | 24,8% | 24,4% | 24,3% | 24,1% | 24,2% | 24,3% | 24,0% | 24,7% |
| Solar | 1,3% | 1,4% | 1,5% | 1,5% | 2,3% | 3,3% | 3,8% | 4,4% |
| **Services** | | | | | | | | |
| Wood | 6,1% | 6,1% | 6,1% | 6,1% | 6,1% | 6,1% | 6,1% | 6,1% |
| Solar | 2,3% | 2,3% | 2,3% | 2,3% | 2,3% | 2,3% | 2,3% | 2,3% |
| **Industry** | | | | | | | | |
| Wood | 3,3% | 1,7% | 1,9% | 1,9% | 1,9% | 1,9% | 1,9% | 1,9% |
| Solar | 0,2% | 0,2% | 0,2% | 0,2% | 0,2% | 0,2% | 0,2% | 0,2% |
| **Total FE Demand** | | | | | | | | |
| Wood | 7,6% | 7,1% | 7,1% | 7,1% | 6,2% | 5,4% | 4,8% | 4,5% |
| Solar | 0,5% | 0,6% | 0,6% | 0,6% | 0,7% | 0,7% | 0,7% | 0,7% |

**Table 42: Shares of wood and solar energy in final energy demand of the sectors, which make use of these fuels as, projected for the WAM scenario. Note that the shares here do not equal the RES HC share, as the reference in RES HC is not final energy, but final energy other than electricity.**

*Dimension Energy Efficiency*

This section details projections with additional measures for the energy consumption of the economy, underlying. It starts with an overview of primary energy supply for all fuels, which completes the discussion of differences in renewable shares in primary energy supply between WEM and WAM in the previous section. This is followed by an assessment of final energy demands, also in a sectoral view of final energy consumption patterns.

## Primary energy supply

As an introduction to primary energy supply in the Albanian economy, Table 43 shows a comparison of primary energy supply in the WEM scenario (from Chapter 4) and the WAM scenarios (this chapter), considering also the variant of WAM in which RE power plants run to meet domestic demand only.

In all scenarios, net energy demand is increasing in total. While in the WEM scenario, net primary energy consumption increases (compared to 2018) by 13.3% until 2030 and 22.9% until 2040, it increases only by 4.4% until 2030 and 8.1% until 2040 in the WAM scenario. Comparatively, the consumption in the WAM scenario decreases compared to the WEM scenario by 7.8% in 2030 and 12.0% in 2040. Note that the difference between 'WAM RE to meet demand' and WAM is not in net values but in the primary production and exports. Excess electricity is exported in 'WAM RE to meet demand', while net consumption remains close to equal.

| [ktoe] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| **WAM RE to meet demand** | | | | | | | | |
| **Primary production and imports** | 2384.8 | 2683.5 | 2598.4 | 2487.3 | 3198.8 | 3305.1 | 3483.1 | 3702.0 |
| **Exports** | 109.0 | 322.2 | 255.7 | 218.4 | 750.9 | 750.4 | 749.8 | 749.1 |
| **Net value** | 2275.8 | 2361.3 | 2342.7 | 2268.9 | 2447.9 | 2554.6 | 2733.3 | 2952.9 |
| **Net value change rel. to 2018 [%]** | | | | -3.1% | 7.9% | 4.4% | 7.0% | 8.0% |
| **WAM** | | | | | | | | |
| **Primary production and imports** | 2384.8 | 2683.5 | 2598.4 | 2662.6 | 3553.6 | 3816.3 | 3904.6 | 4030.9 |
| **Exports** | 109.0 | 322.2 | 255.7 | 391.9 | 1103.9 | 1259.8 | 1169.5 | 1076.1 |
| **Net value** | 2275.8 | 2361.3 | 2342.7 | 2270.7 | 2449.7 | 2556.5 | 2735.1 | 2954.8 |
| **Net value change rel. to 2018 [%]** | | | | -3.1% | 8.0% | 4.4% | 7.1% | 8.1% |
| **WEM** | | | | | | | | |
| **Primary production and imports** | 2384.8 | 2683.5 | 2598.4 | 2491.5 | 3303.0 | 3523.6 | 3776.6 | 4106.6 |
| **Exports** | 109.0 | 322.2 | 255.7 | 218.4 | 750.6 | 749.7 | 748.8 | 747.8 |
| **Net value** | 2275.8 | 2361.3 | 2342.7 | 2273.2 | 2552.4 | 2773.8 | 3027.8 | 3358.9 |
| **Net value change rel. to 2018 [%]** | | | | -3.0% | 12.5% | 13.3% | 18.5% | 22.9% |
| Net value **relative** change **(WAM minus WEM)** | | | | -0.1% | -4.0% | -7.8% | -9.7% | -12.0% |

**Table 43: Primary energy supply [ktoe] in WAM and WEM scenarios**

Figure 47 to Figure 102 give the primary energy demand by fuels as projected in the WAM scenario. By comparing Figure 47 (WAM) and Figure 100 (WAM RE to meet demand), it becomes clear that the difference is again determined by the mode of operation of renewable plants, which in particular determines the RE share discussed above. This is also one of the main drivers between WEM and WAM in terms of primary energy supply (Figure 102), others being the reduction of fossil fuel use in transport and industry by fuel switch and energy efficiency measures.

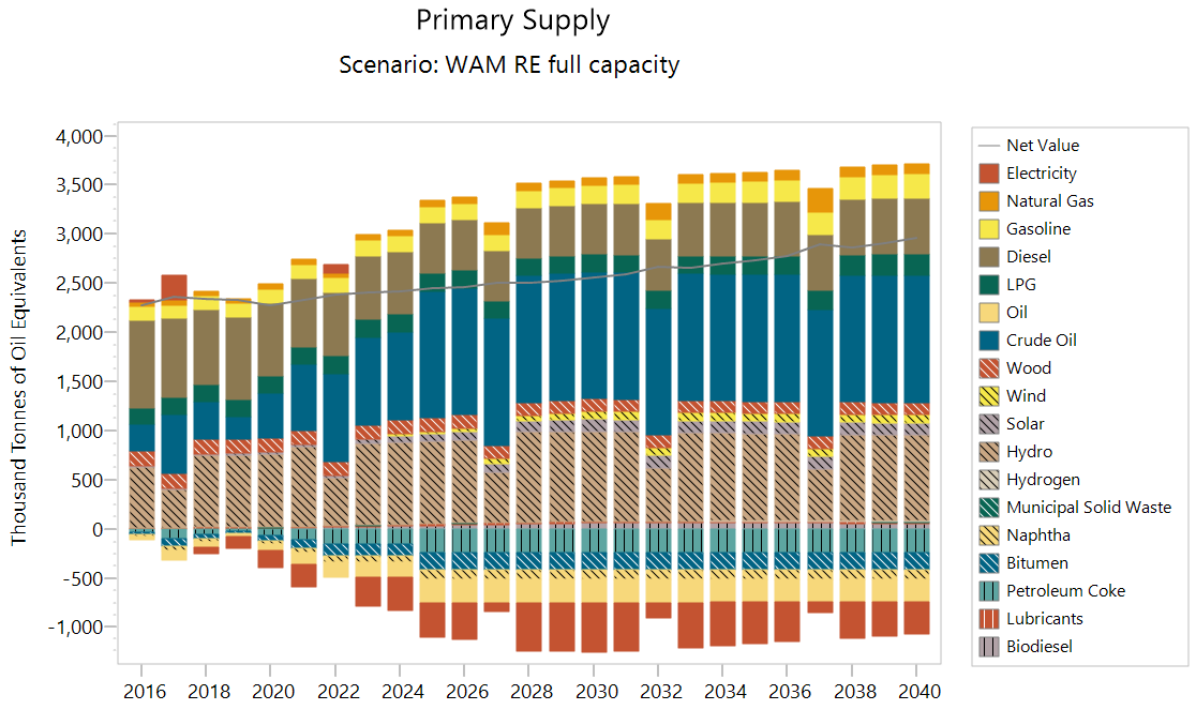



**Figure 99: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040 with additional measures**

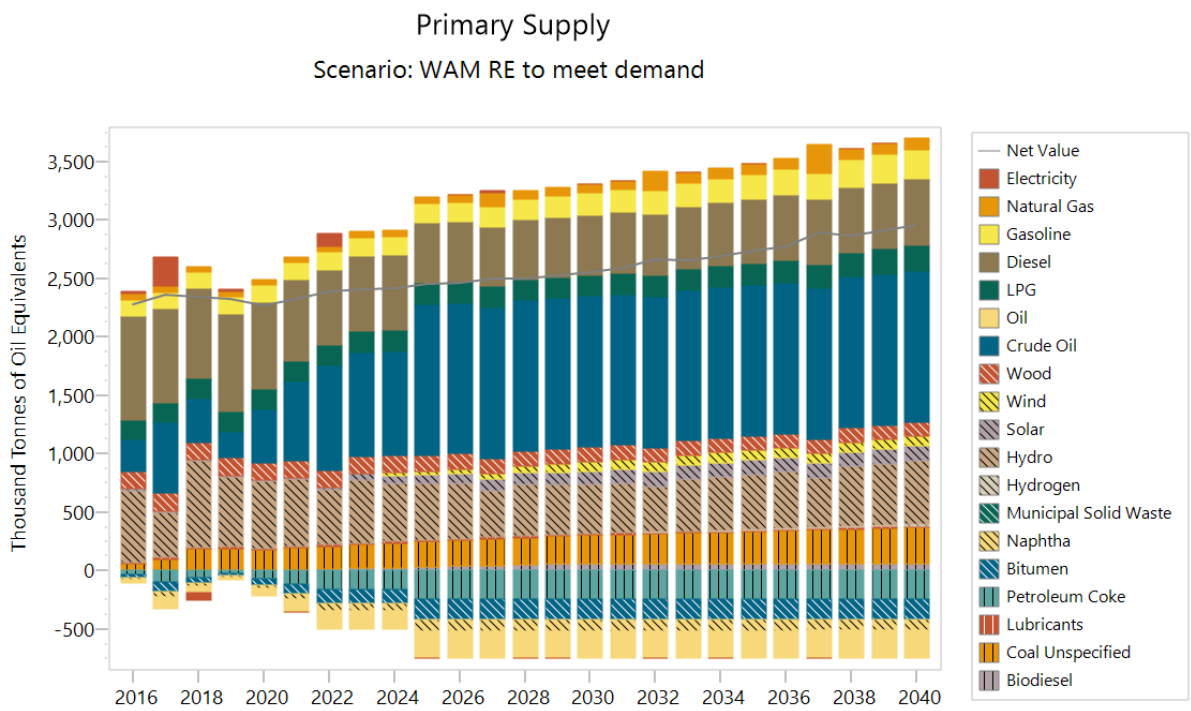



**Figure 100: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040 with additional measures when renewable energy plants run only to meet the domestic energy need**

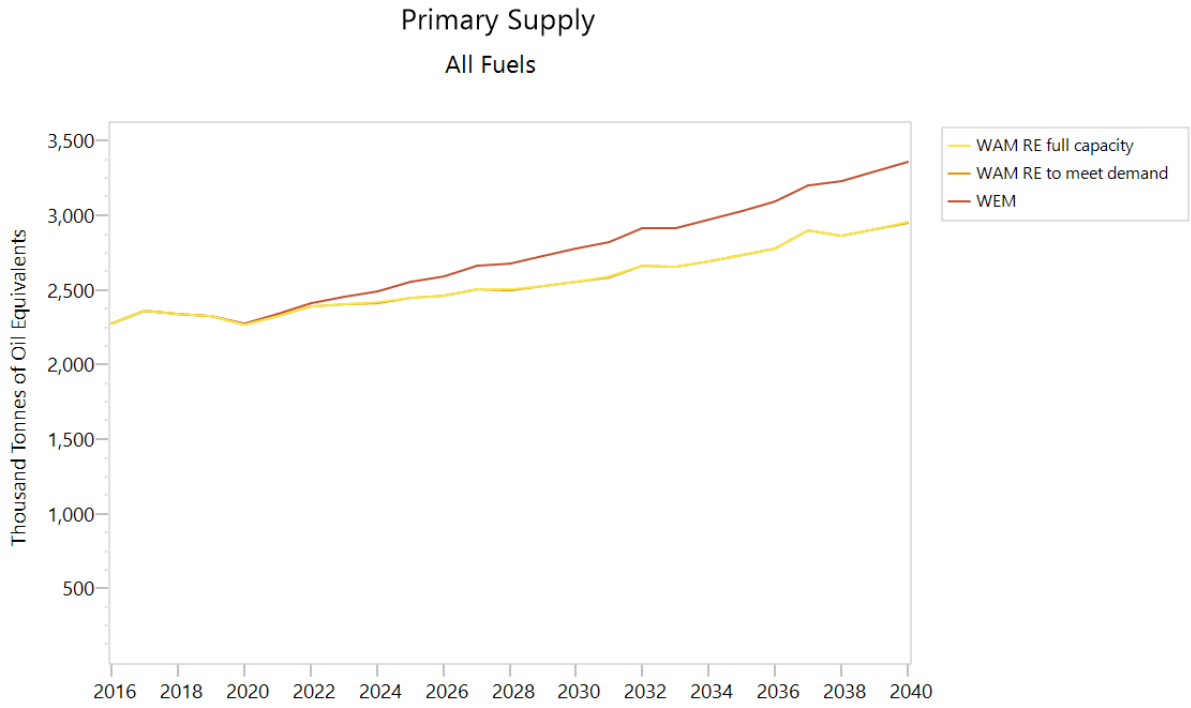



**Figure 101: Net value of primary energy supply for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 with additional measures (both variants) and with existing measures**

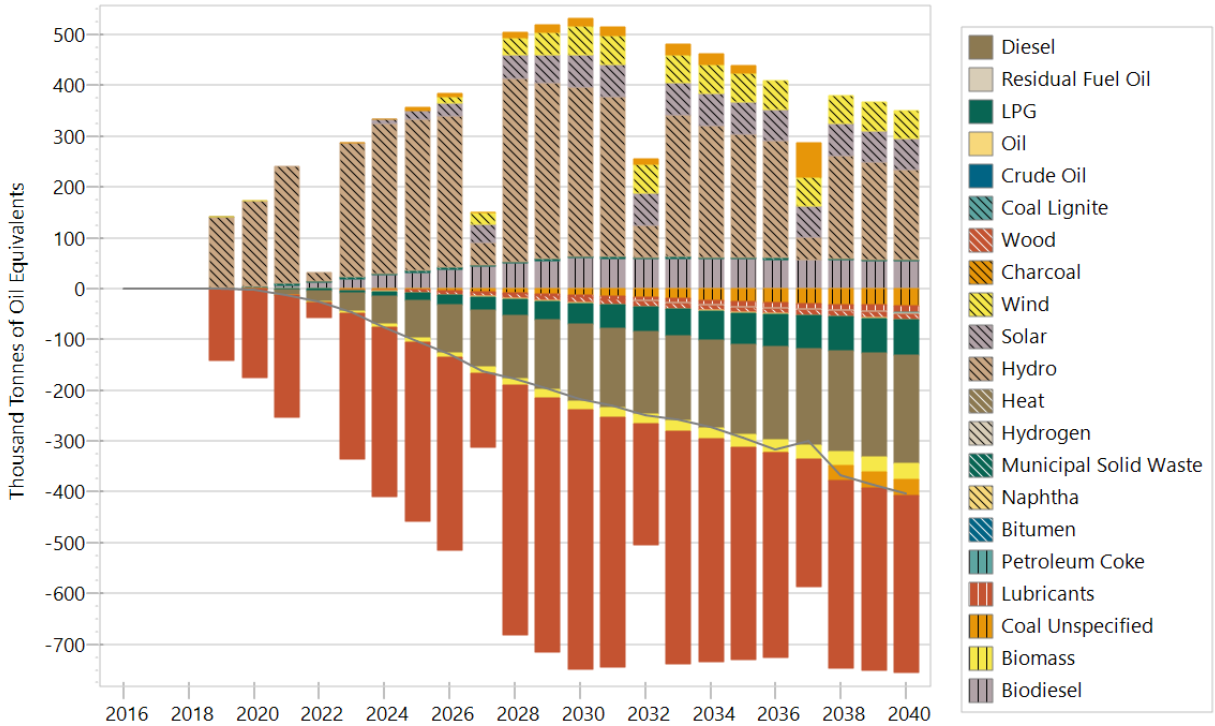



**Figure 102: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040. Differences between WAM (RE full capacity) and WEM broken down into subcategories.**

The following table gives an overview of the primary energy supply in the WAM scenario.

| Fuel | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Electricity | 15.2 | 253.2 | -70.9 | -173.5 | -352.9 | -509.4 | -419.7 | -327.0 |
| Natural Gas | 51.2 | 53.9 | 45.7 | 47.1 | 59.0 | 75.4 | 91.4 | 99.1 |
| Gasoline | 136.7 | 137.5 | 136.2 | 140.7 | 163.0 | 186.8 | 213.8 | 247.5 |
| Jet Kerosene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Kerosene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Diesel | 895.9 | 802.4 | 766.8 | 747.1 | 515.7 | 519.6 | 548.0 | 570.2 |
| Residual Fuel Oil | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| LPG | 165.9 | 170.1 | 174.2 | 176.0 | 180.7 | 175.2 | 186.6 | 220.9 |
| Oil | -32.2 | -100.5 | -54.7 | -65.8 | -234.6 | -234.8 | -235.0 | -235.3 |
| Crude Oil | 269.2 | 605.4 | 377.1 | 452.2 | 1292.2 | 1292.2 | 1292.2 | 1292.2 |
| Coal Lignite | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wood | 154.1 | 149.4 | 150.0 | 146.9 | 136.8 | 125.1 | 120.9 | 122.1 |
| Charcoal | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Wind | 0.0 | 0.0 | 0.0 | 0.0 | 28.2 | 84.7 | 84.7 | 84.7 |
| Solar | 11.1 | 12.0 | 13.2 | 16.4 | 72.6 | 122.8 | 124.5 | 126.3 |
| Hydro | 613.6 | 388.7 | 736.1 | 745.1 | 839.0 | 913.9 | 888.7 | 863.4 |
| Heat | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Hydrogen | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.1 | 16.7 |
| Municipal Solid Waste | 0.0 | 0.0 | 0.0 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| Naphtha | -14.9 | -41.7 | -24.2 | -28.2 | -94.0 | -94.0 | -94.0 | -94.0 |
| Bitumen | -28.5 | -80.0 | -46.3 | -54.0 | -180.0 | -180.0 | -180.0 | -180.0 |
| Petroleum Coke | -33.5 | -100.0 | -59.6 | -70.4 | -242.3 | -241.6 | -240.8 | -239.9 |
| Lubricants | 12.0 | 11.3 | 12.8 | 12.0 | 14.9 | 13.0 | 10.3 | 11.9 |
| Coal Unspecified | 59.8 | 99.6 | 186.3 | 175.4 | 215.4 | 243.4 | 274.9 | 317.8 |
| Biomass | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Biodiesel | 0.0 | 0.0 | 0.0 | 0.0 | 32.4 | 60.5 | 57.9 | 54.4 |
| Net value | 2275.8 | 2361.3 | 2342.7 | 2270.7 | 2449.8 | 2556.5 | 2735.1 | 2954.8 |

**Table 44: Primary energy supply for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 for WAM. Negative values indicate exports.**

## Final energy demand

As an introduction to final energy demand in the Albanian economy, Table 45 shows a comparison of final energy consumption of energy demand sectors between the WEM scenario (from Chapter 4) and the WAM scenario (this chapter). In both scenarios, energy demand is increasing in total.

While in the WEM scenario, final energy consumption increases (compared to 2018) by 20.8% until 2030 and 46.5% until 2040, it increases only by 10.7% until 2030 and 29.0% until 2040 in the WAM scenario. Comparatively, the final energy consumption in the WAM scenario decreases compared to the WEM scenario by 8.4% in 2030 and 12.0% in 2040.

| Branch | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| WAM | | | | | | | | |
| Residential | 486.8 | 481.9 | 474.8 | 469.7 | 412.3 | 348.9 | 319.9 | 298.2 |
| Services | 185.0 | 205.3 | 226.2 | 202.6 | 201.1 | 195.2 | 188.4 | 180.0 |
| Industry | 301.7 | 402.7 | 402.8 | 379.7 | 468.2 | 542.4 | 628.3 | 727.9 |
| Transport | 819.4 | 829.8 | 822.7 | 840.2 | 923.8 | 1003.4 | 1089.7 | 1193.0 |
| Agriculture Forestry | 74.0 | 74.1 | 80.3 | 84.7 | 96.7 | 110.5 | 126.2 | 144.1 |
| Fisheries | 29.1 | 38.5 | 40.5 | 38.2 | 47.6 | 56.0 | 65.8 | 77.4 |
| Nonenergy | 143.3 | 77.4 | 54.7 | 57.3 | 64.2 | 70.6 | 80.0 | 89.9 |
| Total WAM | 2039.4 | 2109.7 | 2102.1 | 2072.5 | 2213.8 | 2326.9 | 2498.4 | 2710.6 |
| WAM change relative to 2018 [%] | | | | -1.41% | +5.32% | +10.70 % | +18.85 % | +28.95 % |
| WEM | | | | | | | | |
| Residential | 486.8 | 481.9 | 474.8 | 471.8 | 451.7 | 434.4 | 427.0 | 431.2 |
| Services | 185.0 | 205.3 | 226.2 | 203.8 | 209.7 | 211.6 | 212.1 | 210.2 |
| Industry | 301.7 | 402.7 | 402.8 | 380.1 | 473.8 | 557.3 | 655.4 | 770.8 |
| Transport | 819.4 | 829.8 | 822.7 | 840.2 | 969.2 | 1098.6 | 1215.0 | 1355.6 |
| Agriculture Forestry | 74.0 | 74.1 | 80.3 | 84.7 | 96.7 | 110.5 | 126.2 | 144.1 |
| Fisheries | 29.1 | 38.5 | 40.5 | 38.2 | 47.6 | 56.0 | 65.8 | 77.4 |
| Nonenergy | 143.3 | 77.4 | 54.7 | 57.3 | 64.9 | 71.6 | 81.2 | 91.2 |
| Total WEM | 2039.4 | 2109.7 | 2102.1 | 2076.1 | 2313.6 | 2540.0 | 2782.7 | 3080.5 |
| WEM change relative to 2018 [%] | | | | -1.24% | +10.06 % | +20.83 % | +32.38 % | +46.54 % |
| Relative reduction (WAM minus WEM) | | | | -0.17% | -4.31% | -8.39% | -10.22% | -12.01% |

**Table 45: Final energy consumption (ktoe) for energy demand sectors in the WEM and WAM scenarios**

The consumption patterns of energy demand sectors are expected to change in the future and more so with additional measures. As can be seen from the following figures, the energy consumption of the transport sector is increasing in percentage of total final energy consumption, while the largest decrease occurs in the residential sector.

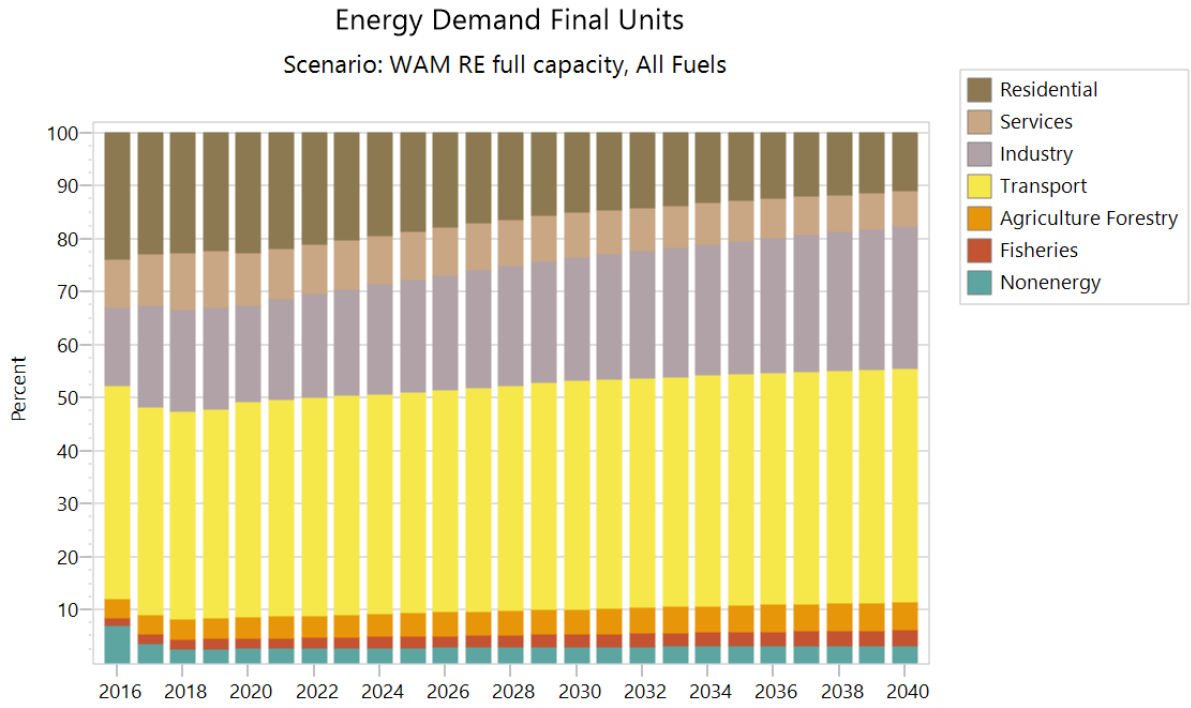



**Figure 103. Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2040 with additional measures**

| Branch | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Residential | 23,87% | 22,84% | 22,59% | 22,67% | 18,62% | 15,00% | 12,80% | 11,00% |
| Services | 9,07% | 9,73% | 10,76% | 9,78% | 9,08% | 8,39% | 7,54% | 6,64% |
| Industry | 14,80% | 19,09% | 19,16% | 18,32% | 21,15% | 23,31% | 25,15% | 26,86% |
| Transport | 40,18% | 39,33% | 39,14% | 40,54% | 41,73% | 43,12% | 43,62% | 44,01% |
| Agriculture Forestry | 3,63% | 3,51% | 3,82% | 4,09% | 4,37% | 4,75% | 5,05% | 5,32% |
| Fisheries | 1,43% | 1,82% | 1,92% | 1,84% | 2,15% | 2,40% | 2,63% | 2,86% |
| Nonenergy | 7,03% | 3,67% | 2,60% | 2,77% | 2,90% | 3,03% | 3,20% | 3,31% |

**Table 46: Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 with additional measures**

Energy consumption in absolute values is presented and compared to the WEM scenario in the following figures. First, total numbers are given, followed by details for each demand sector. Table 47 gives the numbers shown in the figures for reference.

Figure 104 to Figure 107 shows overall WAM scenario values and the comparison with the WEM scenario. While the energy demand in the transport sector and industry grow also in the WAM scenario, the PaMs considered in addition to WEM already lead to a decrease in the energy demand (Figure 107). The residential and services sector also see a substantial decrease of energy demand in the WAM scenario.

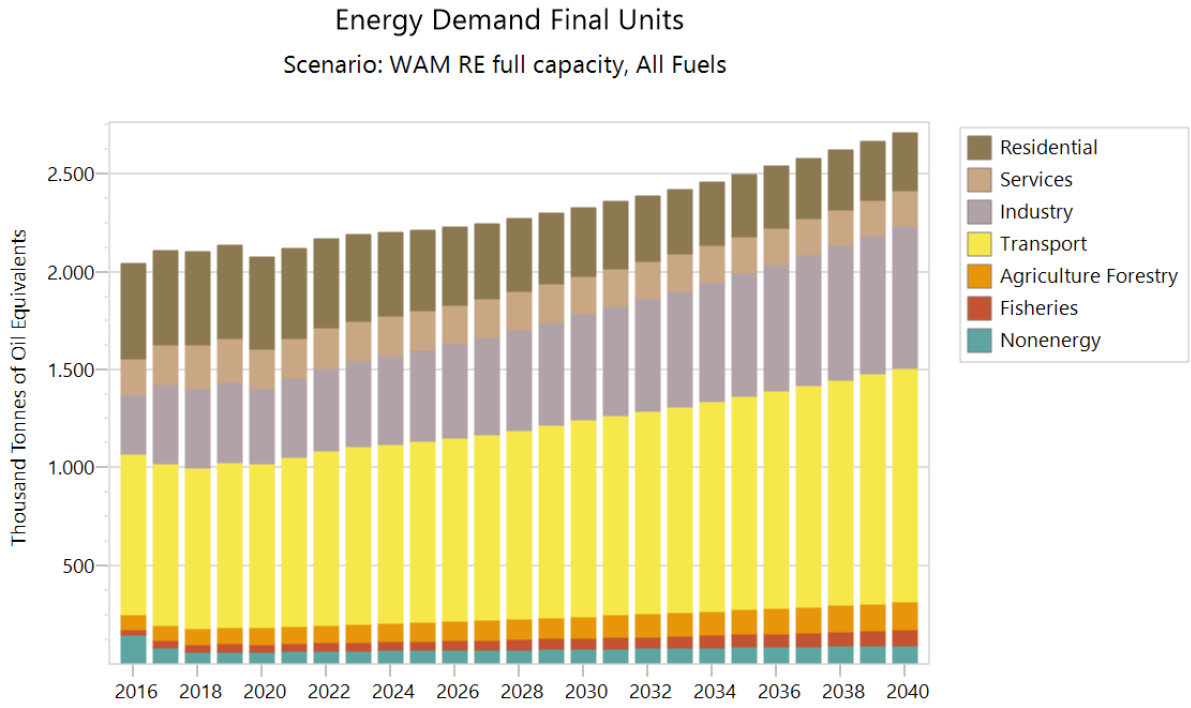



**Figure 104: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040**

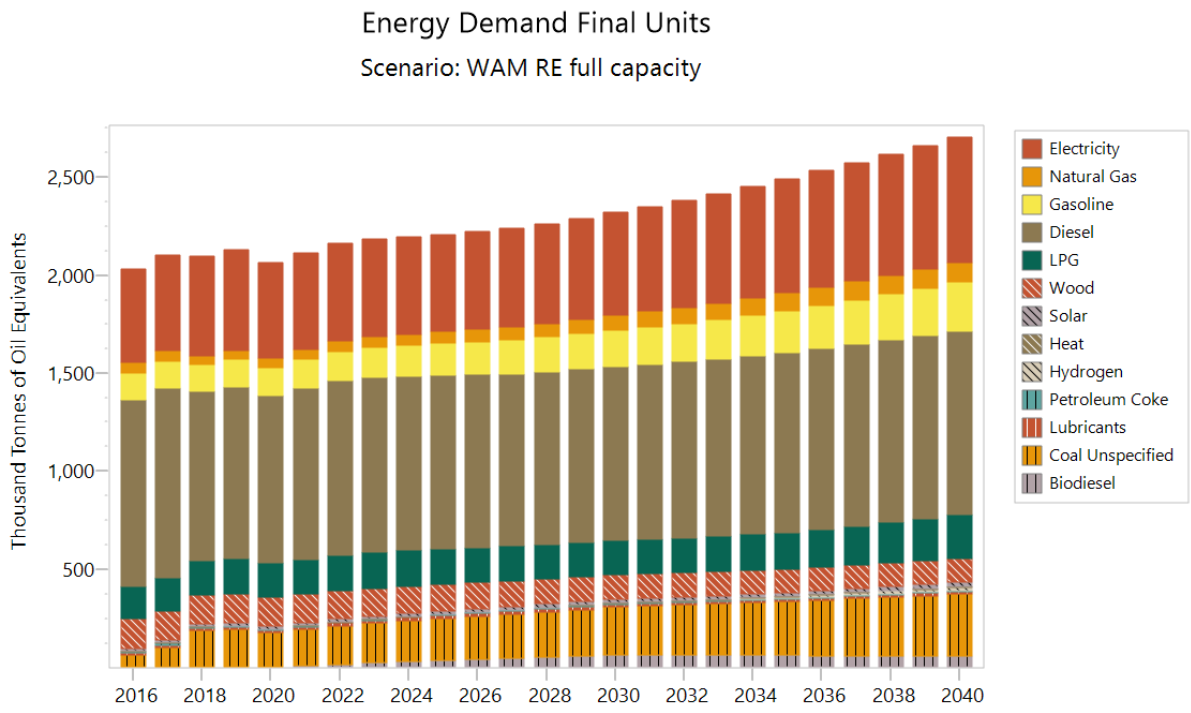



**Figure 105: Fuel split underlying the final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040**

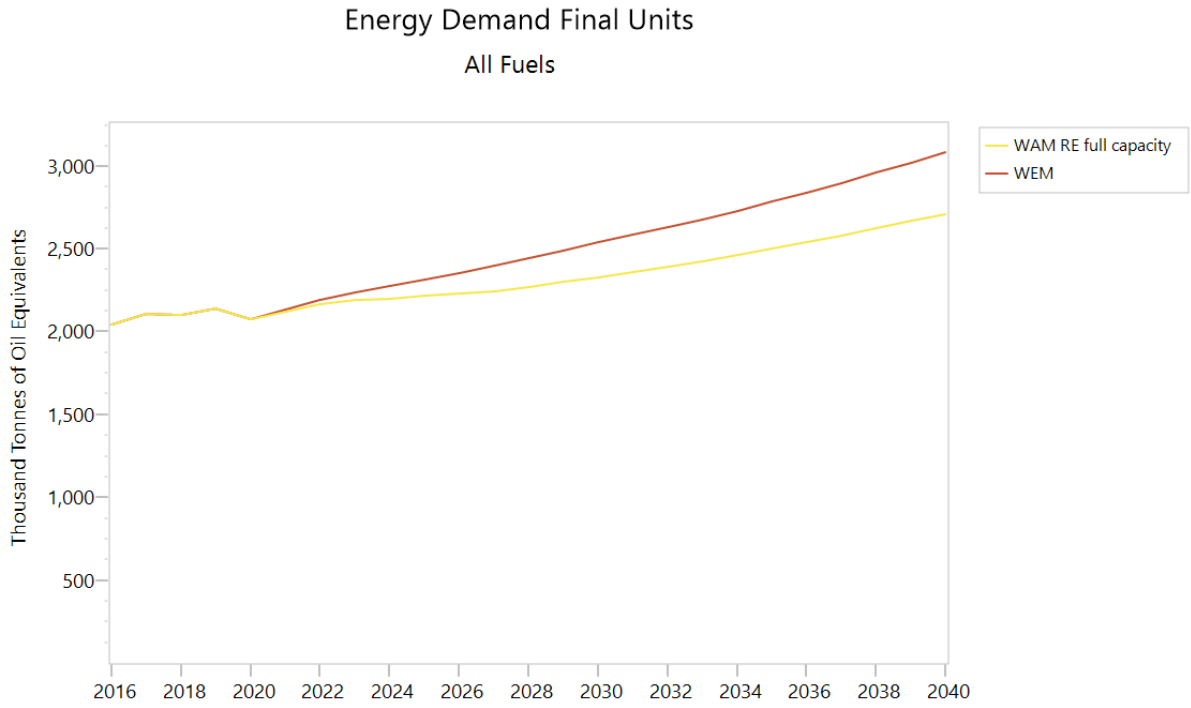



**Figure 106: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040, given for 2019-2030 and for 2035 and 2040. Scenario comparison with the "with existing measures" scenario presented in Chapter 4.**

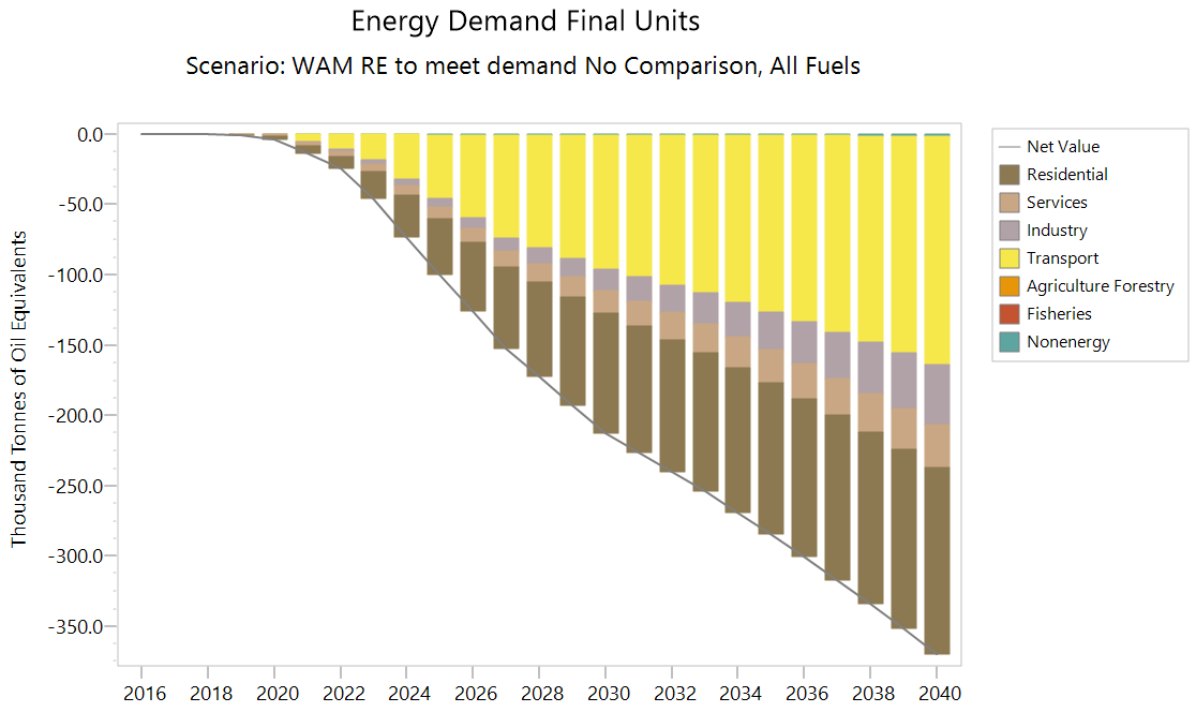



**Figure 107: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040, given for 2019-2030 and for 2035 and 2040. Differences between WAM final and WEM broken down into subcategories.**

The residential sector (Figure 108) is expected to show a strong decrease in energy demand due to a high construction rate and therefore a rapid introduction of more energy efficient buildings. Despite the

rise in penetration of space cooling technologies in Albanian households, the energy consumption for space cooling is only increasing very mildly and finally decreasing again due to the improved energy performance of buildings. In the services sector (Figure 110), the public subsectors (public administration, education and health) are expected to decrease energy consumption. However, the private services subsectors are targeted by fewer policies and at the same time show a very strong expected growth, leading to a further growing path in energy consumption. In the industrial sector, energy demand is expected to rise in every subsector, with the Minerals sector still dominating (Figure 112). The rise is lower than in the WEM scenario, however a growth in this sector is still prevalent. In the transport sector, economic growth and the growing need for mobility lead to an increase of energy demand in the sector (Figure 114). The electrification, efficiency gains and increase of public transport cannot counteract this increase. This applies to both passenger transport and freight (Figure 116, Figure 118). Energy consumption from non-energy demand (Figure 120) has been decreasing significantly in the past but is expected to increase with an increasing demand in transport.

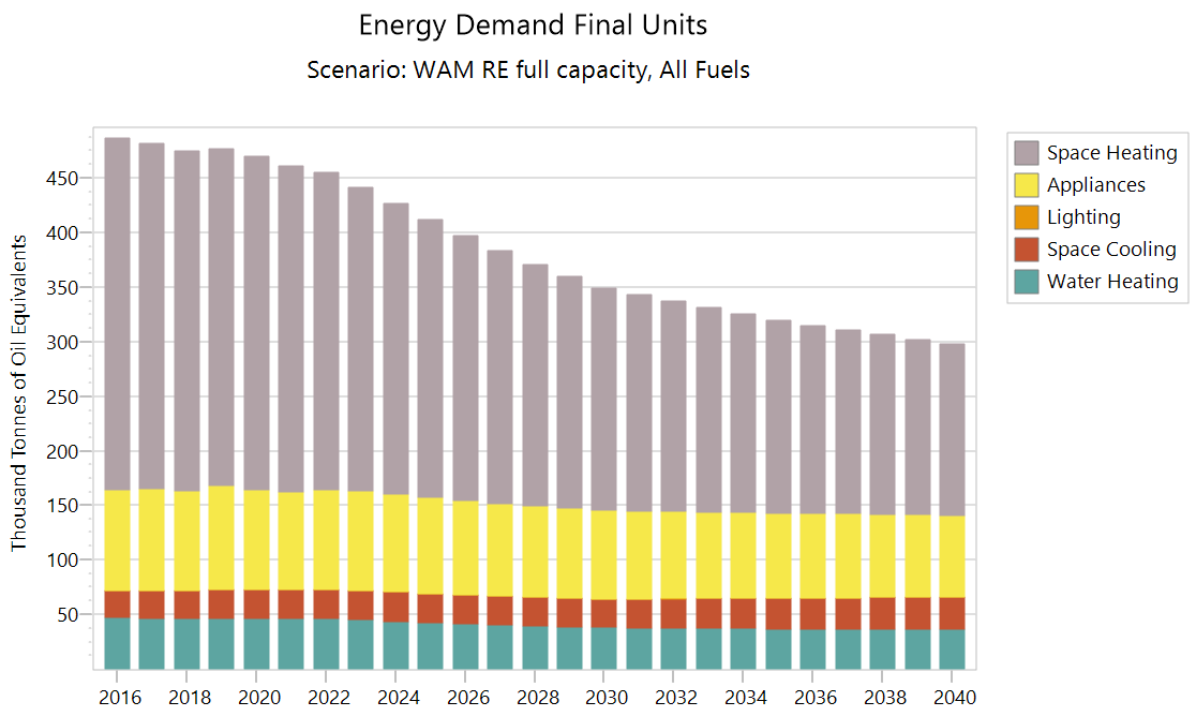



**Figure 108: Final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with additional measures until 2040**

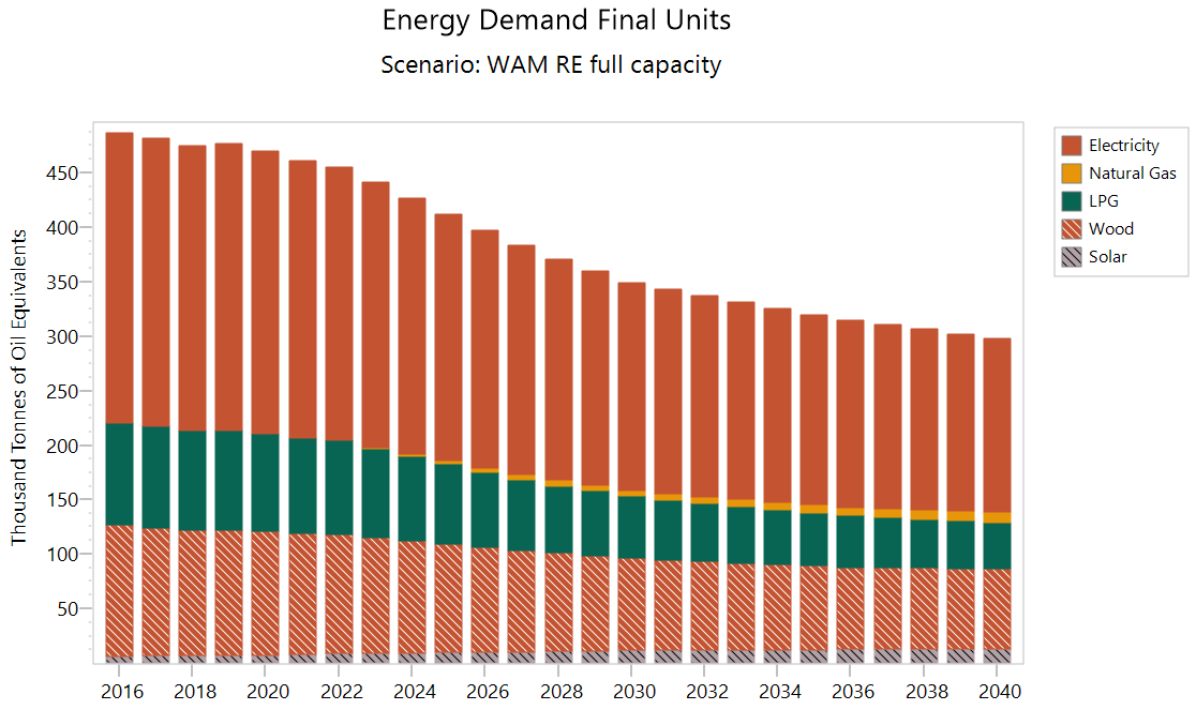



**Figure 109: Fuel split underlying the final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with additional measures until 2040**

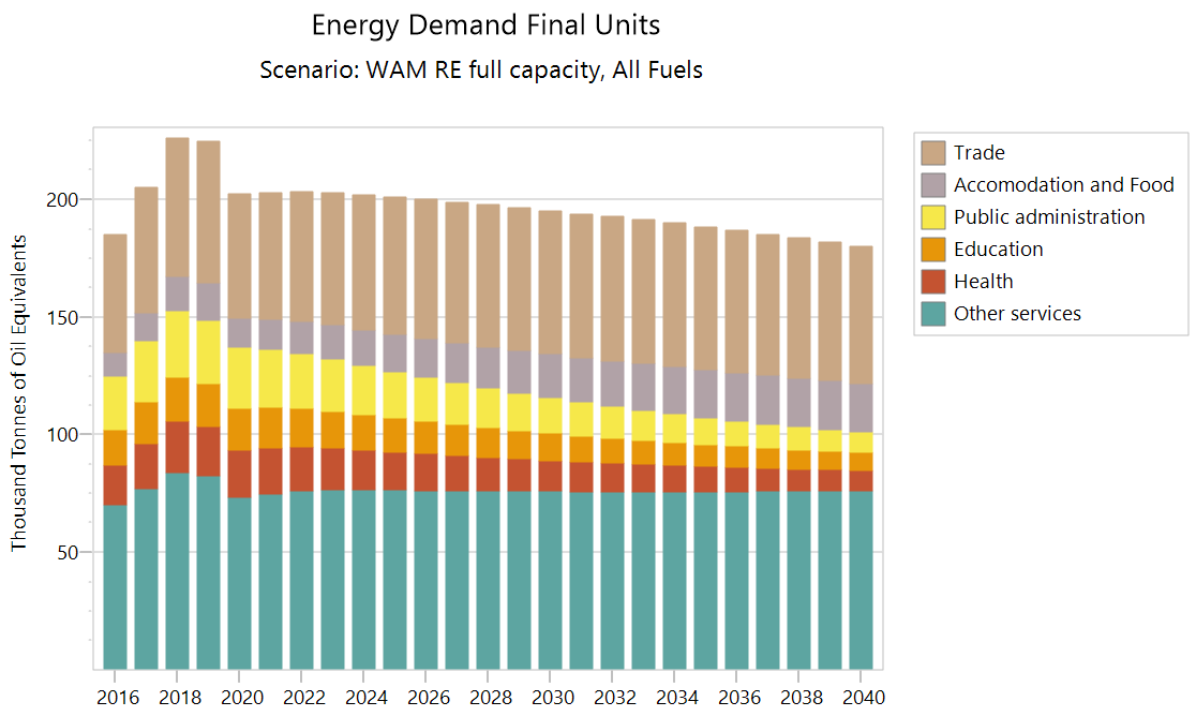



**Figure 110: Final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with additional measures until 2040**

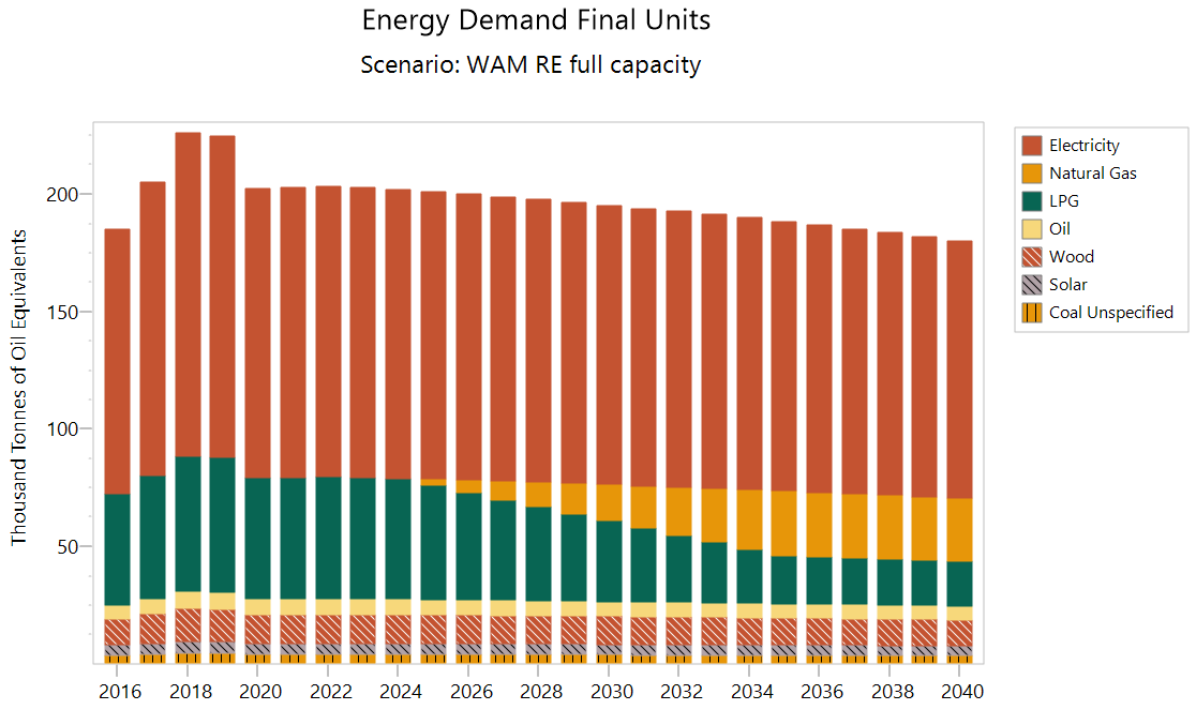



**Figure 111: Fuel split underlying the final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with additional measures until 2040**

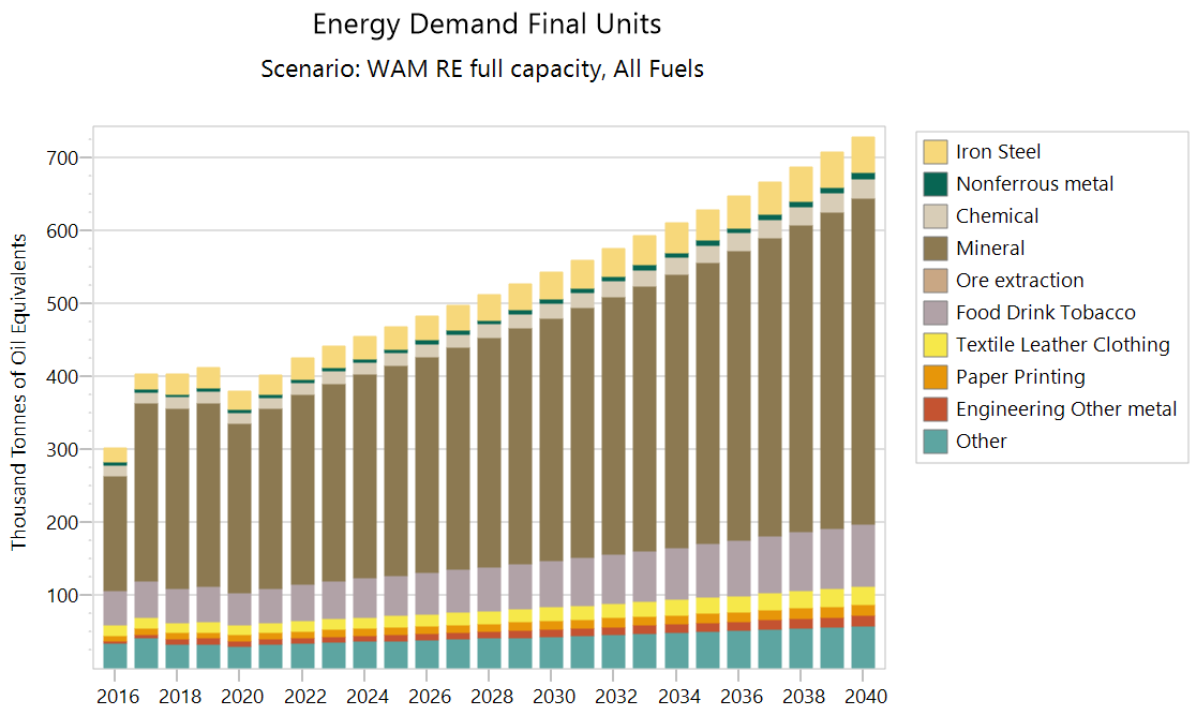



**Figure 112: Final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with additional measures until 2040**

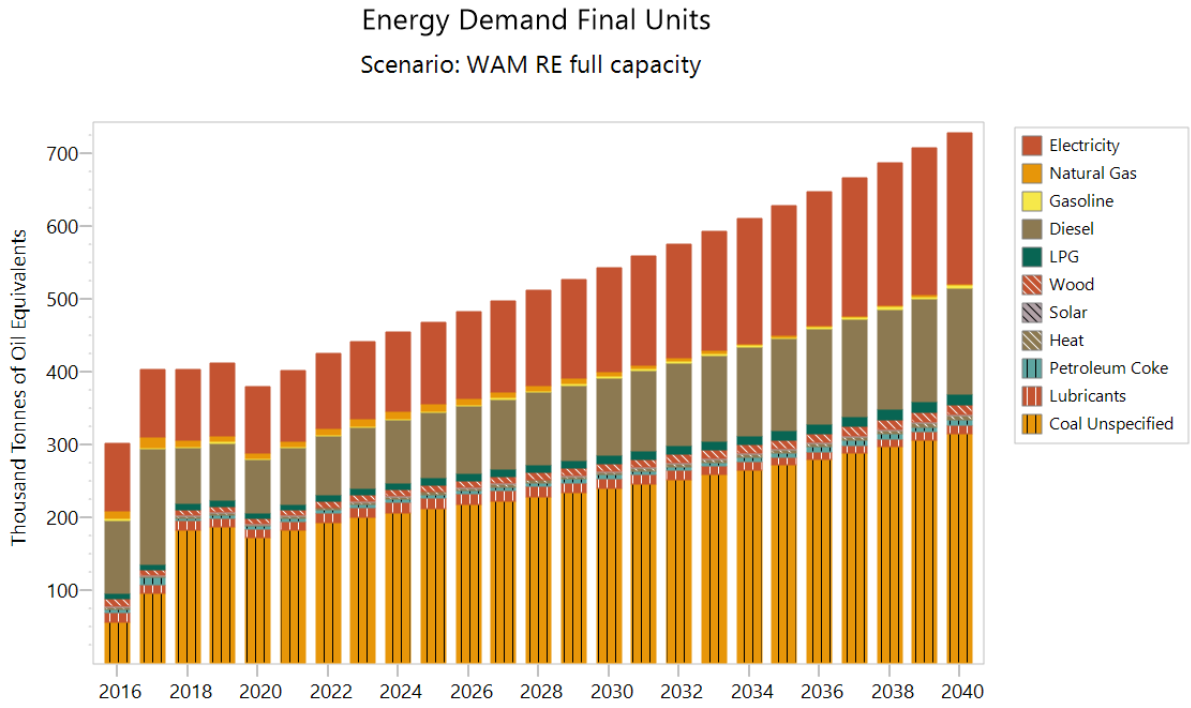



**Figure 113: Fuel split underlying the final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with additional measures until 2040**

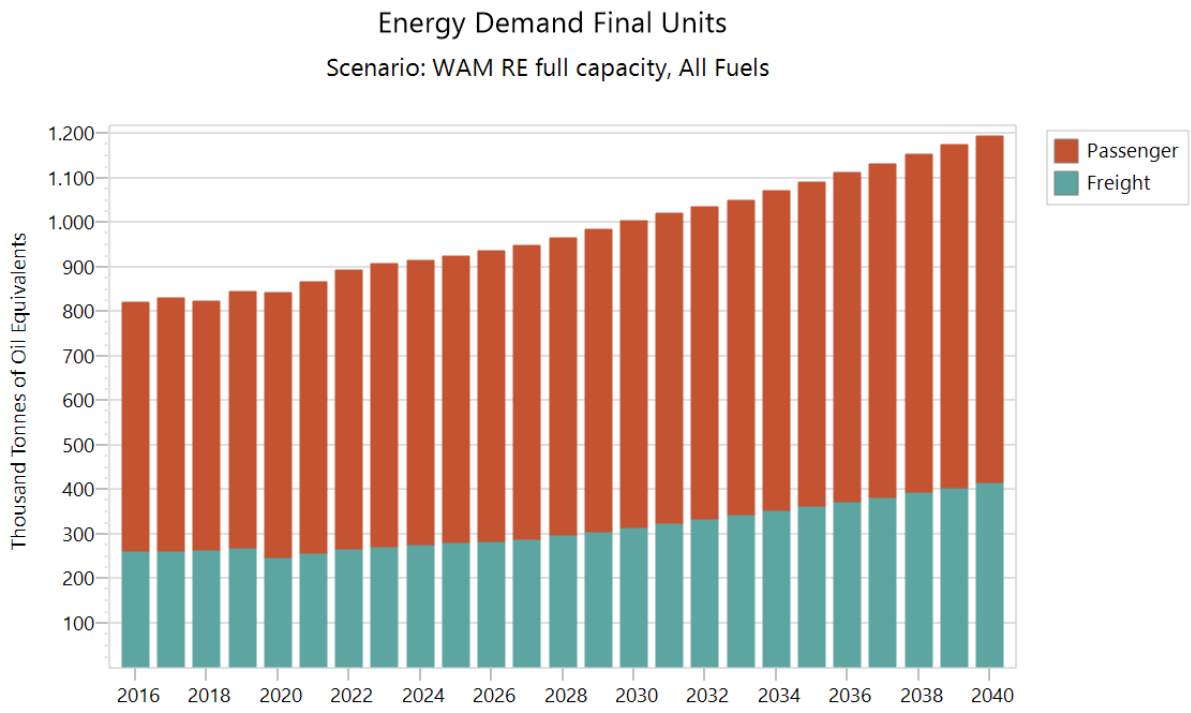



**Figure 114: Final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with additional measures until 2040**

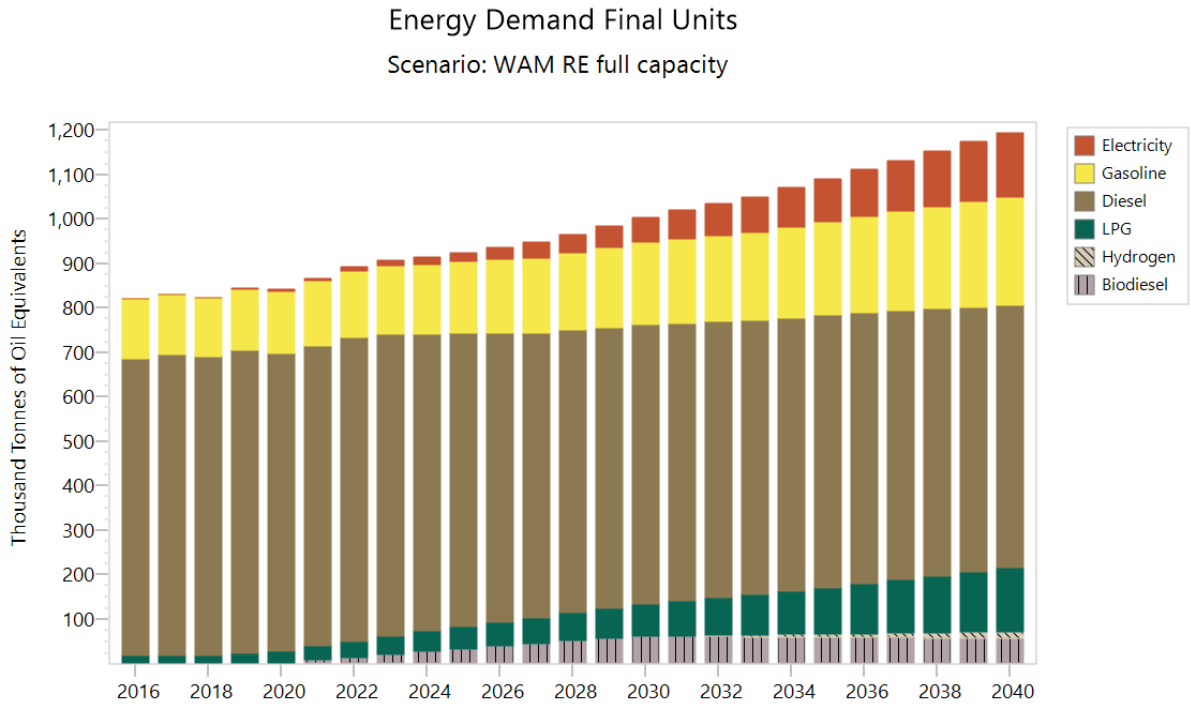



**Figure 115: Fuel split underlying the final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with additional measures until 2040**

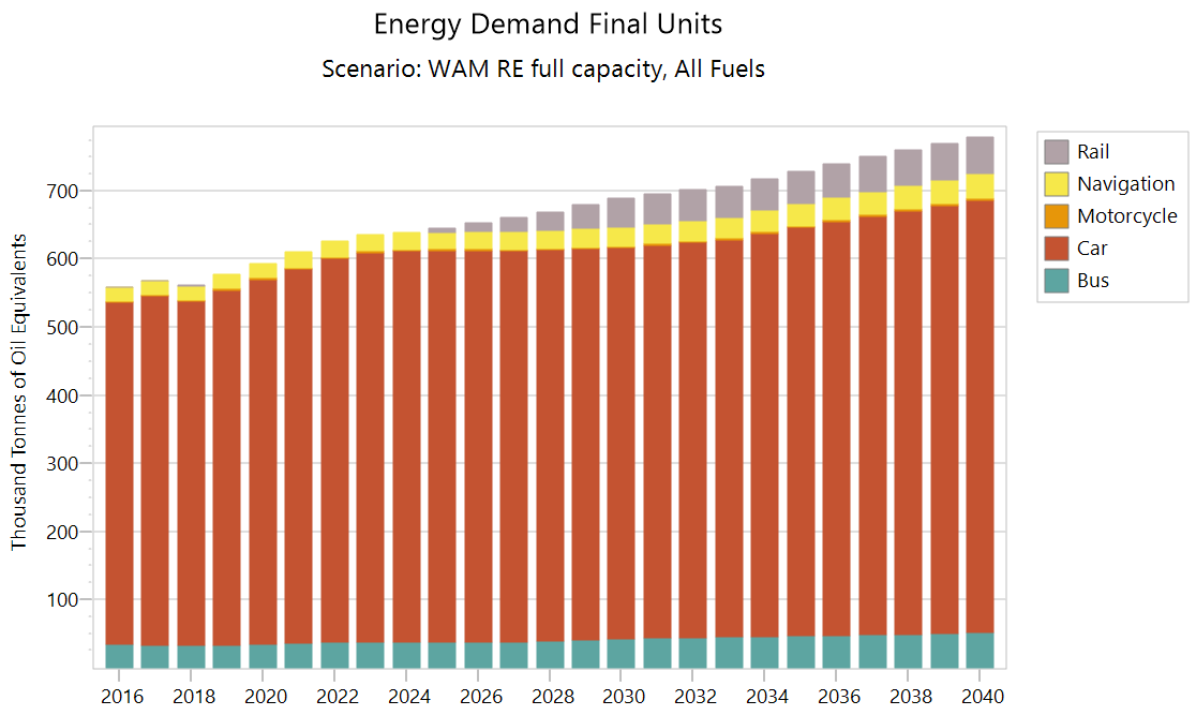



**Figure 116: Final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with additional measures until 2040**

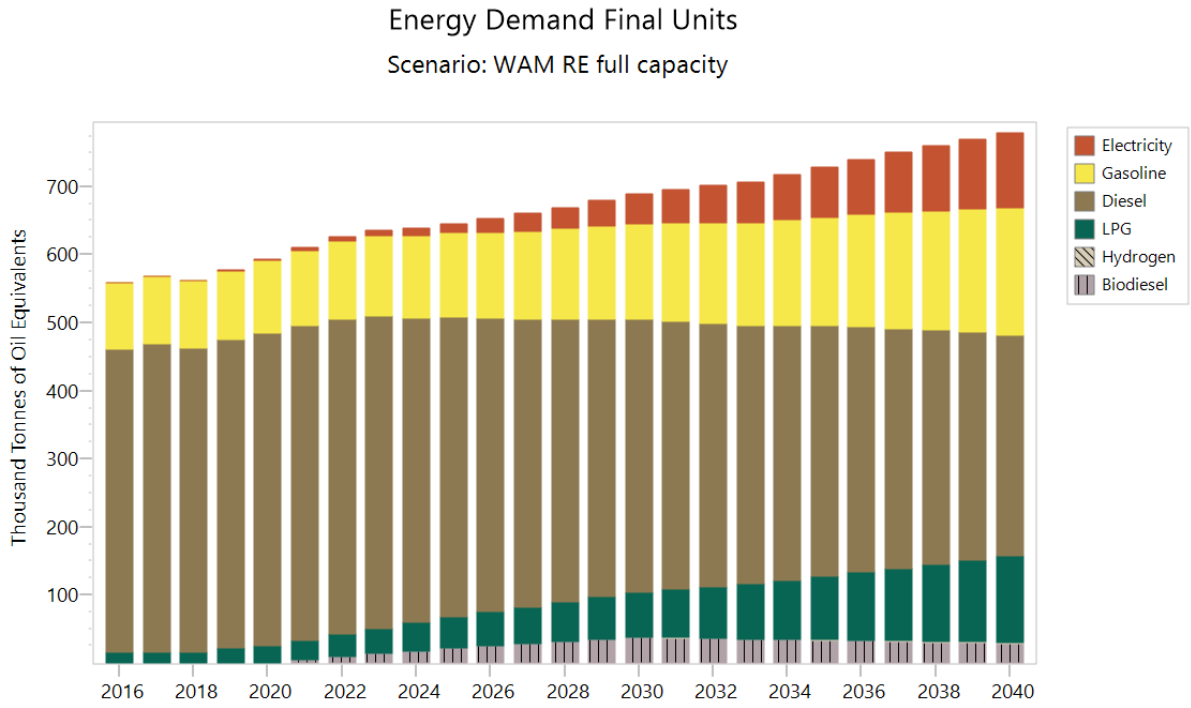



**Figure 117: Fuel split underlying the final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with additional measures until 2040**

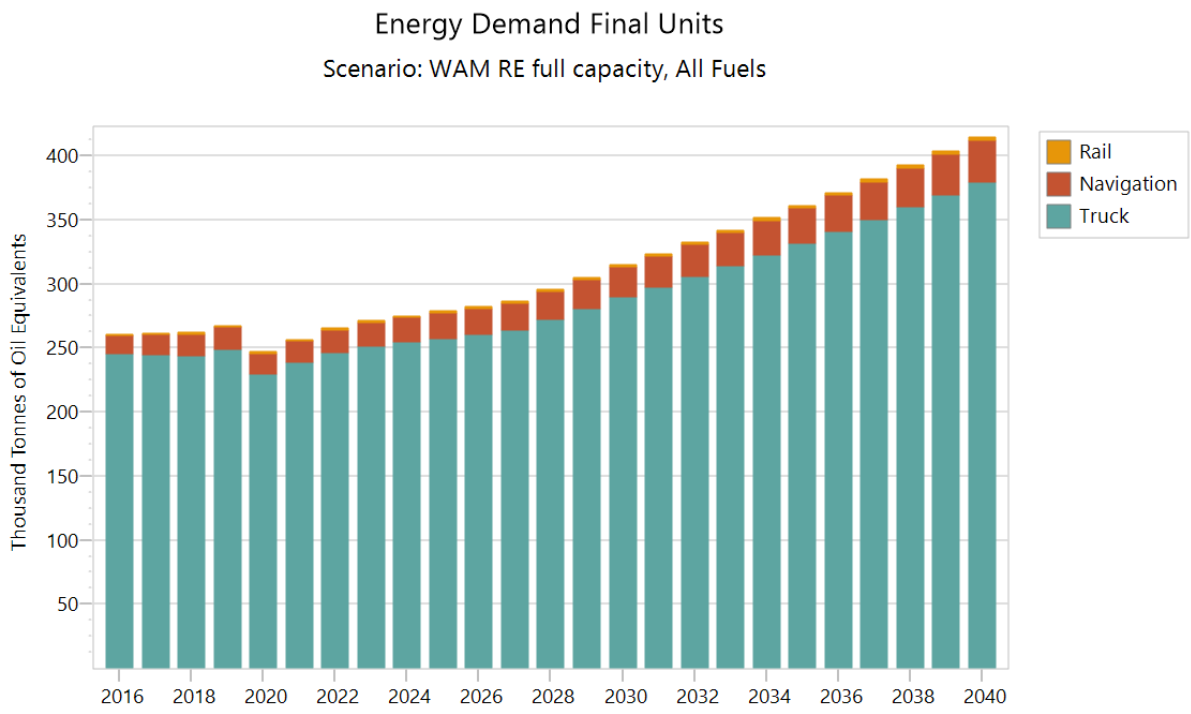



**Figure 118: Final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with additional measures until 2040**

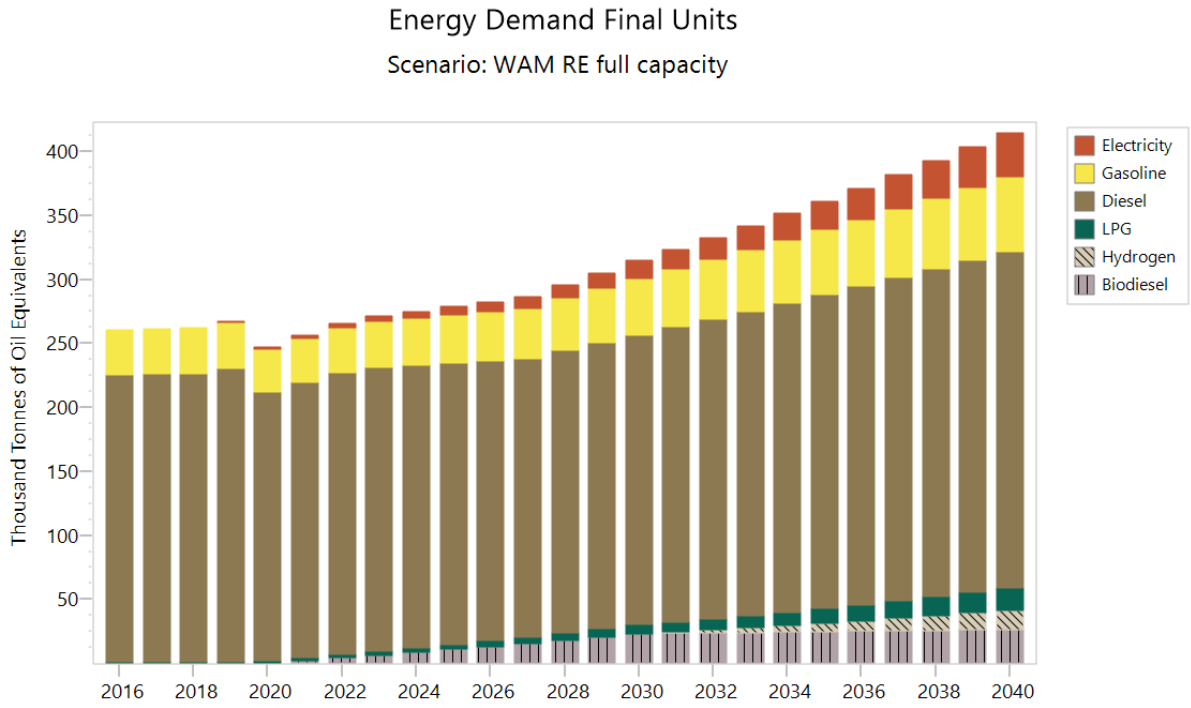



**Figure 119: Fuel split underlying the final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with additional measures until 2040**

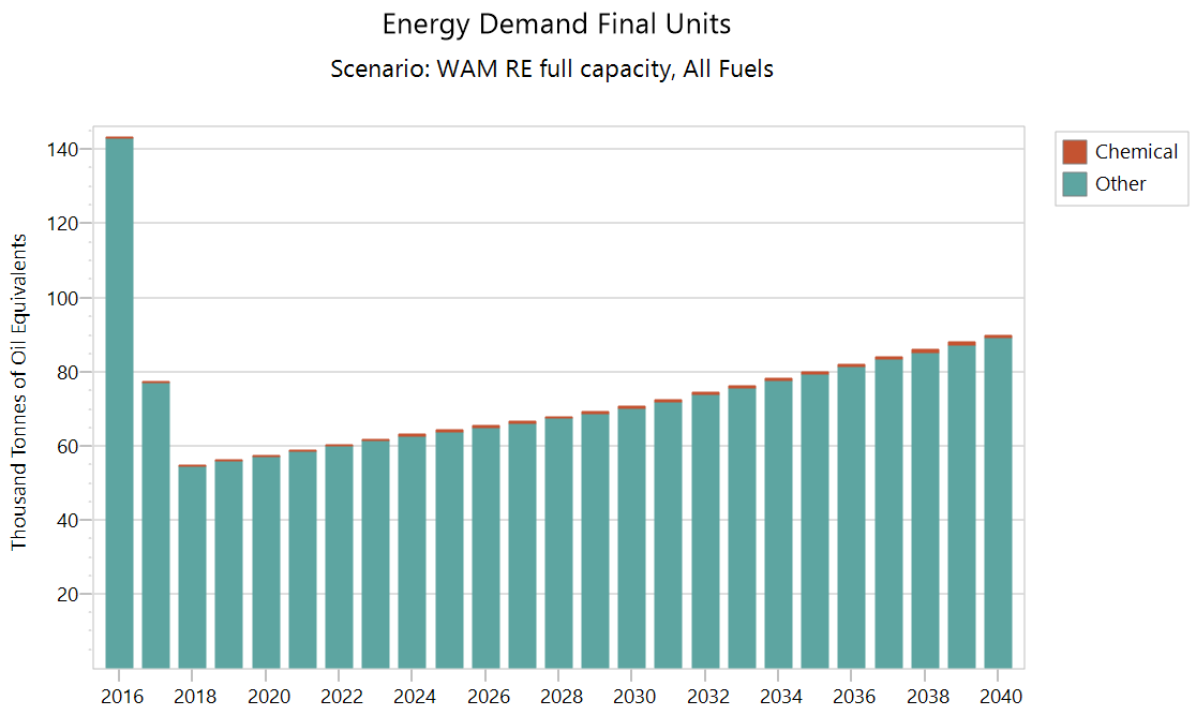



**Figure 120: Final energy consumption (ktoe) for the non-energy demand of energy carriers for historic values from 2016-2018 and as projected with additional measures until 2040**

The following table shows final energy demand in the different subsectors in units of ktoe.

| Branch [ktoe] | 2016 | 2017 | 2018 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Residential | 486.8 | 481.9 | 474.8 | 469.7 | 412.3 | 348.9 | 319.9 | 298.2 |
| Services | 185.0 | 205.3 | 226.2 | 202.6 | 201.1 | 195.2 | 188.4 | 180.0 |
| Industry | 301.7 | 402.7 | 402.8 | 379.7 | 468.2 | 542.4 | 628.3 | 727.9 |
| Transport | 819.4 | 829.8 | 822.7 | 840.2 | 923.8 | 1003.4 | 1089.7 | 1193.0 |
| Agriculture Forestry | 74.0 | 74.1 | 80.3 | 84.7 | 96.7 | 110.5 | 126.2 | 144.1 |
| Fisheries | 29.1 | 38.5 | 40.5 | 38.2 | 47.6 | 56.0 | 65.8 | 77.4 |
| Nonenergy | 143.3 | 77.4 | 54.7 | 57.3 | 64.2 | 70.6 | 80.0 | 89.9 |
| Total | 2039.4 | 2109.7 | 2102.1 | 2072.5 | 2213.8 | 2326.9 | 2498.4 | 2710.6 |
| Residential | | | | | | | | |
| Space Heating | 322.3 | 317.1 | 311.8 | 305.4 | 254.5 | 203.8 | 176.8 | 157.2 |
| Appliances | 92.6 | 92.8 | 91.0 | 91.5 | 88.5 | 81.0 | 78.1 | 75.1 |
| Lighting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Space Cooling | 25.0 | 25.3 | 25.6 | 26.6 | 26.8 | 26.2 | 28.1 | 29.9 |
| Water Heating | 46.9 | 46.7 | 46.4 | 46.3 | 42.5 | 37.9 | 36.9 | 36.0 |
| Total | 486.8 | 481.9 | 474.8 | 469.7 | 412.3 | 348.9 | 319.9 | 298.2 |
| Services | | | | | | | | |
| Trade | 50.0 | 53.5 | 59.0 | 53.1 | 58.5 | 61.0 | 60.9 | 58.4 |
| Accomodation and Food | 10.3 | 12.1 | 14.5 | 12.3 | 15.8 | 18.6 | 20.4 | 20.7 |
| Public administration | 22.6 | 26.0 | 28.2 | 26.2 | 19.9 | 15.2 | 11.5 | 8.7 |
| Education | 15.5 | 17.7 | 19.0 | 17.8 | 14.3 | 11.5 | 9.4 | 7.6 |
| Health | 16.9 | 19.2 | 21.7 | 20.3 | 16.4 | 13.2 | 10.7 | 8.6 |
| Other services | 69.8 | 76.9 | 83.8 | 73.0 | 76.2 | 75.7 | 75.6 | 76.0 |
| Total | 185.0 | 205.3 | 226.2 | 202.6 | 201.1 | 195.2 | 188.4 | 180.0 |
| Industry | | | | | | | | |
| Iron Steel | 18.9 | 20.5 | 27.2 | 25.6 | 31.6 | 36.6 | 42.4 | 49.1 |
| Nonferrous metal | 4.3 | 4.2 | 4.3 | 4.0 | 4.9 | 5.7 | 6.6 | 7.7 |
| Chemical | 14.9 | 15.3 | 15.0 | 14.1 | 17.4 | 20.2 | 23.4 | 27.1 |
| Mineral | 157.1 | 243.0 | 247.2 | 233.0 | 287.3 | 332.8 | 385.6 | 446.7 |
| Ore extraction | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Food Drink Tobacco | 47.4 | 50.6 | 47.4 | 44.7 | 55.1 | 63.8 | 73.9 | 85.7 |
| Textile Leather Clothing | 14.4 | 14.5 | 13.9 | 13.1 | 16.1 | 18.7 | 21.6 | 25.1 |
| Paper Printing | 8.2 | 8.3 | 8.3 | 7.8 | 9.6 | 11.2 | 12.9 | 15.0 |
| Engineering Other metal | 3.3 | 5.5 | 7.6 | 7.2 | 8.9 | 10.3 | 11.9 | 13.8 |
| Other | 33.2 | 40.8 | 32.0 | 30.1 | 37.2 | 43.0 | 49.9 | 57.8 |
| Total | 301.7 | 402.7 | 402.8 | 379.7 | 468.2 | 542.4 | 628.3 | 727.9 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Transport | | | | | | | | |
| Passenger | 558.7 | 568.4 | 560.8 | 593.5 | 645.3 | 688.9 | 728.5 | 778.5 |
| Freight | 260.8 | 261.4 | 261.9 | 246.7 | 278.5 | 314.5 | 361.2 | 414.5 |
| Total | 819.4 | 829.8 | 822.7 | 840.2 | 923.8 | 1003.4 | 1089.7 | 1193.0 |
| Passenger Transport | | | | | | | | |
| Rail | 0.4 | 0.3 | 0.3 | 0.0 | 6.2 | 42.4 | 48.2 | 54.2 |
| Navigation | 20.5 | 20.5 | 20.5 | 21.7 | 24.8 | 28.3 | 32.2 | 36.1 |
| Motorcycle | 2.0 | 2.0 | 2.0 | 2.1 | 2.3 | 2.4 | 2.6 | 2.7 |
| Car | 501.3 | 513.0 | 505.5 | 535.3 | 574.2 | 573.2 | 598.7 | 634.4 |
| Bus | 34.5 | 32.7 | 32.6 | 34.5 | 37.7 | 42.5 | 46.9 | 51.1 |
| Total | 558.7 | 568.4 | 560.8 | 593.5 | 645.3 | 688.9 | 728.5 | 778.5 |
| Freight Transport | | | | | | | | |
| Rail | 0.8 | 1.2 | 1.2 | 1.1 | 1.4 | 1.7 | 2.0 | 2.3 |
| Navigation | 14.9 | 15.8 | 16.7 | 15.8 | 19.8 | 23.4 | 27.6 | 32.7 |
| Truck | 245.1 | 244.5 | 244.0 | 229.8 | 257.3 | 289.4 | 331.6 | 379.5 |
| Total | 260.8 | 261.4 | 261.9 | 246.7 | 278.5 | 314.5 | 361.2 | 414.5 |
| Non-energy | | | | | | | | |
| Chemical | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.6 | 0.7 |
| Other | 143.0 | 77.0 | 54.4 | 57.0 | 63.8 | 70.1 | 79.4 | 89.1 |
| Total | 143.3 | 77.4 | 54.7 | 57.3 | 64.2 | 70.6 | 80.0 | 89.9 |

**Table 47: Final energy consumption (ktoe) for different sectors and subsectors for historic values from 2016-2018 and as projected with additional measures until 2040**

### *Dimension Energy Security*

Two principal areas are most important for the Energy Security of Albania, the electricity production and the oil products sector.

With the additional measures, the import dependency in dry years (assumed in 2022, 2027, 2032, 2037) is almost eliminated as shown in Figure 121. In other years, Albania is expected to be a net exporter of electricity when running hydroelectric plants on full capacity. In normal (not dry) years, the export of electricity is almost at parity with local demand, reaching 97% surplus electricity in 2030.

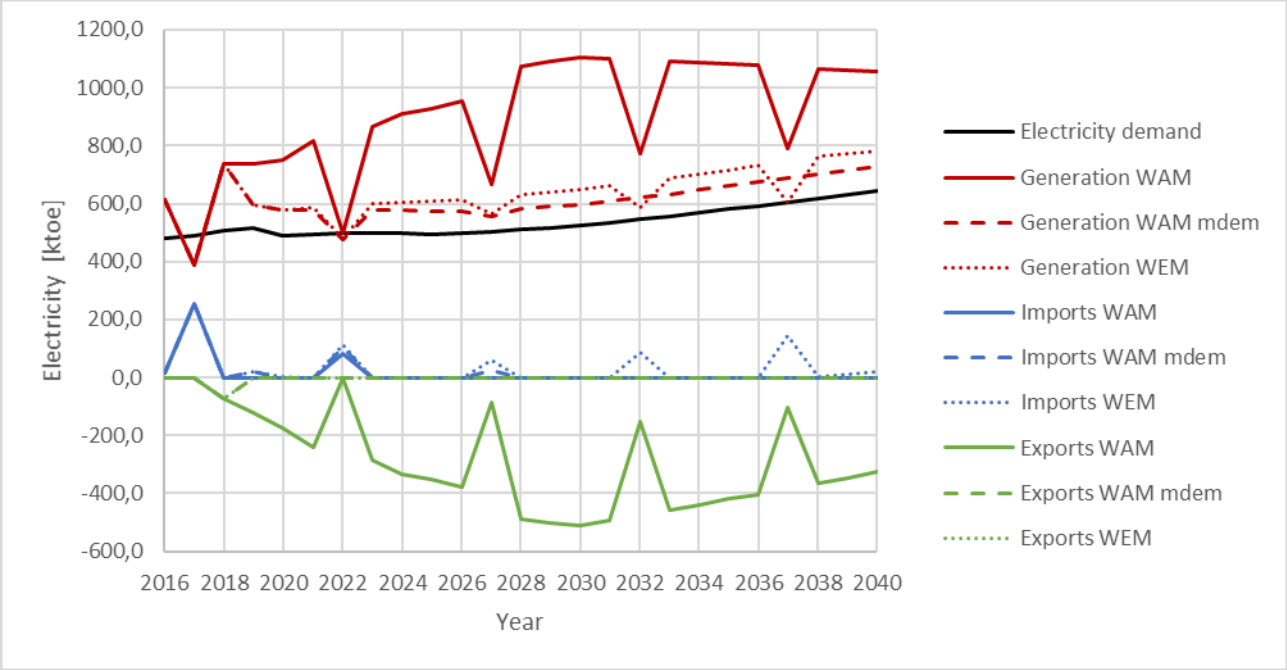



**Figure 121: Electricity demand, generation, exports and imports with additional measures scenarios with renewable energy generation running at full capacity and exporting surpluses (projection 2019 - 2040). WEM and 'WAM RE to meet demand' (denoted 'WAM mdem') are also indicated**

As shown in Figure 122, the bulk of electricity generation is taken over by hydro power plants, which are heavily affected by dry years and the effect of climate change (modelled as a decrease to hydro availability, see Chapter 4). Despite an increase in electricity demand, small hydro power plants (sHPP in Figure 122) see an increase. Gas fired power plants are only used in the dry years as they do not run at full capacity but serve only as a backup in case of shortage in hydro or other renewable availability. While the WEM scenario sees the use of the TPPs (only Vlora in case of WEM) in every year starting in 2035, this is no longer necessary in the WAM scenario with the increased availability of renewable power generation. The shortage of electricity that triggers the dispatch of the TPP appears in autumn and winter of dry years, when solar availability is low.

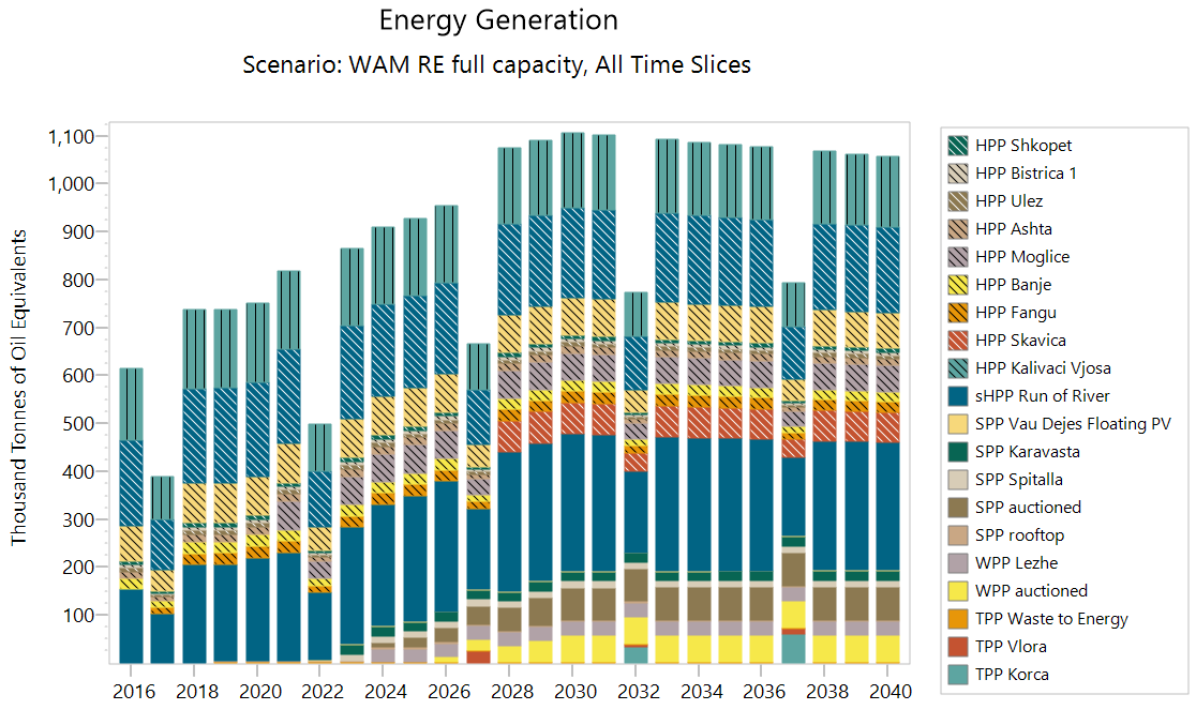



**Figure 122: Electricity generation under the WAM scenario for the different power plants (PP, H - hydro, S- solar PV, W - wind, T - thermal gas). sHPP are small HPPs that are accounted for together, as are auctioned SPPs and WPPs.**

In oil production, the increase of refinery capacity with the refurbishment is expected to increase the production of oil products as can be seen in Figure 123. The import dynamics will change in the sense that the country will change from being a net exporter of crude oil to domestic use of crude oil without major imports nor exports. The imports of oil products will decrease to a very small amount, considerably decreasing import dependency as shown in Figure 124.

There is an increase in the demand for natural gas, which is imported through the TAP pipeline (Figure 124). The natural gas is used for power generation, but also in the residential (1.5% of FEC in 2030) and services sector (8.0% of FEC in 2030), where it replaces the use of LPG. There is also a limited and declining use of natural gas in industry, where it is phased out for electricity.

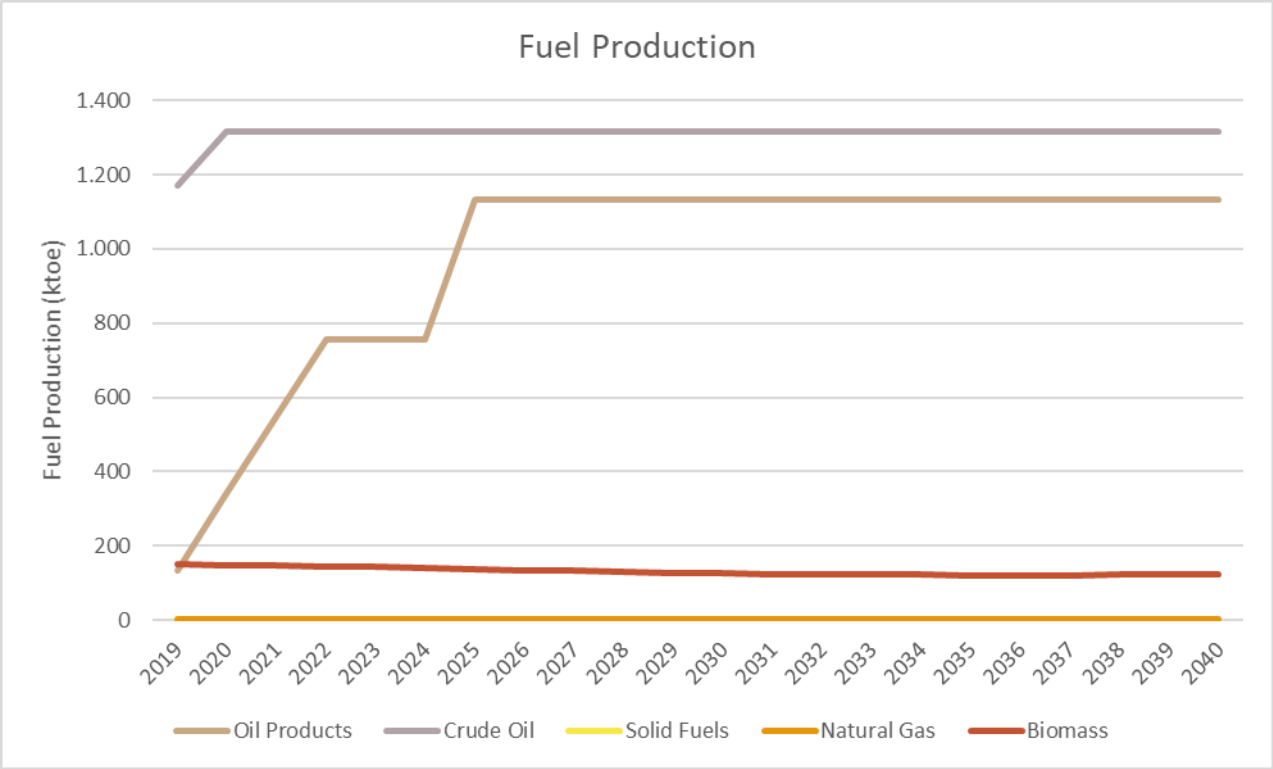



**Figure 123: Fuel production with additional measures (projection 2019-2040)**

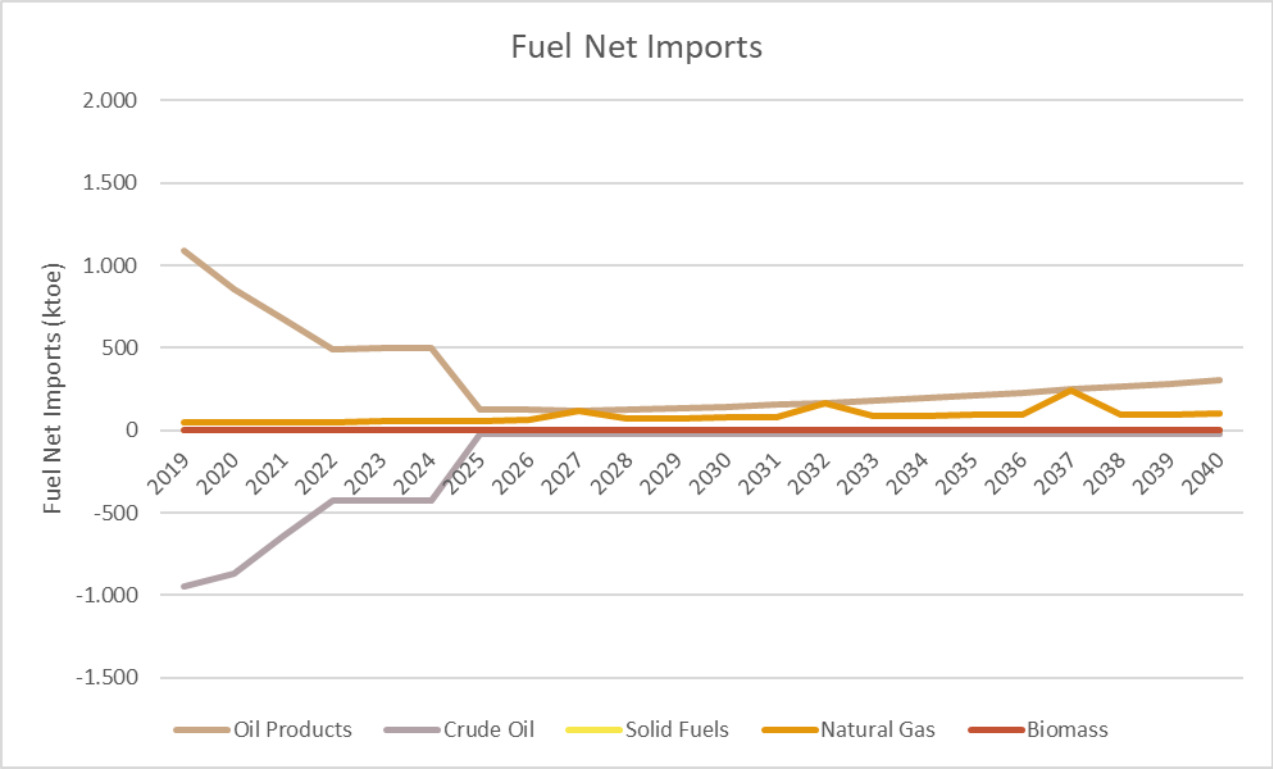



**Figure 124: Fuel Net imports with additional measures (projection 2019-2040)**

*ii. Assessment of policy interactions (between existing policies and measures and planned policies and measures within a policy dimension and between existing policies and measures and planned policies and measures of different dimensions) at least until the last year of the period covered by the plan, in particular to establish a robust understanding of the impact of energy efficiency/ energy savings policies on the sizing of the energy system and to reduce the risk of stranded investment in energy supply*

The modelling results presented in this chapter and for existing measures in Chapter 4 describe the energy system in aggregated form, considering the policies outlined in Chapter 3.

Each individual policy has an individual effect if implemented to the existing system. However, the interactions of policies need to be considered as this can increase or decrease their effect on the final saving values. An example is building policies that, among others, target the replacement of wood fired stoves for space heating in favour of electricity powered heating and heat pumps. The fuel switch itself will lead to a decrease in energy consumption (especially in the case of heat pumps) but the stronger effect in terms of GHG emissions savings occurs in combination with the enlargement of renewable electricity generation. All measures that lead to an increase in electricity consumption in favour of another fuel require an adjustment of electricity production capacity or cross-border interconnectors. Similarly, energy efficiency improvements have to be part of planning for electricity supply.

Without energy efficiency measures, a stronger capacity increase for electricity generation is necessary to avoid import dependency. Energy efficiency measures can reduce the pressure on both the production and transmission capacity. By accounting for supply, network and demand sides of the energy systems, both GHG emissions and costs for overinvestments in production capacities can be avoided.

Figure 125 shows the GHG emission savings for policies and measures implemented in the WAM scenario. Note that some of the PaMs have not been implemented in the modelling as they do not act directly on the system but are nonetheless important to follow. Some of the PaMs have been implemented in combination, then a separate analysis is not possible. Other PaMs (on renewable capacity) have been split. The effects of G-LF1 and G-LF2 are not included in the figure for readability but given in Figure 127. The total effect of all policies is shown in Figure 126. As becomes evident, the joint effect of the policies in WAM (savings of 2347 ktCO2eq in 2030) is larger than the sum of the separate effects (2321 ktCO2eq in 2030), with this effect increasing over time. This difference is due to the interactions of the different policies, particularly of energy efficiency and renewable energy PaMs described above.

Renewable energy plants only lead to emission savings when replacing thermal power plants, as is the case only after 2030 outside of dry years. In other years, they may be replacing imported electricity, the emissions of which are accounted for in the country of electricity generation. On the other hand, the thermal power plant of Korça only leads to emissions in dry years, which are not shown in the figure. Energy efficiency PaMs have only a small effect as as long as they only reduce the demand for electricity in the system, since there is ample of supply of renewable electricity in any case. Nevertheless, and as described above, the energy efficiency first principle should be followed. There are only few PaMs acting on non-energy emissions in the WAM scenario. In terms of total emission savings, the forest management has by far the largest effect.

This discussion shows the limitations of attributing emission savings to individual PaMs. The reference system in which the PaM is implemented needs to be considered. As the NECP attempts to draw up an integrated plan the effect of interactions between PaMs is of essential importance.

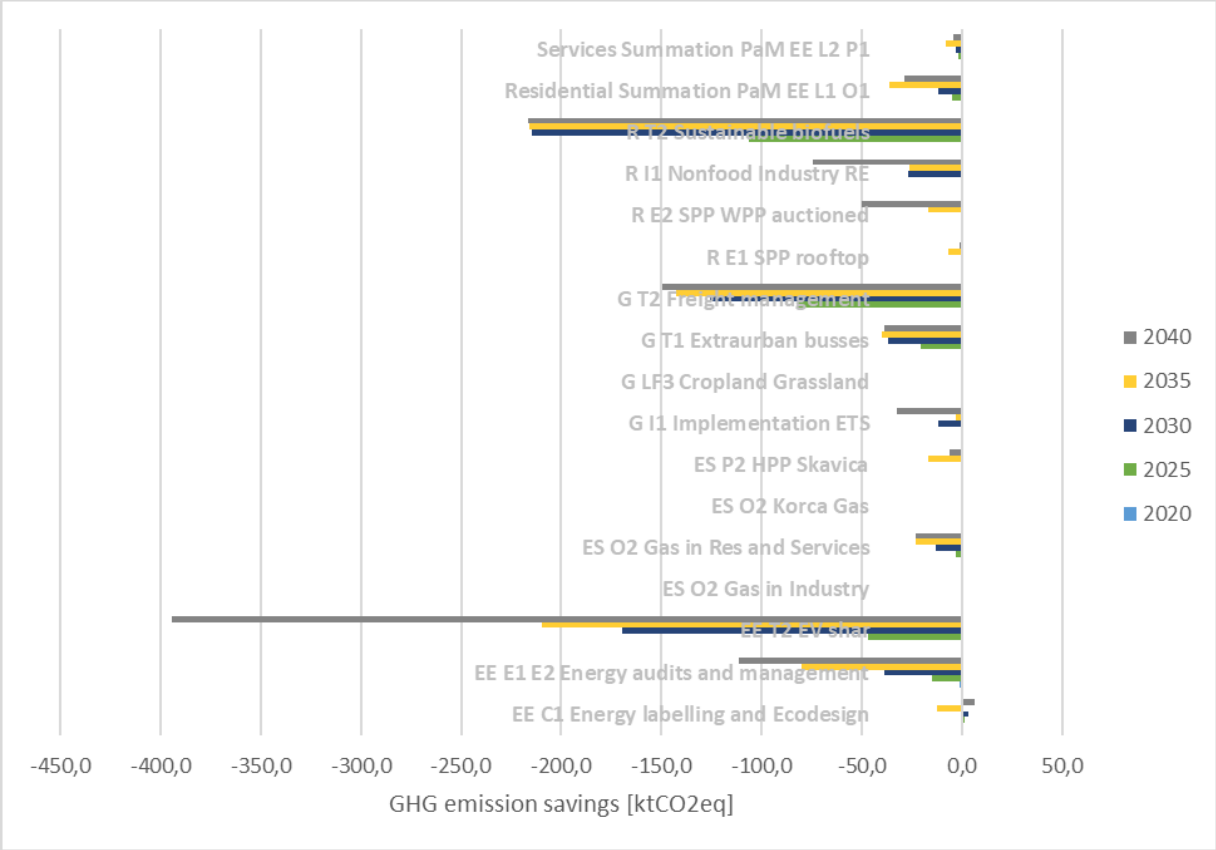



**Figure 125: GHG emission savings [kt $CO_2$eq] for selected measures underlying the WAM scenario. Forest management is not shown for readability**

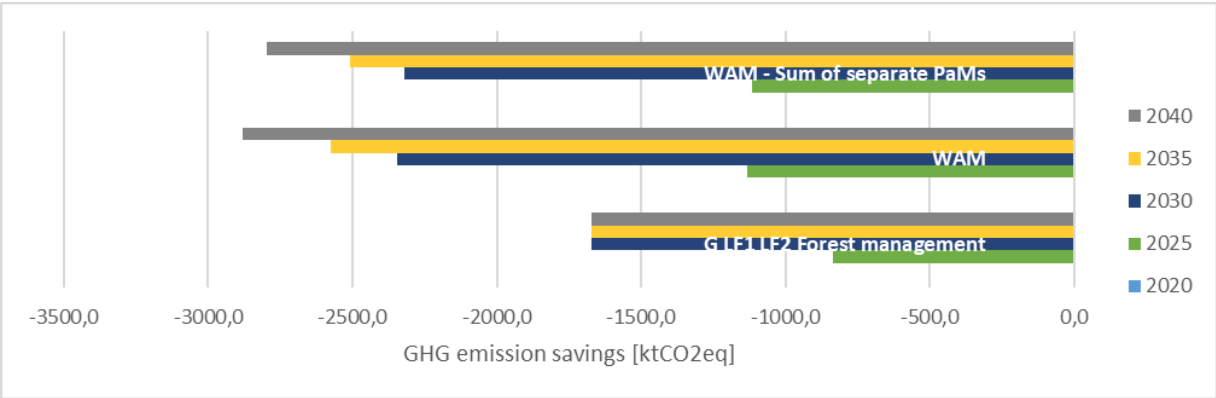



**Figure 126: GHG emission savings for all policies and measures implemented separately (top columns) and implemented jointly in WAM (middle columns). The effect of G-LF1 and G-LF2 is given here for completeness.**

| Abbr. | Short name | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| G LF1 LF2 | Forest management | 0 | -836,1 | -1672,3 | -1672,3 | -1672,3 |
| R T2 | Sustainable biofuels | 0 | -106,2 | -214,3 | -215,9 | -216,5 |
| EE T2 | EV share | 0,2 | -47,1 | -169,6 | -209,4 | -394,4 |
| G T2 | Freight management | 0 | -81,9 | -125,5 | -142,5 | -149,2 |
| EE E1 | Energy audits and management | -1 | -14,7 | -38,7 | -80,3 | -111,3 |
| G T1 | Extraurban busses | 0 | -20,3 | -36,8 | -40 | -38,5 |
| R I1 | Non-food Industry RE | 0 | 0 | -27 | -25,9 | -74,7 |
| ES O2 | Gas in Res and Services | 0 | -2,9 | -13,3 | -22,9 | -22,8 |
| Residential | PaMs EE L1 O1 | -0,8 | -5,2 | -12 | -36,4 | -28,8 |
| G I1 | Implementation ETS | 0 | 0 | -11,7 | -2,9 | -32,3 |
| Services | PaMs EE L2 P1 | 0 | -1,6 | -2,9 | -7,7 | -4,2 |
| G LF3 | Cropland Grassland management | 0 | 0 | 0 | 0 | 0 |
| ES P2 | HPP Skavica | 0 | 0 | 0 | -17 | -6 |
| R E1 | SPP rooftop | 0 | 0 | 0 | -6,9 | -1,2 |
| R E2 | SPP WPP auctioned | 0 | 0 | 0 | -17 | -49,8 |
| ES O2 | Gas in Industry | 0 | 0 | 0 | 0 | 0 |
| ES O2 | Korca Gas | 0 | 0 | 0 | 0 | 0 |
| EE C1 | Energy labelling and Ecodesign | 0,2 | 1,6 | 3 | -12,3 | 6,3 |
| | WAM - Sum of separate PaMs | -1,4 | -1114,4 | -2321,1 | -2509,4 | -2795,7 |
| | WAM | -2,4 | -1134,8 | -2347,1 | -2576,9 | -2882,3 |

**Table 48: GHG savings in kt$CO_2$eq for PaMs underlying the WAM scenario**

### *iii. Assessment of interactions between existing policies and measures and planned policies and measures, and between those policies and measures and Union climate and energy policy and measures*

Three policies that are active on the EU level are part of the PaMs included in the WAM scenario modelling of the Albanian energy system: New construction is required to follow the rules of the EPBD, an ETS is implemented and Ecodesign and Energy Labelling are introduced. Other EU policies already form part of the Energy Community Treaty.

## 5.2 Macroeconomic and other impacts of the planned policies and measures, including comparison to projections with existing policies and measures

This section addresses Macroeconomic and other impacts, to the extent feasible, the health, environmental, employment and education, skills and social impacts, including just transition aspects (in terms of costs and benefits as well as cost-effectiveness) of the planned policies and measures described in section 3 at least until the last year of the period covered by the plan, including comparison to projections with existing policies and measures.

This section specifically provides an assessment on the non-energy impacts of energy and climate policies, as comprised in this NECP. The environmental effects of energy and climate policies aiming to increase the share of renewable energies (RE) in the energy system, as well as improve energy efficiency (EE) across different consumption sectors, are mostly evident and well researched. To a large extent, the implementation of measures related to EE and to increase the share of RE is driven by the aim to reduce greenhouse gas emissions, mitigate climate change and comply with the goals of the Paris Agreement. However, both EE and RE measures can have a range of impacts towards households, employment, private companies, and the public sector. These impacts might be substantial, and can be documented in different dimensions, e.g. ranging from macro-economic effects (impacts on employment, public budgets, value creation, etc.), health impacts (due to reduced local air and water pollution) social impacts (alleviation of energy or fuel poverty, improved comfort and well-being, reduction of inequality), among many others (for an overview, see Bouzarovski (2014)). A comprehensive estimation of the multiple effects of energy and climate policies across actors and dimensions is beyond the scope of this study. This section provides a brief overview on non-energy impacts across three key dimensions, namely: 1) disposable household incomes, as a key indicator to measure the impacts on fuel and energy poverty 2) public budgets, to understand if measures have the potential to increase or decrease public revenue streams and 3) employment, as energy and climate policies bear great potential to provide green jobs.

### *Disposable household incomes*

Achieving a substantial decarbonization of the energy sector will require major efforts in the building sectors. At EU level, greenhouse gas emissions in the building sector represent more than a third of total emissions. Residential buildings account for 75 % of the European building stock, from which more than 40 % was built before 1960 and more than 90 % before 1990. Low income households represent about 17 % of households in the EU (Eurostat, 2014), while estimates of EU-inhabitants suffering from fuel poverty ranging between 50-160 million inhabitants, corresponding to roughly 6–21 % of the total EU-population (Bouzarovski (2014); BPIE (2015); Bird et al. (2010)). Energy efficiency policies in the residential sector bear great potential to improve the disposable income of households. Disposable household incomes can be increased by improved EE in space heating, hot water generation or energy-using products like fridges or televisions, given that the overwhelming share of all implemented measures are cost-effective (Yushchenko and Patel 2017; Dodoo et al. 2017). Derived from this, EE bears a great potential for the alleviation of energy poverty, but additionally induce the multiple benefits of EE, such as improving human health, lowering energy subsidies through social policies, increased the value of properties, local spending and employment, reduced emissions, etc. Initial investments in EE for renovation of buildings usually pay off in terms of heating cost reduction, which enables consumers to spend their money elsewhere in the long run. However, as the evaluation of the German KfW Energy-efficient Refurbishment Programme emphasizes, it must be noted that these investments are profitable after a period of several decades (KfW Group (2018)). Disregarding investment costs is hence a simplification and likewise the neglect of rebound and spill-over effects.

*Public budgets*

Public Budgets can be affected by EE and RE policies in multiple ways. For example, changes in public budgets can be triggered by new jobs generated (e.g. by EE measures the building sector). On the other hand, policies comprising tax cuts and subsidies towards targeted activities to improve EE and deploy a higher share of RE can go along with higher public spending or reduced tax incomes. As an indicator for the impact on public budgets, additional income tax revenues) for a typical average job in the related sectors/subsectors can be computed, using country specific income tax rates. Losses of income tax in the energy sector can also be considered in this way here. The approach can be extended to other impacts related to the public budget, such as VAT and energy taxes to calculate positive or negative effects on public budgets.

*Employment effects*

Employment effects can be of great importance, as providing employment opportunities and reducing unemployment rates represent key political objectives. Direct effects of EE on employment are based on two main drivers: investments in EE measures and related energy savings. While the former triggers demand impulses in industries producing relevant technologies, the latter reduces demand related to energy supply in the long run. In both cases, these impacts indirectly affect other sectors, e.g. energy producers and distributors. As various studies have shown, net employment gains are likely to occur when shifting from spending on energy consumption to investing in EE measures (Wei et al. 2010; Scott et al. 2008; Bacon and Kojima 2011). Provided that EE measures are cost-effective they also increase disposable incomes, which further stimulates job creation in the long-run. Measures improving energy efficiency by construction-intensive activities, such as buildings envelope refurbishment, have also shown to have great potential for employment creation.

Table 49 presents a qualitative assessment of non-energy impacts of selected PaMs, addressing the dimensions disposable household incomes, public budgets and employment18[1]. The values indicated in the table are “low”, “middle”, “high” (i.e. low meaning a PaM only has a minor positive effect on the respective non-energy impact) if a PaM has the potential for respective effects on the examined dimensions, and “neutral”, if it has no effect. Some PaMs require either public funds to operate, or comprise tax exemptions to incentive certain activities, thus impacting public budgets in a negative way. These effects are indicated by a value of “negative” in the respective impact towards public budgets. In general terms, policies improving EE in the residential sector, both in the building stock, as well as of appliances and devices, bear potential to improve household´s disposable incomes and reduce energy poverty. Regarding employment, policies requiring construction works, such as building's refurbishments or infrastructure related projects, bear potential to create green jobs. With regard to public budgets, policies triggering high employment might also improve income-tax revenue, thus improving public budget. Likewise, policies improving EE of public energy use, such as improved EE in public buildings, can reduce public expenditures for energy and benefit public budgets.

18 Of note, several not-included PaMs are of cross-cutting nature or are supportive or enabling to considered PaMs to achieve its non-energy impacts. A prominent example might be Feed-in tariffs, which as such do not lead to employment effects, but the induced development of power plants does.

| Nr | PaM Name | Qualitative Assessment of non-energy impacts of PaMs | | |
|---|---|---|---|---|
| | | Disposable houshold incomes | Public Budgets | Employment |
| EE-E1 | Energy audits for large energy consumers with focus on industrial activities | neutral | neutral | low |
| EE-E3 | Framework for application of renewable energy (solar, wind, small hydropower, biomass and biogas power schemes) for industrial use | n.a. | n.a. | n.a. |
| EE-O1 | Energy efficiency obligation scheme and alternative measures for Albania | medium | low | low |
| EE-T1 | Energy labeling of new cars | low | neutral | neutral |
| EE-T2 | Increase the share of Electrical Vehicles in the national car fleet | low | negative | neutral |
| EE-T3 | Financial incentives for energy-efficient vehicles and clean ones (National and local level) | low | negative | neutral |
| EE-L1 | Implementation of the Minimum Energy Performance Requirements in buildings | high | medium | high |
| EM-P1 | Eradicate energy poverty | high | negative | neutral |
| ES-O2 | Implementation of priority projects identified in the Gas Master Plan (Industry) | neutral | medium | medium |
| ES-O2 | Implementation of priority projects identified in the Gas Master Plan (Residential and Services) | low | medium | medium |
| ES-O2 | Implementation of priority projects identified in the Gas Master Plan (Korca Gas) | neutral | low | medium |
| EE-C1 | Introducing the Energy labelling and Eco-design requirements | medium | low | neutral |
| G-I1 | Implementation of the ETS in Albania | negative | low | neutral |
| G-T1 | Improvement of extra-urban bus network | low | neutral | neutral |
| G-T2 | Integrated freight management | neutral | low | neutral |
| ES-O4 | Increasing hydrocarbons exploration and production | neutral | neutral | low |
| EE-P1 | Energy efficiency measures related to purchasing by public authorities | neutral | low | neutral |
| R-T2 | Sustainable / Advanced biofuels | neutral | negative | low |
| EE-L2 | Renovation of the public building stock | neutral | medium | high |

| | | | | |
|---|---|---|---|---|
| **R-E1** | Mechanism of Feed-in-Tariff for small renewable capacity | low | negative | medium |

**Table 49: Qualitative assessment of non-energy impacts of selected PaMs considered in the WAM scenario**

### *Employment effects - Energy efficiency*

Regarding employment effects PaMs triggering building renovation action usually have the highest impacts. Most of the job creation is taking place in the branches construction and manufacturing while having slightly negative effects in the sectors mining and quarrying and branches directly related to the supply of energy. PaM EE-L1 and EE-L2 can be expected to have substantial impact on the employment derived from the energy savings they generate and the additional investments related to these. The combined effect can be estimated to create 3,500 to 12,000 full-time equivalents[19] in the period 2019 to 2030. As the share of public buildings in the total building stock is relatively small the main share of these additional employment effects will be generated by the implementation of energy performance standards for buildings and its effect on the renovation activity improving residential buildings.

### *Employment effects - Renewable energy*

The development of renewable energy power plants bears great potential for the creation of employment. While the renewable plants would not be manufactured in Albania, there is also a notable effect that can be attributed to the construction phase of RE power plants, while its operation is not employment intensive. Most of the employment is therefore expected to be created during the construction phase of the power plants. Figure 127 shows an estimate of expected employment creation during the construction and operation and maintained phases of solar PV and wind power plants. It is based on normalized employment factors, whereas normalization is carried out from the commonly used unit person-years/MW into the unit jobs/MW by assuming a 20-year lifetime of projects. Results are based on employment factors reported by Cameron and van der Zwaan (2015) in the high bound estimate, who analyses the body of available peer-reviewed scientific literature with this regard. In particular, solar PV bears potential for green jobs creation.

In the WEM scenario, around 280 MW of solar PV are added to the power system until 2030. This results in around 460 jobs in the installation phase, and 460 further jobs in the operation and maintenance phase, resulting in a total of 900 solar PV related jobs until 2030. By a similar metric, a total of 150 jobs are created due to wind power plants, with a higher share (two thirds) attributed to the operation and maintenance phase.

The WAM scenario comprises a capacity addition of 770 MW until 2030 for solar PV and 450 MW in the same timeframe for wind. This results in around 1300 jobs in each the installation and operation and maintenance phase for solar PV, or a total of 2600 jobs. As for wind, a total of 460 jobs are created in the WAM scenario.

19 Gross effect not taking to account second order effects and limitations such as labour force shortages.

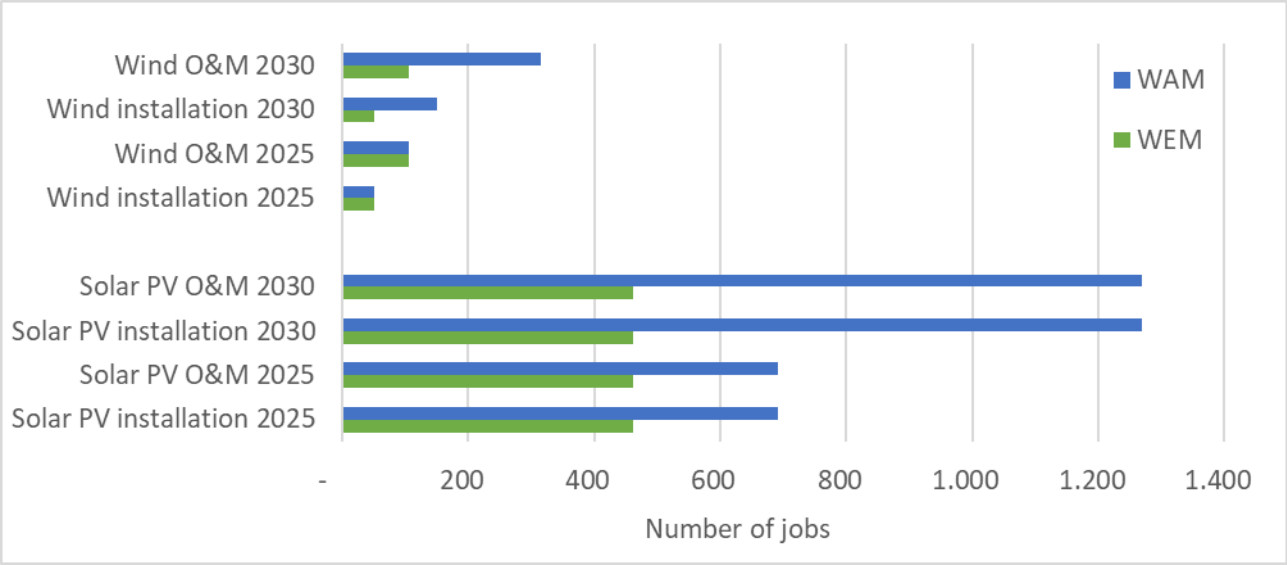



**Figure 127: Cumulative employment until 2025 and 2030 for solar PV and wind for the installation and O&M phases (own elaboration based on Cameron and van der Zwaan (2015))**

## 5.3 Overview of investment needs

### *i. Existing investment flows and forward investment assumptions with regard to the planned policies and measures*

In the PaM description in chapter 3, the budget and investment are presented per PaM. The table below provides an overview of investment assumptions.

| Dimension | Code of PaM | PaM name | Financial - investments | *WEM or WAM* |
|---|---|---|---|---|
| Decarbonisation / GHG emissions & removals | G-A1 | Promotion of organic agriculture | Agri-environmental, climatic and organic farming measures in total foreseen in the IPARD II (2014-2020) scheme have an indicative budget of 1.7 MEur and have an indicative starting date in 2018 (IPARD programme 2014-2020) | WEM |
| | G-A2 | Improve the Agricultural Monitoring in Albania | No budget identified specifically | WAM |
| | G-A3 | Regulating the Agricultural burning practices | No budget identified specifically | WEM |
| | G-B1 | Policies to support RES in Heating and Cooling Sector | No state budget foreseen; cost to be covered by electricity tariffs | WEM |
| | G-I1 | Implementation of the ETS in Albania | 2 MEur (as an indicative figure based on benchmarking) | WAM |

| | | | | |
|---|---|---|---|---|
| | G-I2 | Establishment of a mechanism for implementation of MMR | 1 MEuro | WAM |
| | G-LF1 | Increasing the natural carbon sink capacity of forestry and pastures | 6.5 MEur (annually for the forest sector although not specified by measures) from the State funds | WAM |
| | G-LF2 | Environmentally friendly forest management | | WAM |
| | G-T1 | Improvement of extra-urban bus network | Specific budget not available but the total budget foreseen for investments in the transport sector for a period of 20 years (2019-2038) is 4,888.03 MEur of these 4,458.53 MEur are for projects developed by the public sector while, 429.5 MEur are private investments | WAM |
| | G-T2 | Integrated freight management | | WAM |
| | G-T3 | Efficiency-based car fees and incentives for fleet renewal | | WEM |
| | G-W1 | Emission reduction from waste | The estimated value for landfill rehabilitation is approx. 76 MEur; Collection of dry recyclables approx. 18.5 MEur and collection of organic waste and composting approx. 13 MEur. (All values have been calculated until for the period 2018-2032.) | WEM |
| | G-W2 | Use of Waste Incineration Plants for the waste integrated management process in Albania | The costs foreseen for the 2018-2022 for the investments in Fier and Tiranë moving grate incineration plants are respectively 25.5 and 76 MEur. | WEM |
| | G-W3 | Increase of Wastewater Treatment Plants and their related coverage | The (draft) Water Supply and Sewerage National Strategy 2019-2030 costs approximately 1,500 MEur, with infrastructure representing 99.2% of the total and technical assistance 0.8%. | WEM |
| **Renewable Energies** | R-E1 | Mechanism of Feed-in-Tariff for small renewable capacity | No state budget foreseen because the cost of scheme would be covered by the electricity tariffs.<br>Nevertheless, there is an impact for the budget of the offtaker, which is owned by the government | WEM and WAM |
| | R-E2 | Auctions for new renewable capacity (wind and solar) and contract-for-difference | | WEM |
| | R-E3 | Mechanism of net metering for installations up to 500 kW | | WEM |
| | R-E4 | Robust power grid to accommodate increased renewable energy capacity | According to some preliminary estimates, some EUR 40 to 80 MEur investments are required in order to refurbish the distribution network to better handle variable renewable energy injection in the immediate term | WEM |
| | R-E5 | Facilitate regulatory and physical connection | No budget foreseen since it mainly related to the regulatory action | WEM |
| | R-E6 | Demand side management and electricity storage systems for power grid flexibility | To be determined | WAM |

| | | | | |
|---|---|---|---|---|
| | R-E7 | Metering strategy and digitalization of the power sector | To be determined | WEM |
| | R-I1 | Supporting the deployment of small-scale renewable energy energy applications in the non-food sector | 2 MEur | WAM |
| | R-T1 | Renewable energy sources in transport | To be determined | WAM |
| | R-T2 | Sustainable / Advanced biofuels | 124,000 Euro (Source: National Action Plan for Renewable Energy Resources in Albania 2015-2020) | WAM |
| **Energy Efficiency** | EE-C1 | Introducing the Energy labelling and Eco-design requirements | 70 MEur | WAM |
| | EE-E1 | Energy audits for large energy consumers with focus on industrial activities | Energy audits costs expected to be evaluated. | WAM |
| | EE-E2 | Energy management systems for large energy consumers and SMEs | 3 MEur (considering the multiannual support) has been calculated. | WAM |
| | EE-L1 | Implementation of the Minimum Energy Performance Requirements in buildings | There is no overall calculated budget, but some funds dedicated are: (i) State Aid for "New Green Businesses" in Tirana with a total value of the fund for two years approx. 0.3 MEur; and (ii) 6.5 MEur "For Energy Efficiency for the Student City" from KfW bank | WAM |
| | EE-L2 | Long-term renovation strategy (*for public and private buildings*) | 1 MEur | WAM |
| | EE-L3 | Retrofitting of the existing central governmental building *(excluding other public buildings owned by municipalities, etc.)* | Moderate scenario improvement is estimated: 500 MEur during 2015-2030 (Renovation building cost for public buildings evaluated on SLED 2) | WAM |
| | EE-L4 | Retrofitting of the public building stock *(all public buildings except central government buildings)* | Total investment costs for public buildings retrofits are 1800 MEur for the 2015- 2030 period | WAM |
| | EE-L5 | Financial support schemes for improving energy efficiency in buildings | Private sector buildings, including residential buildings; needs to be estimated | WAM |
| | EE-O1 | Energy efficiency obligation scheme and alternative measures for Albania | Since it has regulatory issues, the budget is more related to the technical assistance (first evaluation is 10-20 kEur) | WAM |
| | EE-P1 | Energy efficiency measures related to purchasing by public authorities | No budget calculated for the moment. | WAM |
| | EE-P2 | Municipalities Energy Efficiency Action Plans, implementation, and reporting | A preliminary budget of 45 kEur as technical assistance has been calculated. | WAM |
| | EE-S1 | Uptake of ESCO models | No budget calculated for the moment | WAM |
| | EE-T1 | Energy labelling of new cars | 2 MEur | WAM |

| | | | | |
|---|---|---|---|---|
| | EE-T2 | Increase the share of Electrical Vehicles in the national car fleet | Approx. 5 MEur CAPEX (capital expenses) of charging towers infrastructures; Upgrade to taxi fleet with hybrid or electric models with a capital cost approx. 0.5 MEur | WAM |
| | EE-T3 | Support mechanisms for EE and clean vehicles | To achieve the target of 15.5% for EE by 2030 (460 ktoe compare with BaU scenario-Fig 4, NSE) there is an estimation about 228 MEur to be invested | WEM |
| | EE-T4 | Increasing the share of public transport for passengers and freight (roads, railways and waterways) | Not a single value because there are several projects related to several interventions for the transport system | WEM |
| **Energy Security** | ES-O1 | Fully functional legal framework for a reliable and safe gas supply to customers | Not defined | WAM |
| | ES-O2 | Implementation of priority projects identified in the Gas Master Plan | New gas transmission line budget is foreseen from 150 MEur until 185 MEur, from which 67 MEur for 168km are for Ionian Adriatic Pipeline (IAP) | WAM |
| | ES-O3 | Linking Albania with the international gas network | "Pre-feasibility Study for Albania to Kosovo Gas Pipeline" (ALKOGAP project), implemented by IPF4 TA, financed by the WBIF with a grant 0.3MEur (was completed at the end of 2018)<br>67 MEur for 168km are for Ionian Adriatic Pipeline (IAP) | WEM |
| | ES-O4 | Increasing hydrocarbons exploration and production | No budget assessed since Investment costs for rehabilitation and modernization studies of the two refineries depends directly on the actual situation of installations, equipment and environment pollution level. Ministry of Energy and Industry also is considering the option of building new refineries with 3.2 million tons capacities | WEM |
| | ES-O5 | Emergency plan for natural gas | No budget assessed | WEM |
| | ES-O6 | Draft Law "On the establishment, maintenance and management of the minimum reserves of crude oil security and its products". | N/A | WEM |
| | ES-P1 | Gas supply for Vlora Thermal Power Plant | Approx. 58 MEur | WAM |
| | ES-P2 | New construction of power plants - – Skavica, Vau Dejës, Moglicë | To be checked | WEM and WAM |
| | ES-R1 | Ionian Adriatic Pipeline & Albania Kosovo Gas Pipeline | 67 MEur for 168 km are for Ionian Adriatic Pipeline | WEM |

| | | | | |
|---|---|---|---|---|
| Energy Market | EM-I1 | Electricity interconnectors | Budget from the transmission system operator | WEM |
| | EM-I2 | Electric Energy Sector Reform | Indicative budget: 2 MEur | WEM |
| | EM-I3 | Establish RES operator and transform Feed-in-Tariffs | No budget calculated for this PaM | WAM |
| | EM-P1 | Eradicate energy poverty | No budget calculated for this PaM | WAM |
| Research, Innovation and Competitiveness | RIC-E1 | Improvement of the regional and international collaboration in the scientific research related to the energy sector | Budget forecast is approx. 8.24 MEur | WEM |
| | RIC-E2 | National program of R&D | 0.6 MEur (foreseen for 2021) | WEM |
| | RIC-E3 | Business Investment Development Strategy (BIDS) | Not assessed | WAM |
| | RIC-E4 | Demonstrating Innovation and Competitiveness | Feasibility study: cost estimation 150 000 EUR; suggestion for donor funded project. Cost and financing of demonstration project to be determined by feasibility study. | WAM |

**Table 50: Overview of investment assumptions**

*ii. sector or market risk factors or barriers in the national and regional context*

One of the risk that might limit the increase of RES is the constraint on state budget. Indeed, the majority of new capacity would be supported, either with FIT/CfD or net metering. These support scheme shave an impact on the state budget, through the national utilities and the electricity price.

## 5.4 Impacts of planned policies and measures on other Member States and regional cooperation, including comparison to projections with existing policies and measures

This section addresses Impacts of planned policies and measures described in section 3 on other Member States and regional cooperation at least until the last year of the period covered by the plan, including comparison to projections with existing policies and measures.

*i. Impacts on the energy system in neighbouring and other Member States in the region to the extent possible*

No impact is foreseen for the petrol sector. The impacts in the gas sector are the increased capacity to transmit gas through TAP and the Ionian Adriatic Pipeline (IAP).

The most important impact is within the electricity sector. The increase of renewable energy as well as the on-going reforms in the electricity sector, most notably the introduction of a power exchange, will allow the export of electricity to the neighbouring countries. Indeed, comparatively, the electricity from Albania would be cheaper than the neighbouring countries leading to a reduction of domestic generation

in these countries. This is especially true thanks to the large transmission capacity already existing in the region. Figure 121 shows the amount electricity planned to be exported to neighbouring countries.

### *ii. Impacts on energy prices, utilities and energy market integration*

As mentioned above, the increase of renewable energy will lead to cheaper electricity on the power exchange which would have an impact on the regional electricity prices.

Considering energy market integration, the gas projects, especially the Ionian Adriatic Pipeline will enhance the regional integration of the energy markets. In addition, the launch of the power exchange in Albania which is to be coupled with Kosovo, will also lead to greater market integration. Finally, the electricity interconnectors would also allow more trade with neighbouring countries.

### *iii. Where relevant impacts on regional cooperation*

The improved integration of the gas and electricity sectors of Albania with the neighbouring countries through the planned projects in interconnections and through the liberalization of these sectors would impact favourably the regional cooperation.

# 6 References


**RELEVANT DOCUMENTS**

EU EC, Governance Regulation, 2018: “”EGULATION (EU) 2018/1999 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council”, Brussels 11 December 2018, available at:

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1999&from=EN

EnC 2018/1/MC-EnC, 2018: “RECOMMENDATION OF THE MINISTERIAL COUNCIL OF THE ENERGY COMMUNITY 2018/1/MC-EnC on preparing for the development of integrated national energy and climate plans by the Contracting Parties of the Energy Community”, Vienna 3rd January 2018, available at:
https://www.energy-community.org/dam/jcr:de3adce9-e047-4fb3-a632-f63c64a5c9c6/REC_2018_01_MC_CLI.pdf

EnC PG 03/2018: “POLICY GUIDELINES by the Energy Community Secretariat on the development of National Energy and Climate Plans under Recommendation 2018/01/MC-EnC”, Vienna: June 2018, available at:

https://www.energy-community.org/dam/jcr:c9886332-a1f5-43ee-b46c-31c637aedfa6/PC_03_2018_ECS_NECP.pdf

**DOCUMENTS used for elaborating chapters 1 and 2 (complementing the sources directly referenced in the text)**

Study prepared by Consultants:

- Baseline report: Current national policy, legal and institutional setup for the National Energy and Climate Plan Albania. Prepared by Narin Panariti upon request of the GIZ as part of the Capacity Development for Climate Policy in the countries of South East, Eastern Europe, the South Caucasus and Central Asia, Phase III, Tirana, on 30.11.2019

Overall policy documents:

- Consolidation of climate planning processes in the Energy Community Contracting Parties, New Climate Institute, May 2019
- National Sector Strategy for Energy 2018-2030, approved by DCM No. 480 dated 31.7.2018
- National Strategy for Development and Integration (2015–2020) approved by DCM No. 348 dated 11.05.2016
- WINDOW 3 – IPA III Sectoral Strategic Response on Energy

Legal framework on Energy Efficiency:

- Albania: Second Annual Report under the Energy Efficiency Directive
- Albanian Sustainable Transport Plan (Draft 2016)
- Executive Summary: 2nd and 3rd National Action Plan on Energy Efficiency for Albania, 2017-2020
- Law No. 116/2016 dated 10.11.2016 “On the energy performance in buildings”
- Law No. 124/2015 dated 12.11.2015 “On the energy efficiency”
- Law No. 68/2012 on “Energy consumption information and on other products related to the energy"
- Monitoring of the Strategy of Energy Report
- National Energy Efficiency Action Plan 2010-2018 DCM No. 619 dated 7.09.2011
- Second and Third National Energy Efficiency Action Plan for Albania, 2017-2020, approved by DCM No. 709 dated 01.12.2017

- Sectorial strategy of transport & Action Plan 2016 – 2020, DCM No. 811 dated 16.11.2016

Legal framework on Renewable energy:

- Decision No. 179, dated 28.3.2018 On approval of the National Action Plan for Renewable Energy Sources, 2018-2020
- National Action Plan for Renewable Energy Resources in Albania 2015-2020, September 2015 (passed in January 2016)
- The National Consolidated Renewable Energy Action Plan (NCREAP 2019 – 2020) DCM No. 580 dated 31.7.2018

Legal framework on Greenhouse Gas Emissions, 2015 Paris Agreement:

- Intended Nationally Determined Contribution (INDC) of the Republic of Albania following decision 1/CP.19 and decision 1/CP.20
- The first National Determined Contribution (NDC) document pursuant to the achievement of the UNFCCC target, approved by DCM No. 762, dated 16.9.2015

Legal framework on Security of energy supply:

- Law No. 43/2015 dated 30.4.2015 "On electricity sector" as amended
- Master Plan of Natural Gas for Albania is approved by DCM No. 87 dated 14.02.2018
- Updated security of supply statement of the Republic of Albania, prepared by the Ministry of the Economy, Trade and Energy in cooperation with ERE and TSO. Tirana, May 2009

Other literature:

Energy Poverty in South East Europe – Surviving the Cold. South East Europe Sustainable Energy Policy programme (SEE SEP), 2016

**DOCUMENTS used for elaborating chapter 3 are listed at the beginning of each Dimension**

**PUBLICATION BIBLIOGRAPHY for chapters 4 and 5**

Bacon, Robert; Kojima, Masami (2011): Issues in Estimating the Employment Generated by Energy Sector Activities. Available online at https://openknowledge.worldbank.org/handle/10986/16969.

Bird, J.; Campbell, R.; Lawton, K. (2010): The long cold winter: beating fuel poverty. Available online at https://www.ippr.org/publications/the-long-cold-winter-beating-fuel-poverty.

Bouzarovski, S. (2014): Social justice and climate change: addressing energy poverty at the European scale. Available online at http://www.socialplatform.org/wp-content/uploads/2014/01/Article_energy-poverty_Bouzarovski.pdf.

BPIE (2015): Alleviating Fuel Poverty in the EU: investing in home renovation, a sustainable and inclusive solution. Available online at http://bpie.eu/wp-content/uploads/2015/10/Alleviating-fuel-poverty.pdf.

Cameron, Lachlan; van der Zwaan, Bob (2015): Employment factors for wind and solar energy technologies: A literature review. In Renewable and Sustainable Energy Reviews 45, pp. 160–172. DOI: 10.1016/j.rser.2015.01.001.

Dodoo, Ambrose; Gustavsson, Leif; Tettey, Uniben Y.A. (2017): Final energy savings and cost-effectiveness of deep energy renovation of a multi-storey residential building. In Energy 135, pp. 563–576. DOI: 10.1016/j.energy.2017.06.123.

Energy Community Secretariat (2021): Electricity Interconnection Targets in the Energy Community Contracting Parties

EU (2009): Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, checked on 5/13/2021.

EU (2009): Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, checked on 5/13/2021.

European Commission (2018): SHARES Tool Manual. Version 2018.031219.

European Commission (2018): SHARES Tool Manual. Version 2018.031219.

IMF (2021): IMF Data Mapper. Country Data Albania. Real GDP Growth. Available online at https://www.imf.org/en/Countries/ALB, checked on 2/5/2021.

Instat (2021): Statistical Database. Available online at http://databaza.instat.gov.al/pxweb/en, checked on 5/8/2021.

KfW Group (2018): Monitoring der KfW-Programme „Energieeffizient Sanieren“ und „Energieeffizient Bauen“(2016).

Ministria e Turizmit dhe Mjedisit (2021): National Greenhouse Gas Inventory Under The First Biennial Update Report Of Albania To The UNFCCC. Draft. Available online at forthcoming.

OST (2018): Albanian Transmission Network Development Plan. Edited by Operatori i Sistemit te Transmetimit. Tirana.

Scott, Michael J.; Roop, Joseph M.; Schultz, Robert W.; Anderson, David M.; Cort, Katherine A. (2008): The impact of DOE building technology energy efficiency programs on U.S. employment, income, and investment. In Energy Economics 30 (5), pp. 2283–2301. DOI: 10.1016/j.eneco.2007.09.001.

SLED (2015): The typology of the residential building stock in Albania and the modelling of its low-carbon transformation. Regional Environmental Center, with funding from the Austrian Development Cooperation. Available online at http://sled.rec.org/building.html, checked on 5/9/2021.

Wei, Max; Patadia, Shana; Kammen, Daniel M. (2010): Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US? In Energy Policy 38 (2), pp. 919–931. DOI: 10.1016/j.enpol.2009.10.044.

World Bank (2021): Commodity Markets Outlook 2021. Available online at https://www.worldbank.org/en/research/commodity-markets, checked on 5/10/2021.

World Bank ESMAP (2009): Climate Vulnerability Assessment. An Assessment of Climate Change Vulnerability, Risk, and Adaptation in Albania's Energy Sector.

Yushchenko, Alisa; Patel, Martin Kumar (2017): Cost-effectiveness of energy efficiency programs: How to better understand and improve from multiple stakeholder perspectives? In Energy Policy 108, pp. 538–550. DOI: 10.1016/j.enpol.2017.06.015.

# 7 List of Tables

Table 1: Objectives 2030 and sector contributions ..... 4

Table 2: Electricity generation from renewable energy sources (Source: The Consolidated Renewable Energy Action Plan 2019-2020; page 24) ..... 6

Table 3: Aligning Albanian Energy Legislation with Energy Community and EU Directives for RES ..... 15

Table 4: Renewable Energy Implementation (Source: Annual Implementation Report 2018/2019 Energy Community Secretariat 1 November 2019, page.23/24) ..... 16

Table 5: Policies and key laws related to the EE dimension, including Energy Community and EU legislation ..... 19

Table 6: Final Energy savings by sector ..... 20

Table 7: Bill collection rate in 2013 – 2019 (in %) (*Source: Energy Regulatory Authority (ERE annual reports)* ..... 20

Table 8: Quantities of oil stock reserve for crude oil and by-products for 2019 (Source: Ministry of Infrastructure and Energy) ..... 26

Table 9: NDC baseline scenario targets ..... 50

Table 10: Budget for High Education ..... 62

Table 11: Overview table of key policies affecting the national climate target to 2030 ..... 66

Table 12: Definition of building types ..... 122

Table 13: Heating and Cooling degree days (HDD base temperature: 17.5°C, CDD base temperature 18.5°C) Source: SLED 2015 ..... 122

Table 14: Technology shares in passenger transport as given for historic vehicle statistics in 2016 to 2018 and as projected under consideration of existing measures until the year 2040 ..... 127

Table 15: The implementation in modelling of policies and measures listed in Chapter 3 as relevant to the scenario with existing measures ..... 132

Table 16: Electricity Production Costs by technology. Source: IEA Global Energy Outlook 2020, IRENA Cost analysis for Hydropower ..... 134

Table 17: GHG emissions (kt $CO_2$eq) for different branches of the economy, as determined for historic years (2016-2018) and as projected with existing measures until the year 2040. ..... 145

Table 18: 100 year global warming potential for those gases considered in the projection. ..... 146

Table 19: Absolute values for selected fuels in TPES given in ktoe, in particular those considered for the renewable share of TPES ..... 147

Table 20: Shares in TPES for those fuels considered in the renewable share of TPES. ..... 148

Table 21: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures ..... 149

Table 22: RES-E share (renewable share in electricity generation), calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures ..... 149

Table 23: Shares of energy sources in the transport sector for historic years 2016-2018 and projected up to year 2040 with existing measures ..... 150

Table 24: Shares of wood and solar energy in final energy demand of the sectors which make use of these fuels. Note that the shares here do not equal the RES HC share, as the reference in RES HC is not final energy, but final energy other than electricity ..... 151

Table 25: Primary energy supply (in ktoe) for historic years 2016-2018 and as projected up to 2040 with existing measures. Negative values indicate exports..... 154
Table 26: Final energy demand for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 with existing measures..... 154
Table 27: Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2040 with existing measures..... 155
Table 28: Final energy consumption (ktoe) for different sectors and subsectors for historic values from 2016-2018 and as projected with existing measures until 2040..... 165
Table 29: Existing cross-border interconnectors. Source: (Energy Community Secretariat 2021)..... 170
Table 30: Interconnection level as calculated for the scenario with existing measures..... 172
Table 31: Ongoing and planned transmission network projects. Source: OST 2018..... 175
Table 32: Energy price components for average electricity prices..... 176
Table 33: Energy price components for electricity during peak demand..... 177
Table 34: Tariffs approved by ERE, the Albanian Energy Regulatory Authority..... 177
Table 35: GHG emissions ($CO_2$eq) for the whole economy in the WEM and WAM scenarios..... 181
Table 36: GHG emissions (kt $CO_2$eq) for different branches of the economy, as determined for historic years (2016-2018) and as projected with additional measures until the year 2040..... 194
Table 37: Absolute values of renewable energy sources and total values of primary energy supply for different scenarios..... 196
Table 38: Shares of renewable energy sources in TPES and total renewable share for different scenarios..... 197
Table 39: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures (top rows) and existing measures (bottom rows)..... 199
Table 40: RES-E share, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures. WEM total is given for reference.. 200
Table 41: Shares of energy sources in the transport sector for historic years 2016-2018 and projected up to year 2040 with additional measures..... 201
Table 42: Shares of wood and solar energy in final energy demand of the sectors, which make use of these fuels as, projected for the WAM scenario. Note that the shares here do not equal the RES HC share, as the reference in RES HC is not final energy, but final energy other than electricity. ..... 201
Table 43: Primary energy supply [ktoe] in WAM and WEM scenarios..... 202
Table 44: Primary energy supply for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 for WAM. Negative values indicate exports..... 205
Table 45: Final energy consumption (ktoe) for energy demand sectors in the WEM and WAM scenarios..... 206
Table 46: Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 with additional measures..... 207
Table 47: Final energy consumption (ktoe) for different sectors and subsectors for historic values from 2016-2018 and as projected with additional measures until 2040..... 218
Table 48: GHG savings in kt$CO_2$eq for PaMs underlying the WAM scenario..... 224
Table 49: Qualitative assessment of non-energy impacts of selected PaMs considered in the WAM scenario..... 228

Table 50: Overview of investment assumptions ..... 233

# 8 List of Figures

Figure 1: Gross Inland Consumption (ktoe) (Source: Albanian Energy Balances)..... 6
Figure 2: Imports vs Gross Inland Consumption 2004-2019 in % (Source: Albanian Energy Balance) 7
Figure 3: Final energy consumption by sectors (ktoe) (Source: Albanian Energy Balance) ..... 7
Figure 4: Final Energy Consumption 2019 by fuels and sectors (Source: Albanian Energy Balance)... 8
Figure 5: Transmission and distribution losses vs electricity transmitted and distributed into the grids (Source: ERE annual reports) (red line: transmission losses, blue line: distribution losses) ..... 8
Figure 6: Energy intensity (Source: National Strategy of Energy) ..... 9
Figure 7: Overview of policy documents (Source: Consolidation of climate planning processes in the Energy Community Contracting Parties, New Climate Institute, May 2019)..... 12
Figure 8: Organigram of governmental institutions involved in NECP development and implementation ..... 13
Figure 9: Overall implementation performance 2018/2019 of Albania (Source: Energy-community.org Status 1 November 2019)..... 24
Figure 10: Implementation by oil indicators (Source: Energy-community.org Status 1 November 2019) ..... 25
Figure 11: Albania's electricity market scheme (Source: Energy Community Secretariat) ..... 29
Figure 12: Implementation by electricity indicators (Source: Energy-community.org Status 1 November 2019)..... 30
Figure 13: Retail Market Opening (Source: Ministry of Infrastructure and Energy)..... 31
Figure 14: Implementation by gas indicators (Source: Energy-community.org Status 1 November 2019) ..... 32
Figure 15: Albania's WB6 electricity soft measures implementation (Source: Energy-community.org Status 1 November 2019)..... 35
Figure 16: Scheme of Albanian transmission network..... 36
Figure 17: Involvement of experts through Working Groups and external Stakeholder engagement .. 45
Figure 18: Real GDP development 2012 - 2040 ..... 119
Figure 19: Population development 2012-2040 ..... 120
Figure 20: Value added share of energy demand sectors explicitly analysed in the model from 1995 to 2018..... 120
Figure 21: Floor area development by year of construction. Source: SLED 2015, own representation ..... 121
Figure 24: Share of building types by floor area. Source: SLED 2015, own representation ..... 123
Figure 23: Value added of subsectors to the Services sector, normalized to the year 2012..... 123
Figure 24: Annual demand for passenger transport in Albania, giving historic values and the future growth..... 124
Figure 25: Shares of transport modes in passenger transport in Albania projected with existing measures until the year 2040..... 125
Figure 26: Technology shares in passenger transport by cars as given for historic vehicle statistics in 2016 to 2018 and as projected under consideration of existing measures until the year 2040..... 126
Figure 27: Livestock historically and until the year 2050 ..... 128

Figure 28: Oil Price (USD/bbl). Historical data Brent Source: Enerdata Projection data world average. Source: World Bank 2021 ..... 133

Figure 29: Natural Gas Price (USD/Mil BTU). Source: World Bank 2021 ..... 133

Figure 30: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019- to 2040 ..... 135

Figure 31: Direct GHG emissions ($CO_2$eq) for energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040 ..... 136

Figure 32: Direct GHG emissions ($CO_2$eq) for the residential sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 137

Figure 33: Direct GHG emissions ($CO_2$eq) for the services sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 137

Figure 34: Direct GHG emissions ($CO_2$eq) for industry (energy demand) for the historic years 2016-2018 and as projected for 2019-2040 ..... 138

Figure 35: Direct GHG emissions ($CO_2$eq) for the transport sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 138

Figure 36: Direct GHG emissions ($CO_2$eq) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 139

Figure 37: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019- 2040 ..... 140

Figure 38: GHG emissions ($CO_2$eq) from industrial processes and product use for the historic years 2016-2018 and as projected for 2019-2040 ..... 141

Figure 39: Non-energy related GHG emissions ($CO_2$eq) from agricultural activities for the historic years 2016-2018 and as projected for 2019- 2040 ..... 141

Figure 40: Non-energy GHG emissions ($CO_2$eq) from land-use, land-use change and forestry (LULUCF) for the historic years 2016-2018 and as projected for 2019-2040 ..... 142

Figure 41: Non-energy GHG emissions ($CO_2$eq) from the waste sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 142

Figure 42: Renewable sources of primary energy supply and total net consumption for historic years (2016-2018) and as projected with existing measures until the year 2040 ..... 146

Figure 43: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures ..... 148

Figure 44: RES-E share (renewable share in electricity generation), calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with existing measures ..... 149

Figure 45: Energy sources in the transport sector, to accompany and explain the RES-T share given in Figure 45 ..... 150

Figure 46: Final energy and fuels used in the residential sector for space heating across all building classes and geographic zones for historic years 2016-2018 and as projected for up to year 2040 with existing measures ..... 152

Figure 47: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040 with existing measures. Negative values indicate exports ..... 153

Figure 48. Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2040 with existing measures. ..... 155

Figure 49: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 156
Figure 50: Fuel split underlying the final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 157
Figure 51: Final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 157
Figure 52: Fuel split underlying the final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 158
Figure 53: Final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 158
Figure 54: Fuel split underlying the final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 159
Figure 55: Final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 159
Figure 56: Fuel split underlying the final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 160
Figure 57: Final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 160
Figure 58: Fuel split underlying the final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 161
Figure 59: Final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 161
Figure 60: Fuel split underlying the final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 162
Figure 61: Final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 162
Figure 62: Fuel split underlying the final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 163
Figure 63: Final energy consumption (ktoe) for the non-energy demand of energy carriers for historic values from 2016-2018 and as projected with existing measures until 2040 ..... 163
Figure 64: Electricity import share (historical data 2004 - 2018) ..... 166
Figure 65: Fuel Production (historical data 2011 - 2018) ..... 167
Figure 66: Fuel Net Imports (historical data 2011 - 2018) ..... 167
Figure 67: Electricity generation, demand and imports for the scenario with existing measures.(projection 2019 - 2040) ..... 168
Figure 68: Electricity generation, demand, and imports for the scenario with existing measures. ..... 168
Figure 69: Fuel production (projection 2019-2040) ..... 169
Figure 70: Fuel Net imports (projection 2019-2040) ..... 169
Figure 71: Map of main transmission lines and interconnectors. Source: own representation based on OST 2018 ..... 171
Figure 72: Interconnector capacities. Source: Energy Community Secretariat 2021 ..... 172
Figure 73: Albanian Transmission System Structure: Source: OST 2018 ..... 174

Figure 74: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019-2040. ..... 181
Figure 75: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019-2040, WAM and WEM ..... 182
Figure 76: GHG emissions ($CO_2$eq) for the whole economy for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM and WEM broken down into subcategories. ..... 182
Figure 77: Direct GHG emissions (kt$CO_2$eq) for energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040 with additional measures ..... 183
Figure 78: GHG emissions (kt$CO_2$eq) for energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040 for WAM and WEM..... 184
Figure 79: GHG emissions (kt$CO_2$eq) for the energy demand sectors for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM and WEM broken down into subcategories. ..... 184
Figure 80: Direct GHG emissions (kt$CO_2$eq) for the residential sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 185
Figure 81: Direct GHG emissions (kt$CO_2$eq) for the services sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 185
Figure 82: Direct GHG emissions (kt$CO_2$eq) for industry (energy demand) for the historic years 2016-2018 and as projected for 2019-2040 ..... 186
Figure 83: Direct GHG emissions (kt$CO_2$eq) for the transport sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 186
Figure 84: Direct GHG emissions ($CO_2$eq) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 187
Figure 85: GHG emissions ($CO_2$eq) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040 (WAM RE full capacity). Scenario comparison with the “with existing measures” scenario presented in Chapter 4. ..... 187
Figure 86: GHG emissions ($CO_2$eq) for the transformation sector for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM and WEM broken down into subcategories. ..... 188
Figure 87: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019-2040 ..... 188
Figure 88: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019-2040 for WAM and WEM ..... 189
Figure 89: Non-energy related GHG emissions ($CO_2$eq) for the historic years 2016-2018 and as projected for 2019-2040 (WAM). Differences between WAM RE full capacity and WEM broken down into subcategories. ..... 189
Figure 90: GHG emissions ($CO_2$eq) from industrial processes and product use for the historic years 2016-2018 and as projected for 2019-2040 ..... 190
Figure 91: Non-energy related GHG emissions ($CO_2$eq) from agricultural activities for the historic years 2016-2018 and as projected for 2019-2040 ..... 190
Figure 92: Non-energy GHG emissions ($CO_2$eq) from land-use, land-use change and forestry (LULUCF) for the historic years 2016-2018 and as projected for 2019-2040 ..... 191

Figure 93: Non-energy GHG emissions ($CO_2$eq) from the waste sector for the historic years 2016-2018 and as projected for 2019-2040 ..... 191

Figure 94: Renewable primary energy sources and total net demand for historic years (2016-2018) and as projected with additional measures until the year 2040 if RE plants run only to meet local demand ..... 195

Figure 95: Renewable primary energy sources and total net demand for historic years (2016-2018) and as projected with additional measures until the year 2040 if RE plants run at full capacity (WAM) . 195

Figure 98: RES shares in final energy demand, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures. Values from WEM scenario are also indicated. ..... 198

Figure 99: RES-E share, calculated according to RED (Directive 2009/28/EC) for historic years 2016-2018 and projections up to year 2040 with additional measures. WEM values are given for reference. ..... 199

Figure 100: Energy sources in the transport sector, shown to accompany and explain the RES-T share given in Figure 45. ..... 200

Figure 101: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040 with additional measures ..... 203

Figure 102: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040 with additional measures when renewable energy plants run only to meet the domestic energy need203

Figure 103: Net value of primary energy supply for historic years 2016-2018 and as projected up to the year 2030 and for 2035 and 2040 with additional measures (both variants) and with existing measures ..... 204

Figure 104: Primary energy supply for historic years 2016-2018 and as projected up to the year 2040. Differences between WAM (RE full capacity) and WEM broken down into subcategories. ..... 204

Figure 105. Shares of final energy demand for the demand sectors for historic years 2016-2018 and as projected up to the year 2040 with additional measures ..... 207

Figure 106: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040 ..... 208

Figure 107: Fuel split underlying the final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040 ..... 208

Figure 108: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040, given for 2019-2030 and for 2035 and 2040. Scenario comparison with the “with existing measures” scenario presented in Chapter 4. ..... 209

Figure 109: Final energy consumption (ktoe) for all main demand sectors for historic values from 2016-2018 and as projected until 2040, given for 2019-2030 and for 2035 and 2040. Differences between WAM final and WEM broken down into subcategories. ..... 209

Figure 110: Final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 210

Figure 111: Fuel split underlying the final energy consumption (ktoe) for the residential sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 211

Figure 112: Final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 211

Figure 113: Fuel split underlying the final energy consumption (ktoe) for the services sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 212

Figure 114: Final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 212

Figure 115: Fuel split underlying the final energy consumption (ktoe) for the industry sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 213

Figure 116: Final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 213

Figure 117: Fuel split underlying the final energy consumption (ktoe) for the transport sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 214

Figure 118: Final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 214

Figure 119: Fuel split underlying the final energy consumption (ktoe) for the passenger transport sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 215

Figure 120: Final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 215

Figure 121: Fuel split underlying the final energy consumption (ktoe) for the freight transport sector for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 216

Figure 122: Final energy consumption (ktoe) for the non-energy demand of energy carriers for historic values from 2016-2018 and as projected with additional measures until 2040 ..... 216

Figure 123: Electricity demand, generation, exports and imports with additional measures scenarios with renewable energy generation running at full capacity and exporting surpluses (projection 2019 - 2040). WEM and 'WAM RE to meet demand' (denoted 'WAM mdem') are also indicated ..... 219

Figure 124: Electricity generation under the WAM scenario for the different power plants (PP, H - hydro, S- solar PV, W - wind, T - thermal gas). sHPP are small HPPs that are accounted for together, as are auctioned SPPs and WPPs. ..... 220

Figure 125: Fuel production with additional measures (projection 2019-2040) ..... 221

Figure 126: Fuel Net imports with additional measures (projection 2019-2040) ..... 221

Figure 127: GHG emission savings [kt $CO_2$eq] for selected measures underlying the WAM scenario. Forest management is not shown for readability ..... 223

Figure 128: GHG emission savings for all policies and measures implemented separately (top columns) and implemented jointly in WAM (middle columns). The effect of G-LF1 and G-LF2 is given here for completeness. ..... 223

Figure 129: Cumulative employment until 2025 and 2030 for solar PV and wind for the installation and O&M phases (own elaboration based on Cameron and van der Zwaan (2015)) ..... 229

# 9 Annex

## 9.1 Overview of institutions

The most significant institutions in setting policy and regulation in the power sector in Albania are the Ministry of Infrastructure and Energy ("MIE") and the regulator, the Energy Regulatory Authority ("ERE").

In addition to MIE and ERE there are a number of ministries that have a smaller role in the sector, and also a number of government agencies with responsibilities with respect to the power sector that are delegated to them by the ministries. Other important Ministries are: Ministry of Finance and Economy ("MoFE"); Ministry for Health and Social Welfare; Ministry of Tourism and Environment ("MoTE").

**Regulatory bodies and other government agencies for energy:**

**Energy Regulatory Authority (ERE):** The Energy Regulatory Authority ("ERE") is an independent public body responsible for the regulation of activities in the electricity and natural gas sectors. ERE is also responsible for the development of most secondary legislation in the sector as well as approving the electricity market rules. ERE is the competent body for:

- issuing licenses for carrying out electricity generation, transmission, distribution, supply and trade of electricity
- for approving the grid codes which govern the connection with and access to the transmission and distribution networks to all power producers.
- approving tariffs in the sector, including feed-in tariffs for RES producers, tariffs for access to the transmission and distribution networks, and tariffs for end users supplied by the Universal Service Provider.
- Approving the standard industry documents such as the standard PPA, which will be used by priority RES producers.

**Agency of Energy Efficiency:** is established by a Decision of the Council of Ministers in accordance with **Law no. 124/2015 "On energy efficiency.** Duties and responsibilities of the Agency for EE are set out in detail in Article 8 and 25 of the EE Law, and include:

- Develop secondary legislation and programs to promote energy efficiency.
- Develop and monitor the National Energy Efficiency Action Plan ("NEEAP") and prepare an annual progress report regarding the NEEAP.
- Work with market participants and stakeholders to develop a database to monitor progress being made in improving energy efficiency.
- Develop technical standards and regulations to improve the energy efficiency of products.
- Evaluate projects to improve energy efficiency for potential funding from the EE Fund.
- Support energy efficiency through providing advice, training, and developing open source contracts for energy services.
- Verify the accuracy of data from energy audits, if deemed necessary.

**Energy Efficiency Fund:** The EE Law mandates the setting up of an Energy Efficiency Fund that shall be managed by a Board of Trustees composed by representatives of different public institutions. The revised EE law is under consultation and it will be decided if the Energy Efficiency Fund will be established or if it is necessary to create other financial mechanisms for investments in the field of energy efficiency. Currently, is pre estimated that there are no favourable conditions to establish the Energy Efficiency Fund for Albania due to the bottlenecks that were faced since this process has initiated (2017). Thus, the related articles might be excluded from the law.

**AKBN – National Agency of Natural Resources:** The National Agency of Natural Resources ("AKBN") reports to MIE. AKBN mission is the development, supervision of rational use of natural resources, according to the government policy, and monitoring of their post-exploitation in mining, petroleum and energy.

**AKPT – National Territorial Planning Agency and National Territory Council:** The National Territorial Planning Agency ("AKPT") is a public institution subordinated to MIE that is responsible for preparation and coordination of the national planning instruments. The National Territorial Planning Agency is in charge of coordinating the land use planning and thus has an important role with regard to making use of the renewable energy potential which is determined by the provisions in the land laws. Energy spatial planning (also called energy zoning or energy master planning) has a crucial role in achieving NECP targets. The National Territory Planning Agency and its functions are based on Law "On Territory Planning and Development" No. 28/2017.

**AZHT - National Agency of Development**: AZHT has responsibility for making decisions regarding specific projects of national importance. This includes, for example, approval of construction permits for projects in the energy sector such as power generation, transmission and distribution, and oil and gas projects.

**AKM – National Environment Agency:** National Environment Agency ("AKM") is an institution subordinated to the Ministry of Tourism and Environment, which is responsible for reviewing and approving the environmental impact assessments for large development projects, such as those in the energy sector. The Agency also has responsibilities for monitoring compliance with environmental standards.

**Public Energy Companies**

In addition to the government departments and agencies presented above, there are a number of large public energy companies in Albania who are essentially the incumbent state-owned utilities.

**Albania Power Corporation, KESh:** KESH remains the dominant electricity generator in Albania, generating ~75% of power generated in 2015. Originally KESh was established as a state-owned, vertically-integrated company comprising all functions of electricity generation, transmission and distribution. KESH is also responsible for the administration, the proper operation and guaranteeing the technical and operational safety of the power plants it operates.

**Transmission System Operator, OST:** OST is the Transmission System Operator ("TSO") in Albania managing the network at 110 kV and above. TSO is an independent joint stock company whose shares are owned by the Ministry of Finance and Economy. The main responsibilities of TSO are:

- Power flows management in the electricity transmission system;
- System balancing services;
- Development of the transmission network to guarantee the security of the electricity transmission system;
- Covering of network losses and providing ancillary services;
- Cross – border capacity allocation;
- Connecting users with the transmission system network.

**Distribution Company, OShEE:** OShEE owns the electricity power distribution system below 110 kV. OSSHEE is the parent company in the capacity of the founding shareholder, establishing three controlled companies, aiming to unbundle the distribution activity, the universal service of supply and sales for the free electricity market as follows:

- Universal Service Supplier S.A. (FSHU) for the "Electricity supply of end-customers operating in the regulated market defined by the legislation in force".
- Free Market Supplier S.A. (FTL) for the "Purchase and management of electricity and operation in the free market, etc".
- Distribution System Operator S.A. (OSSH) for the "Distribution of electricity, construction, operation and maintenance of the electricity distribution network for the supply of electricity to customers, connection of customers and users of the network electricity distribution, installation and electricity metering services, etc".

OSHEE S.A. through the Albanian Energy Regulator Authority, transferred its licenses to the newly created companies.

**Market Operator** (Albanian Power Exchange), is the responsible structure for the management and administration of the organized market, through the market platform, which will operate in the field of electricity exchange in Albania, in the form of a joint stock company, financially and legally separated from Transmission System Operator.

The **State Technical and Industrial Inspectorate** (STII) is responsible for public safety aspects of equipment used in power generation, transportation and distribution and in maintaining safety in gas infrastructure as well. ISHTI is also responsible for monitoring and controlling compliance with the technical conditions and norms of plants and installations in the field of hydrocarbons ranging from exploration and production of crude oil till the sale of final products by the end consumer. Quality control of all fuel products trade and used in the territory of the Republic of Albania, is included within the mandate of the Inspectorate.

**ALBPETROL** is a wholly government-owned, vertically integrated oil company that has the exclusive rights for the development of all oil and gas fields. Most of the oil production over which ALBPETROL has production rights has been contracted out to foreign companies of which nearly 60% is exported for refining into products elsewhere.

**ALBGAZ** is a wholly-owned government company, created in the form of a combined gas transmission and distribution operator in Albania.