



RISE 2024

REGULATORY INDICATORS
FOR SUSTAINABLE ENERGY

THE TIME IS NOW



THE WORLD BANK
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ESMAP
Energy Sector Management
Assistance Program

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The Energy Sector Management Assistance Program (ESMAP) is a partnership between the World Bank and over 20 partners to help low- and middle-income countries reduce poverty and boost growth through sustainable energy solutions. ESMAP's analytical and advisory services are fully integrated within the World Bank's country financing and policy dialogue in the energy sector. Through the World Bank Group (WBG), ESMAP works to accelerate the energy transition required to achieve Sustainable Development Goal 7 (SDG 7) to ensure access to affordable, reliable, sustainable, and modern energy for all. It helps to shape WBG strategies and programs to achieve the WBG Climate Change Action Plan targets. Learn more at: <https://esmap.org>

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Carlos Guadarrama and Daron Bedrosyan led the project. Yaya Liu, Ashot Movsisyan, and the International Institute of Energy Conservation (IIEC) collected the data. The RISE pillars—electricity access, energy efficiency, clean cooking, and renewable energy—were written up as chapters by the staff members and consultants named below:

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analytical and advisory services are fully integrated within the World Bank’s country financing and policy dialogue in the energy sector. Through the World Bank Group (WBG), ESMAP works to accelerate the energy transition required to achieve Sustainable Development Goal 7 (SDG 7) ensuring access to affordable, reliable, sustainable, and modern energy for all. It helps to shape WBG strategies and programs to reach the WBG Climate Change Action Plan targets.

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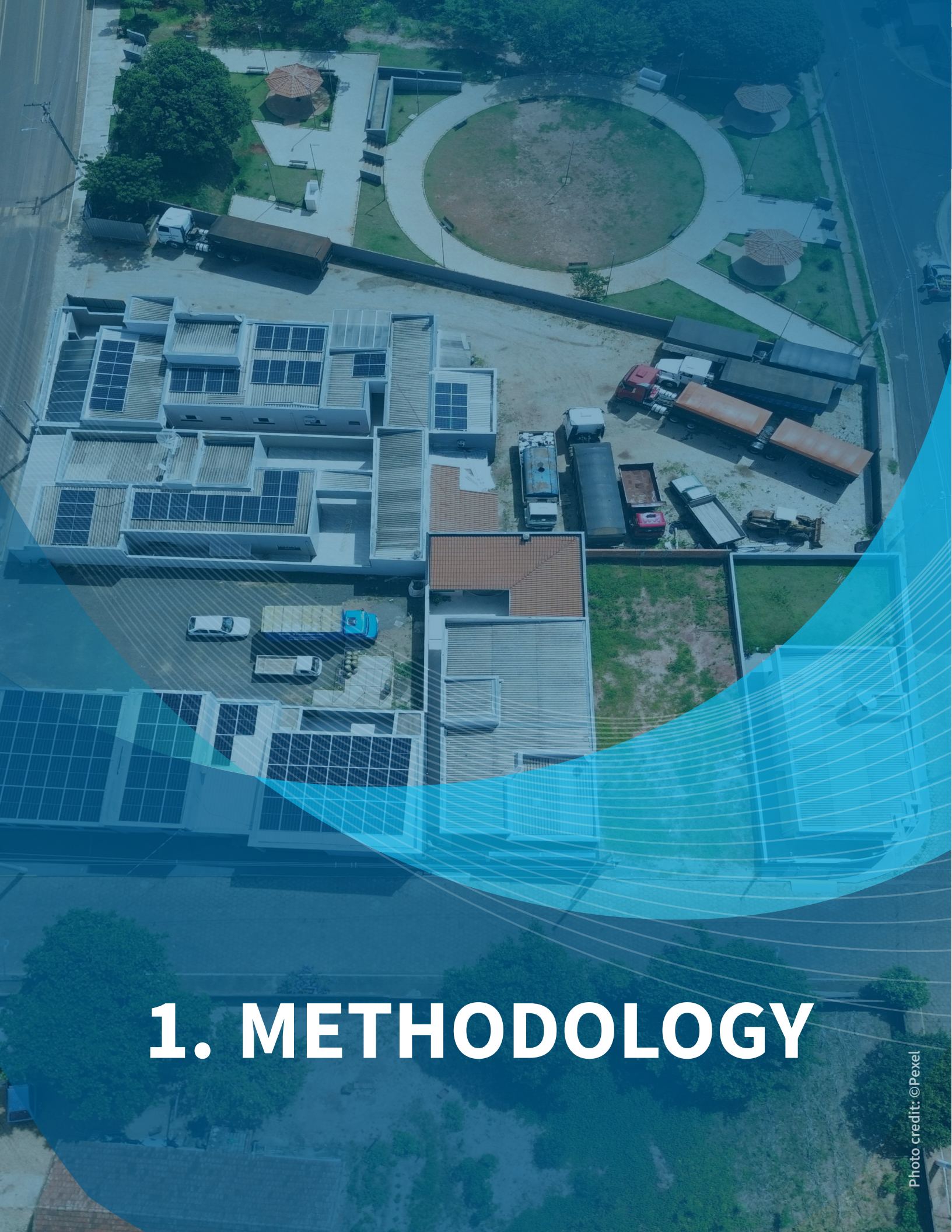
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ABBREVIATIONS

ECOWAS	Economic Community of West African States
ESCO	energy service company
ESMAP	Energy Sector Management Assistance Program
EU	European Union
GHG	greenhouse gas
GO	guarantee of origin
ICS	improved cookstove
IEA	International Energy Agency
IRENA	International Renewable Energy Agency
ISO	International Organization for Standardization
LPG	liquefied petroleum gas
MTR	Market Trends Report
NDC	Nationally Determined Contribution
PAYG	pay-as-you-go
RBF	results-based financing
REN21	Renewable Energy Policy Network for the 21st Century
RISE	Regulatory Indicators for Sustainable Energy
SAF	sustainable aviation fuel
SDG	Sustainable Development Goal
WBG	World Bank Group

KEY MESSAGES

- Since the publication of the previous (2022) RISE edition, progress toward universal electrification reversed course for the first time in 20 years. About 685 million people, most of them living in Sub-Saharan Africa, lacked access in 2022. While RISE electricity access scores climbed in many countries between 2021 and 2023, progress in fragile states stalled due to structural barriers and instability. Most countries with substantial unelectrified populations have high RISE scores, but this has not translated into significant electrification gains, because access requires more than sound policies. Expanding access requires capacity for implementation, together with efforts to address barriers to affordability and financing—and challenging environments for doing business. With just five years left to achieve Sustainable Development Goal (SDG) 7, moving beyond strong RISE scores to expand actual electricity access is more urgent than ever.
- Clean cooking policy and regulatory frameworks saw modest progress between 2021 and 2023. Many countries showed minimal changes, while any improvements were slow and uneven. More than half of surveyed countries remain in the red zone, underscoring the need for stronger frameworks, targeted financial interventions, and greater international collaboration to scale clean cooking solutions.
- Progress in energy efficiency was also modest. Advancing progress requires robust policies and sound regulatory frameworks—the latter to attract investments, incentivize innovation, and contribute to the formulation of strategies to enhance energy efficiency across sectors. Immediate policy action is crucial to accelerate the transition to a sustainable energy future with the lowest-cost option: energy efficiency.
- Virtually no progress occurred in renewables policy and regulatory frameworks over these past two years. This worrying lack of progress is mirrored by the stagnation of the shares of (modern) renewables in energy consumption. Because most efforts are focused on the electricity sector, more efforts could be directed toward transport, and heating and cooling. Naturally, without carbon pricing and the removal of fossil fuel subsidies, renewables do not have a level playing field.

An aerial photograph of a modern, multi-story building with a flat roof covered in solar panels. The building is surrounded by a parking lot with several large trucks and a smaller car. To the right of the building is a circular landscaped area with a gazebo and a paved path. The image is overlaid with a blue, wavy, semi-transparent graphic element that curves across the bottom half of the frame.

1. METHODOLOGY

1. METHODOLOGY

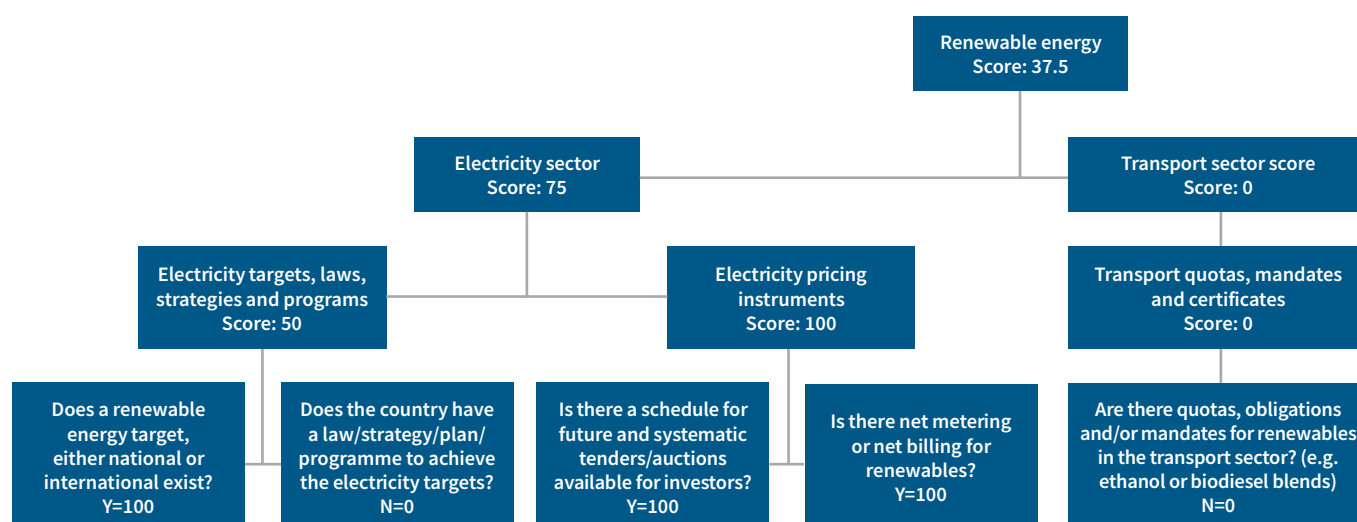
The Regulatory Indicators for Sustainable Energy (RISE) is a global inventory of policies and regulations that support the achievement of Sustainable Development Goal (SDG) 7. RISE provides policy makers with a tool to benchmark their countries' progress over time and against peers to identify areas for policy and regulatory reform. For investors in sustainable energy projects, it provides a comprehensive picture of the investment environment and informs decision-making.

First piloted in 2014 in 17 countries, RISE then focused on three pillars: electricity access, renewable energy, and energy efficiency. After expanding its country coverage for 2018 and adding clean cooking as the fourth pillar, RISE now covers 140 countries in renewable energy and energy efficiency, 56 countries in electricity access, and 57 countries in clean cooking. The countries where RISE tracks electricity access account for 96 percent of the global population lacking access,¹ while

in clean cooking, RISE covers 19 of the 20 countries with the largest clean cooking deficits. Hence, RISE has comprehensive messages to convey about access.

RISE follows a simple average score methodology. Scores range between 0 and 100, and all variables have equal weight when summed up to arrive at a score for each area. The pillar score (i.e., renewable energy) is the simple average of its indicators' scores. In turn, the indicators' scores are the simple average of the scores for subindicators. Each subindicator has a set of binary questions. The score for these questions is 100 if Yes and 0 if No. The average of those values produces the subindicators' scores. Figure 1.1 depicts a simplified example, which should be read from bottom to top. The scores, between 0 and 100, are grouped into three categories based on a "traffic light" system: green (67–100), yellow (34–66), and red (0–33).

FIGURE 1.1 • RISE scoring: A simplified example



Note: This is a simplified and illustrative example. To consult all the pillars, indicators, subindicators, and questions of RISE, please visit the RISE website (rise.esmap.org).

¹ Most of the global population without electricity access—over 85 percent—is in Sub-Saharan Africa, while East Asia & Pacific and South Asia each account for approximately 5 percent. Only a few countries with major electricity access gaps are not included, such as Botswana, Gabon, Equatorial Guinea, Lesotho, Namibia, and a few others.

This simple framework has limitations. First, while the Energy Sector Management Assistance Program (ESMAP) publishes an overall RISE score, the number of constituent pillars varies across countries. For countries where electricity access and clean cooking are measured, the overall score is the simple average of the scores for the four pillars. However, for countries for which the above two pillars are not measured, the overall score is, in fact, the simple average of the scores for the electricity access, energy efficiency, and renewable energy pillars. For countries with universal electricity access, RISE assigns a score of 100 for electricity access; it assigns a “not available” (N/A) score for clean cooking when that pillar is not measured. Future publications will explore how to address this inconsistency.

Second, while simple averages naturally assign equal weight to all the variables involved, it is worth noting that the varying number of questions across subindicators, and likewise, the varying number of sub-indicators and indicators have different impacts on the scores. Simply put, as the number of questions within a subindicator increases, each question will have a reduced impact on the score. Similarly, the more subindicators there are, the less impact one will have on the indicator’s score. Figure 1.1 shows how a single question in transport can pull the score down for the pillar, compared with four questions spread across two subindicators in electricity.

The RISE methodology has another limitation: it monitors the enactment and not the implementation of policies and regulations. It is not *de jure* policies and regulations but *de facto* conditions on the ground that advance SDG 7 goals.

Every RISE publication undertakes incremental changes to improve its methodology. These incremental methodological improvements mean that the data for one edition is not comparable with data collected for previous editions. With each new iteration or publication, a new database is shared, in which the time series is adjusted to the new methodology. More specifically, if a new question is added, the year in which that given policy or regulation was first enacted is verified, and a new score for that year and the years that follow is calculated. If questions, subindicators or indicators are streamlined, then the scores are also back-calculated, so users can analyze progress in RISE scores according to the new methodology. Our time series starts in 2010—pre-2010 policies are reflected in the 2010 scores.

For this 2024 edition, the upgraded methodology sought to avoid duplication, to impose more consistency, and to ease data interpretation and analysis.

The renewable energy pillar, for example, aligned its indicators with the analyses and databases of RISE partners—the International Renewable Energy Agency (IRENA), Renewable Energy Policy Network for the 21st Century (REN21), and International Energy Agency (IEA). By classifying policies and regulations into indicators for (1) governance, (2) electricity, (3) heating and cooling, (4) transport, and (5) leveling the playing field, RISE built on and complemented their work. As an example, their information on targets and mandates across sectors was cross-checked, and new questions were added on the frameworks to monitor and penalize noncompliance with the RISE indicator for governance.

The present edition stopped tracking questions where results could not be objectively verified with reference to an official policy or regulation. Sample queries range from “Are standard PPAs bankable?” to “Is the compensation due because of curtailment actually given out?”. Likewise, utility performance indicators, such as creditworthiness, are better tracked by the Utility Performance and Behavior Today (UPBEAT) dashboard (World Bank n.d.) and are not, in fact, renewable energy policies or even regulations that policy makers can enact. They are instead outcome indicators in the electricity sector. That said, this edition retains the indicators for utility transparency and monitoring, both of which policy makers can act upon. The scoring also stops rewarding fiscal incentives (i.e., tax credits and subsidies) because the literature deems them ineffective. They are costly instruments for supporting large-scale renewable energy developments given they incur revenue losses, which must be covered through distortionary taxes (i.e., labor taxes) and most times, the projects would have taken place without the fiscal incentive in any case (Metcalf 2007; IMF 2015; Klemm 2009; Gouché, Everette, and Haynes 2002; OECD n.d.; Blanchard, Gollier, and Tirole 2023). Besides, low-income economies do not have the fiscal space to compete with richer economies in a race to the bottom. Nor do tax incentives address the barriers to low-carbon investments, such as access to finance, market and infrastructure risks, trade restrictions, and high up-front capital (UNCTAD 2023; Farole 2011). Similarly, subsidies for green technology are not substitutes for taxes on pollution, which are more effective in any event (Rapson and Muehlegger 2023; Fabra and Reguant 2024). Lastly, both tax credits and subsidies on green technologies are regressive, which is to say they often benefit those at the top of the income distribution (Borenstein and Davis 2016).

In the end, the renewables pillar went from seven to five indicators. This is mostly due to subindicators being reorganized

and merged to fit the new indicator categories. Also, a few new subindicators (e.g., tradable renewables certificate systems and fossil fuel subsidy removal) were added to complement carbon pricing in the indicator for leveling the playing field (see annex). Again, this sectoral approach aligns with the work of RISE partners, and, we argue, eases identification and interpretation by classifying sectoral subindicators as price, quantity, or target instruments. We recognize that achieving a perfect balance among the number of questions, subindicators, and indicators across and within pillars is a herculean, perhaps impossible, task. That said, we have streamlined them in the past and will continue to do so whenever we see fit.

As the renewables pillar went from seven to five indicators, we also sought to streamline the other pillars. The electricity access pillar went from eight to five indicators, and each indicator has now three subindicators (see annex). Likewise, the energy efficiency pillar went from eleven to nine indicators. In both pillars, as in the renewables pillar, we merged subindicators and questions where we could. For example, the energy efficiency entities indicator was merged with the national planning indicator to make a more comprehensive indicator called “energy efficiency governance” (see annex). But the number of indicators in both pillars was also reduced to avoid duplication across pillars.

Previous RISE reports included utility performance indicators in the electricity access and renewable energy pillars. To avoid duplication, this edition removes them altogether from the access pillar. Similarly, carbon pricing was in the renewables and energy efficiency pillars, and here it is kept only in renewables. While we recognize that these indicators are cross-sectional, they were being double-counted for the overall score. Future publications will explore how to link these cross-themed indicators without double-counting them.

Data Collection

RISE is published every even year (2016, 2018, 2020, 2022, 2024). Data collection takes place the year before and must be completed by December 31. In other words, for the RISE 2024 scores published in December 2024, the data collection had to be completed by December 31, 2023.

Two data collection methods were employed for this publication. Data on electricity access, clean cooking, and energy efficiency were collected following the precedent of previous years—through a World Bank vendor, who, in turn, engaged local consultants in each country. These consultants conducted desk research to respond to each question and provide the justification supporting the answer (i.e., a link to the published policy or regulation).

With the renewable energy pillar, we piloted a different approach. The ESMAP team built on different databases that our partners have made publicly available and conducted desk research to close any gaps (table 1.1) This data collection method was not only more resource and cost efficient, but it also allowed us to gain a deeper understanding of the policy and regulatory reforms. As a result, this new data collection method eased both the analysis and the writing of the renewables chapter. RISE may explore replicating the approach for the other pillars in upcoming publications.

In both methods, once we had all the answers to our questions and had prepared the preliminary scores, we shared them internally with World Bank local experts for their feedback. Once that feedback (if any) was addressed, we finalized and published the data. Future publications will explore engaging external experts, such as regional and national regulatory bodies, in this review process.

TABLE 1.1 • Databases consulted for the renewables pillar

Database	Author
Carbon Pricing Dashboard	World Bank
NDC Registry	UNFCCC
Long-Term Strategies Portal	UNFCCC
Climate and Clean Air Coalition	UNEP
UNEP—Law and Environment Assistance Platform	UNEP
Legal Resources on Renewable Energy	RES-LEGAL
GSR Policy Data Pack 2023	REN21
Climate Actions and Policies Measurement Framework	OECD
Energy Policy Review—IEA	OECD
Climate Action Tracker	New Climate Institute and Climate Analytics
Climate Policy Database	New Climate Institute
Industry Transition Tracker	Leadership Group for Industry Transition—Leadit
NDC RE Targets	IRENA
RE Power and End-use Targets National Policies	IRENA
Fossil Fuel Subsidies	IMF
Energy Policy Tracker	IISD, IGES, OCI, ODI, SEI, and Columbia University
Renewable Energy Policies and Measures Database	IEA and IRENA
Global Observatory on People-Centred Clean Energy Transitions	IEA
GH2 Country Portal	Green Hydrogen Organization (GH2)
Climate Change Laws of the World	Grantham Research Institute at LSE and Climate Policy Radar
FAOLEX Database	FAO
EUR-LEX—Access to European Union Law	European Union
EU Countries' 10-Year National Energy and Climate Plans for 2021–2030	European Commission
Eurobserv'er Online Database_RES Policy and Statistics Reports	EurObserv'ER
Asia Pacific Energy Portal	ESCAP
1.5°C National Pathway Explorer	ClimateAnalytics
National Hydrogen Strategies and Roadmap Tracker	Center on Global Energy Policy (Columbia SIPA)
ASEAN Energy Database System	ASEAN Centre for Energy
Africa Energy Portal	APUA, AFUR, AFREC
Sustainable Energy for All—Africa Hub	ADB, SEforALL, AU, NEPAD, UNDP
Africa NDC Hub	Africa NDC Hub

Note: ADB = Asian Development Bank; AFREC = African Energy Commission; AFUR = African Forum for Utility Regulators; APUA = Association of Power Utilities of Africa; ASEAN = Association of Southeast Asian Nations; AU = African Union; ESCAP = United Nations Economic and Social Commission for Asia and the Pacific; EU = European Union; FAO = Food and Agriculture Organization; GSR = Global Status Report; IEA = International Energy Agency; IGES = Institute for Global Environmental Strategies; IISD = International Institute for Sustainable Development; IMF = International Monetary Fund; IRENA = International Renewable Energy Agency; LSE = London School of Economics; NDC = Nationally Determined Contribution; NEPAD = New Partnership for Africa's Development; OCI = Oil Change International; OECD = Organisation for Economic Co-operation and Development; RE = renewable energy; REN21 = Renewable Energy Policy Network for the 21st Century; RES = renewable energy sources; SEforALL = Sustainable Energy for All; SEI = Stockholm Environment Institute; SIPA = School of International and Public Affairs; UNDP = United Nations Development Programme; UNEP = United Nations Environment Programme; UNFCCC = United Nations Framework Convention on Climate Change.

A photograph of a man in a light blue uniform, possibly a police officer, looking down at a small white device he is holding. In the background, a woman in a red traditional Chinese garment stands in a room with shelves. The image is overlaid with a large yellow and orange curved graphic on the left and bottom.

2. ELECTRICITY ACCESS

2. ELECTRICITY ACCESS

RISE covers 56 countries, which together account for 96 percent of the global population without electricity access. Of these 56 countries, 35 are in Sub-Saharan Africa, 9 in East Asia, 7 in South Asia, and 4 in Latin America. One country is in the Middle East and North Africa.² The data set is, therefore, highly representative of the global status of policy/regulation on electricity access. Sub-Saharan Africa holds the vast majority—over 85 percent—of the global population without electricity access. East Asia and Pacific and South Asia each accounts for about 5 percent of those without access. Not included are a few countries with significant electricity access gaps, such as Botswana, Equatorial Guinea, Gabon, Lesotho, and Namibia.

Since the previous (2022) edition of the RISE report, progress toward universal electrification reversed course for the first time in 20 years (World Bank 2024a). According to the latest SDG 7 analysis in 2022, population growth outstripped advances in electrification, leaving 685 million people in energy poverty. If trends persist, 660 million people will still lack access in 2030, 85 percent of them in Sub-Saharan Africa.

Nevertheless, RISE electricity access scores for some countries rose between 2021 and 2023. The largest share of

surveyed countries is now in the green zone (RISE score of 67+), climbing from 21 countries in 2021 to 26 in 2023 (figure 2.1).³ Advances in governance and planning, along with strengthened grid and mini-grid frameworks, made this progress possible. However, the pace of progress has slowed—significantly since 2019—and barriers remain. This suggests that while many countries have strengthened their regulatory environments, further gains may require deeper structural reforms, more sustained policy efforts, and targeted investments. A concerning number of countries remain in the red zone (RISE score of 33 or less), with barely any change since 2021, save one country, which moved into the yellow zone. Stagnation in policy progress points to structural barriers and instability in the most fragile states, stalling reform.

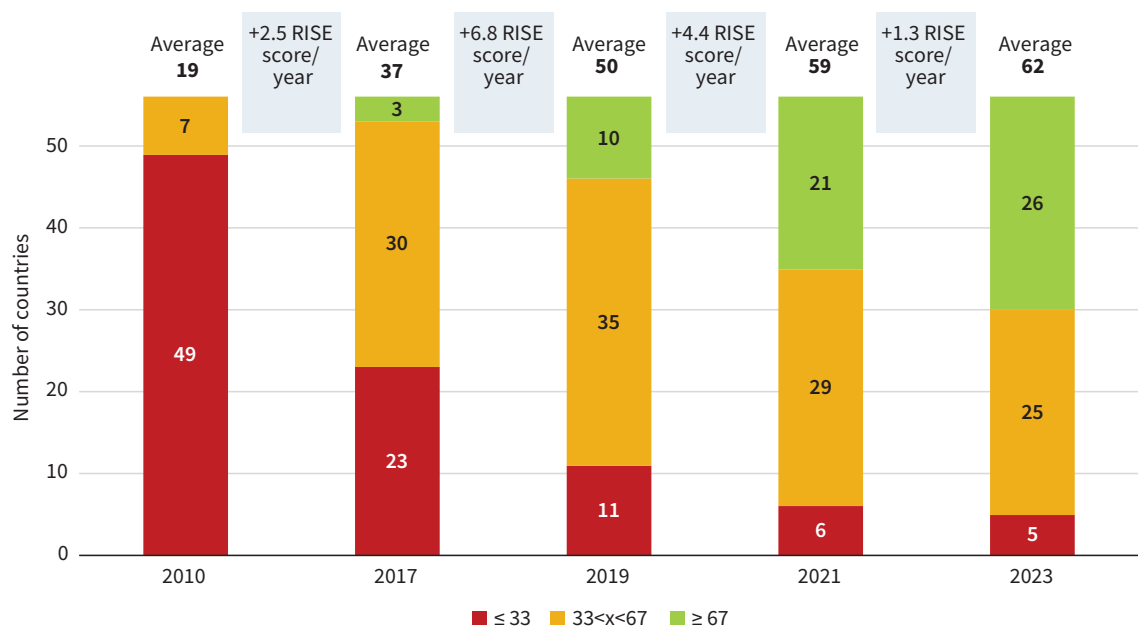
Countries across all regions have made improvements since 2010, but progress has slowed since 2019. South Asian countries, notably Pakistan, have seen their RISE electricity access scores climb since 2021. Pakistan's National Electricity Plan 2023–27 (Ministry of Energy 2023), which laid out a 15-year strategic framework, has been a key force behind the country's higher RISE score (box 2.1).

2 See list of countries per region considered for RISE below:

- Sub-Saharan Africa: Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Republic of Congo, Côte d'Ivoire, Eritrea, Ethiopia, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, and Zimbabwe
- South Asia: Afghanistan, Bangladesh, India, Maldives, Nepal, Pakistan, and Sri Lanka
- East Asia & Pacific: Cambodia, Indonesia, Lao People's Democratic Republic, Mongolia, Myanmar, Papua New Guinea, Philippines, Solomon Islands, and Vanuatu
- Latin America: Guatemala, Haiti, Honduras, and Nicaragua
- Middle East & North Africa: Yemen

3 The yellow zone corresponds to a RISE score of 33 to 67, the red zone corresponds to a RISE score ≤ 33.

FIGURE 2.1 • Evolution of RISE zones for electricity access pillar in surveyed countries, 2010–23

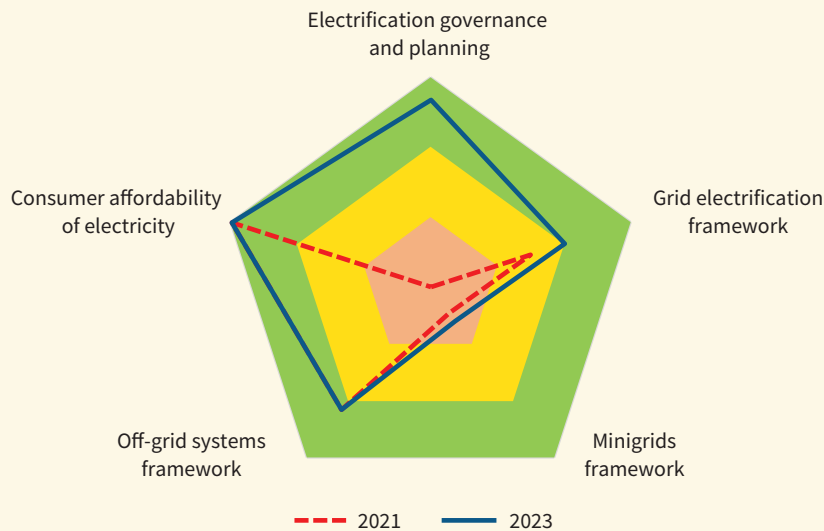


Source: ESMAP 2024.

BOX 2.1 • Pakistan: The best improver

Between 2021 and 2023, Pakistan made noteworthy strides in the RISE electricity access pillar. Progress can be attributed largely to better electrification governance and planning (figure 2.1.1), particularly through the introduction of the National Electricity Plan 2023–27 (Ministry of Energy 2023). Although it has a low score for mini-grid frameworks, it has focused on grid electrification and stand-alone off-grid solar.

FIGURE 2.1.1 • Pakistan’s progress in RISE electricity access indicators, 2021–23



Source: ESMAP 2024.

BOX 2.1 (Cont.) • Pakistan: The best improver

Pakistan's five-year plan for the power sector has a comprehensive roadmap, which takes a 15-year perspective to ensure long-term sustainability. The plan has five objectives:

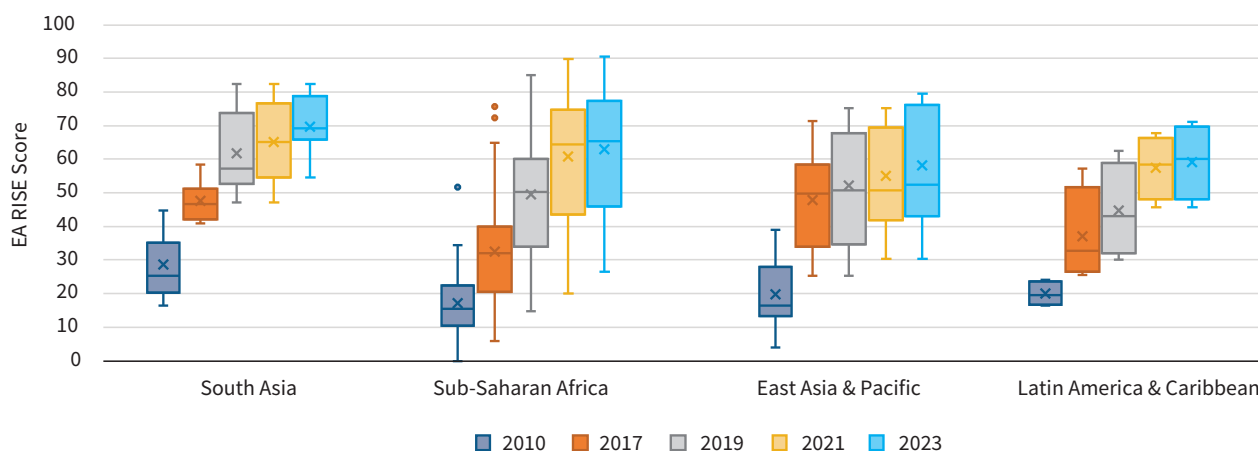
1. **Diversification.** An expanded energy infrastructure and fuel sources derive from an integrated energy, sectoral expansion, distributed energy resources, and more regional interconnections.
2. **Resilience and accessibility.** Uninterrupted, reliable electricity depends on stronger network planning, more disciplined service providers, and continuous risk monitoring for timely corrective measures.
3. **Self-sufficiency.** Lowered reliance on imported energy is achieved by leveraging indigenous technology and fuel resources, while developing emerging technologies like hydrogen and electricity storage.
4. **Affordability.** More equitable electricity access is gained through lowering the cost of electricity for consumers through transitioning to targeted subsidies.
5. **Financial viability.** The financial health of the sector is strengthened with cost recovery that (1) revisits consumer tariff structures in view of consumer satisfaction and financial viability, (2) caps cross-subsidy contributions from productive consumer categories at 20 percent based on cost of service, and (3) imposes a level playing field for market participants through uniform application of open-access charges.

In East Asia and Pacific, electricity access scores have risen since 2021, primarily due to gains in Indonesia and the Philippines. A stronger off-grid framework explains improvements in the Philippines, which has also introduced consumer financing, public financing for companies, and environmental regulations surrounding the disposal of solar devices and stand-alone system components. Indonesia, for its part, has strengthened both its mini-grid framework and governance and planning around electrification. It is important to note, however, that East Asia and Pacific represents only 5 percent of

the global population lacking electricity access—only a fraction of the global electrification gap.

In Sub-Saharan Africa—home to over 85 percent of the global population without electricity access—progress has slowed significantly. The median score for the region grew less than the scores for South Asia and East Asia and Pacific (figure 2.2). Among the region's strongest performers, Uganda recorded remarkable gains. Strong governance and improved grid and mini-grid frameworks appear to be products

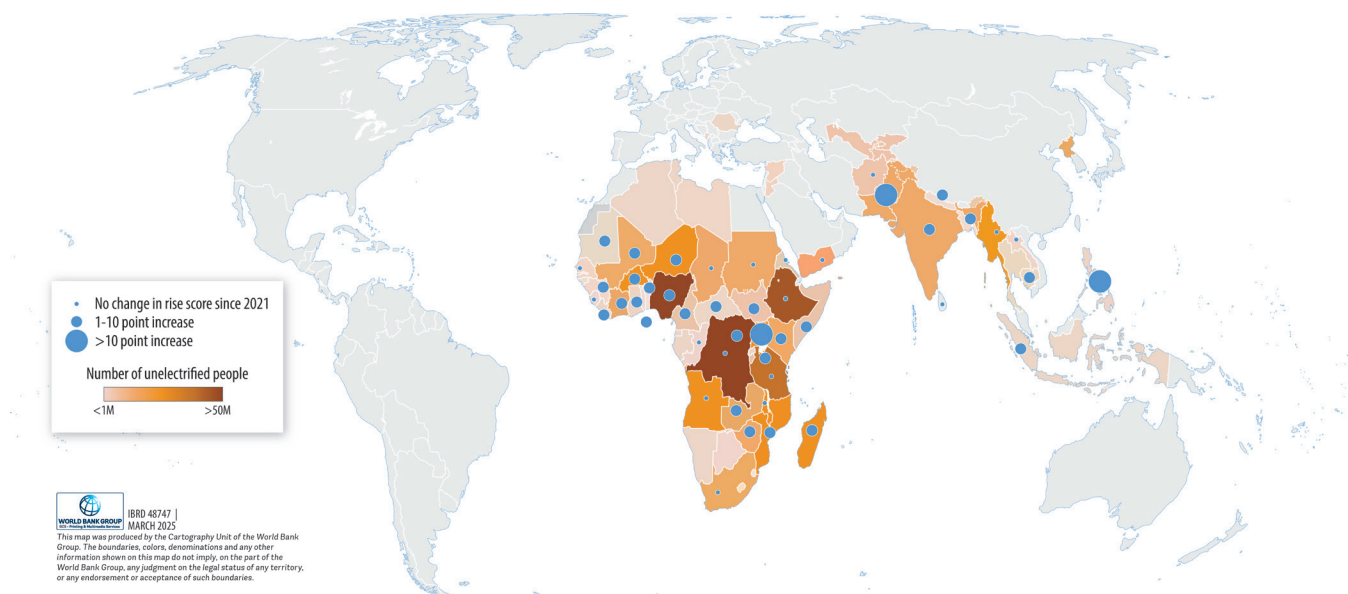
FIGURE 2.2 • Evolution of RISE electricity access scores across surveyed countries, by region, 2010–23



Source: ESMAP 2024.

Note: These are not regional scores. They represent the RISE sample scores for countries within the region. The Middle East and North Africa region has been excluded from this figure, since only one country (Yemen) represents it. EA = electricity access.

FIGURE 2.3 • Evolution of RISE electricity access scores in surveyed countries, 2021–23



Source: ESMAP 2024. Map of unelectrified people adapted from World Bank (2024a).

of the country's 2023 Energy Policy update (Ministry of Energy and Mineral Development 2023), which replaced its 2002 policy. The 2023 policy emphasizes off-grid solar in rural electrification and outlines how off-grid solar is integrated into national electrification plans. Zambia was another “most-improved” country, due to improved governance and planning. Its national electrification plan now explicitly incorporates decentralized energy solutions while boosting private sector participation and funding to expand access. Togo also demonstrated notable progress, having improved its mini-grid framework. Togo's results-based funding for operators was supported by dedicated debt-financing facilities for developers and capacity-building programs for sector stakeholders.

While several Sub-Saharan African countries have made incremental progress in their RISE electricity access scores, 12 surveyed countries⁴ have shown no change.

Among them, Ethiopia and the Democratic Republic of Congo stand out, given their large access-deficit populations (figure 2.3). Ethiopia is already in the green zone, meaning its policy and regulatory frameworks are relatively strong. In contrast, the Democratic Republic of Congo lags in key policy and regulatory areas; it has the world's second-largest population without electricity access—78 million people (IEA et al., 2024). Given the country's vast rural population and fragile institutional capacity, the lack of progress suggests deep-rooted

challenges in policy development and implementation, financing, and private sector engagement.

In Latin America and the Caribbean, progress in RISE indicators was driven by Guatemala and Haiti. Improving indicators were seen in the grid and off-grid solar frameworks. Meanwhile, in the Middle East and North Africa, Yemen's RISE score remains the lowest—unchanged since the previous edition—as the country deals with conflict and limited institutional capacity.

Since 2021, surveyed countries have focused not only on governance and planning but also on mini-grid frameworks, making these the two most-improved pillars across the five evaluated. The countries have better integrated strategies and clearer national targets for electrification governance and planning. Meanwhile, more countries have policy frameworks for their mini-grid sectors (box 2.2). Uganda and the Philippines have improved the most. Uganda's progress appears rooted in an improved solar hybrid mini-grid technology, which in turn is supported by national programs for the productive uses of electricity. Uganda also has improved its financing framework with dedicated debt facilities and stakeholder training initiatives. The Philippines strengthened its financing framework to support mini-grid developers with specific debt and risk mitigation facilities.

4 Twelve countries in Sub-Saharan Africa have observed no change in RISE scores: Angola, Chad, Democratic Republic of Congo, Republic of Congo, Eritrea, Ethiopia, Malawi, Senegal, Sierra Leone, South Africa, Sudan, and Tanzania.

BOX 2.2 • Enabling environment insights from the 2024 Mini-Grids Market Report

The State of the Global Mini-Grids Market Report 2024, produced by Sustainable Energy for All (SEforALL 2024), reinforces the RISE findings on mini-grid policy frameworks and adds depth.

Governments have continued to strengthen enabling environments for mini-grids. Since 2021, more countries—Angola, Ethiopia, Kenya, Nigeria, Uganda, and Zambia—have adopted comprehensive regulatory frameworks. Nigeria revised its mini-grid regulation in 2023 and launched the Interconnected Mini-grid Acceleration Scheme (IMAS) to fast-track deployment in grid-connected areas that were underserved (NERC 2023). The scheme offers an “interconnected mini-grid explorer” tool to identify grid-connected sites that are limited to four to eight hours of electricity per day. In Ethiopia, the energy authority approved a mini-grid directive to boost private sector investment and electrification. The directive created a transparent regulatory framework for the country’s electrification goals and issued technical guides to assist implementation (USAID, NARUC, and Power Africa 2021).

The report highlights the following trends:

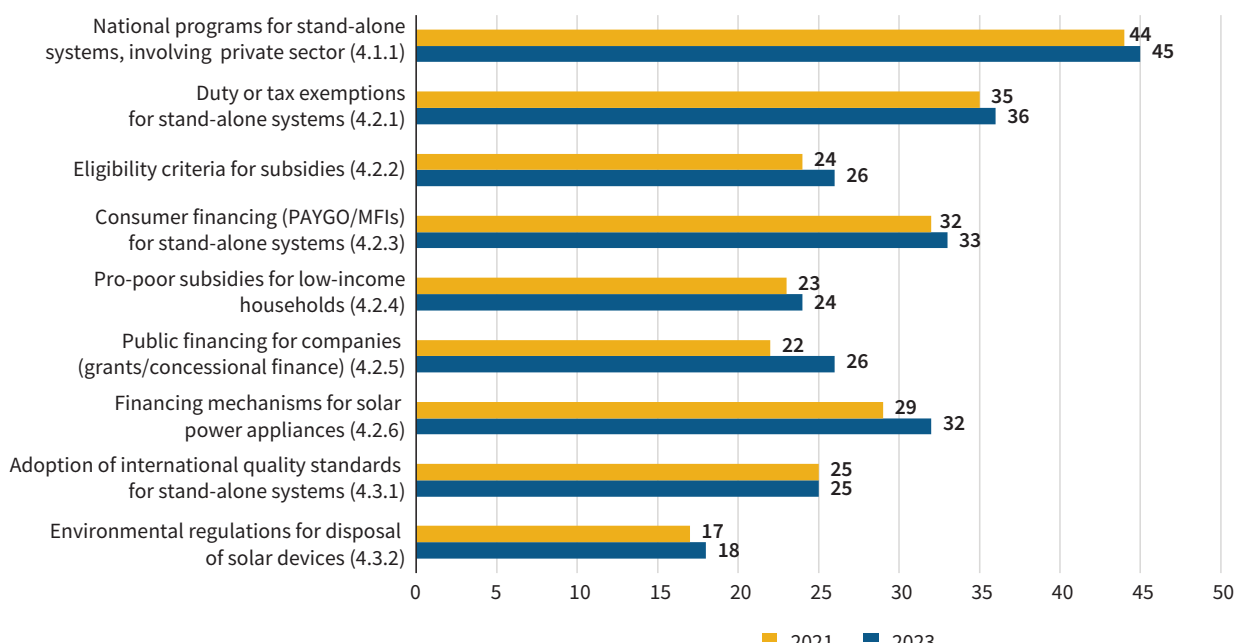
- Regulatory processes now account for system size, exempting small systems (<100 kilowatts) to reduce barriers, and allow community-based tariff setting, as seen in Nigeria and India.
- Portfolio-based licensing and longer permitting durations (10–25 years) are improving bankability and lowering transaction costs.
- Cost-reflective tariffs based on transparent formulas are now common across markets like Ethiopia, Kenya, Nigeria, Tanzania, and Zambia. Attention is more focused on inflation and currency adjustments as ways to maintain investor confidence and protect consumers.
- Policies on investment protection and tariff methodologies are being standardized; harmonization of processes for due diligence remains a challenge.
- Licensing and permitting processes are getting digitized and streamlined, with support from development partners. Nigeria’s IMAS platform and one-stop shops are new tools for accelerating deployment.

The gap between regulation and implementation remains critical. Although funders have incorporated technical assistance into mini-grid programs, many countries have little guidance on how to operationalize the formal regulations. Frameworks that expand planning for integrated energy access are available, and are supported by realistic financing strategies. Standardized approaches that allow for local adaptations will be key to accelerating mini-grid development (refer to box 2.4 for additional information).

Since 2010, the off-grid framework indicator has shown remarkable progress as off-grid solar became a vital part of expanding electricity access. In fact, countries have integrated off-grid policies into their national electrification strategies, closing access gaps with market-driven, decentralized energy solutions. Of those countries surveyed, more than 80 percent adopted national programs to develop markets for off-grid solar systems or to support their growth by working with the private sector (box 2.3). And about 65 percent of countries

now have tax exemptions to incentivize the adoption of solar products. However, since 2021, progress has slowed (figure 2.4). Overall, these trends underscore the growth of the off-grid solar sector and its prominence on national and international agendas. The rise of off-grid solar is exemplified by Mission 300, a new World Bank Group partnership with the African Development Bank that will connect 300 million people in Sub-Saharan Africa to electricity by 2030 (World Bank 2024b).

FIGURE 2.4 • Progress on the RISE off-grid framework in surveyed countries, by number of countries per subindicator, 2021 and 2023



Source: ESMAP 2024.

Note: India has been excluded from this figure to prevent skewing, since data for India cover five states rather than nationwide policy and regulatory frameworks. PAYGO = pay-as-you-go; MFI = microfinance institution.

BOX 2.3 • Policy insights from the 2024 Off-Grid Solar Market Trends Report

The 2024 Off-Grid Solar Market Trends Report (MTR), produced by the World Bank and GOGLA, corroborates RISE findings on off-grid solar policy frameworks and provides additional insights (World Bank 2024a).

Since 2021, the off-grid solar sector has secured more funding as it gains international visibility. These advances pose an opportunity for governments to secure financing for market development programs through multilateral development banks. One such initiative is Mission 300, in which the World Bank Group has partnered with the African Development Bank and others to connect 300 million people to electricity in Sub-Saharan Africa by 2030 (World Bank 2024b). World Bank lending for off-grid solar reached an all-time high in FY 2024, at US\$660 million—while a range of development partners are supporting technology, business model, and financial innovation, mainly for productive uses.

Consistent with findings from the RISE indicators, governments have continued to strengthen their off-grid policies. For example, Uganda updated its energy policy in 2023, replacing the 2002 policy, to center off-grid solar in its rural electrification efforts (Ministry of Energy and Mineral Development 2023). Rwanda's 2023 National Electrification Plan aims to connect 52 percent of households to the national grid and link 48 percent to off-grid solutions and micro-grids (EDCL 2023). Off-grid solar is now central to Rwanda's electrification plan, along with an enabling environment. Understanding both these elements has helped to advance solar adoption and investment.

The MTR also highlights nuances in fiscal incentives as some countries introduce incentives for the sector while others are rolling them back. Nigeria and Sierra Leone, to name just two countries, already have value-added tax or duty exemptions in place. However, others have chosen to remove tax exemptions for the off-grid solar industry. Sierra Leone reintroduced a goods and services tax on solar equipment in 2023, while continuing to exempt these items from import duties (GOGLA 2023).

BOX 2.3 (Cont.) • Policy insights from the 2024 Off-Grid Solar Market Trends Report

In adopting quality standards, countries are facing implementation challenges, which are diminishing the proportion of quality-assured products in the market. According to the MTR and consistent with the findings from the RISE indicators, over 20 countries have engaged with VeraSol to adopt a harmonized standard, but inconsistent application and capacity constraints hinder the ability of authorities to fully utilize and enforce standards.

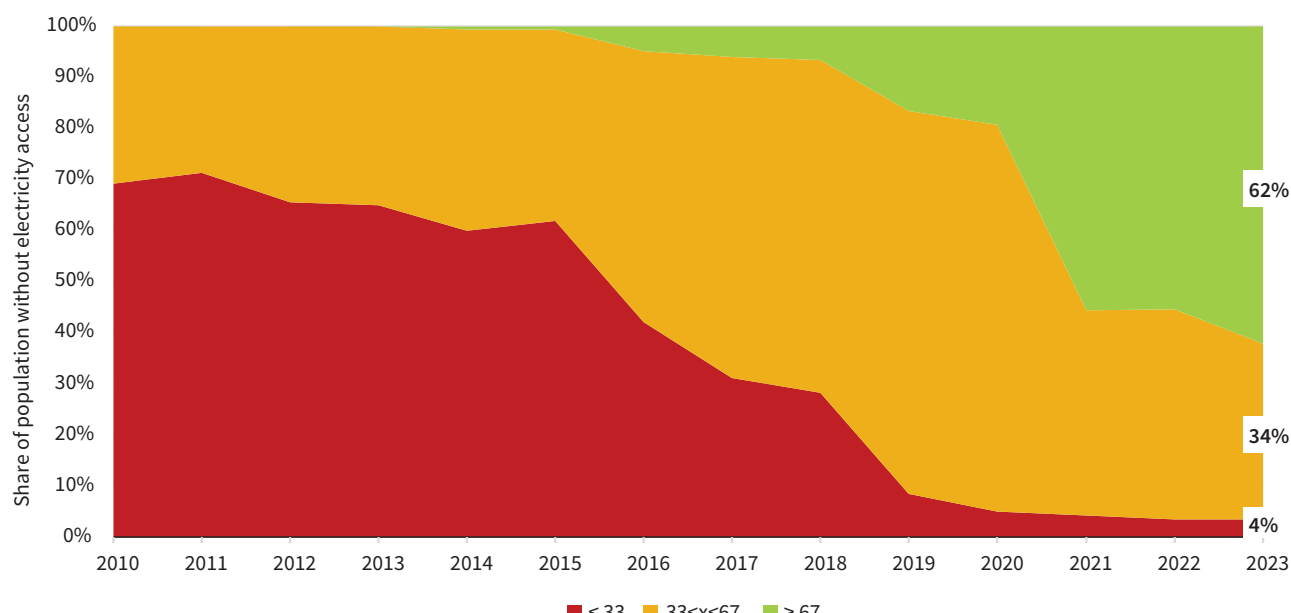
Very few countries have introduced e-waste management policies and regulations to codify and address sustainable disposal. Kenya is developing a framework to operationalize the Extended Producer Responsibility (EPR) regulation introduced in 2020. The industry has responded with the E-waste Producers' Responsibility Organisation of Kenya (E-PROK) to comply with the regulation and collaborate on improving circularity and e-waste management. Meanwhile, the Zambian government is developing its own regulations and standards for e-waste management (ITU n.d.). India has recently expanded its e-waste management rules to include solar modules (Ministry of New and Renewable Energy 2023).

Affordability remains the biggest barrier to energy access. The slow progress in RISE subindicators on consumer financing options (e.g., pay-as-you-go [PAYG], microfinance) and support for low-income households (e.g., pro-poor subsidies) is concerning. Globally, only 22 percent of households without electricity can afford the monthly payment required for a basic solar energy kit with PAYG. To translate RISE scores into energy access, countries must continue improving access to consumer financing and scaling up pro-poor subsidies.

In 2023, the number of people without electricity access in the red- or yellow-zone countries fell to 250 million. They account for less than 40 percent of the global access-deficit population (figure 2.5). For example, Nigeria has long had a large access deficit, but it continues to show progress; its over-

all score has risen 6 points. A strengthened grid electrification framework appears responsible for the rise, along with dedicated funding for expansion, consumer financing mechanisms, and strengthened performance standards for supply reliability.

FIGURE 2.5 • RISE electricity access scores in surveyed countries, weighted by populations without access, 2010–23



Source: ESMAP 2024.

Most of the countries with the largest access deficits fall within the green zone, yet this has not translated into major gains in electrification (box 2.4). Four of the five countries with the largest unelectrified populations score well into the green zone (figure 2.6), but progress remains limited, despite

strong policy frameworks. Since 2019, Ethiopia has reduced its unelectrified population by 7 percent, Tanzania and Nigeria by just 5 percent, while the Democratic Republic of Congo’s unelectrified population has grown 7 percent.

FIGURE 2.6 • Comparison of RISE score zones and progress in the five countries with the largest access deficits, 2023

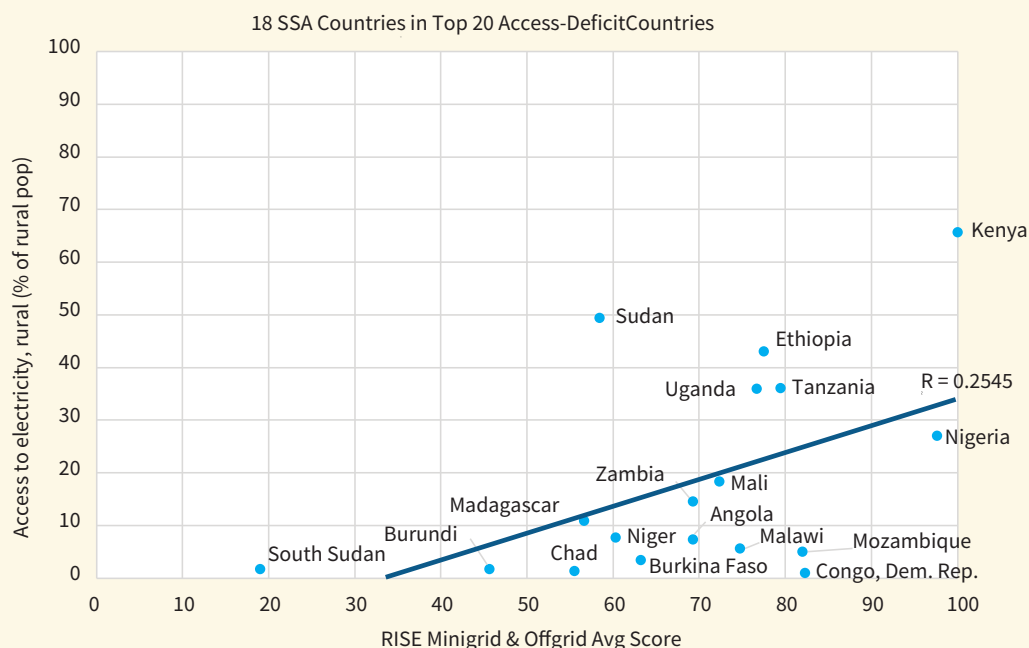


Source: ESMAP 2024; IEA et al., 2024.
 Note: M = million; RISE = Regulatory Indicators for Sustainable Energy.

BOX 2.4 • Relationship between RISE scores and electricity access rates

A forthcoming World Bank study (Guadarrama et. al, forthcoming) finds no clear correlation between RISE scores for off-grid and mini-grid policies and rural electrification rates in Sub-Saharan Africa. Countries with strong policy frameworks do not necessarily achieve high access rates, indicating that policy and regulatory frameworks alone are insufficient to drive electrification (figure 2.4.1).

FIGURE 2.4.1 • RISE mini-grid and off-grid scores versus rural electrification rates in Sub-Saharan Africa



Source: ESMAP 2024 and IEA et al. 2024.

Note: RISE = Regulatory Indicators for Sustainable Energy; SSA = Sub-Saharan Africa.

The findings categorize Sub-Saharan African countries by policy strength (RISE score) and electrification rates, using case studies from the Democratic Republic of Congo, Kenya, Nigeria, and South Sudan to identify key lessons. These countries have different access levels and RISE scores:

- Kenya: High access, high RISE score
- Nigeria and the Democratic Republic of Congo: Lower access despite high RISE scores
- South Sudan: Low access, low RISE score

Kenya stands alone in the quadrant with high access and a high RISE score. It therefore offers key lessons in effective electrification. Strong government commitment, backed by clear policies and regulatory frameworks, has contributed to closing the electricity access gap. Comprehensive planning, including based on geospatial data, and integrated strategies have optimized resource allocation and project execution. Capacity building and training have equipped local officials and energy sector personnel with the skills to sustain and manage electrification. Finally, consumer financing mechanisms, such as pay-as-you-go (PAYG) and microfinance, have made remote, stand-alone solar systems more accessible in ways that ensure broader off-grid adoption.

BOX 2.4 (Cont.) • Relationship between RISE scores and electricity access rates

Implementation challenges persist, however, despite Kenya’s strong policy framework and the government’s commitment to achieving universal electricity access by 2030. Fiscal constraints, administrative delays, and difficult operating environments continue to slow progress toward Sustainable Development Goal 7. Regulatory uncertainty also creates risks for off-grid and mini-grid companies, making underserved areas less attractive for investment. So, strong policies alone are not enough. Equally important are effective execution and a stable business environment.

In Nigeria, policy frameworks are in place but face hurdles, including large financing gaps, a rapid population growth, and weak implementation capacity. The financing gap could be bridged with public budgeting that strategically directs funds on the one hand and on the other attracts private capital to areas with high needs to support privatized distribution companies and so forth. Clear-cut policies and strong incentives would encourage private sector participation in off-grid electrification—evidenced in coherent licensing procedures for mini-grids, and participation in regional trade, among other priorities. At the same time, affordability remains a significant barrier, indicating a need to expand consumer financing and pro-poor subsidies. Finally, building local technical expertise is critical. External technical assistance could provide short-term support, but the country needs to develop long-term domestic capacity. Project implementation needs to support the domestic manufacture of equipment for on-grid and off-grid systems.

The Democratic Republic of Congo meets many RISE policy criteria and receives the support of international and development partners. To make policy more effective, the country must strengthen the technical expertise of its public institutions. Expertise ensures that regulatory frameworks are not only well designed but also well implemented. In fact, the Democratic Republic of Congo highlights the limitations of best practices without local adaptations. The PAYG models have succeeded in other countries, but they may not be the best fit for the Democratic Republic of Congo. Alternative business models tailored to local market conditions might improve affordability and adoption.

South Sudan has the second-lowest RISE score among the countries surveyed. As a conflict-affected state, South Sudan exemplifies the difficulties of expanding access in fragile environments. Traditional grid infrastructure is often destroyed or rendered inoperable by violence, leaving large parts of the population without electricity.

Overall, the research highlights that although sound policy and regulatory frameworks are necessary, they are not sufficient for attaining universal electricity access. Closing the electricity access gap requires several additional components:

- **Building implementation capacity.** Weak implementation capabilities undermine policy effectiveness. It is therefore essential to develop local technical expertise so governments can formulate, implement, and enforce policies themselves, rather than relying on donor-driven frameworks.
- **Overcoming financing barriers.** Public financing remains a major obstacle, limiting both grid and off-grid expansion. Energy access could be accelerated with greater recourse to concessional financing, results-based funding, and risk mitigation mechanisms.
- **Improving the business environment.** A weak investment environment deters private sector participation. Countries with clear, enforceable regulatory frameworks attract more private investment. Policy predictability is vital to the long-term engagement of the private sector.

Expanding electricity access is challenging in fragile-, conflict-, and violence-affected regions, where traditional grid infrastructure is often damaged. Public utilities operate at constrained capacities, private sector involvement remains limited, and governments are deprived of resources and capacity that would otherwise drive meaningful improvements.

Market-based solutions are often infeasible when end users struggle with payments, and operating costs and risks are high. While some fragile states may eventually achieve progress in policy development, instability and other structural deficits continue to limit their ability to translate reforms into higher rates of electricity access (World Bank 2024a).

To continue improving their RISE scores, countries need to sustain efforts across all indicators while prioritizing the lowest-performing areas in the electricity access pillar.

Priorities will vary by country, but the overall focus should be on stronger frameworks for grid electrification, mini-grids, and off-grid solutions—the lowest-performing indicators.⁵ For grid electrification, this means continued expansion of consumer financing mechanisms (such as utility loans, on-bill financing, and microloans) and more direct subsidies so consumers can afford connection fees. Countries should continue to set coherent performance standards for reliability, such as guaranteed hours of service per day, to ensure consistent and high-quality electricity supply. Mini-grid frameworks will require to continue supporting solar-hybrid mini-grid systems, strengthening financial frameworks to attract investment (especially with the availability of risk mitigation facilities), and enhancing regulatory structures to ensure long-term sustainability (including through quality standards). Finally, for off-grid solar, the need to keep products affordable remains crucial. This requires fi-

nancial incentives, including subsidies, and public funding for companies to help leverage private co-investment. Also important are quality standards (adopting and enforcing them) and developing regulations for e-waste management.

With just five years remaining to reach SDG 7, the need for progress is more urgent than ever.

Sound policy and regulatory frameworks are necessary but not sufficient to achieve universal access. To move beyond a strong RISE score and deliver electricity access, countries must focus on policy implementation. While each country will choose its own path to success, several key actions could translate a good RISE score into actual energy access. These include strengthening local capacity to drive policy execution; continuing to close financing gaps to expand grid, mini-grid, and off-grid solutions; and making electricity more affordable for consumers. Additionally, improving the business environment by ensuring policy predictability and reducing investment risks will be key to unlocking private sector participation.

⁵ These areas are highlighted due to their relatively low average scores across surveyed countries—not as a “recipe for success” in accelerating energy access. Specific actions will necessarily vary by country, depending on context and challenges.

A woman wearing a vibrant, patterned orange and blue dress is shown from the waist up, leaning over a large wooden mortar. She is using a pestle to grind a light-colored substance, likely grain, inside the mortar. The background features a thatched roof and a wooden fence. The image is overlaid with a teal and green graphic design consisting of curved lines and a semi-transparent teal circle. In the bottom right corner, there is a small image of a fire.

3. CLEAN COOKING

3 • CLEAN COOKING

RISE covers clean cooking in 57 countries, and within that subset, 19 of the 20 countries with the largest access deficits.

The 57 countries are broken down as follows: 35 (Sub-Saharan Africa), 10 (East Asia and Pacific), 7 (South Asia), 4 (Latin America and the Caribbean), and 1 (Middle East and North Africa). According to the latest Tracking SDG 7 report (IEA et al. 2024), about 74 percent of the global deficit for clean cooking access occurs in just 20 countries. India and China hold the largest shares. In eight of these countries—namely, the Democratic Republic of Congo, Ethiopia, Madagascar, Mali, Mozambique, Niger, Uganda, and Tanzania—less than 10 percent of the population has access to clean cooking fuels, while 14 of the 20 countries have access rates below 50 percent. Sub-Saharan Africa has a severe deficit: between 1990 and 2022, the number of people without access in the region has more than doubled, reaching 923 million. By 2022, half the world’s population without access to clean cooking lived in the region, a figure projected to rise to 60 percent by 2030. Nigeria (86 million), the Democratic Republic of Congo (78 million), and Ethiopia (55 million) accounted for nearly a third of the global deficit.

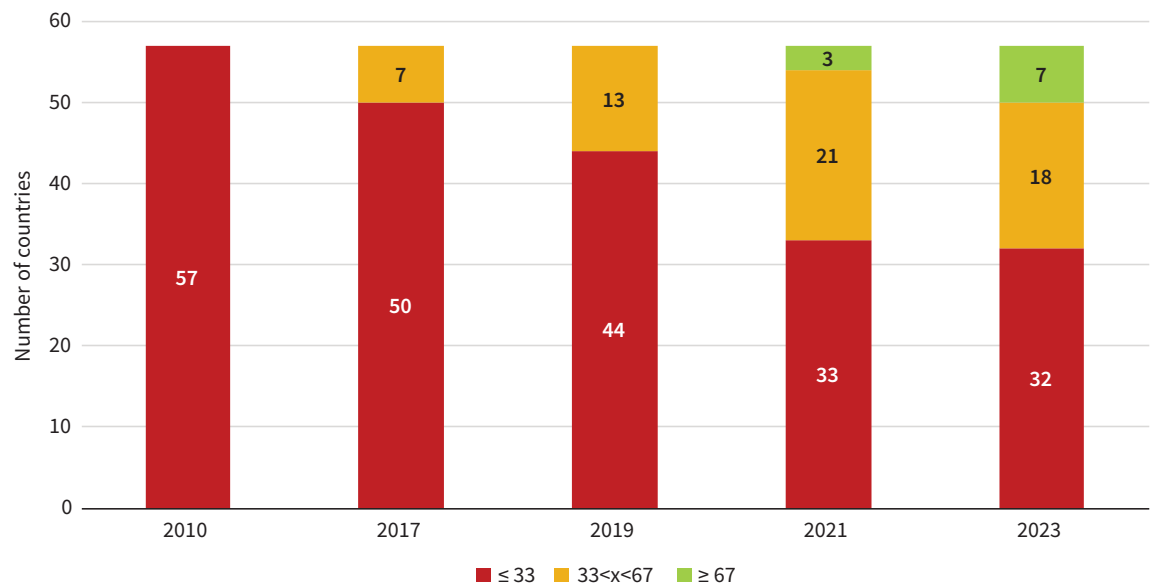
There is a clear and urgent need for targeted interventions characterized by better data collection and analytical tools able to support policy decisions. RISE therefore

provides a highly representative assessment of global policy and regulation for countries with the greatest access deficits in clean cooking. The assessment covers 19 of the 20 countries with the largest access deficits—the Democratic People’s Republic of Korea the only exception. This comprehensive assessment of policy efforts worldwide is focused on countries facing major challenges in access to clean cooking.

Progress in clean cooking regulatory frameworks between 2021 and 2023 was modest; overall scores changed minimally for most countries, and improvements remained under 10 points for the most part.

As of the end of 2023, 56 percent of the surveyed countries remained in the red zone, a slight improvement from 58 percent in 2021, while 32 percent fell into the yellow zone, reflecting a shift from 37 percent in 2021, as a few countries moved into the green zone. Notably, the percentage of countries in the green zone increased to 12 percent, up from 5 percent in 2021, marking policy advancements (figure 3.1). Although progress has been observed, particularly with countries transitioning from the yellow to the green zone, improvements remain slow and uneven. The persistent stagnation in the red zone underscores the need for stronger regulatory frameworks and more effective policy implementation to drive wider adoption of clean cooking solutions globally.

FIGURE 3.1 • Progress of RISE scores for clean cooking, 2010–23

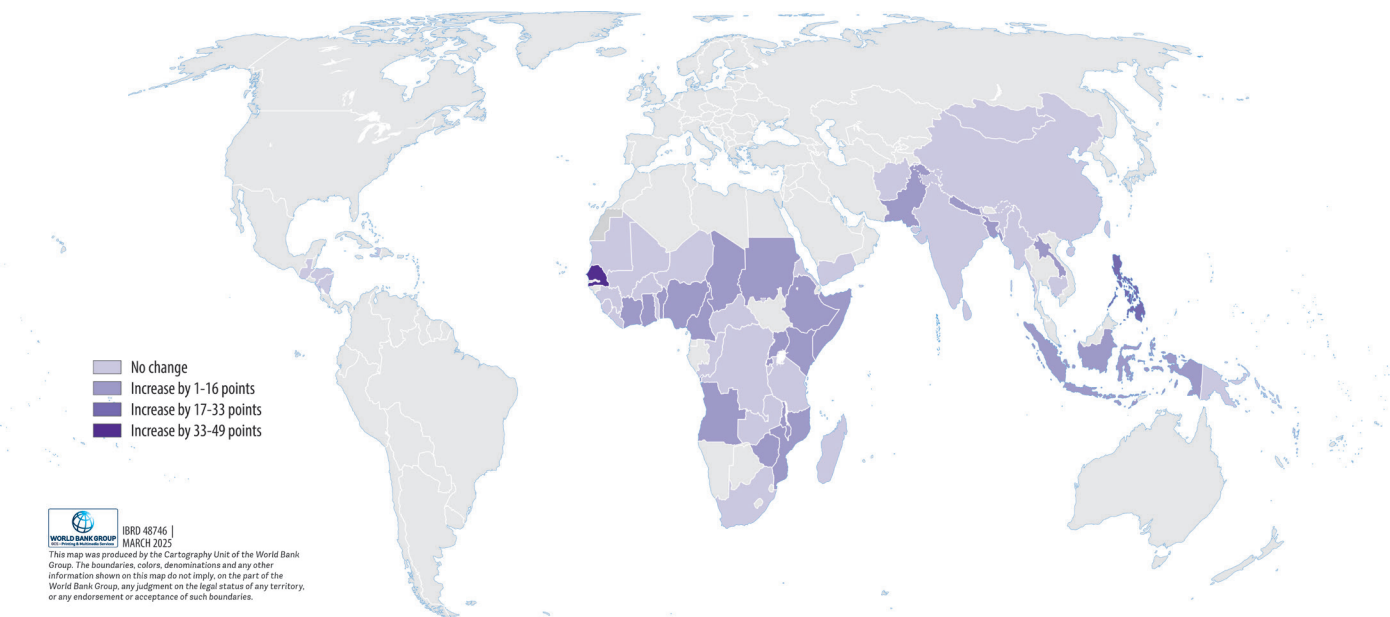


Source: ESMAP 2024.
Note: The historical data for the clean cooking pillar are different from those in previous RISE reports. For more details, please refer to the Methodology section.

In total, 7 of the 57 surveyed countries (Ghana, India, Indonesia, Kenya, Malawi, Nepal, and Rwanda) are in the green zone. Between 2021 and 2023, Ghana, Indonesia, Malawi, and Nepal transitioned from the yellow to the green zone, demonstrating hefty progress in their clean cooking pol-

icy frameworks (figure 3.2). Senegal emerged as the most-improved country, making a remarkable leap from the red zone to the yellow zone. Its overall score rose 35 points, the most noteworthy progress among all surveyed countries during this period (box 3.1).

FIGURE 3.2 • RISE clean cooking pillar scores, 2021–23



BOX 3.1 • Senegal: The top improver in the RISE clean cooking pillar, 2021–23

Between 2021 and 2023, Senegal made notable progress in the RISE clean cooking pillar, primarily through standards, labeling, and national clean cooking planning. The Center for Studies and Research on Renewable Energies (CERER) and the Senegalese Standards Association (ASN) collaborated to develop the Senegalese Standard NS 14-002 (2009) for Jambar stoves, to ensure quality and performance. Stove quality and testing protocols will be improved further through cooperation with the Economic Community of West African States (ECOWAS) Center for Renewable Energy and Energy Efficiency (ECREEE) and other partners. The Plan Sénégal Emergent (PSE), adopted in 2014, guides national development through 2035. The plan emphasizes energy access, renewable energy promotion, and infrastructure improvements. The Energy Sector Development Policy Letters (2019–23) further define Senegal’s approach to sustainable cooking energy, with objectives such as expanding nationwide access to liquefied petroleum gas (LPG), promoting alternative fuels like biochar and biogas, and strengthening institutional capacity. A key component of this strategy is harmonizing LPG prices nationwide, supporting climate-sensitive cooking projects, and implementing an integrated forest resource management system (SIG-COD).

Senegal’s Nationally Determined Contribution (NDC) of 2020 also sets ambitious goals to reduce greenhouse gas (GHG) emissions by up to 29 percent by 2030, focusing on key sectors like energy, forestry, and agriculture. The clean cooking sector aims to distribute 1.5 million improved cookstoves (ICSs) per year and to expand the diffusion of biodigesters. The Bioenergy National Action Plan (2020–30) is a complementary plan that aligns with ECOWAS’s Bioenergy Policy and seeks to boost the use of modern cooking fuel to 41 percent and the adoption of ICSs to 100 percent by 2030. The Renewable Energy Action Plan (PANER) 2015–30 seeks to expand modern fuel use (LPG, biogas, and solar) to 64 percent of the population while promoting efficient charcoal production and the adoption of improved cookstoves. At the regional level, Senegal follows the ECOWAS Renewable Energy Policy (PERC 2013), which contributes to sustainable energy transitions through mandating efficient stoves for urban and rural areas.

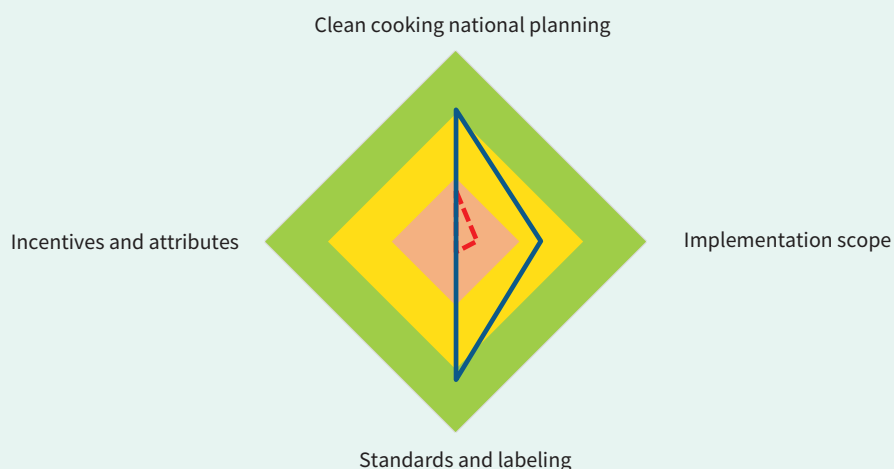
Senegal has implemented projects to support clean cooking and sustainable energy. The Natural Resources Management Project (2022) focuses on community-based forest management, sustainable fuelwood production, and ICS promotion, and seeks to reduce fuelwood consumption by 30 percent. The Climate-Sensitive Cooking Methods Promotion Project (2020–25), co-financed by the Green Climate Fund and Germany’s BMZ, supports stove manufacturing, market expansion, and financing access. It benefits 11.23 million people and reduces 984,915 metric tons of carbon dioxide emissions. The World Bank-supported PROGEDE II Project (2011 to present) focuses on sustainable household fuels and ICS promotion; it has led to the installation of 259 biodigesters and distribution of 836,235 ICSs.

Earlier initiatives like PERACOD (2004–15) boosted rural energy access, reduced deforestation across 117,590 hectares, and created 1,370 jobs. The FASEN Project (2006–15) improved the ICS market, distributed 556,628 cookstoves, and established a nationwide distribution network. The National Biogas Programme of Senegal (PNB-SN) (2009 to the present) aims to install 10,000 biodigesters by 2025, replacing 48,000 tons of firewood annually and preserving 1,366 hectares of forest. Collectively, these projects reinforce Senegal’s commitment to clean cooking energy, forest conservation, and climate resilience, ensuring both environmental sustainability and economic benefits for local communities.

Senegal’s progress in its RISE clean cooking score reflects a well-coordinated approach that prioritizes advancements in standards and labeling alongside national planning and implementation (figure 3.1.1). By strengthening regulatory frameworks through the development of quality standards for cookstoves, harmonizing fuel pricing, and aligning with regional and international policies, the country can now support the sustainable development of the clean cooking sector. The integration of clean cooking initiatives into broader national strategies has reinforced institutional capacity and expanded access to clean cooking solutions. Additionally, large-scale projects and targeted interventions demonstrate Senegal’s commitment to reducing GHG emissions, boosting energy security, and improving livelihoods. As the country continues to build on these achievements, its multifaceted approach to clean cooking underscores the importance of policy-driven innovation and collaborative efforts in fostering long-term sustainability and resilience in the sector.

BOX 3.1 (Cont.) • Senegal: The top improver in the RISE clean cooking pillar, 2021–23

FIGURE 3.1.1 • SENEGAL'S PROGRESS IN THE RISE CLEAN COOKING INDICATORS, 2021–23



Source: ESMAP 2024.

Sub-Saharan Africa is witnessing a transformation in clean cooking, with Ghana, Kenya, Malawi, and Rwanda having moved into the green zone.

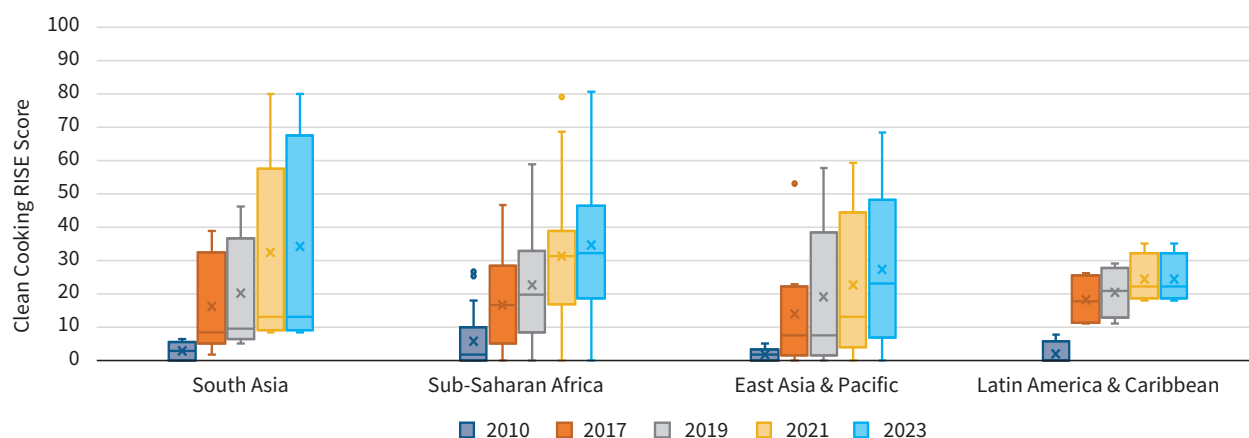
Ghana has a dedicated national action plan fueling this transition. Its Country Action Plan for Clean Cooking is set to boost the adoption of liquefied petroleum gas (LPG) from 5.5 percent to 50 percent in peri-urban and rural households while distributing 2 million efficient cookstoves by 2030. This progress is further reinforced by public and private investments, donor support, and a strong push toward clean fuels and high-efficiency cookstoves compliant with the standards of the International Organization for Standardization (ISO). Kenya is also making significant strides with its SDG 7 Energy Compact and its Kenya National Cooking Transition Strategy (2024–28), which commits to universal access to modern energy cooking services by 2028. With robust tracking systems, mandatory labeling, and financial incentives like tax benefits and subsidies, Kenya is creating a strong foundation for a nationwide transition to clean cooking. In Malawi, the shift is driven by the SDG 7 Energy Compact and Integrated Energy Plan, with support from the Malawi Clean Cooking Fund to expand access to alternative fuels and fuel-efficient stoves. Policies prioritizing household-level tracking, gender-inclusive consultations, and supplier incentives are speeding the adoption of clean cooking solutions across the country. Rwanda

is also making remarkable progress, leveraging its Energy Compact commitments and the World Bank's Results-Based Financing (RBF) Facility on clean cooking. Rwanda is demonstrating how government-led subsidies, tax exemptions on LPG and clean cookstoves, and public-private partnerships can drive large-scale adoption.

Besides Africa, other regions are also seeing progress, with challenges and breakthroughs unique to country context.

Indonesia has moved into the green zone over the past two years. Its transition from kerosene to LPG and the expansion of clean biomass stoves through the Indonesia Clean Stove Initiative and RBF mechanisms reflect its growing commitment, although barriers remain in consumer financing, last-mile distribution, and alignment with global standards. The Philippines is now gaining momentum, after years of stagnation. Newly established tracking systems, the integration of clean cooking into its Nationally Determined Contributions (NDCs), and the introduction of emissions standards mark a new chapter, with public awareness campaigns, policy planning, and international support from the Clean Cooking Alliance and Asian Development Bank signaling a growing commitment to change. In South Asia, Nepal's accelerated adoption of electric cooking and gender-responsive initiatives, together with tax exemptions and subsidies, moved it from the yellow zone to the green

FIGURE 3.3 • Evolution of RISE clean cooking scores in surveyed countries, by region, 2010–23



Source: ESMAP 2024.

Note: The scores are not regional averages; rather, they represent the RISE sample scores for surveyed countries within each region. The Middle East and North Africa region has been excluded from this figure since only one country (Yemen) represents it. China has also been excluded.

zone. Yet institutional funding, labeling schemes, and supplier incentives remain critical gaps. In contrast, Latin America and the Caribbean, and the Middle East and North Africa remain at a standstill, with clean cooking scores unchanged between 2021 and 2023, underscoring the need for renewed urgency and investment in these regions (figure 3.3).

Across the surveyed countries from 2010 to 2023, national planning for clean cooking consistently received the highest scores among the RISE clean cooking indicators. This reflects governments' prioritization of structured approaches to expanding clean cooking access. Within this category, institutional capacity emerges as the strongest-performing sub-indicator, followed by tracking and existence of a plan. The strength of institutional capacity suggests that many of the surveyed countries have designated agencies responsible for formulating and implementing clean cooking strategies, setting and enforcing standards, and tracking adoption. These agencies often have dedicated funding lines—via public funds, private investment, or donor support—which further strengthen their ability to sustain long-term efforts. Tracking mechanisms, which assess household-level cooking data, including fuel use, stove stacking, and indoor or outdoor cooking practices, show slightly lower scores, suggesting that while data collection exists, areas such as public data accessibility, sex-disaggregated reporting, and sustained stove usage monitoring still need attention. Meanwhile, existence of a plan shows the lowest scores, indicating that while many governments have drafted or adopted clean cooking plans, gaps remain in resource allocation, public consultation, and gender-inclusive planning. Additionally, while some plans integrate clean cooking targets

within NDCs, fewer include specific time-bound targets. This analysis highlights that while countries have stronger institutional frameworks for clean cooking, there is a need to ensure there are comprehensive tracking systems and sufficiently funded, well-integrated national plans to drive meaningful progress.

Standards and labeling remain the most overlooked indicator in RISE clean cooking scores. They consistently receive the lowest ratings. This reflects significant gaps in the development, enforcement, and transparency of clean cooking product standards. Within this category, labeling scores are the lowest, indicating that few countries have implemented mandatory or widely recognized labeling schemes for efficiency and emissions. Monitoring and verification—the second-weakest subindicator under the category—highlights challenges in enforcement, accreditation of testing facilities, and field verification of standards. This in turn raises concerns about the existing frameworks. While standards for efficiency, emissions, and safety perform slightly better, they often lack alignment with ISO tiers of performance and remain inconsistently applied across fuel types. Additionally, many countries either adopt standards from external sources without adaptation or fail to establish a domestic framework with clear enforcement mechanisms. The absence of certified testing facilities, mandatory compliance measures, and verification through field testing further weakens the impact of existing regulations. The persistent weaknesses in standards, monitoring, and labeling suggest that clean cooking markets in many countries operate without sufficient quality assurance. This makes it difficult for consumers, manufacturers, and policy makers to expand the

adoption of efficient and safe cooking solutions. Addressing these gaps requires regulatory enforcement, transparency, and testing and certification systems that strengthen global access to clean cooking.

Incentives and attributes, which received minimal attention across the surveyed countries, remain among the most underdeveloped areas in RISE clean cooking scores.

This category includes three subindicators—consumer financing mechanisms, institutional incentives, and supplier incentives—across which persistent gaps are seen. Institutional incentives rank the lowest, highlighting a dearth of government-led support for public institutions to adopt clean cooking solutions, such as funding for schools, hospitals, and social programs. Consumer financing mechanisms (which assess the availability of loans, subsidies, and safety net programs for clean cooking purchases) also remain weak, suggesting that many households, particularly low-income ones, struggle to afford cleaner alternatives due to insufficient financial support. Supplier incentives, which include tax exemptions, subsidies, and business development programs for clean cooking manufacturers and distributors, perform slightly better but still face barriers in accessibility, sustainability, and targeted funding for gender-inclusive businesses. Additionally, the absence of dedicated funding for research, development, and innovation further limits the sector's expansion. The weaknesses in these three subindicators suggest that without stronger financial mechanisms for consumers, targeted institutional support, and well-structured incentives for suppliers, progress in clean cooking adoption will lag, demonstrating the need for adequate policy frameworks and investment strategies to drive sustainable growth in the sector.

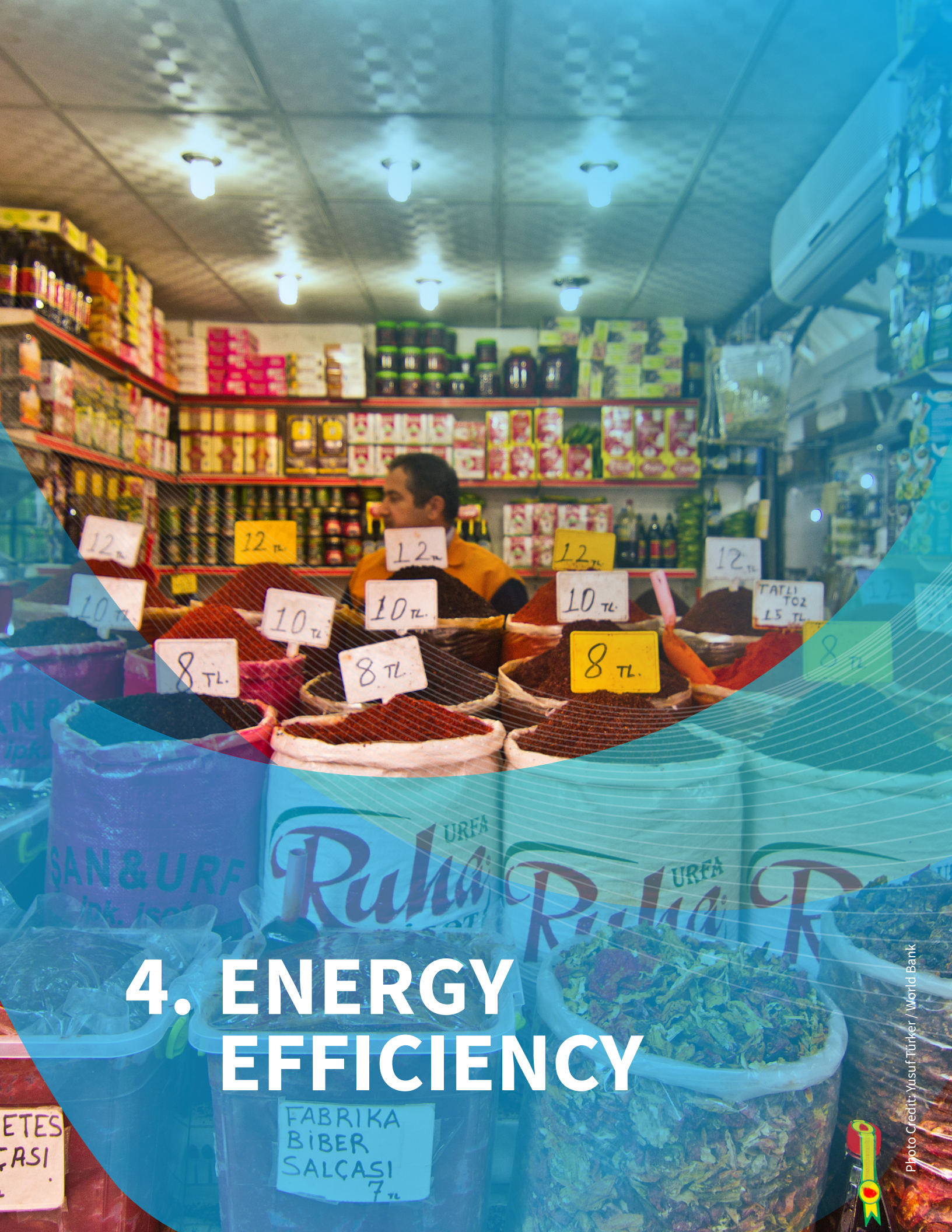
While progress in the clean cooking pillar is evident, the slow and uneven improvement underscores the urgent

need for stronger regulatory measures, robust tracking systems, and well-financed implementation strategies.

Countries that have transitioned to the green zone demonstrate that comprehensive national action plans, combined with institutional commitment, public and private collaboration, and targeted incentives, can drive meaningful change. But the stagnation of many countries in the red zone points to persistent challenges, including weak enforcement of standards, insufficient financing mechanisms, and limited consumer awareness. To surmount these barriers, governments need to strengthen institutional capacity, allocate dedicated funding for clean cooking initiatives, and implement gender-inclusive policies that support both consumers and suppliers. By integrating clean cooking policies into broader climate and energy goals, governments can provide a strategic roadmap that speeds adoption and fosters long-term sector development.

Scaling clean cooking solutions will require a multifaceted approach that fortifies policy enforcement, expands financial support for both consumers and suppliers, and fosters regional and global collaboration.

Strengthening standards and labeling frameworks, particularly by aligning with ISO tiers of performance, will improve product quality assurance and increase consumer trust, while enhancing monitoring and verification systems will ensure sustained adoption and long-term impact. Additionally, targeted financial interventions such as concessional loans, subsidies, and RBF can help bridge affordability gaps, particularly for low-income households. As clean cooking gains momentum in global energy access discussions, integrating innovative technologies, digital tracking systems, and decentralized energy solutions will be key to fostering inclusive and sustainable transitions. By prioritizing these measures, countries can accelerate their shift to clean cooking, reduce reliance on polluting fuels, and build a more resilient and equitable energy future.



4. ENERGY EFFICIENCY

4 • ENERGY EFFICIENCY

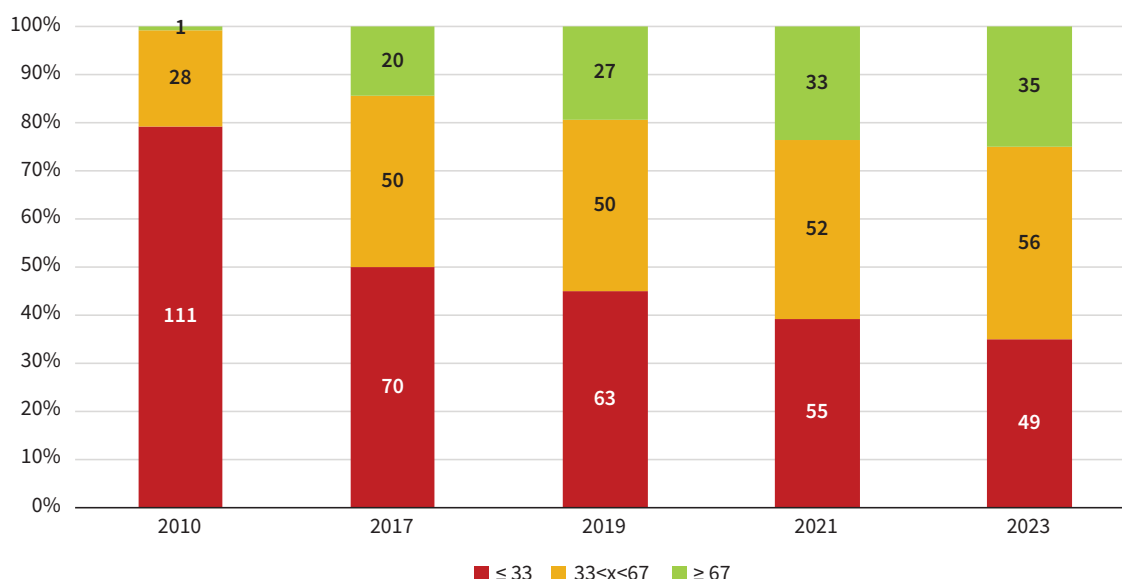
Since 2010, energy efficiency has soared in significance, as evidenced by marked shifts in regulatory indicators.

The trend (Figure 4.1) reveals a strong decline in the number of countries in the red zone and concurrent increase in the green zone indicating a move to adequate energy efficiency policies and showing commitment to enhancing energy efficiency regulation. This transformation underscores a global recognition that effective regulatory frameworks are critical to sustainable energy practices. Countries are increasingly adopting robust policies and regulations that support energy-saving technologies, incentivize investments in efficiency measures, and implement stricter building and appliance standards. There is more: as national policies align with international agreements on climate change and lower GHG emissions, stronger legal frameworks bring benefits not only to the environment but to job creation in the green technology sector. The data reveal a shift toward a more sustainable energy future, driven by strong regulatory commitments.

Progress has slowed, however. Over the past two years, only six countries in the red zone beefed up their regulations. Two countries advanced from the yellow to the green zone with notably improved regulations. Red and yellow zone countries are marked by low and lower incomes, so in these instances, the regulatory focus tends to be on expanding access rather than integrating critical energy efficiency measures. An analysis by region and income group provides a more comprehensive picture of global regulatory trends.

Regulatory scores for energy efficiency are trending higher across all regions, although progress and achievements vary a great deal. Member countries of the Organisation for Economic Co-operation and Development (OECD, for instance, have made rapid advances in energy efficiency regulations (figure 4.2), measures backed by robust legislative commitments like the European Green Deal and state-level mandates. Many OECD countries are implementing aggressive energy efficiency

FIGURE 4.1 • Energy efficiency: Progress of RISE scores, 2010–23



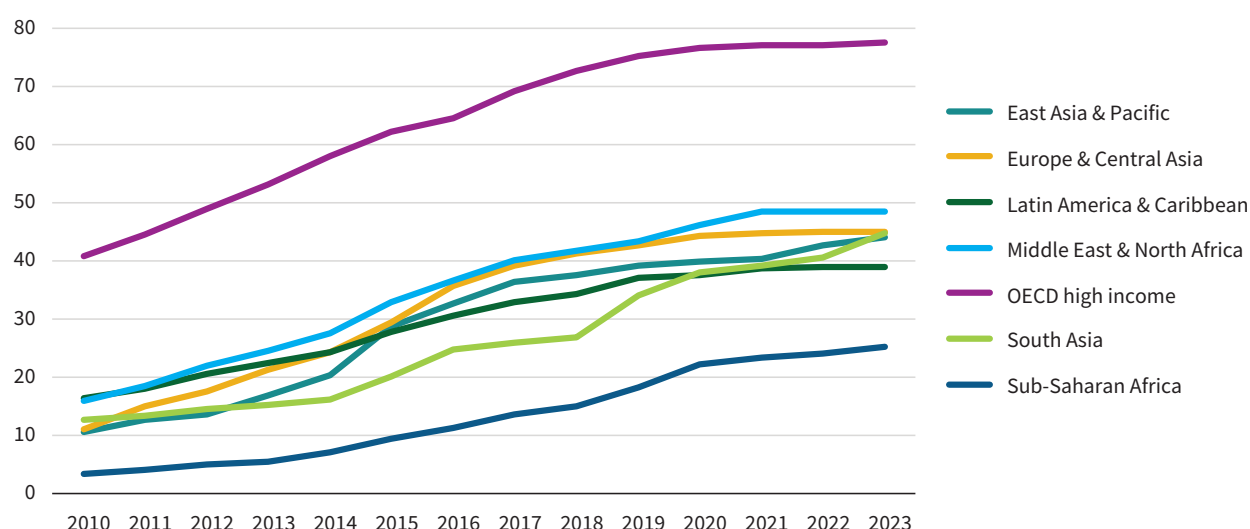
Source: ESMAP 2024.

policies and investing in clean energy technologies. This proactive approach has caused regulatory scores to leap, catapulting some countries into leadership status. Over the past few years, scores have barely budged, suggesting that the new regulations met a high, ambitious legal standard. Conversely, while Sub-Saharan Africa and South Asia are showing improvements, progress is slower. Challenges such as limited access to funding, regulatory incapacity, and technological infrastructure can hinder swift implementation of effective measures. Despite constraints, some initiatives are aimed at increased awareness and more capacity building. These can lay the groundwork for future regulatory advancements. In summary, while global trends point toward stronger regulatory frameworks for energy efficiency, disparities in the pace (and extent) of improvement

signals a need for tailored strategies that recognize a region's socioeconomic and technical landscapes. By addressing these regional challenges (box 4.1) and leveraging successful policy frameworks from more advanced regions, it is possible to foster greater energy efficiency across the globe.

An analysis by income level indicates a clear disparity in the adoption of robust regulatory frameworks across different income level countries. Many high-income countries fall into the top zones for regulations (figure 4.3). Wealthier nations are more likely to have developed comprehensive regulatory frameworks. Conversely, low-income countries occupy the lower-scoring zones that lack regulatory measures on energy efficiency. Lacking adequate regulatory frameworks, these

FIGURE 4.2 • Energy efficiency: Evolution of RISE scores by region, 2010–23



Source: ESMAP 2024.

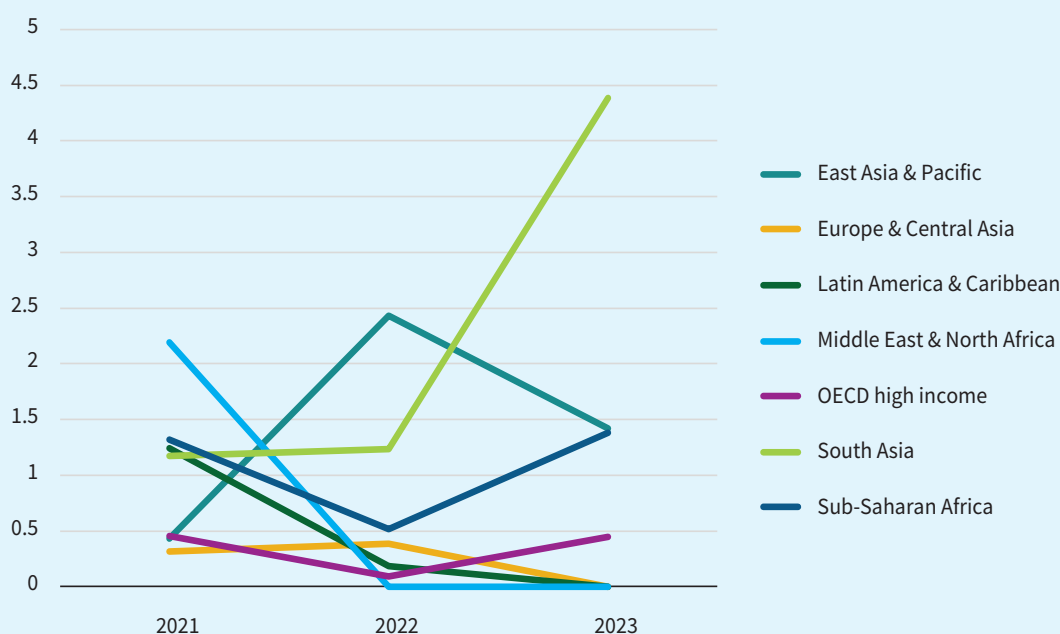
Note: OECD = Organisation for Economic Co-operation and Development.

BOX 4.1 • Energy efficiency regional analysis

Comparing regions' relative improvement to the worldwide average rate of improvement brings additional insights (figure 4.1.1):

1. **Regional comparison.** By evaluating the relative changes in RISE scores, we can identify which regions are not only improving but are doing so at a rate that exceeds or lags the global average. This highlights regions showing lots of progress (South Asia), as well as those that may require additional support and resources.
2. **Implications of trends.** Understanding these dynamics is crucial for policy makers and stakeholders. Regions that demonstrate faster improvements can serve as models for best practices, while those falling behind may benefit from targeted interventions. This nuanced perspective allows for a more tailored approach to enhancing energy efficiency.
3. **Strategic focus.** By focusing on both absolute and relative improvements in RISE scores, stakeholders can prioritize investments and policies effectively, ensuring that resources are allocated to regions with the greatest potential for impact.

FIGURE 4.1.1 • Energy Efficiency: Rise Score Improvement, 2021–23



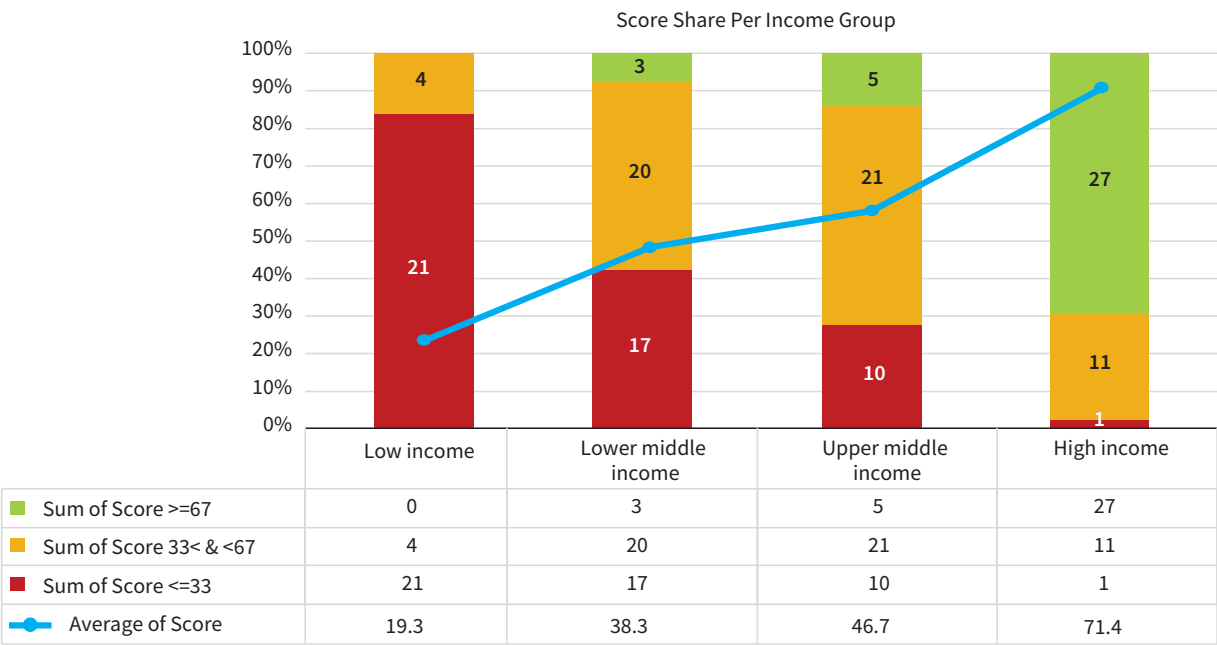
Source: ESMAP 2024.

Note: OECD = Organisation for Economic Co-operation and Development.

countries will also lack ways to optimize energy use and reduce waste. Unequal capabilities have global implications, like all global inequality. High-income countries have more resources to invest in strong regulatory frameworks and to establish durable policy implementation frameworks. The findings show that low-income countries need reliable regulatory frameworks to

become energy efficient. International support and knowledge transfer may help them do so. Overall, the RISE data illustrates a clear correlation between a country's income level and its regulatory vigor vis-à-vis energy efficiency. Resolving the disparities means the expansion of sustainable energy use globally.

FIGURE 4.3 • Energy efficiency: RISE scores per income group, 2023

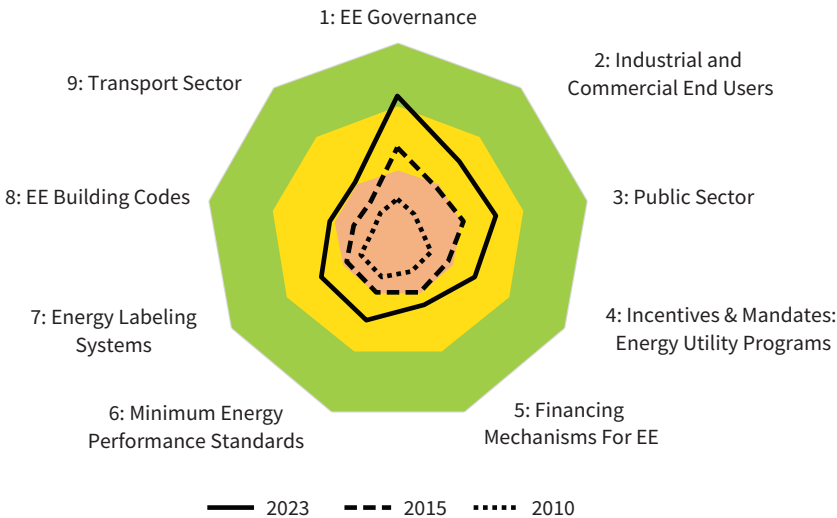


Source: ESMAP 2024.
Note: EE = energy efficiency; OECD = Organisation for Economic Co-operation and Development.

The indicator on governance and planning consistently gets the highest scores, reflecting the essential role of these actions in the development of effective energy efficiency policies. Governance and strategic planning help to steer the direction and set the priorities for energy efficiency initiatives. In contrast, advances in building codes have lagged

(figure 4.4). Yet buildings account for 30 percent of global energy consumption, according to the IEA. Countries could address the gap and in so doing lower their energy expenditures on both construction and operations while realizing substantial energy savings and contributing to global energy efficiency goals.

FIGURE 4.4 • Elements of energy efficiency regulation



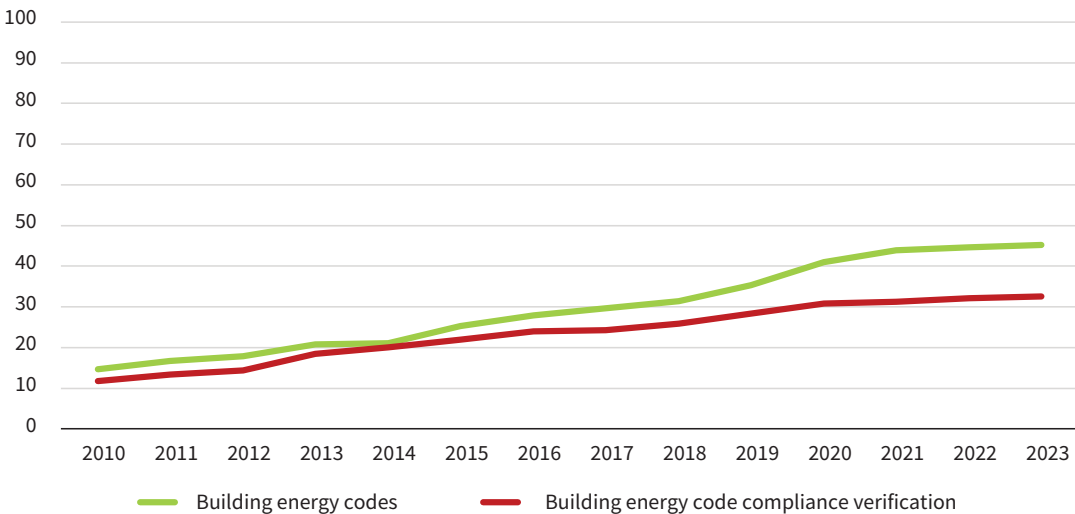
Source: ESMAP 2024.
Note: EE = energy efficiency.

The growing embrace of building codes is commendable, as nearly a third of surveyed countries have scores that place them in the green zone. A notable gap exists, however, between adopted policy on the one hand and systems for verification and compliance on the other. Figure 4.5 demonstrates that, despite new, steadily improving building codes, compliance mechanisms are not keeping pace. This gap raises questions about the role of energy efficiency policies in lowering overall energy consumption.

In 2023, 29 percent of countries reported strong building

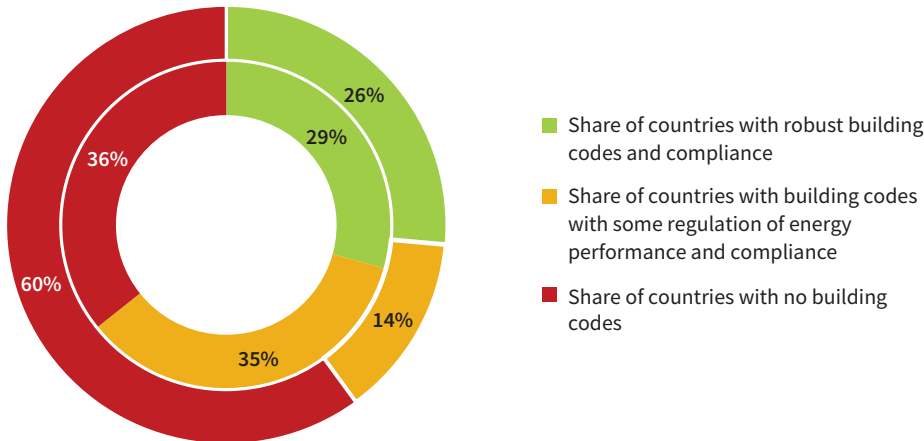
codes to address energy efficiency, while 35 percent were classified as moderate, and 36 percent were in the red zone. Robust regulations that mandate energy efficiency in the buildings sector, along with effective compliance mechanisms, are depicted in figure 4.6. The inner ring shows the adoption of the regulations, and the outer ring reflects the enforcement of the adopted requirements. Compliance verification systems were notably weak, with only 26 percent appearing in the green zone, 14 percent in the yellow zone, and a concerning 60 percent in the red zone. Yes, more countries have adopted energy codes, but without enforcement the codes do little.

FIGURE 4.5 • Enforcing building codes that consider energy efficiency, 2010–23



Source: ESMAP 2024.

FIGURE 4.6 • Energy efficiency: Building codes and their enforcement, 2023



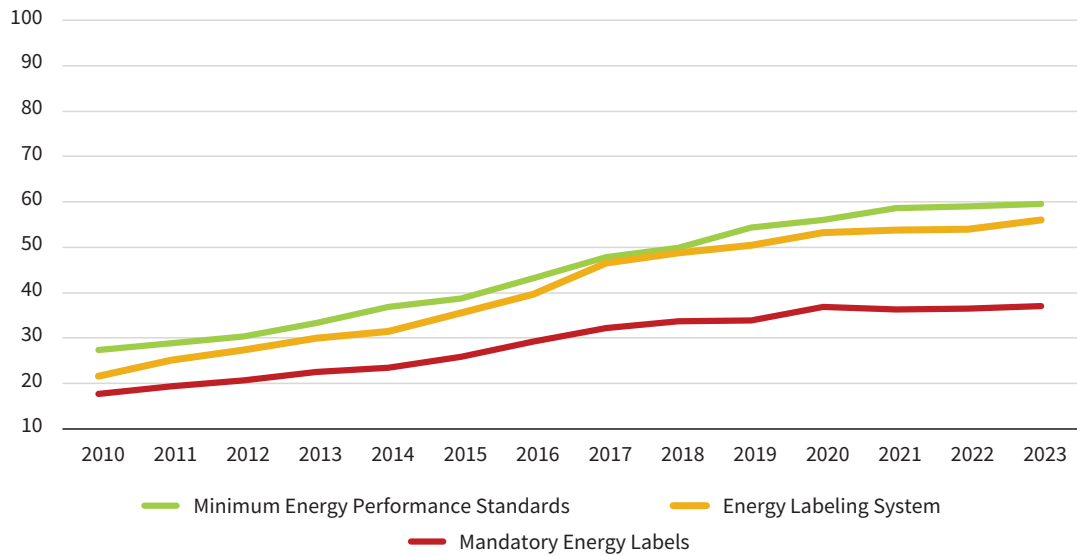
Source: ESMAP 2024.

Without robust compliance mechanisms, policies remain policies and buildings remain energy inefficient. Weak verification systems lead to substandard implementation, undermining the potential for energy savings and emissions reductions. A similar scenario is evident in the regulations governing the energy performance of equipment. Countries have gradually adopted Minimum Energy Performance Standards (MEPS) and energy labeling systems (figure 4.7). While the figures on global uptake are encouraging, the delays in mandatory enforcement reveals a downward trend for energy labeling. This gap is concerning, as energy labels play a crucial role in shaping consumer behavior around the purchase of efficient appliances. The centrality of this issue is amplified by the recent sharp rise in global energy prices. Energy-efficient appliances are now more than an environmental imperative: they are an economic priority for households and businesses.

Many countries have financing facilities to boost energy efficiency among residential consumers. Figure 4.8 shows the

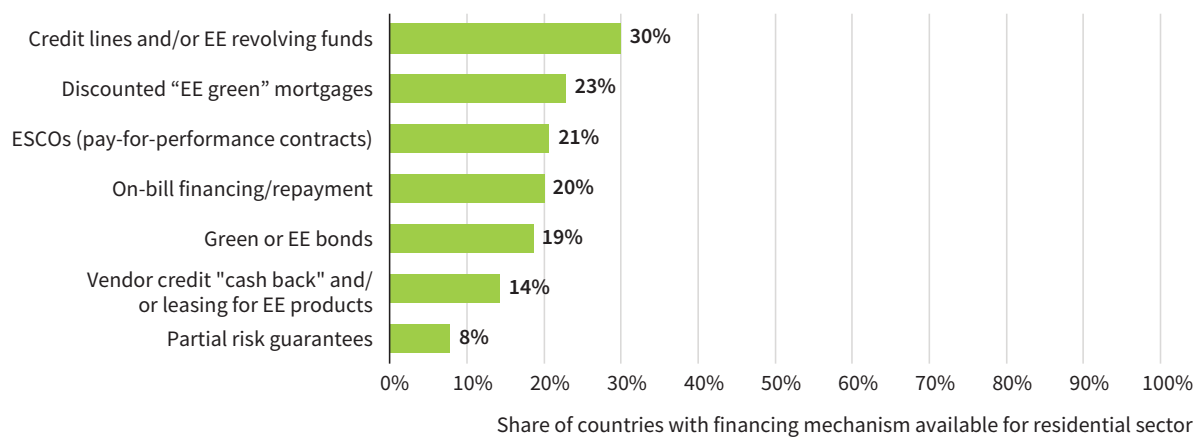
prevalence of financing mechanisms across the surveyed countries. Specific instruments, and the proportion of countries offering them, are highlighted. Various institutions provide credit lines and energy efficiency revolving funds; these represent the dominant financing options for advancing energy efficiency. These options are accessible, however, in less than a third of the surveyed countries. Discounted “EE green” mortgages are next. They point to the critical need for greater access to these financial products. Energy service companies (ESCOs) that offer pay-for-performance contracts appear in about one-fifth of the surveyed countries. Successful ESCO programs in India, Poland, and Ukraine, supported by the World Bank, demonstrate the potential of this financing model. On-bill financing and repayment options, as well as green or EE bonds, are less common but offer innovative solutions for financing energy efficiency initiatives. Vendor credit options, including cash-back offers and leasing for energy-efficient products, are available in only 15 percent of countries, signaling an opportunity for vendors to help reduce up-front costs for consumers.

FIGURE 4.7 • Adoption of minimum energy performance standards and energy labeling systems, 2010–23



Source: ESMAP 2024.

FIGURE 4.8 • Residential energy efficiency financing instruments

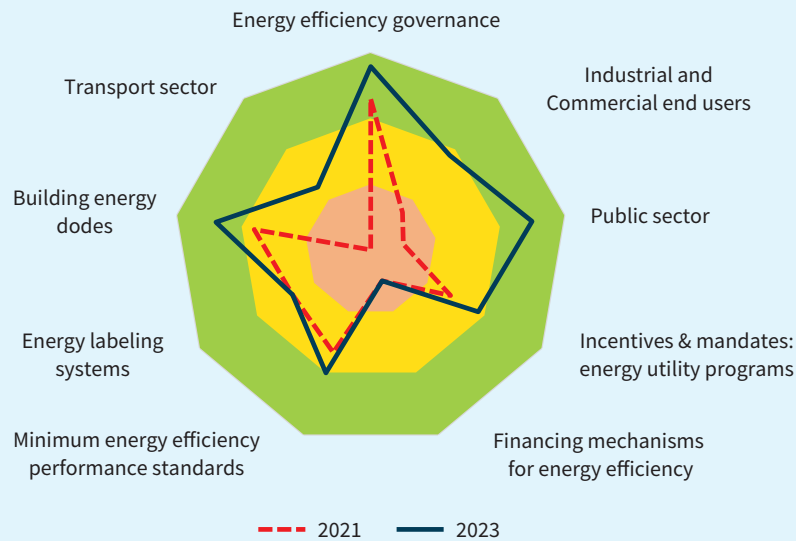


Source: ESMAP 2024.
Note: EE = energy efficiency; ESCO = energy service company.

BOX 4.2 • SENEGAL: BEST ENERGY EFFICIENCY IMPROVER

Senegal made notable strides in 2023, achieving the most improved RISE scores for energy efficiency worldwide, and ranking third after Kenya and South Africa in the Sub-Saharan Africa Region. Figure 4.2.1 illustrates its gains, fueled by national initiatives and international commitments that span multiple sectors, including public, transport, and buildings.

FIGURE 4.2.1 • Senegal RISE energy efficiency scores, 2021 and 2023



- Source: ESMAP 2024.
- **National strategic initiatives.** Senegal’s improvements were driven by the Strategic Development Plan 2019–23 and the 2030 Energy Management Strategy, alongside commitments under the Nationally Determined Contributions (NDC) and Economic Community of West African States (ECOWAS) frameworks.
 - **Public sector advancements.** The establishment of a super energy service company (ESCO) and the ECOFRIDGES Sénégal initiative showcase Senegal’s commitment to more energy efficient public services, supported by international funding mechanisms.

BOX 4.2 (Cont.) • SENEGAL: BEST ENERGY EFFICIENCY IMPROVER

- **Transport sector innovation.** The launch of Africa’s first fully electric public bus network— the Dakar bus rapid transit system—aims to make urban transport more efficient while reducing emissions and travel times.
- **Building energy efficiency measures.** The implementation of energy efficiency construction codes and the awarding of the first Excellence in Design for Greater Efficiencies (EDGE, a green building certification) highlight Senegal’s efforts in promoting sustainable building practices.

Senegal’s remarkable progress in energy efficiency offers several key lessons for other nations with similar aims.

First, the importance of a comprehensive and coordinated approach cannot be overstated. Senegal’s achievements were driven by a combination of national strategic plans, such as the Strategic Development Plan 2019–23 and the 2030 Energy Management Strategy, and international commitments, including those under the ECOWAS framework and the country’s NDC.

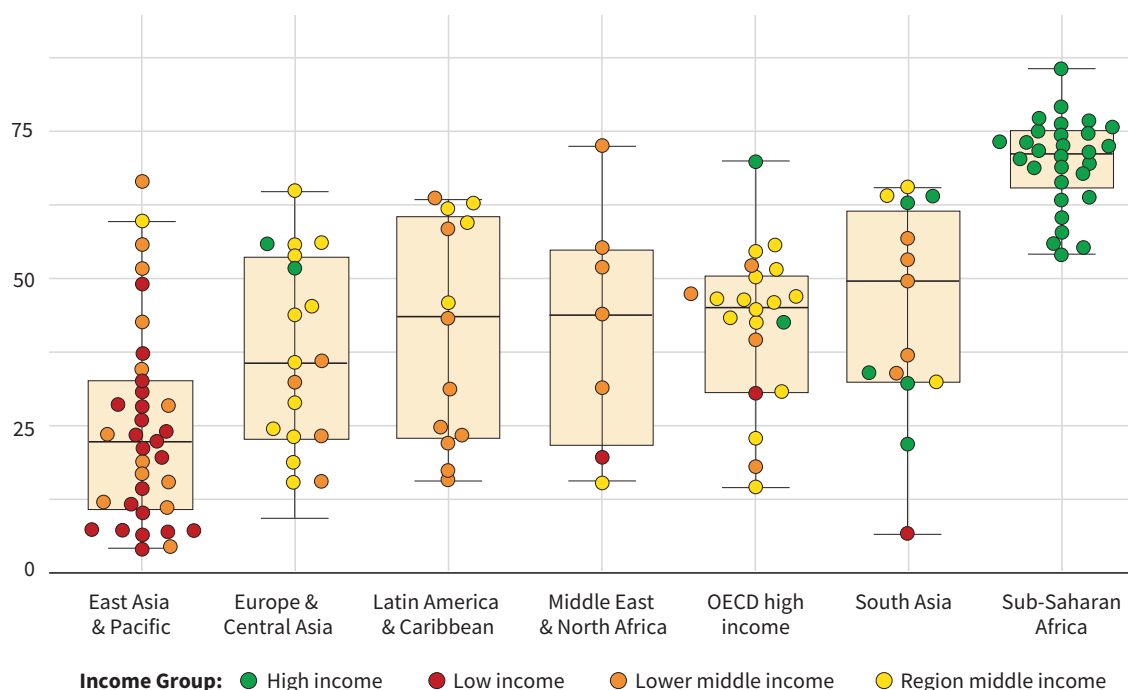
Second, the establishment of dedicated institutions and partnerships, such as the National Energy Conservation Agency (AEME), the super ESCO, and the ECOFRIDGES Sénégal initiative, highlights the critical role of institutional frameworks and collaborative efforts in driving energy efficiency.

Third, the integration of energy efficiency measures across various sectors—including public, transport, and buildings—demonstrates the need for a multisectoral approach. The launch of Africa’s first fully electric public bus network in Dakar and the implementation of energy efficiency construction codes are prime examples of successful sector-specific initiatives.

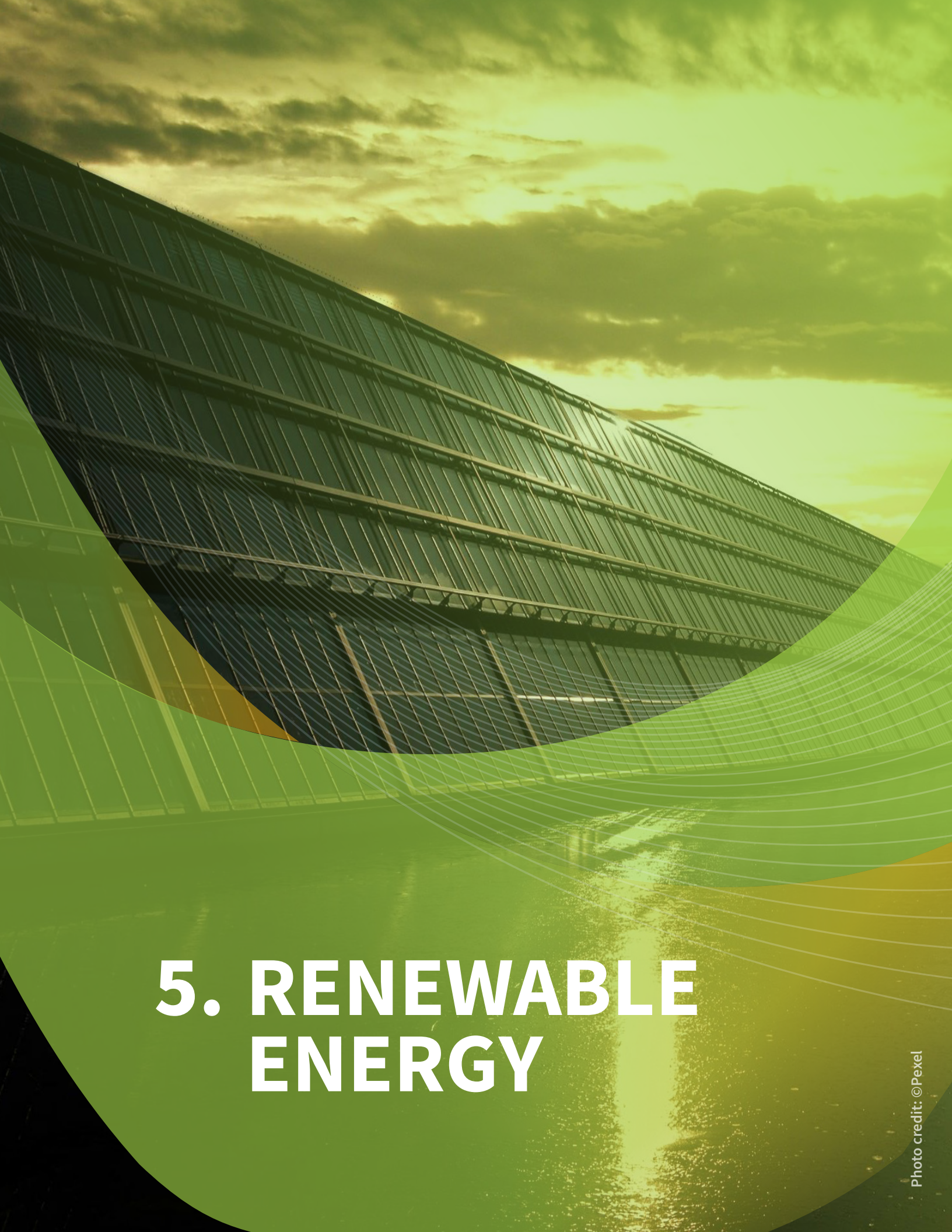
Finally, the involvement of the private sector and the provision of financial mechanisms, such as zero-interest green credits, underscore how important innovative financing solutions are in promoting energy-efficient technologies. Senegal’s experience shows that with strong political will, strategic planning, and collaborative efforts, major strides in energy efficiency are achievable.

As a summary of the chapter the comprehensive snapshot of the regulatory indicators for energy efficiency is presented in Figure 4.9.

FIGURE 4.9 • Distribution of countries with EE scores. Snapshot for 2023.



It shows distribution of countries categorized by region and income level, along with their respective scores.



5. RENEWABLE ENERGY

5 • RENEWABLE ENERGY

Little progress was made in renewable energy policies and regulations over the past two years.

Several factors are at work here, chief among them policy saturation in the electricity sector, geopolitical uncertainties, and fossil fuels policy priorities that compete with renewable initiatives. The war in Ukraine, for instance, has amplified energy security concerns and renewed the focus on securing fossil fuel supplies in some regions (Guenette, Kenworthy, and Wheeler 2022), slowing the fossil fuel phaseout progress. Many countries have even increased subsidies on fossil fuels (OECD and IISD n.d.), and are stalling plans to phase them out. Ultimately, the number of countries in the different RISE zones remained virtually unchanged between 2021 and 2023 (figure 5.1).

Instead of introducing new policies and regulations, many countries updated existing ones, adopting more ambitious

targets that aligning with their international climate commitments. RISE tracks the adoption of new policies and regulations. Failing to capture the policy updates contributes to a picture of stagnation.

Countries have different starting points and face different challenges.

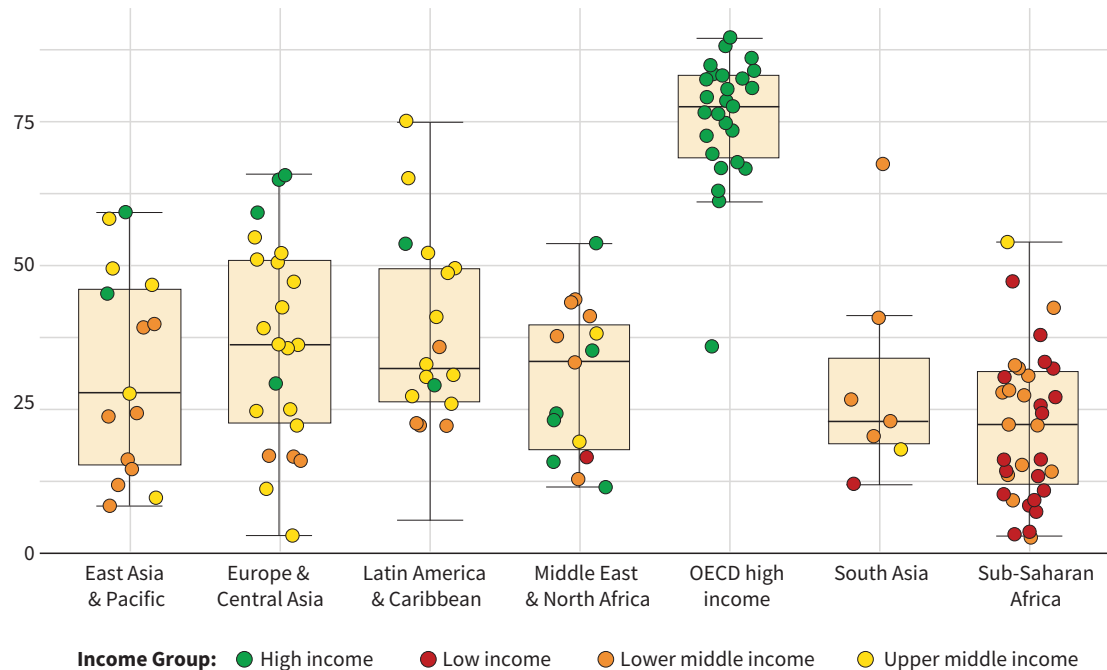
High-performing countries are generally high-income as well (figure 5.2) and improvements in the margins are challenging. They must innovate to stay ahead, by exploring new technologies, developing better grid integration strategies, and addressing the social and economic impacts of energy transitions. In contrast, those countries trying to catch up struggle with structural issues—weak institutional capacity, lack of technical expertise, and limited financial resources. Policy design for renewable energy must consider country limitations, rather than blindly copying best practices from other countries.

FIGURE 5.1 • Renewable energy: Progress of RISE scores, 2010–23



Source: ESMAP 2024.

FIGURE 5.2 • RISE renewable energy score distribution, by region and country income level



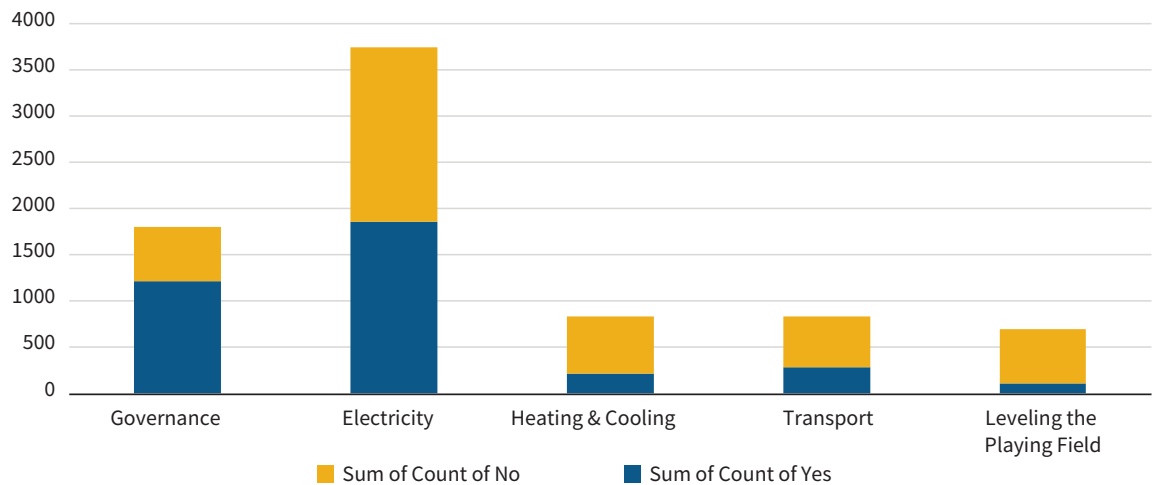
Source: ESMAP 2024.

Note: As its income is unclassified (data unavailability) Venezuela is not depicted. The graph is a jitter plot that avoids overlap: the horizontal placement of the data-points is not related to the income. RE = renewable energy; OECD = Organisation for Economic Co-operation and Development.

Most renewable energy policies and regulations are directed at the electricity sector; a speedier energy transition depends, however, on efforts across all sectors. Figure 5.3 shows that most policies and regulations tracked by RISE are concentrated in the electricity sector. Because of this

uneven policy distribution (and saturation), improvements in other indicators have significant impacts on the RISE score. Albania was the best improver thanks to improvements in its leveling the playing field indicator (box 5.1).

FIGURE 5.3 • Aggregated number of policies, by indicator, across the 140 countries



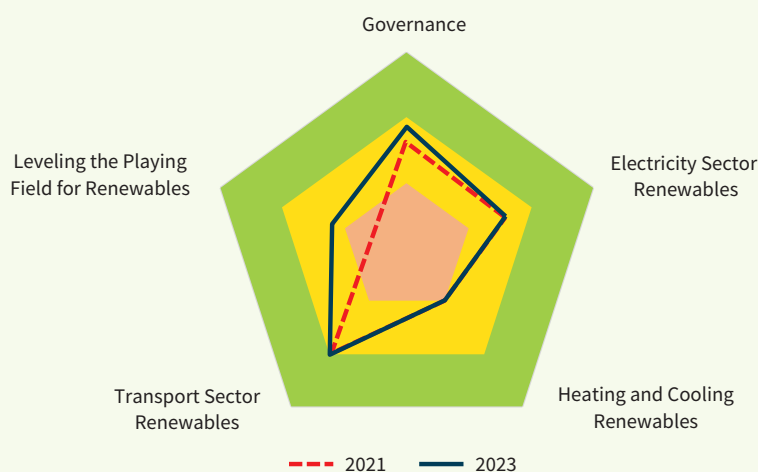
Source: ESMAP 2024.

Note: The graph depicts the total number of policies and regulations tracked across 140 countries (whether a given country had it or not, Yes/No), grouped by indicator. This is not the number of policies and regulations that each indicator has. India's data were not considered in this exercise, as five states' data were collected to calculate the national average.

BOX 5.1 • Albania's renewables trading system

Albania introduced a renewables trading system known as guarantees of origin (GOs); the corresponding law governs compliance. This system certifies the origin of electricity generated from renewable sources; in doing so it promotes transparency and the use of green energy. Indeed, by providing additional income to renewable energy generators, trading systems level the playing field (5.1.1) by addressing financial distortions such as subsidies and tax exemptions that favor conventional energy sources. In addition, carbon pricing policies skew the market against renewable energy.

FIGURE 5.1.1 • Albania's progress in renewable energy scores, by indicator



Source: ESMAP 2024.

The establishment of the GO system in Albania is part of a broader effort initiated in May 2022 by the Energy Community Secretariat. It stresses the importance of guarantees of origin in the Western Balkans (Malinen 2023) and their role in fostering renewable energy development and market integration. The GO system aligns with European Union (EU) standards to ease integration into the regional energy market. The Energy Community—an international organization that builds an integrated energy market comprising the European Union and its neighbors—has played a vital role in the region's use of GO. The system is expected to be vital in Albania's energy transition, helping the country meet its renewable energy targets and reduce greenhouse gas emissions.

The legal framework for the GO system in Albania is primarily governed by Law No. 24/2023 "On the Promotion of the Use of Energy from Renewable Sources" (Republic of Albania 2023). This law outlines the principles and procedures for the issuance, transfer, and cancellation of GO. It aims to ensure that the electricity produced from renewable sources is accurately tracked and certified.

Key provisions of the law include:

- **Issuance of guarantees.** The law mandates that GO be issued for each megawatt-hour of electricity generated from renewable sources.
- **Transfer and cancellation.** The guarantees can be transferred among market participants and must be canceled once the electricity is consumed or sold as renewable energy.
- **Transparency and reporting.** The law requires detailed reporting and transparency in the issuance and transfer of guarantees to prevent fraud and ensure the integrity of the system.

BOX 5.1 (Cont.) • Albania's renewables trading system

In addition, Grexel, which specializes in energy certification, has helped to establish and implement Albania's electronic GO system (Simonova 2023). This electronic system is expected to streamline the process of issuing and managing guarantees, making it more efficient and reliable.

The implications of the GO system in Albania are far reaching. By aligning with EU standards, Albania's GO system facilitates the integration of its energy market, attracting foreign investment and strengthening the country's energy security. There are, in addition, environmental benefits and economic growth for the country.

As mentioned above, greater effort beyond the electricity sector is needed to accelerate renewable energy deployment. Next, we share insights from our RISE policy and regulations database for these other sectors.

Governance. Sound governance is crucial for renewable energy policy frameworks, as it promotes effective implementation, monitoring, and enforcement. Sound governance also promotes a transparent, accountable, and inclusive decision-making process to foster stakeholder trust and participation. Practically all countries (134) have established agencies for monitoring renewable deployment progress, but only about half of them (75) have mechanisms to adjust planning based on that progress. Regarding utility transparency and monitoring, progress was scant over the past two years. The RISE 2022 publication had acknowledged improvements by 2021 but noted that most countries had not yet reached a sound framework under this indicator—RISE's green zone. Further improvements rely mainly on making the information publicly available and it being audited.

Transport. Only 55 countries have a renewable energy target for transport, compared with 135 in the electricity sector. Accordingly, only 55 countries—most notably those in the European Union, but also others like Brazil and the United States—have established biofuels blending mandates in the road transport sector. In contrast, the regulatory frameworks for biofuels in aviation and maritime shipping are still young. International organizations such as the International Civil Aviation Organization and the International Maritime Organization are working on developing standards and policies to promote the use of sustainable fuels in these sectors. Nationally, notable first movers in sustainable aviation fuel (SAF), are Norway and Sweden. The former mandated a 0.5 percent advanced biofuel blending requirement for aviation fuel in 2018, the first national mandate in the world (Skjelhaugen et al. 2021). Sweden's SAF

mandate was implemented in 2021 under the Act on Reduction of Greenhouse Gas Emissions from Certain Fuels (FAO 2017). This law requires fuel suppliers to reduce aviation fuel emissions through SAF blending. The initial target set by 2021 was for a 0.8 percent GHG reduction for aviation fuel, equivalent to a 1 percent SAF blend by volume. At the EU level, the ReFuelEU Aviation (Economic Commission n.d.a) and FuelEU Maritime (Economic Commission n.d.b) mandates will become effective in 2025, so they were not captured in this publication.

Heating and cooling. As with the transport sector, only 51 countries have renewable targets for heating and cooling. Accordingly, only a similar number of countries (53) require new buildings to be equipped with solar thermal, geothermal, or other renewable energy systems. Even fewer countries (8) have banned the use of fossil fuel appliances in buildings. France, for example, banned the installation of new oil-fired boilers in 2022 for both new and existing buildings. This was part of France's efforts to reduce GHG emissions and meet climate goals. This policy is rooted in the Convention Citoyenne pour le Climat and seeks to encourage the use of cleaner heating alternatives like heat pumps and biomass systems.

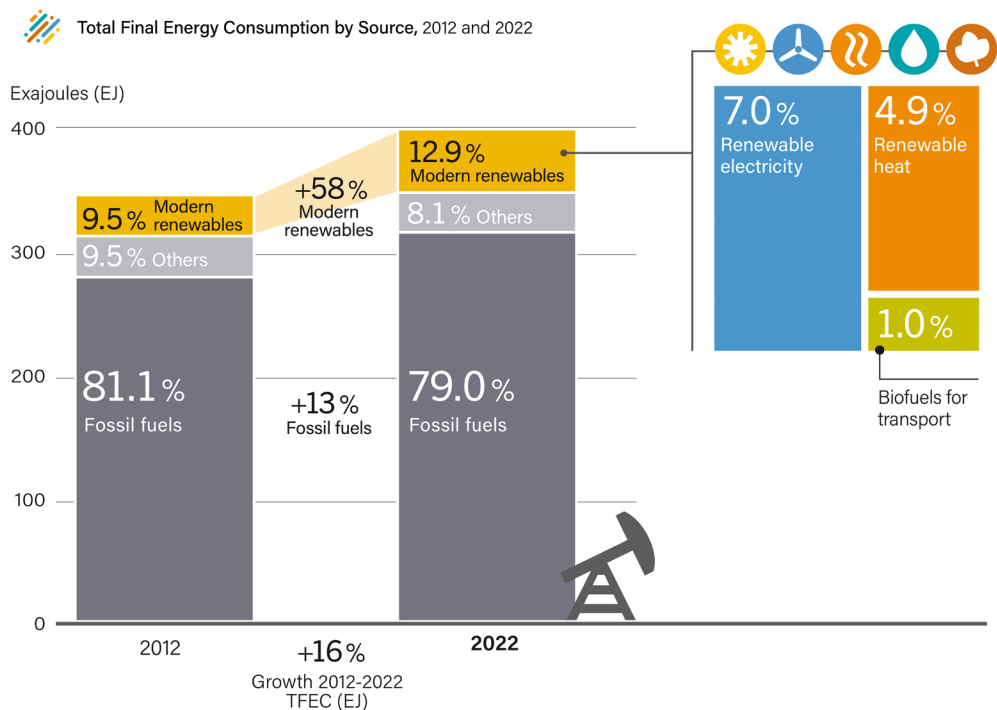
Leveling the playing field. RISE incorporates carbon pricing policies from the World Bank's dashboard. That said, it is widely acknowledged that carbon pricing can have regressive impacts that slow implementation. In that context and for this publication, we began to complement the dashboard display to show revenue recycling and redistribution policies. We found, however, that only a few countries (10) have them. In 2022, Denmark enacted a Green Tax Reform (Climate Change Laws of the World 2022), which claimed to relax electricity taxes for all Danes while targeting lower-income households. Other countries had already implemented similar policies. Australia, for example, imposed its Carbon Pricing Mechanism between 2012 and 2014 with a household assistance package (ACOSS 2011)

to assist and compensate low-income households. Likewise, when Canada introduced its federal pollution pricing scheme, it launched the Canada Carbon Rebate (CCR) for Individuals program (Government of Canada 2025) to help eligible individuals and families offset the cost of the federal pollution pricing. Ireland’s carbon tax fund, established in 2020, uses revenues from the carbon tax to support initiatives, including more spending on social welfare and measures to prevent fuel poverty. A budget report on the carbon tax fund is published each year, for transparency (Government of Ireland 2024). By earmarking carbon tax revenues for social welfare programs, Ireland prevents the burden of carbon pricing from disproportionately affecting vulnerable populations. This approach helps to maintain public support for climate policies and demonstrates a commitment to social equity. Overall, these examples illustrate the importance of integrating social equity considerations into carbon pricing policies to ensure that they are both effective and fair. Finally, the playing field for renewables will not be leveled until fossil fuel subsidies are phased out. In line with the work of the

International Monetary Fund (IMF n.d.), we found that no country has phased them out entirely.

The time is now; more effort is needed. Most analyses—most notably those written up by the Intergovernmental Panel on Climate Change, IEA, International Renewable Energy Agency, and Climate Action Tracker—conclude that if governments implement all their pledged renewable policies and regulations, the world will fall well short of the 1.5°C target. More concerning, the share of modern renewables in total final energy consumption—the SDG 7.2.1 indicator—had not budged in 2022, although the share showed healthy movement the previous ten years, after 2012. The fossil fuel share remains practically unchanged (figure 5.4). Zero progress in RISE renewable scores over the past two years is yet another call for policy makers to scale up efforts, especially in designing new and innovative policies, tailored to local contexts, that promote effective and rapid renewable deployment to bring the world closer to reaching climate goals.

FIGURE 5.4 • World’s total final energy consumption by source, 2012 and 2022



Source: Extracted from REN21 (2024).
 Note: T FEC = total final energy consumption.

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ANNEX. RISE PILLAR CHANGES BETWEEN 2022 AND 2024

FIGURE A.1 • Renewable energy pillar changes between 2022 and 2024

Legal framework for renewable energy
• Legal framework for renewable energy
Planning for renewable energy expansion
• Electricity—targets and plans • Heating and cooling—targets and plans • Transport—targets and plans • Institutions and meeting targets • Renewable energy in generation and transmission planning • Resource data and siting
Incentives and regulatory support for renewable energy
• Financial and regulatory support for electricity • Electricity grid access and dispatch • Financial and regulatory support for transport • Financial and regulatory support for heating and cooling
Attributes of financial and regulatory incentives
• Auctions • Fixed tariffs for small producers
Network connection and use
• Connection and cost allocation • Network usage and pricing • Renewable grid integration
Counterparty risk
• Creditworthiness • Payment risk mitigation • Utility transparency and monitoring
Carbon pricing and monitoring
• Does any carbon pricing mechanism include GHG emission coverage? • Is there a greenhouse gas emission monitoring, reporting, and verification system in place?



Governance
• Institutions, monitoring, and meeting targets • Utility transparency and monitoring
Electricity
• Electricity targets, laws, strategies, and programs • Electricity quotas, mandates, and certificates • Electricity pricing instruments • Market design (merged legal framework for renewable energy, electricity grid access and dispatch, network usage and pricing) • Renewable grid integration (merged with renewable energy in generation and transmission planning, resource data and siting, connection and cost allocation) • Risk mitigation
Heating and cooling
• Heating and cooling targets, laws, strategies, and programs • Heating and cooling quotas, mandates, and certificates • Heating and cooling pricing instruments
Transport
• Transport targets, laws, strategies, and programs • Transport quotas, mandates, and certificates • Transport pricing instruments
Leveling the playing field for renewables
• Does any carbon pricing mechanism include GHG emission coverage? • Are there mechanisms to compensate low-income households for the regressive effects of carbon pricing or protect them against those effects? • Is there a renewables certificate tradable system for new projects in any sector (e.g., the electricity, heating and cooling, and digital sectors)? • Has a fossil fuel subsidy removal reform been enacted? Or does the country NOT have a law or policy to subsidize fossil fuels? • Are there mechanisms to compensate low-income households for the regressive effects of fossil fuel subsidy phase-out/removal or protect them against those effects?

FIGURE A.2 • Electricity access pillar changes between 2022 and 2024

Electrification planning
• Existence • Public availability of an electrification plan • Targets and implementation • Institutional setup
Scope of the officially approved electrification plan
• Service-level target • Inclusion of off-grid solutions • Inclusion of community and productive services • Inclusion and gender sensitivity • Financing of the plan
Framework for grid electrification
• Funding support for grid electrification • Funding support for consumer connections • Performance standards regarding quality of supply
Mini-grid framework
• Solar hybrid mini grid technology • Geospatial planning for mini grids • Productive uses and community engagement • Access to finance • Institutional capacity, and training and skill development • Workable regulations • Regulatory authority • Enabling business environment
Framework for off-grid systems
• Existence of programs leveraging private sector participation • Financial incentives • Payment methods • Standards and quality
Electricity affordability for the consumer
• Cost of subsistence consumption • Affordability of the connection fee • Policy to support low-volume consumers • Utility transparency and monitoring • Publicly available financial statements • Publicly available annual reports • Usage of an outage recording system • Publicly available reliability measurements • Utility creditworthiness

- Current ratio
- EBITDA margin
- Debt service coverage ratio
- Days payable outstanding ratio



Electrification governance and planning (merged with scope of the officially approved electrification plan)

- Existence (merged with public availability of the electrification plan)
- Targets and implementation (merged with institutional setup, service-level target)
- Inclusion of decentralized energy solutions for specific groups (merged with inclusion of off-grid solutions, inclusion of community and productive services, inclusion and gender sensitivity, and financing of the plan)

Framework for grid electrification

- Funding support for grid electrification
- Funding support for consumer connections
- Performance standards regarding quality of supply

Mini-grid framework

- Solar hybrid mini grid technology strategy (merged with geospatial planning for mini grids, productive uses, and community engagement)
- Financing framework (merged access to finance with institutional capacity, training and skill development)
- Workable regulations (merged with regulatory authority, enabling business environment)

Off-grid systems framework

- Private sector participation
- Financial incentives
- Standards and quality

Electricity affordability for the consumer

- Cost of subsistence consumption
- Affordability of the connection fee
- Policy to support low-volume consumers

FIGURE A.3 • Energy efficiency pillar changes between 2022 and 2024

National energy efficiency planning
• National energy efficiency legislation/action planning • Subsectoral targets • Scope of targets
Energy efficiency entities
• Human capital and institutions
Incentives and mandates: industrial and commercial end users
• Mandates for large consumers • Incentives for commercial and industrial consumers
Incentives and mandates: public sector
• Obligations for public infrastructure • Tracking and enforcement of obligations • Public procurement of energy efficiency products • Ability to retain energy savings
Incentives and mandates: energy utility programs
• Utility energy efficiency programs • Utility consumer pricing and information
Financing mechanisms for energy efficiency
• Financing mechanisms available in each sector
Minimum energy efficiency performance standards
• Have minimum energy efficiency performance standards been adopted? • Verification and penalties for noncompliance
Energy labeling systems
• Have energy efficiency labeling schemes been adopted? • Mandatory vs voluntary labeling system
Building energy codes
• New residential and commercial buildings • Compliance system • Renovated buildings • Green buildings
Transport sector
• Planning • Private transport • Commercial and/or industrial transport
Carbon pricing and monitoring
• GHG emissions regulations



Energy efficiency governance (merged with national energy efficiency planning and energy efficiency entities)
• National energy efficiency legislation/action planning (merged with sub-sectoral targets and scope of targets) • Human capital and institutions
Industrial and commercial end users
• Mandates for large consumers • Incentives for commercial and industrial consumers
Public sector
• Obligations for public infrastructure (merged with tracking and enforcement of obligations) • Public procurement of energy efficiency products (merged with ability to retain energy savings)
Incentives and mandates: energy utility programs
• Utility energy efficiency programs • Utility consumer pricing and information
Financing mechanisms for energy efficiency
• Financing mechanisms available in each sector
Minimum energy efficiency performance standards
• Have minimum energy efficiency performance standards been adopted? • Verification and penalties for noncompliance
Energy labeling systems
• Have energy efficiency labeling schemes been adopted? • Mandatory vs voluntary labeling system
Building energy codes
• New residential and commercial buildings • Energy efficiency incentives and mandates for existing buildings • Energy efficiency verification and compliance for buildings
Transport sector
• Private transport • Commercial and/or industrial transport

FIGURE A.4 • Clean cooking pillar changes between 2022 and 2024

Clean cooking planning
• Tracking • Existence of a plan • Institutional capacity
Scope of planning
• Aspects of the plan • Awareness strategy • Last-mile distribution
Standards and labeling
• Standards • Monitoring and verification • Labeling
Financing incentives and attributes
• Financing mechanisms • Supplier incentives



Clean cooking national planning
• Tracking • Existence of a plan • Institutional capacity
Implementation of Scope
• Targets and implementation aspects • Awareness strategy • Last-mile distribution
Standards and labeling
• Standards • Monitoring and verification • Labeling
Financing incentives and attributes
• Consumer financing mechanisms • Institutional incentives • Supplier incentives



RISE report, customized analyses, datasets, and library of legal and regulatory documents are available in:

<http://RISE.esmap.org>

