SEU
Sustainable Energy Unit
Kingdom of Bahrain
وحدة الطاقة المستدامة
مملكة البحرين

جامعة البحرين
University of Bahrain

The Sustainable Energy Unit

Net Metering Policy and Wind Power Opportunity

Water and Energy Sustainable Innovation and Industry – WESII 2018
University of Bahrain

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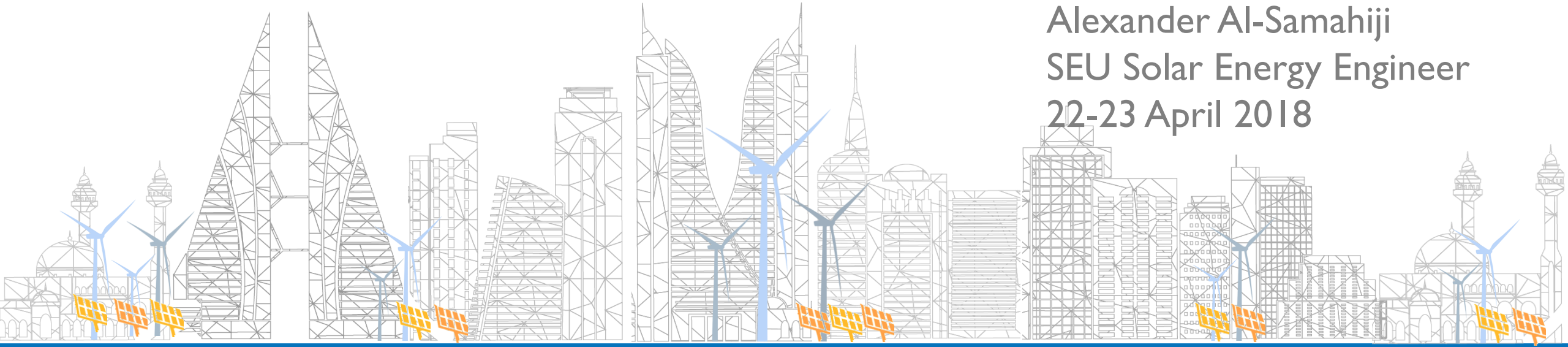
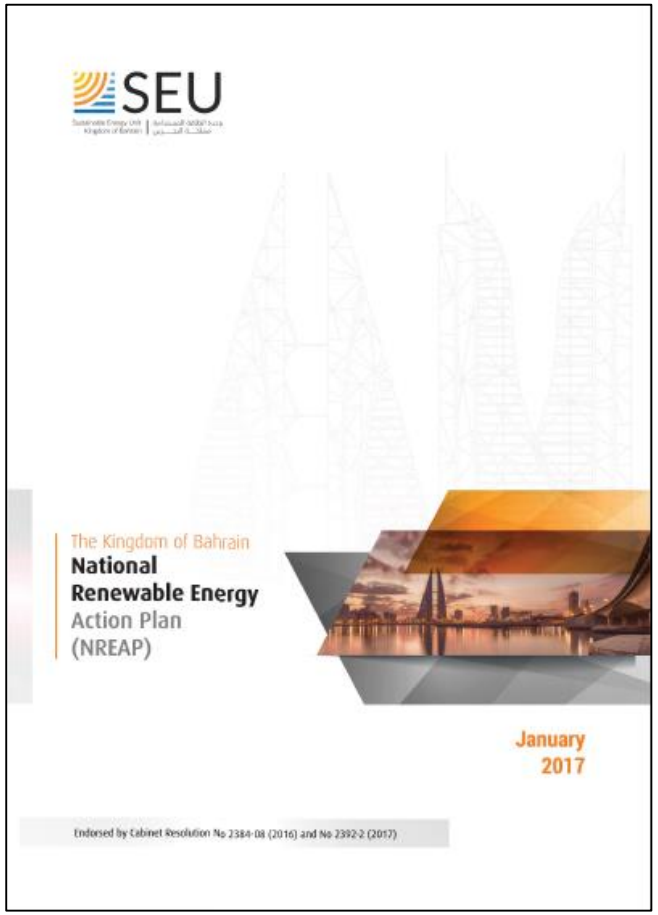
22-23 April 2018



NREAP and Net Metering Policy



Net Metering is one of three key policies derived from NREAP

5% RE in the energy mix by 2025

↓

255MW by 2025

↓

100MW target for Decentralised Urban Generation

↓

Annual installation rate = 12MW

Net Metering

What it is:

Net Metering "is a metering and billing arrangement designed to compensate distributed energy generation (DG) system owners for any generation that is exported to the utility grid."[1]

"Net metering allows residential and commercial customers who generate their own electricity from solar power to feed electricity they do not use back into the grid."[2]

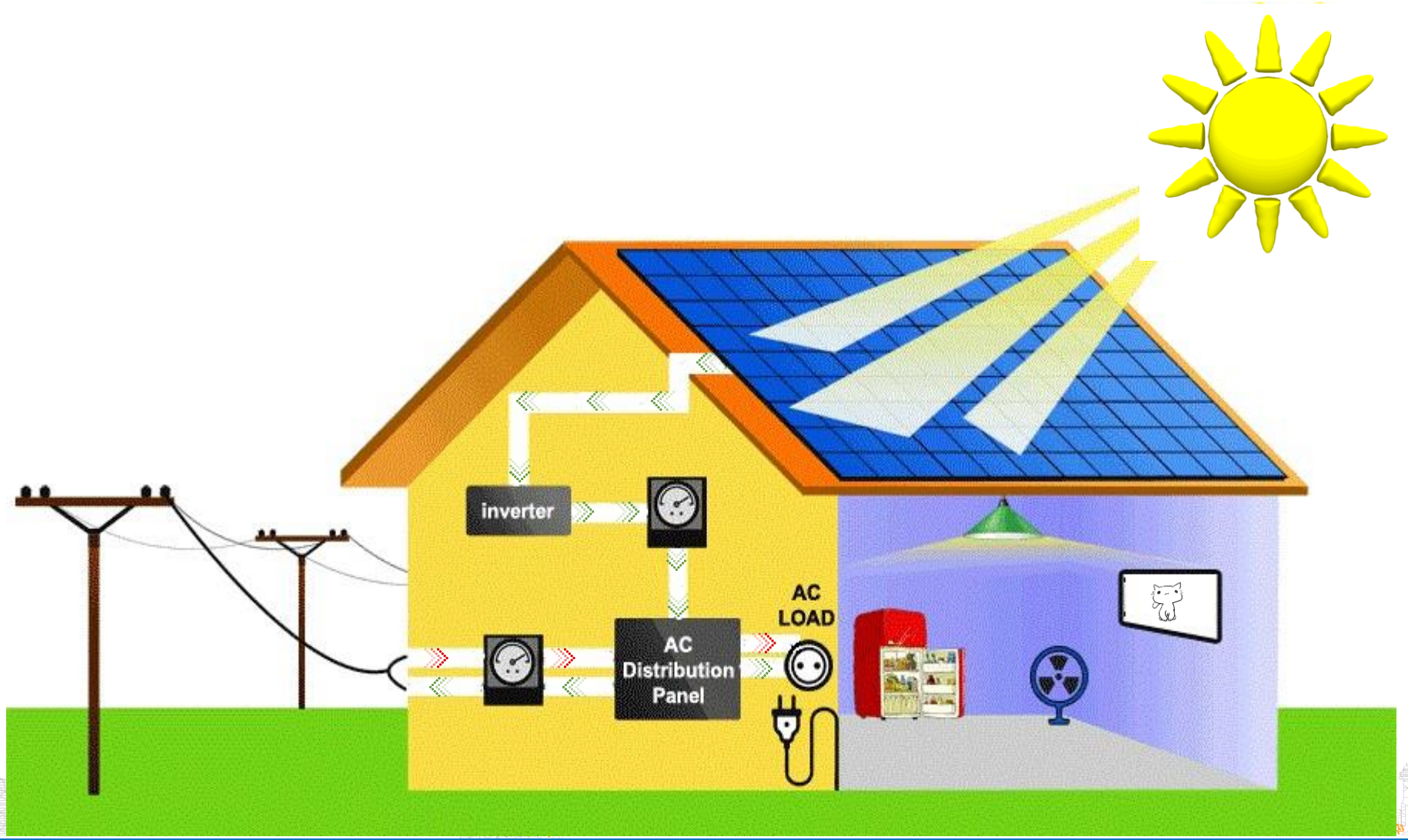
What it isn't:

A cash payment. Any excess renewable electricity generated is credited as electricity units (kWh) carried over to the next billing cycle.

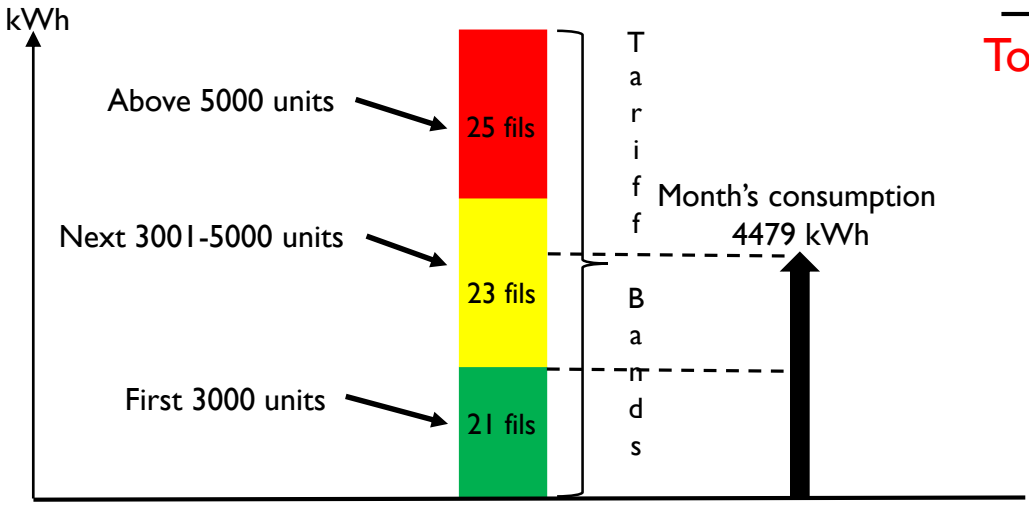
In Bahrain, the Net Metering Resolution allows for individuals and organisations to install Solar Photovoltaic Plants at their premises, use the energy generated to offset their consumption and feed back excess generation to the electricity grid.

1 https://www.nrel.gov/technical-assistance/basics-net-metering.html 2 https://www.seia.org/initiatives/net-metering

Net Metering – Solar PV on a Property



Example of regular electric bill calculation



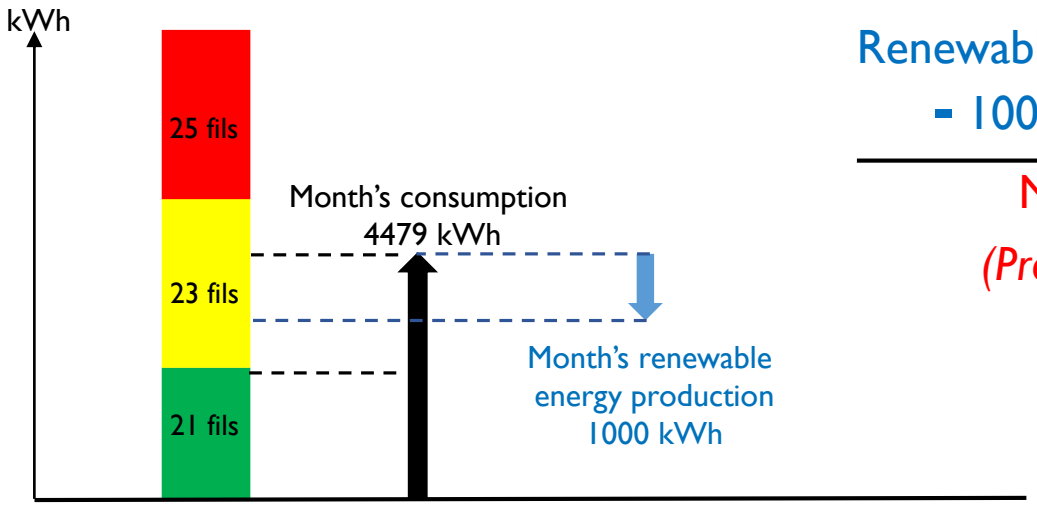
Electricity from grid

1479 x 0.023 = BD34

3000 x 0.021 = BD63

Total Electricity bill = BD97

Bill with Solar PV plant installed on premises



Imported Electricity from grid

1479 x 0.023 = BD34

3000 x 0.021 = BD63

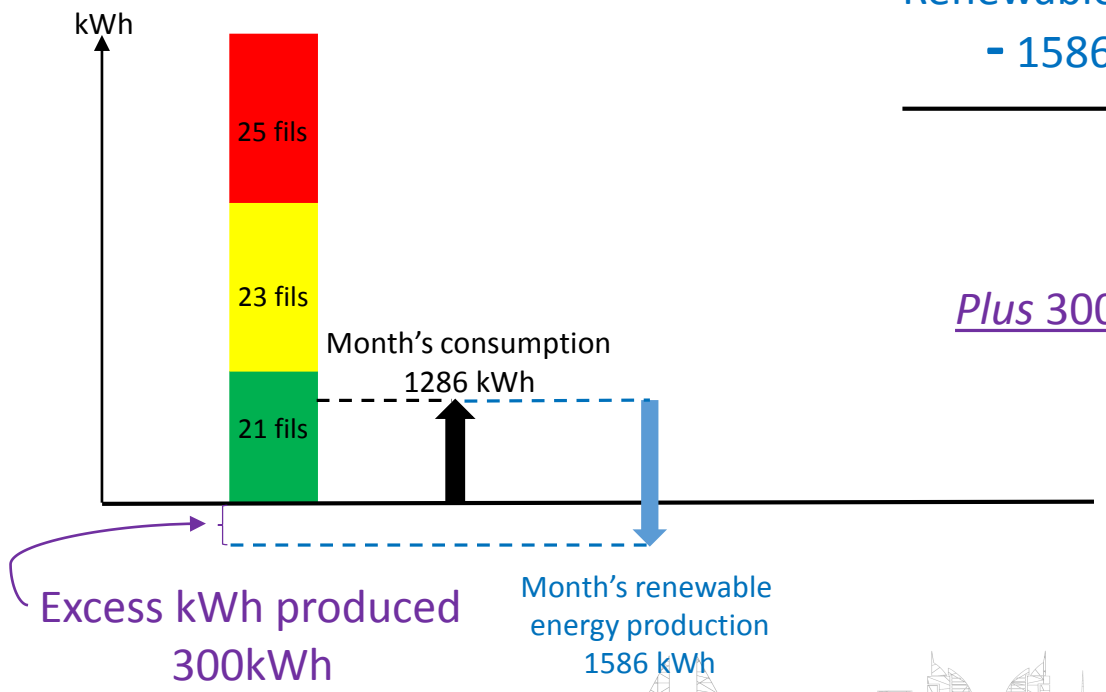
Renewable Electricity produced

- 1000 x 0.023 = - BD23

New Total = BD74

(Previous bill was BD97)

Bill settlement with excess Solar PV energy generated



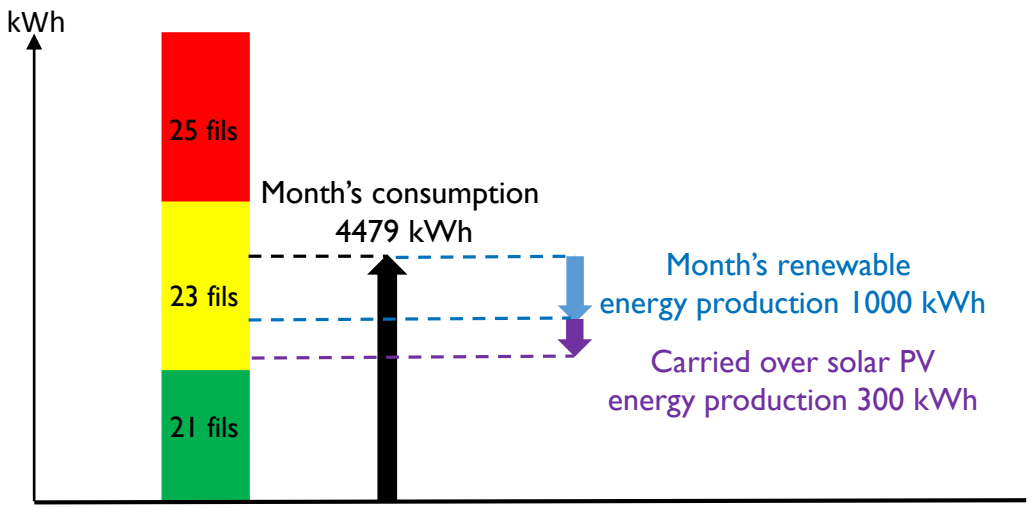
Imported Electricity from grid
1286 x 0.021 = BD23

Renewable Electricity produced
- 1586 x 0.021 = - BD33

Total = BD0

Plus 300 kWh carried over

Bill settlement – with Solar PV generated energy carried over



Imported Electricity from grid

1479 x 0.023 = BD34

3000 x 0.021 = BD63

Renewable Electricity produced

- 1000 x 0.023 = - BD23

Renewable kWh carried over

- 300 x 0.023 = - BD6.9

Total electricity bill = BD67.1

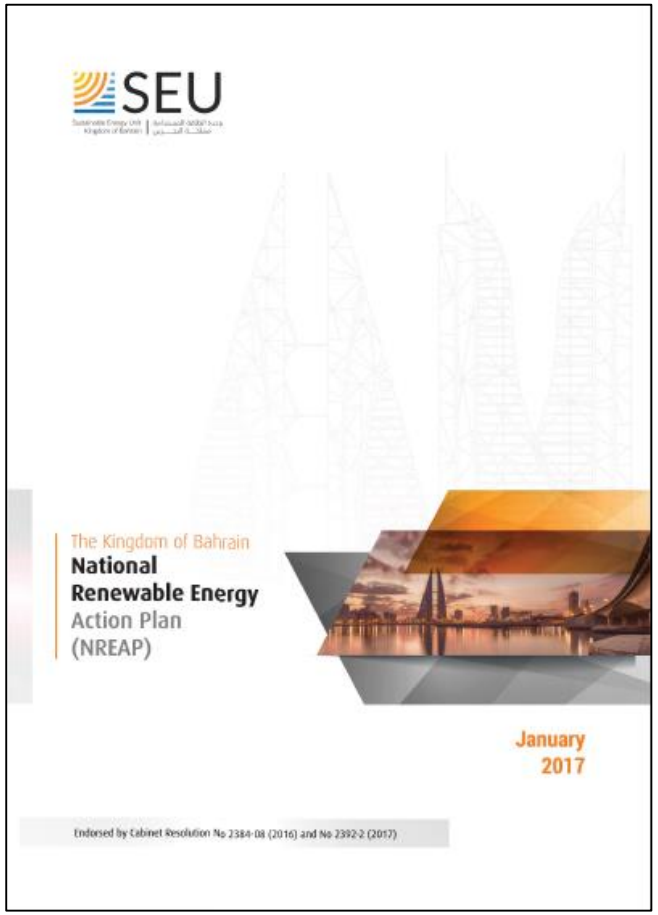
One Owner with Multiple Properties

One Owner

Excess kWh produced here…

…can be credited here

NREAP and Wind Energy



Decentralised Generation derived from NREAP

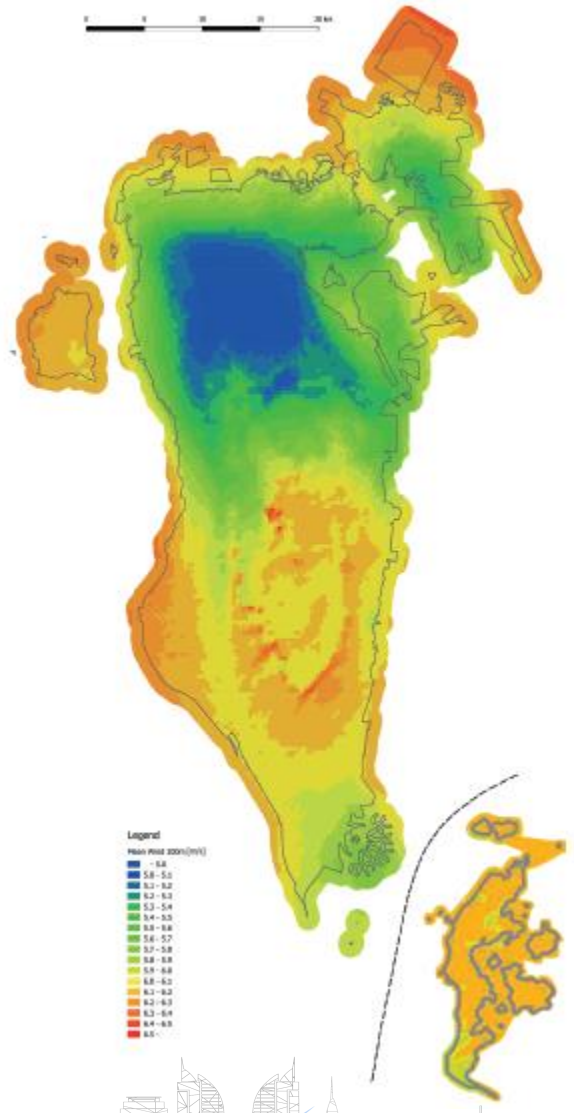
⬇

255MW in the energy mix by 2025

⬇

Wind Powered RE = 50MW by 2025

Wind Resource – Bahrain Wind Atlas



Wind Atlas is the first step to exploiting wind resources

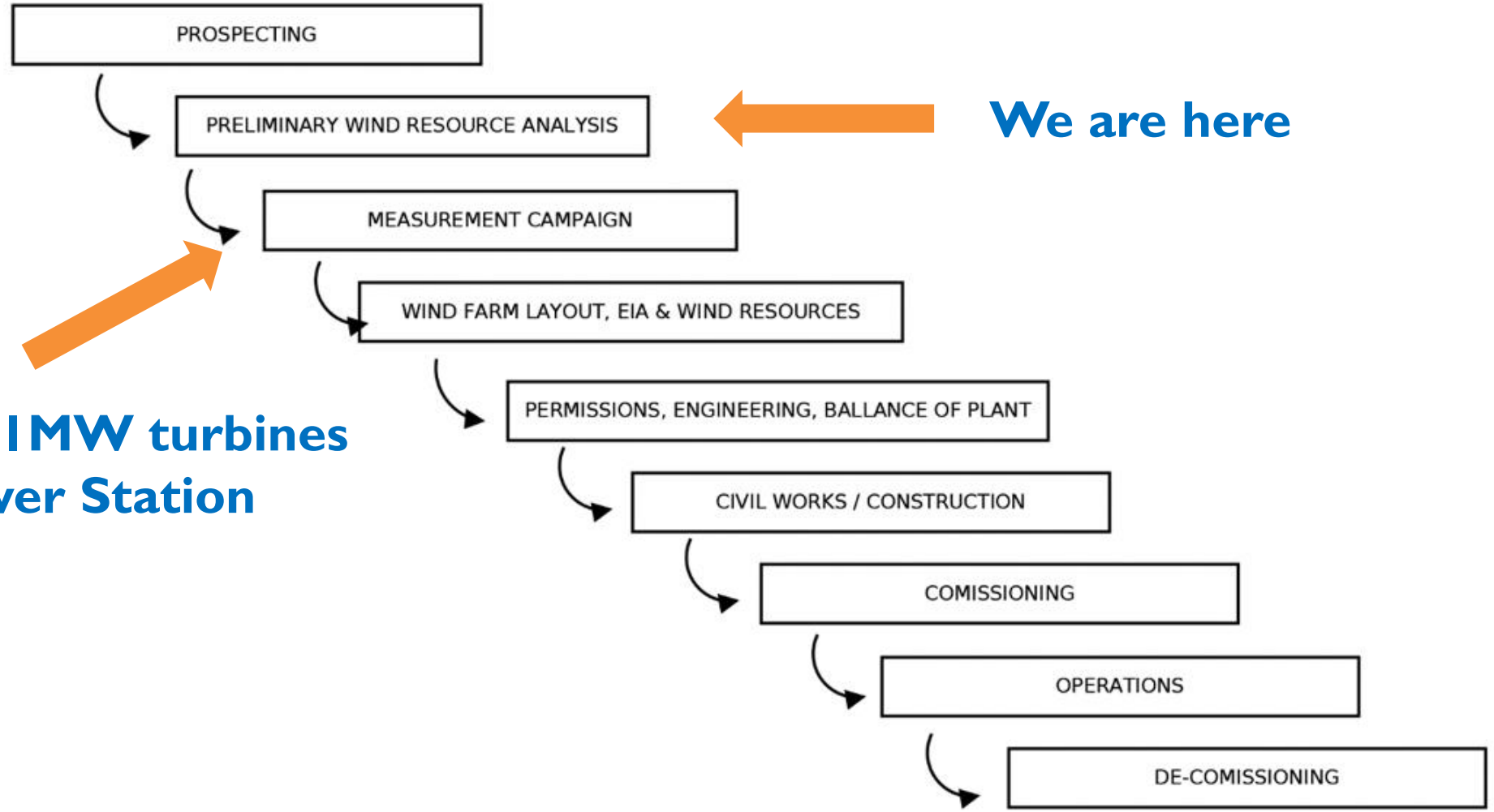
Launched on April 12th 2018

Interactive map available free to all at

www.seu.gov.bh/windatlas/

There is enough wind resource for commercial exploitation

Wind Resource – Steps to Utilise Wind Energy



EWA pilot 2 x 1MW turbines
Al Dur Power Station

Wind Energy – Potential

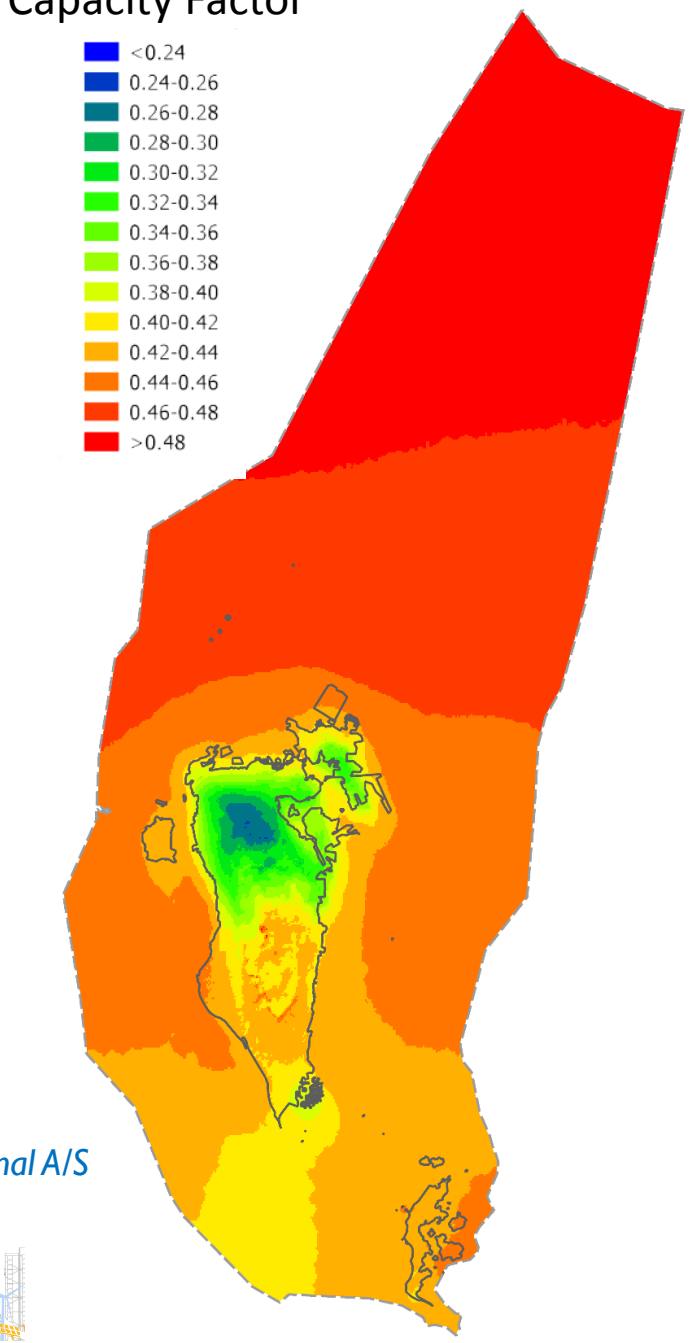
Power:	2.0 MW
Hub height:	80-120m
Operating range:	3-20m/s
Rotor diameter:	120m
Total height:	140m -180m

Calculation Example:
A 2MW wind turbine site close to the King Fahd Causeway at capacity factor of 0.42 (orange area).

Yearly Gross Yield:
0.42*2MW*8760h = 7358 MWh

Yearly Net Yield (10% loss):
0.9 * 7358MWh = 6622 MWh

Equivalent to a 4MW Solar Plant



After EMD International A/S

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Thank You

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