

# Seminar on: “Monitoring the Implementation of Energy Related SDG Indicators in the Arab Region”

## Energy Efficiency in the Arab Region

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Economic and Social Commission for Western Asia

### Session IV. Sustainable Energy and Climate Actions

#### SUSTAINABLE ENERGY AND CLIMATE ACTIONS IN THE ARAB REGION

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Sustainable development in ***energy efficiency and renewable energy are crucial in the global carbon reduction process*** which renders ***accelerating the progress of sustainable energy development in the Arab region ever more eminent.***

The year 2019 will include major milestones for tracking progress towards sustainable energy and climate actions which highlights ***the importance of the interlinkages between progress made towards sustainable energy at Arab regional level and climate actions (SDG7 and SDG13).***

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- Interlinkages between SDG7 and SDG13
  - Context of the Arab region
  - Air pollution and Carbon footprint
  - Case Study: Power – Water sectors: investigating energy efficiency of the Arab countries, mainly the GCC's intensive power and water sectors.
  - Alignment of National Energy Plans and SDG7

# Interlinkages between SDG7 and 2019 SDGs

## SDG 7: Affordable and Clean Energy

- 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services
- 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
- 7.3 By 2030, double the global rate of improvement in energy efficiency

### Key outcomes, multiple benefit of access, renewable energy and energy efficiency

Capacity building skills for low-carbon future. Low-Carbon education institutions.

New jobs and skills with adoption of new energy technologies

Energy efficiency & distributed renewable energy deliver lower cost access wellbeing and economic services

Direct reductions in GHG from renewable energy and energy efficiency

Redeveloped energy systems and institutions to deliver sustainability and SGD outcomes

Integrated resource planning, collaboration, Improved delivery of SDGs and consumer needs

**SDG4 Quality Education**

**SDG8 Decent Work and Economic Growth**

**SDG10 Reduced Inequality**

**SDG13 Climate Action**

**SDG16 Peace and Justice Strong Institutions**

**SDG17 Partnerships to Achieve Goals**

2019 SDG focus review goals

# Arab Region Context

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- 2<sup>nd</sup> lowest energy intensity across the 6 regions, it is declining slowly,
- Activity-driven growth in energy and GHG emissions, despite the relatively low energy intensity,
- 5% of global emissions, but some of the highest per capita emissions of the world's regions,
- Extremes of diversity in resources, industrialisation, wealth, and wellbeing
- Prospect of being more challenged by climate change than other regions.

# Climate getting worse before we can mitigate and adapt

## ***Worsening climatic drivers for air conditioning***

- AC is 70% of peak-period electricity consumption
- Cooling demand in GCC is expected to nearly triple by 2030, \$100Bn new cooling capacity \$120Bn new power capacity.

***Climate induced summer peak temperatures.*** 2010 was exceptionally warm in the Arabian region temperatures reaching 52.0 °C in Jeddah.

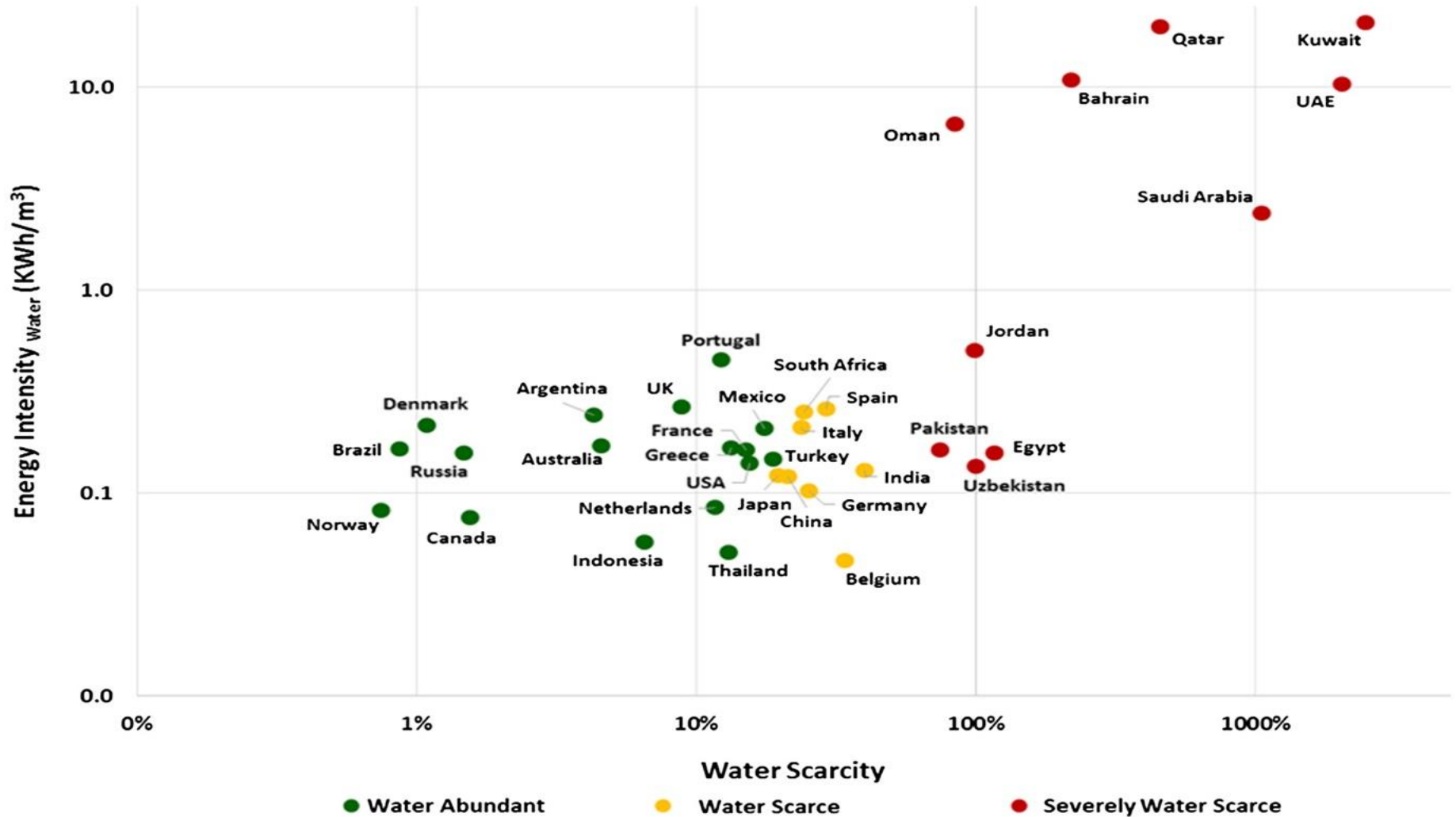
Unprecedented demand for electricity, eight power plants in forced to shut down.

The temperature rise seems to be a fairly recent (post-1997) phenomenon, a trend of 0.21deg C / decade increase observed;

Relative indices show significant warming trends for the majority of stations in all seasons. Strong warming (above 5 days per decade) is witnessed in the spring, summer and autumn seasons..

(Nazrul M. et al 2015)

# Water scarcity isn't linear



# Water - Energy - Food nexus.

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Increasingly energy constraints can easily constrain water systems and the food systems that depend on them both.

Egypt's NDC:

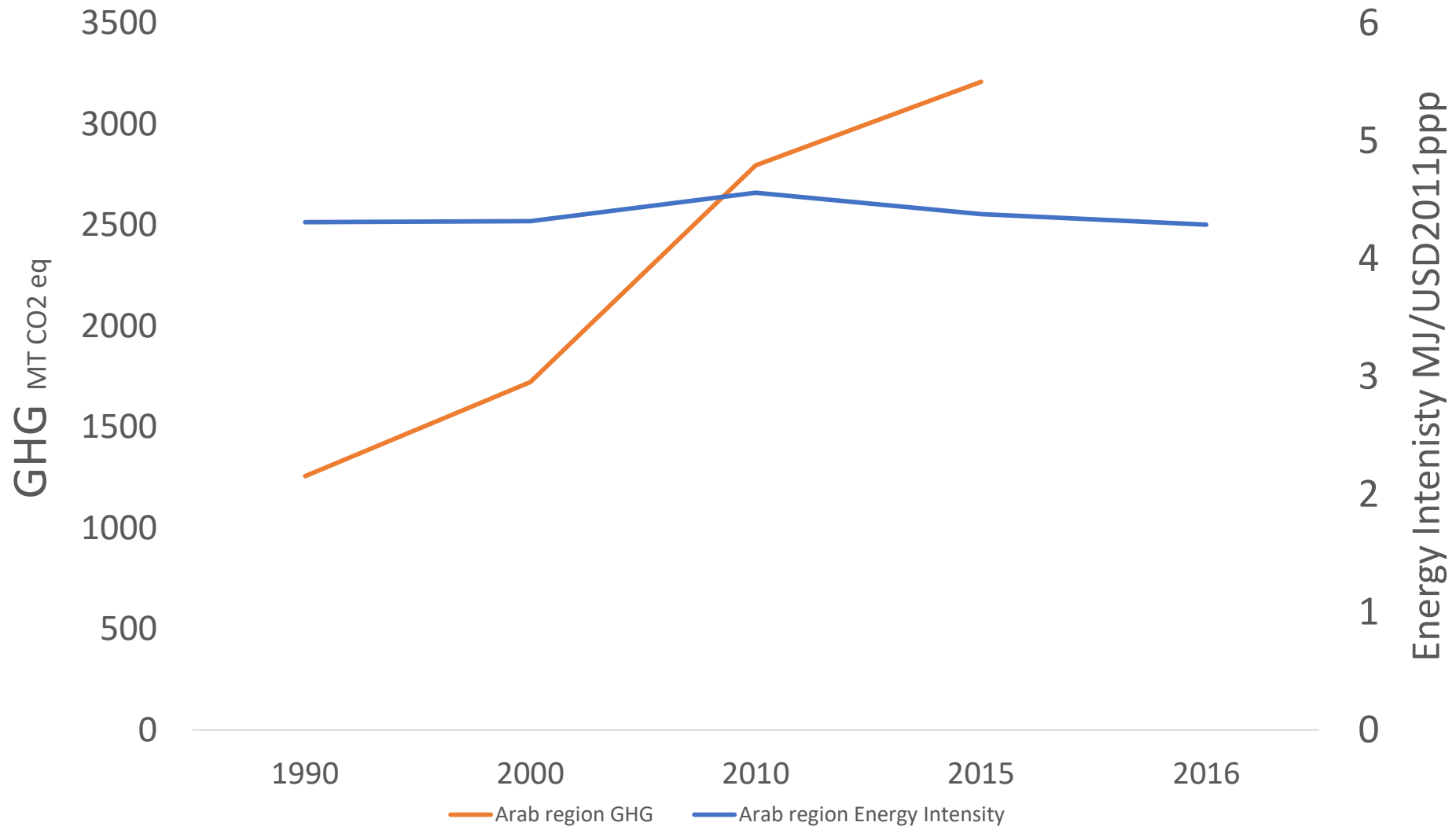
“In the agricultural sector, climate change studies expect that the productivity of two major crops in Egypt - wheat and maize –will be reduced by 15% and 19% respectively, by 2050. Losses in crop productivity are mainly attributed to frequent temperature increase, irrigation water deficit, and pests and plant disease.

In addition, 12% to 15% of the most fertile arable land in Nile Delta is negatively affected by sea level rise and salt water intrusion.”

Most countries face similar adverse land productivity impacts.



# Arab Region, Energy intensity and GHG emissions 1990-2016



# Local and Global emissions

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Energy systems create both local and global emissions.

While the global greenhouse gas pollutant has global recognition, local energy related pollution challenges are less well recognised.

Annual mean exposure to fine particulate air pollution (<PM<sub>2.5</sub> particulates) in the Arab region exceeds WHO guideline values in all countries.

Data gaps, and the fact that many urban and industrial centres will exceed country average levels are highly concerning.

# Case study: GCC Power-Water sector efficiency

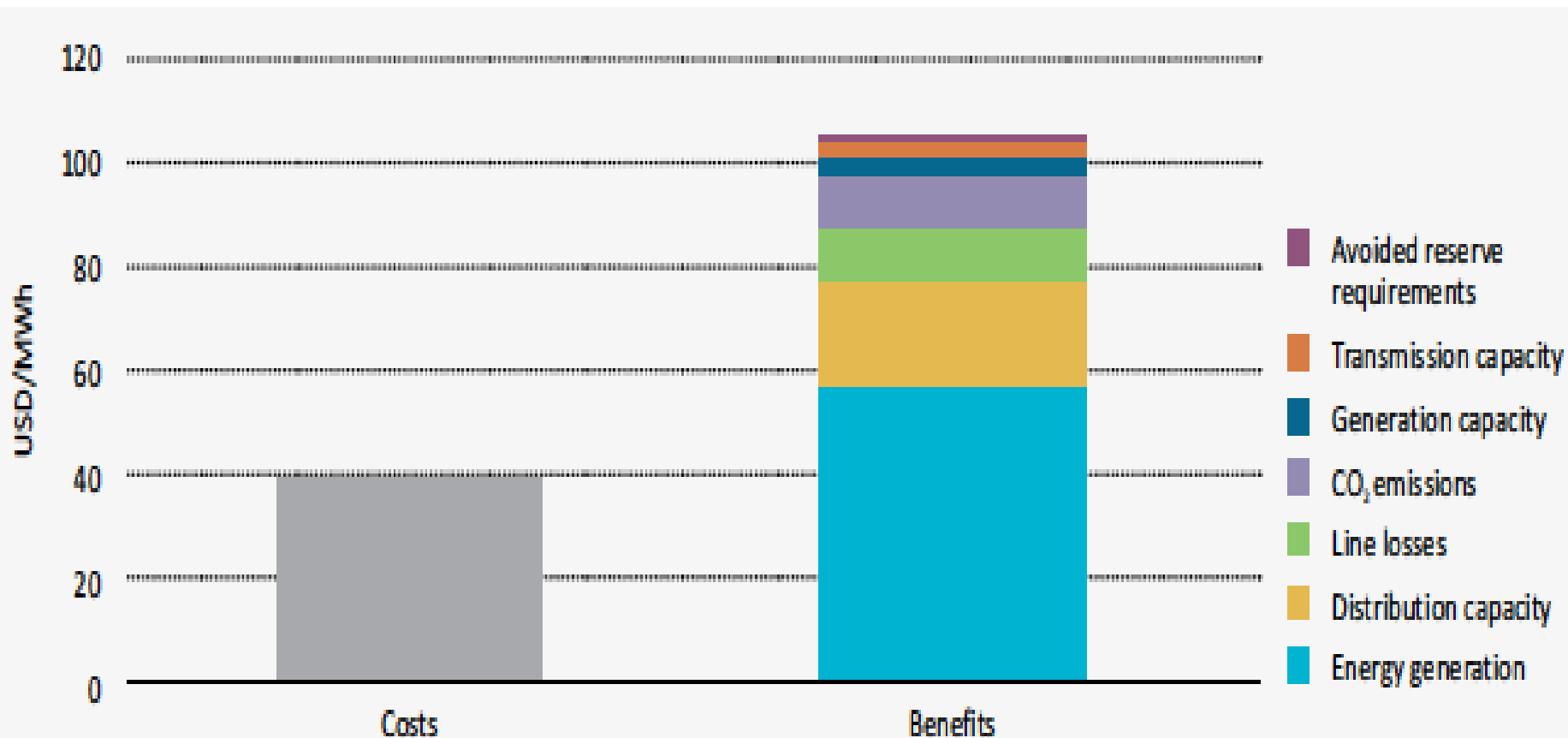
- Analysis of GCC power and water plants, the insights apply just as well to other Arab countries.
- Improving power and water sector energy productivity underpins the capacity of GCC countries to continue development of ambitious social and economic objectives.
- Key role in transforming the region's singular advantage in low cost oil and gas resources into consumer energy products that enable capital and labour to add value and drive income to higher levels in an economy.
- They have been, and will increasingly be the region's foundation to economic productivity,
- Economies electrify services, increase value adding activities and social wellbeing.
- This sector underpins SDG goals.



# Impacts

- Substantial investments in high-efficiency (CCGT) and integrated water and (IWPP) have been undertaken in the past two decades
- Providing GCC countries with energy efficient power plants.
- Some of the highest efficiency plants are world leading.
- The older stock of inefficient single cycle power plants are planned for phase out from the stock.
- Despite the low cost of fuel for power and desalination, GCC power plants and IWPP efficiencies on a similar path to Europe where substantial energy import costs and market economics dictate high plant efficiencies.
- The efficiency of electricity and heat production in public conventional thermal power plants in the EU28 countries increased from 42% in 1990 to 48% in 2013. The average efficiency for district heating conventional thermal power plants in the EU28 in 2013 was 82.8%, almost at the same level as in 2005. (EEA 2015)

# Better money to be made in efficiency



Note: Values are expressed as levelised USD/MWh.

Source: Efficiency Vermont (2012), Annual Report 2010, Efficiency Vermont, Burlington, [www.efficiencyvermont.com/docs/about\\_efficiency\\_vermont/annual\\_reports/2010\\_Annual\\_Report.pdf](http://www.efficiencyvermont.com/docs/about_efficiency_vermont/annual_reports/2010_Annual_Report.pdf).

# Significant potentials for integration need to be addressed.

Adding value and progressing SDG goals by advancing end-use efficiency opportunities is key to managing future power capital and operating costs as well as stabilising persisting trends of power and water demand growth.

Shifting to increasing adoption of solar power and desalination plants is linked to these energy efficiency improvements.

Both energy efficiency and renewable energy work best when implemented on the demand side along with electricity and water conservation efforts.

Reduced transmission and distribution costs as well as power and water production costs,

Requires a shift from a supply side paradigm to one which seeks increasing system value for public investments.

# National Energy Plans and NDCs, Alignment with SDG7 and SDG13?

Country sustainable energy policies	Country Nationally Determined Contribution UNFCCC NDC Registry	Reported SDG7 progress. UN Sustainable Development Knowledge Platform. Voluntary National Reviews	Alignment of policies and plans with SDG7 and SDG13
<p>██████ National Program for Renewable Energy and Energy Efficiency 2030.</p> <p>National Energy Efficiency Program (2016) and the relevant action plan.</p> <p>Adoption of feed in tariff for Renewable Electricity production by regulatory agency</p> <p>.30% increase in fuel prices from the 2010 prices in 2016.</p> <p>National Fund for Energy Control (FNME) includes a portion of financing reserved for EE projects.</p>	<p>GHG reduction by 7% with national means. 22% reduction by 2030 compared to BAU conditional on external finance, technology transfer and capacity building.</p> <p>27% electricity from RE sources by 2030. NDC 20/10/2016</p> <p>Total emissions in 1994 100,344Gg.</p> <p>Saving 30Toe (building) 30 Toe (industry) and 16 million Toe, (transportation) during 2015 – 2030</p>	<p>7.1.1 Access to electricity: %.</p> <p>7.1.2 Primary reliance on clean fuel: %.</p> <p>7.2.1 Renewable energy:</p> <p>7.3.1 Energy efficiency:</p> <p><b>NO VNR REPORT by March 2019</b></p> <p><b>Total emissions in 2000 103,142Gg.</b></p>	<p>The intended and actual impacts of the NEEAP, pricing measures and the NDC, don't seem aligned and have yet to be quantified.</p>



<b>Policy measures</b>	<b>SDG7 Direct Benefits</b>	<b>Multiple Benefits</b>	<b>2019 Focal SDGs</b>
Implement large-scale retrofit programs of achievable EE measures targeting all types of buildings across Arab region. Includes tailor-made measures specifically targeting energy intensive buildings. 10-200Bn investments required in KSA alone depending on depth of retrofits.	85 - 470 TWh/yr avoided electricity consumption.  13 - 65GW peak demand reduction.	Job creation. 12,000 -247,000 jobs per year in Saudi Arabia.	SDG8 Decent work and economic growth
		Improved health for vulnerable through better living conditions	SDG10 Reduced Inequality
		Avoided health risks through maintaining safe indoor temperatures.	
		Increased access to energy services (not just electricity connections) esp in remote communities.	
		26-146MtCO <sub>2</sub> direct carbon reduction from lowered electricity consumption.	SDG13 Climate Actions
		Upstream benefits to utilities could be 140% of investment in consumer energy efficiency (US experience).	SDG 17 Partnerships to achieve goals
Integrate renewable energy on New Zero Energy Buildings. USD90Bn cost in KSA, 25Bn Tunisia based on \$2,500 per NZEB.	229TWh distributed renewable electricity by 2040, 458TWh by 2050. 38GW distributed renewable electricity capacity by 2040.	Job creation in sustainability	SDG8 Decent work and economic growth
		Access to sustainable energy services	SDG10 Reduced Inequality
		29MT CO <sub>2</sub> emissions avoided	SDG13 Climate Actions
		Renewable energy integrated in new buildings lower costs	SDG 17 Partnerships to achieve goals
Improved Room Air Conditioner MEPS across Arab region	11TWh/yr avoided electricity by 2030	Avoided health risks through maintaining safe indoor temperatures.	SDG10 Reduced Inequality
		7.0Mt avoided CO <sub>2</sub> emissions	SDG13 Climate Actions
Improve knowledge of energy consumption patterns in buildings. Systematic statistical data collection of end-use consumption patterns. Monitor relevant energy performance indicators			SDG 17 Partnerships to achieve goals

# Key guiding questions for discussion

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1. How are country sustainable energy policies and Nationally Determined Contribution (NDCs) aligned with the SDG7 and SDG13 targets and indicators?
2. What statistics and information are needed to provide clarity to leaders, insight for strategies and economic actions for energy sustainable development?
3. What is the role for cross-regional cooperation and investment in “green” energy, taking into consideration Climate Change Agreements and COP22 outcomes?
4. How we can develop the right information?

**Thank you**

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