



# UAE National Energy Strategy 2050

## Presentation for CEM Long Term Energy Scenarios



# National Energy Strategy 2050

**Our Leadership has set an ambitious target to ensure sustainable and prosperous nation**



## Supply side

**50%** Clean  
Energy in Capacity  
Mix by 2050



**UAE National Energy Strategy 2050**

January, 2017

## Demand side

**40%** Final  
Energy Demand  
reduction vs. BaU  
by 2050



# Launching the Energy Strategy- January 2017

**For the Energy Strategy the concept of Future Lab was developed.** A game was created to suit the elements of the Strategy. Through this approach the targets were tested including stakeholders from the energy sector, private and public voices. Created to stress test the targets and the scenarios created





# Designing the Future Lab

The game was designed to capture all the players in the energy sector as well as reflect public voice. A total of 36 entities were invited and the event was attended by the Prime Minister HH Sheikh Mohammed Bin Rashid Al Maktoum.





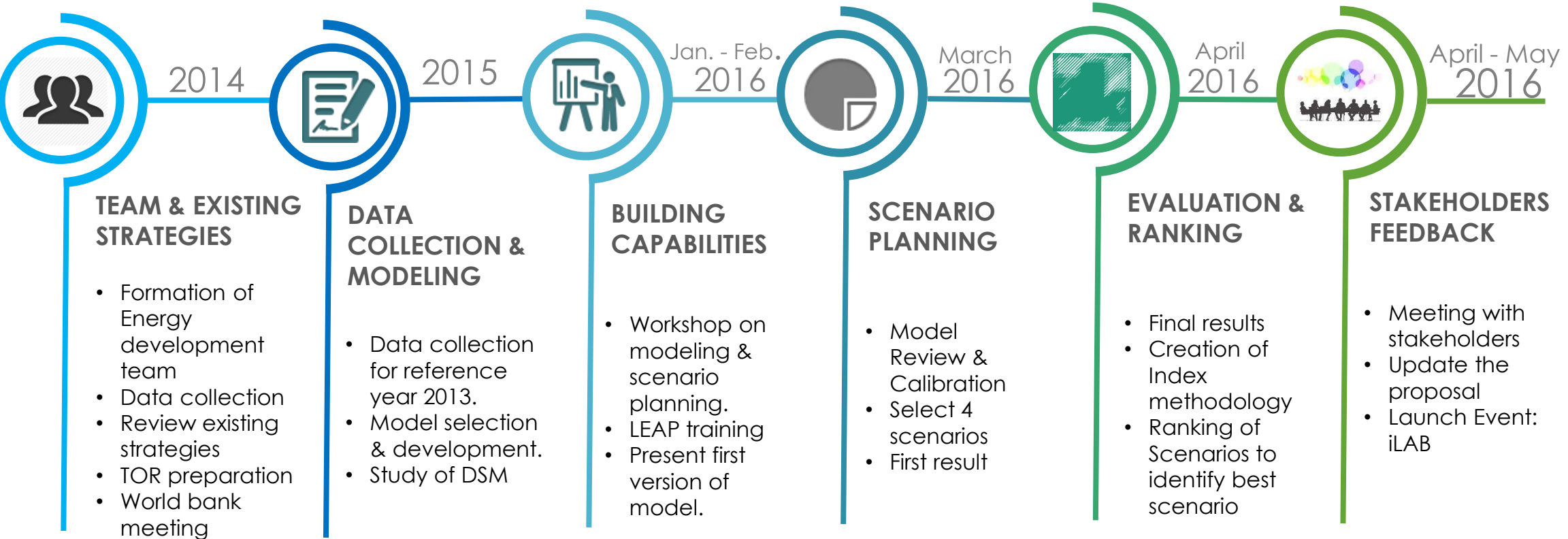
# Objective for National Energy Strategy

- To deliver clean, secure, affordable energy while treating the environment responsibly.
- Maximize Energy Productivity of UAE economy and ensure happiness of the residents of UAE.
- To respond to the risks of climate change by reducing the greenhouse gases caused by the production and use of energy.





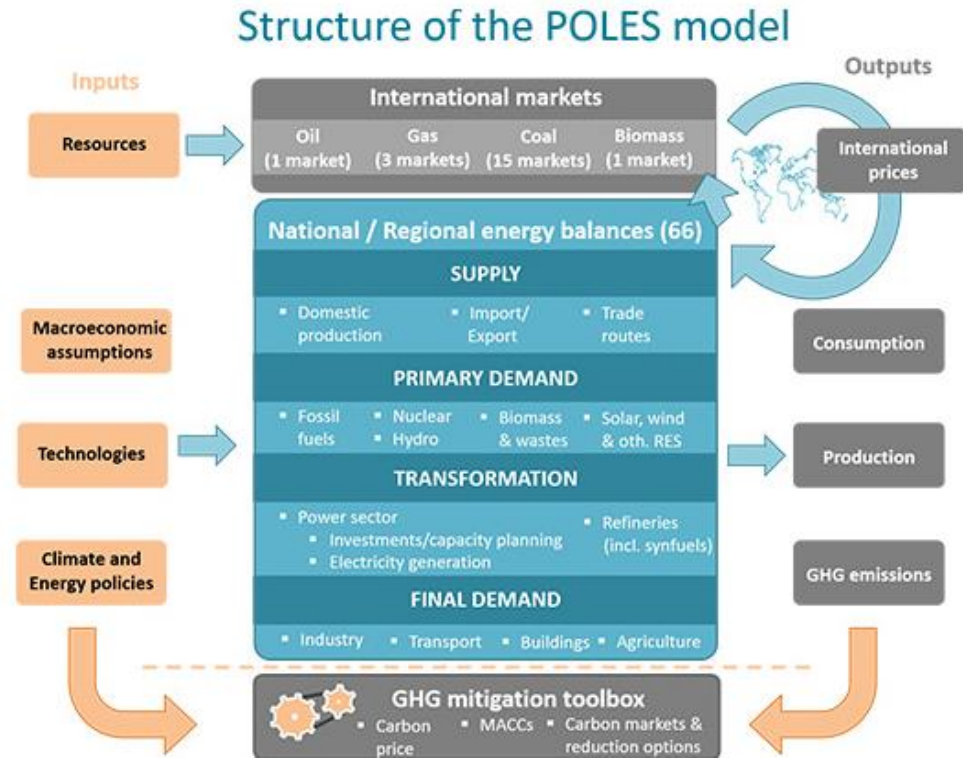
# UAE Energy Strategy Development





# Modelling Tool Used

- The primary tool used was based on the POLES model developed by Enerdata
- Elements such as desalination was incorporated to reflect the national circumstance
- The record low prices for the solar technologies were also incorporated
- The outputs were used to develop an index approach for scenario selection





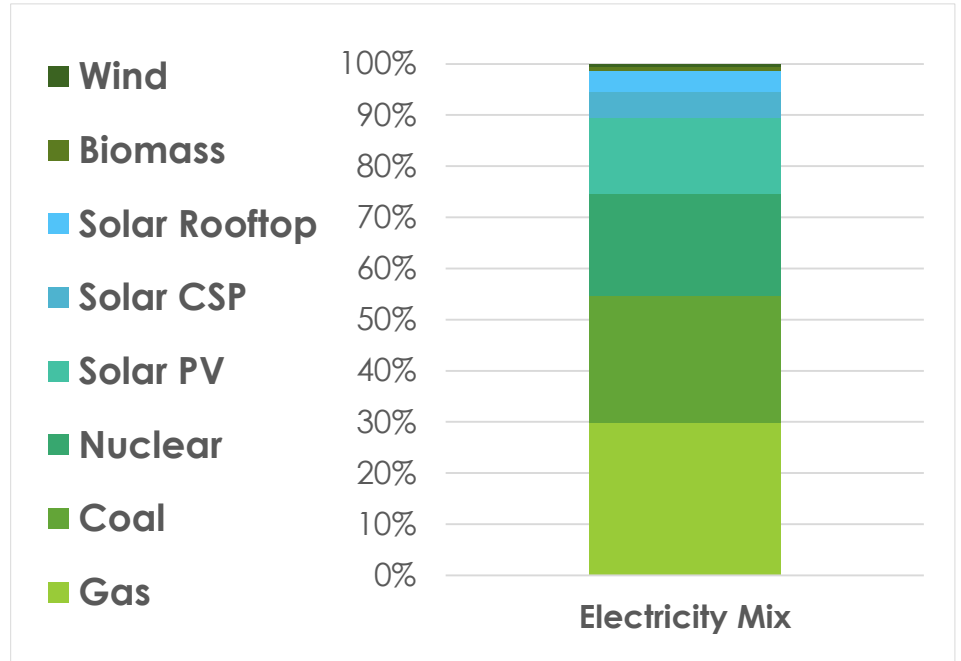
# Sectors Investigated

## Energy Demand Side



The sectors listed above constitute the total demand for the UAE and are forecasted based on econometric relations. The Industry and Transport sectors are simulated based on the best practices around the world. The targets for demand side management are applied across all sectors.

## Electricity Supply Side



The Electricity Mix is selected to meet the total electricity demand. The technologies are selected based on the cost, availability of resource and infrastructure readiness. All the key technologies are investigated and all the key projects/targets announced by utilities are incorporated.





# Forecasting UAE Energy Demand\*

## Demand Sectors

1. **Industry** (Energy Intensive Industries, Non Energy Intensive Industries, Non Energy Use, Desalination)
2. **Transport** (Road, Rail, Air, Marine)
3. **Services** (Residential, Services and Agriculture Sector)

## Demand Side Forecast (2013 – 2050)

Energy Demand Next Year = Energy Demand Current Year impacted by

1. Price Effects (Price of Electricity, Gas, Petroleum Products)
2. Activity Effects (GDP, Production (Tons))
3. Income Effects (GDP Per Capita)
4. Efficiency Factor

\* Note: In this study we cover the key sectors: Electricity and Water Generation, Industries and Transportation. Within Electricity generation the sub sectors include residential, commercial, public and industries in line with the sectors serviced by utilities.



# Scenario Definition

Scenario	Basis for Scenario Development	Demand Reduction compared to BAU
<b>BAU</b>	<ul style="list-style-type: none"> <li>Capacity Additions as per Vision 2021</li> <li>Cost competitive selection criteria</li> </ul>	
<b>Midway</b>	<ul style="list-style-type: none"> <li>Medium efforts towards demand reduction</li> <li>More preference for renewables</li> </ul>	<b>20%</b>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>Demand reductions based on Best Practices</li> <li>More preference for renewables:</li> </ul>	<b>30%</b>
<b>UAE Energy Strategy (50@50)</b>	<ul style="list-style-type: none"> <li>Maximum demand reduction based on Best Available technology</li> <li>More preference for renewables</li> </ul>	<b>40%</b>
<b>Climate Force</b>	<ul style="list-style-type: none"> <li>Maximum efforts towards demand reduction</li> <li>More preference for renewables and carbon value</li> </ul>	<b>46%</b>

## Key Drivers for all Scenarios

**GDP Growth Rate** Local and international sources

**Oil Price Forecast** Local and international sources

**Gas Price Forecast** Local and international sources



# Index for Scenario Evaluation



## Energy Security and Reliability

40%

- % of Imported Fuel used in Total Energy Mix
- Number of energy sources



## Energy Affordability

30%

- Average Cost of electricity production
- Total investment for capacity additions



## Sustainability

15%

### Clean Energy and Emissions

- CO2 emissions per GDP
- Share of clean energy in generation mix

### Energy Efficiency and Productivity

- Electricity use per capita
- GDP Per Unit of Primary Energy Use



## Happiness

15%

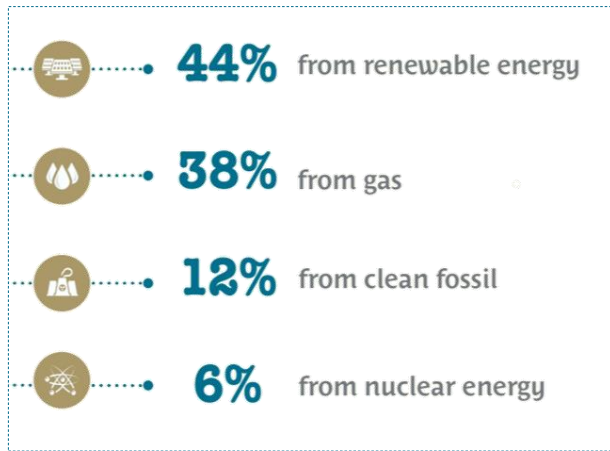
- Difference in Cost of Production from 2013
- Total emissions for electricity sector

**The Index was developed in house** to rank the various scenarios. The key areas reflect the objective and the priorities of the leadership.

**Sensitivity** was conducted for variations to the GDP, Population and Gas Prices. **The 50 @ 50 scenario came out as the best in all cases.**



# The Final Solution: National Energy Strategy 2050



**25-50%**

The plan will increase the contribution of clean energy 25-50% by 2050

**70%**

Will reduce carbon emissions resulting from the power generating process by 70%

**40%**

Improve energy efficiency by 40% by the middle of the century

**6%**

Annual growth in demand for energy stands at 6%

**AED 700 BN**

Savings resulting in AED 700 billion worth



UNITED ARAB EMIRATES  
MINISTRY OF ENERGY & INDUSTRY



الإمارات العربية المتحدة  
وزارة الطاقة والصناعة