

# CEBC WEBINAR

## The Solar Despatchability Challenge

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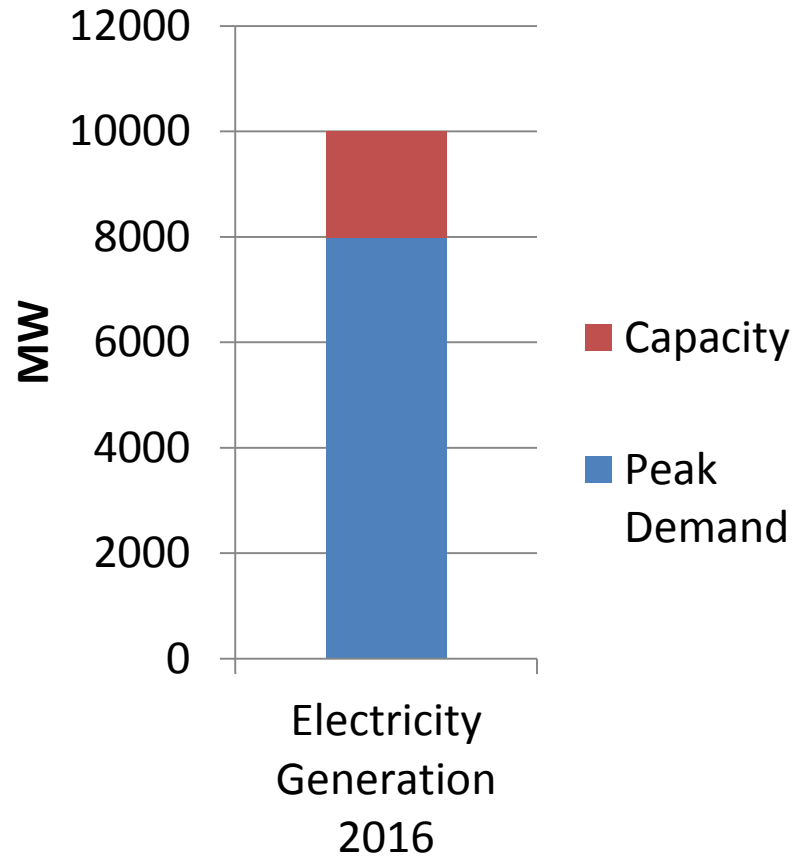
# Outline

- About the RSB
- Dubai's power system
- Solar in Dubai
- The challenges & solutions from high solar penetration

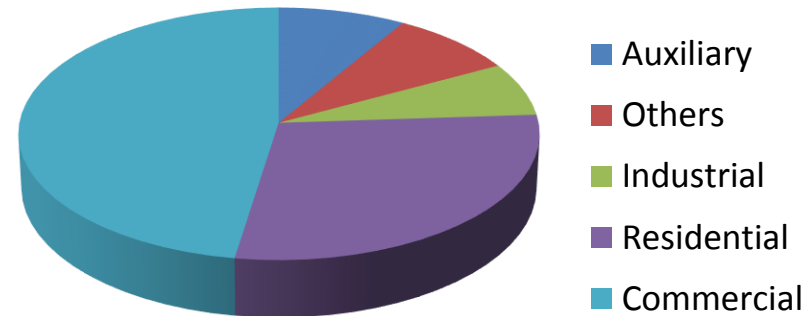
# The Role of the RSB

- Established by Dubai government in 2010
- Responsible for regulating the Emirate's electricity and water production sector
- 2011 Law established framework for Dubai's IPP programme and the RSB's role in licensing, standard setting and enforcement
- Role has further expanded in support of Dubai Supreme Council of Energy
  - Especially in relation to demand side management measures

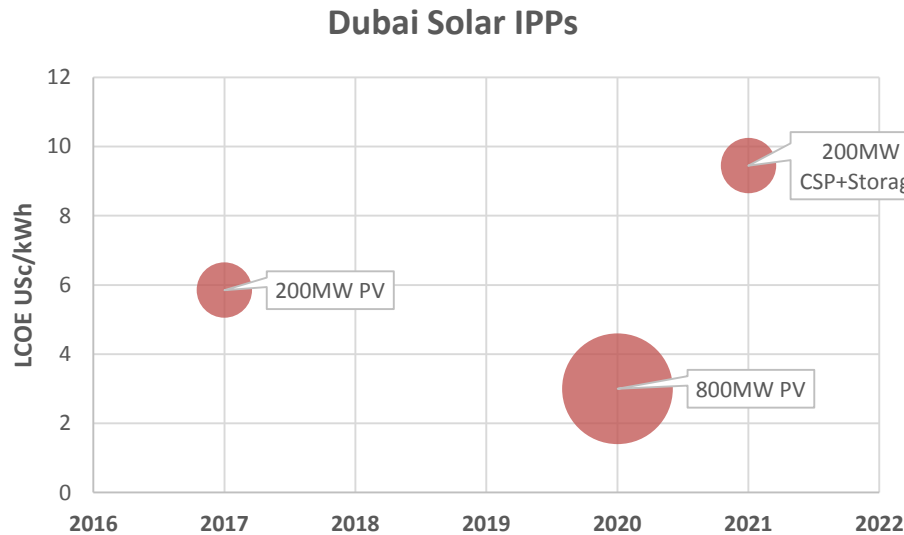
# Dubai's Power System



Consumption 2016 –  
43,093 GWh

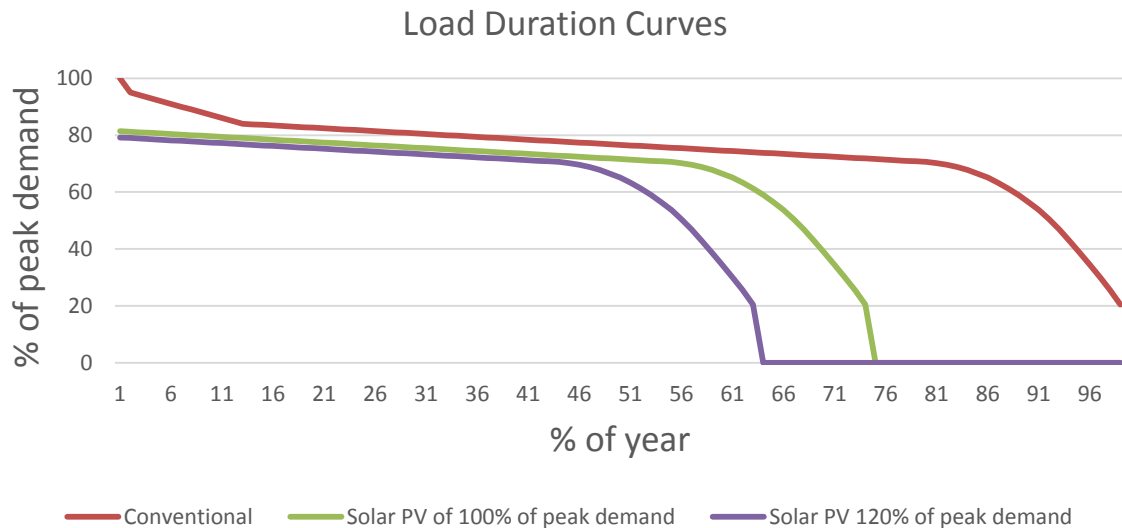


## Solar in Dubai has enormous technical potential, the economics are rapidly catching up



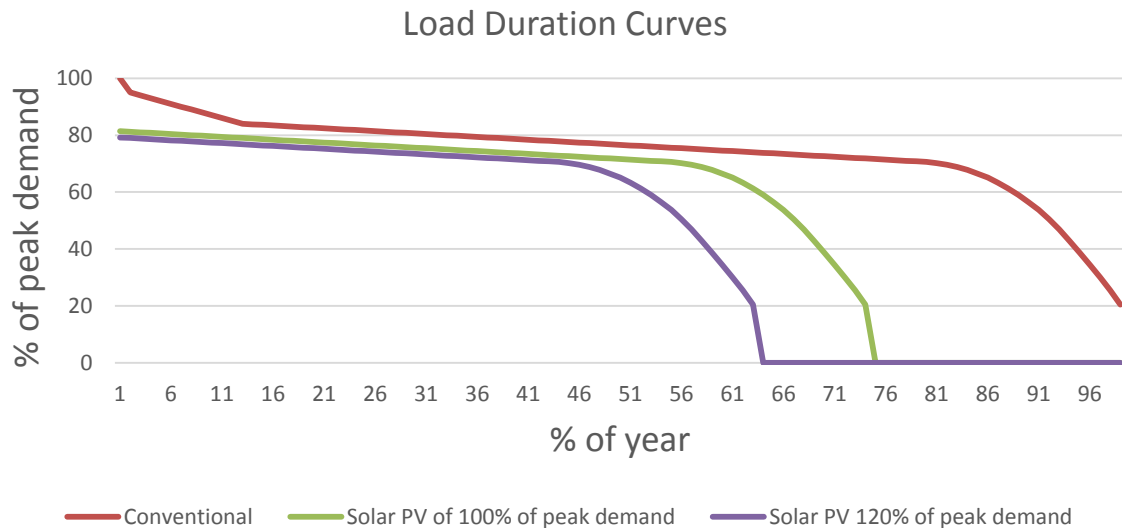
- 2012 study identified ready technical potential for 49GW
- Target then was just 5% of peak to be met by solar in 2030
- Distribution system can readily accommodate 23% of 2030 peak demand
- Now expect 21% of 2030 capacity from utility scale solar – 80%PV:20% CSP
- Rooftop market driven by net metering scheme – 16MW so far

## The challenge with (very) high solar penetration



- Even with solar capacity equal to peak demand, 80% still has to be met when sun doesn't shine
  - And 70% of total energy requirement remains
- System operation also more complex
  - Frequency regulation with less synchronous generation, thus lower system inertia
  - Voltage regulation esp. when demand on transmission system becomes very low with significant distributed generation
  - Ramp rates increase
  - More generation not visible to TSO

## The solutions with (very) high solar penetration



- Batteries already competitive for energy storage and frequency response
  - Dubai foresees c.1,000MW in 2030s
- Dubai looking at “green peakers”
- Pumped storage an existing resource in many places
  - Dubai developing 250MW in Hatta
- UAE & GCC interconnection in place, though more scope to use
- EVs
  - A solution or an added headache?
- Non-electricity solutions
  - Reverse Osmosis for water production and storage
  - Thermal energy storage for large cooling scheme

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THANK YOU

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