



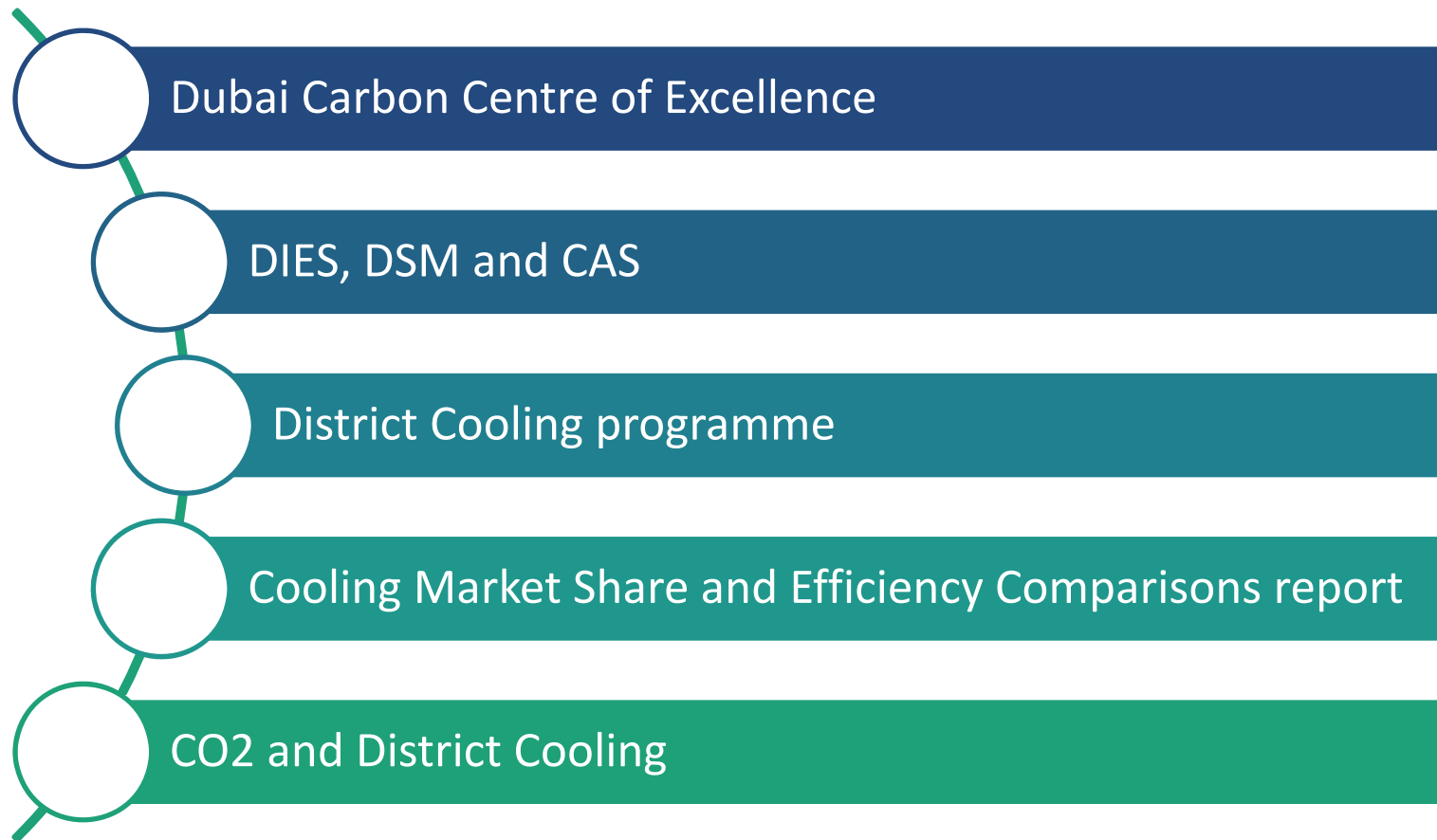
# District Cooling 2.0 - A Climate Solution

Dr. Pablo Izquierdo



# District Cooling 2.0

## Agenda





# Dubai Carbon Centre of Excellence





# Dubai Carbon Centre of Excellence



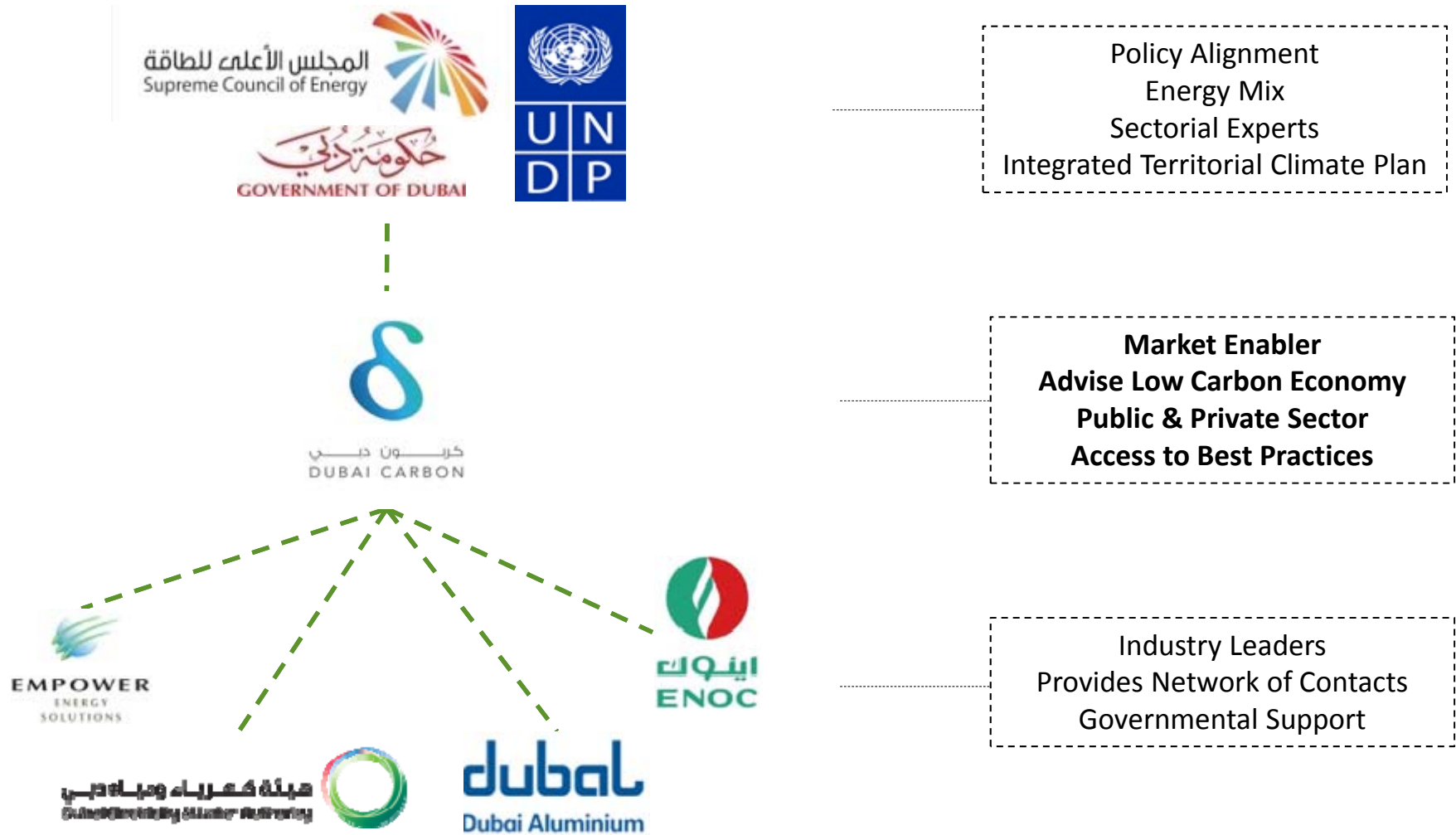
## Who are we?

Dubai Carbon was established on 18<sup>th</sup> January 2011, by an agreement between the Dubai Supreme Council of Energy (DSCE) and the United Nations Development Programme (UNDP), in the presence of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President & Prime Minister of the UAE & Ruler of Dubai, and HH Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, and UN Secretary General Ban Ki Moon.

Together with the UNDP, Dubai Carbon forms a Public Private Partnership (PPP). We are headquartered in Dubai, UAE, but we are growing regionally throughout the GCC countries. Dubai Carbon today acts as a Dubai level and UAE level focal point to capture, streamline, analyse and harmonise GHG data which is then utilised by the public & private sector to develop country level negotiations



# Dubai Carbon Centre of Excellence



# Dubai Carbon Centre of Excellence

DCCE



Accelerating the uptake of energy efficiency and renewable energy in the global energy mix is the single biggest contribution to keep global temperature rise under 2°C





# DIES, DSM and CAS



# Dubai Integrated Energy Strategy (DIES)



المجلس الأعلى للطاقة  
Supreme Council of Energy



## Objectives

1. secure a sustainable supply of energy
2. Enhance the efficiency of water, power and fuel use in the Emirate

Deployed in 2011

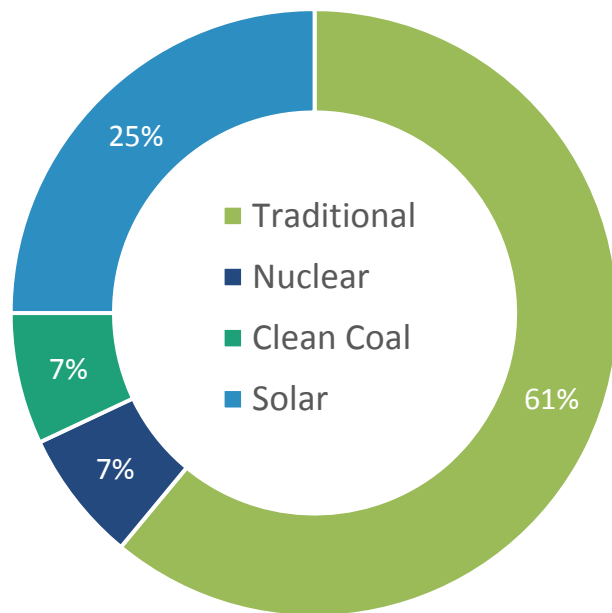


# Dubai Integrated Energy Strategy (DIES)

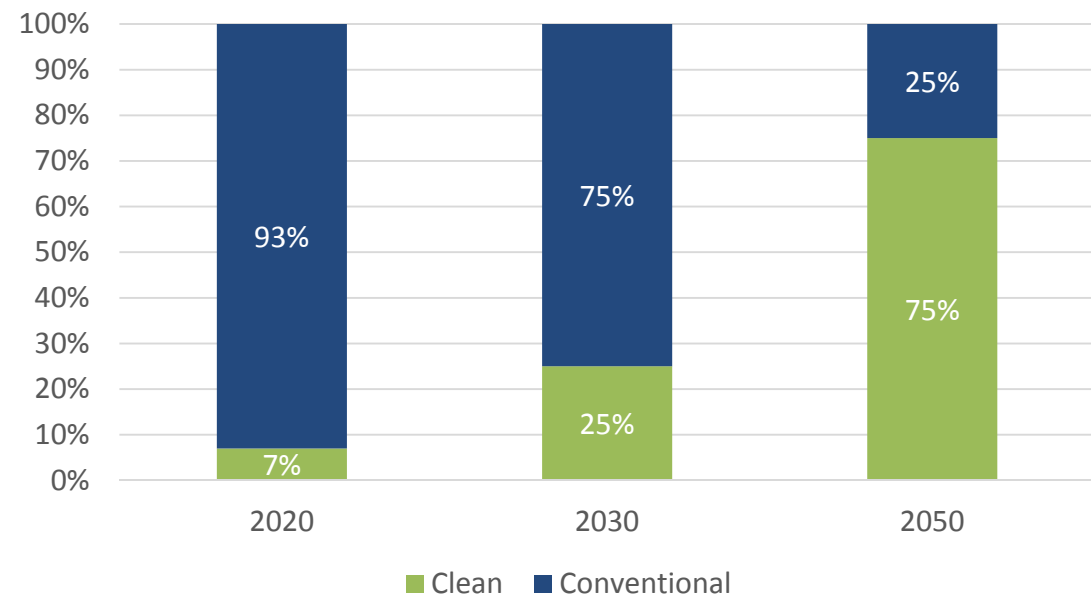
## Overview



### Dubai Energy mix 2030



### Dubai Energy Mix



# Demand Side Management (DSM)

## Overview



Demand Side Management (DSM) is part DIES 2030 and was launched in 2013. The Shams Dubai programme was added in 2015

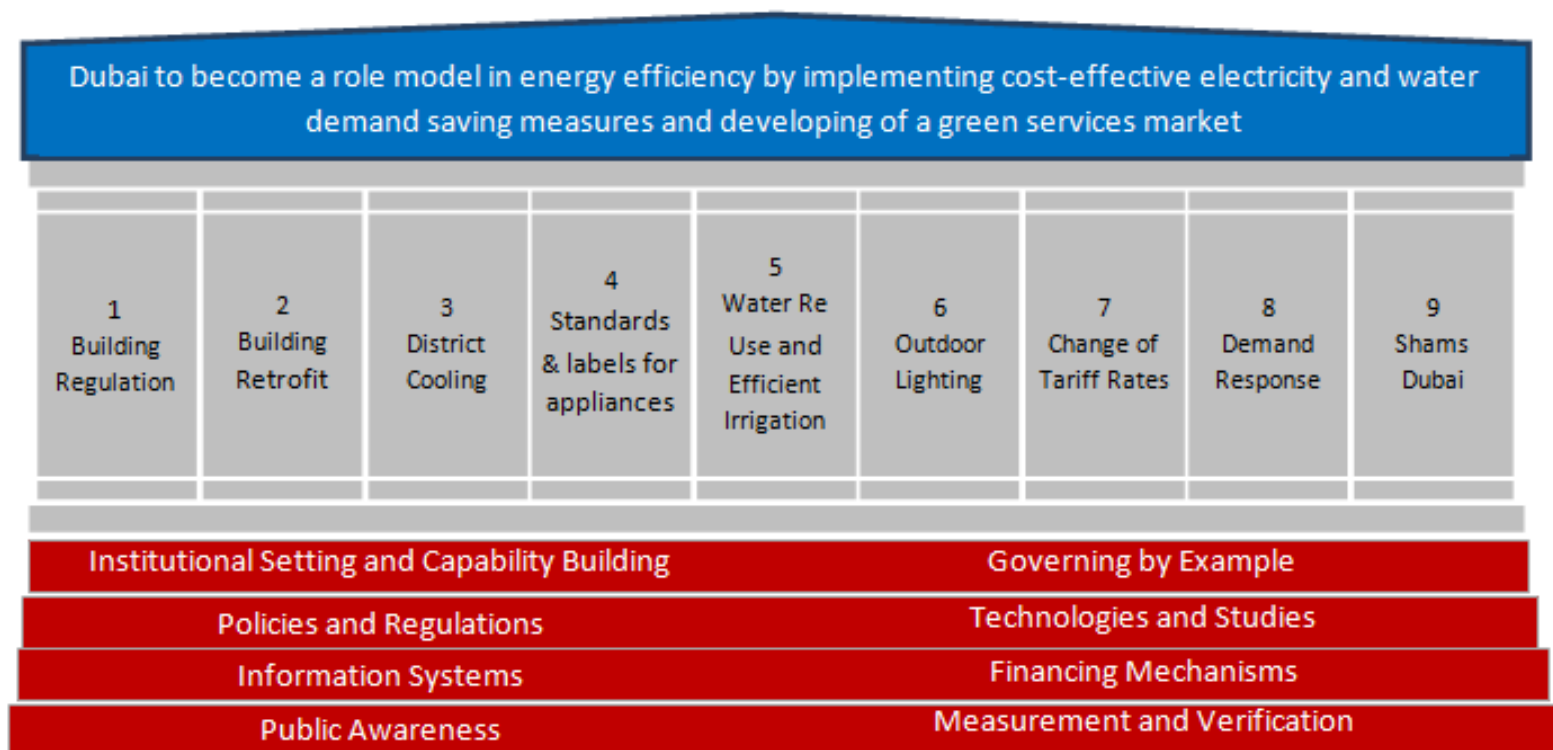


Figure 1: Dubai's Demand Side Management Programme

# Demand Side Management (DSM)

General targets



## Electricity

Reduce  
consumption

**30%**

by 2030 vs. BAU

## Water

Reduce  
consumption

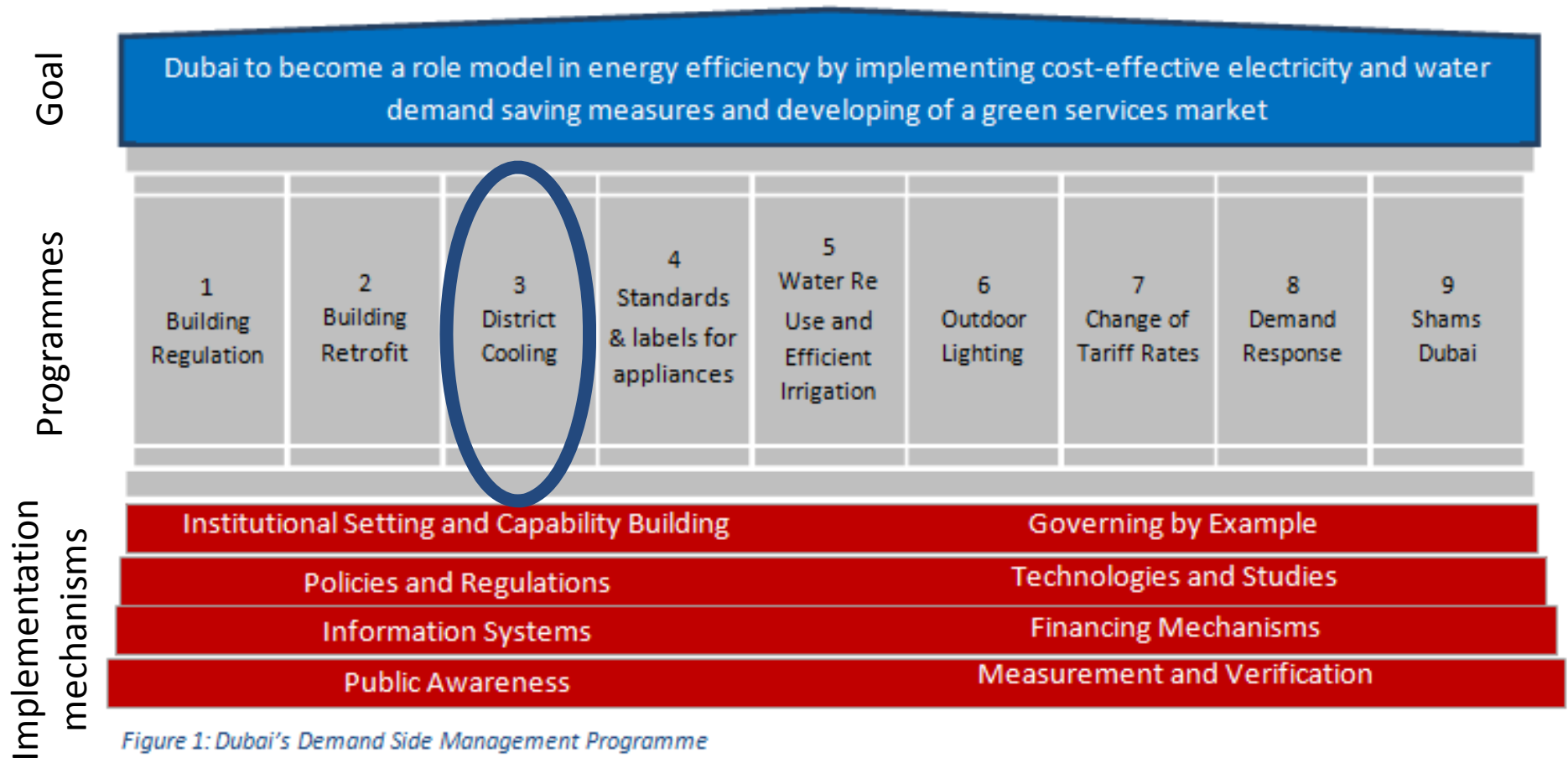
**30%**

by 2030 vs. BAU

Savings

# Demand Side Management (DSM)

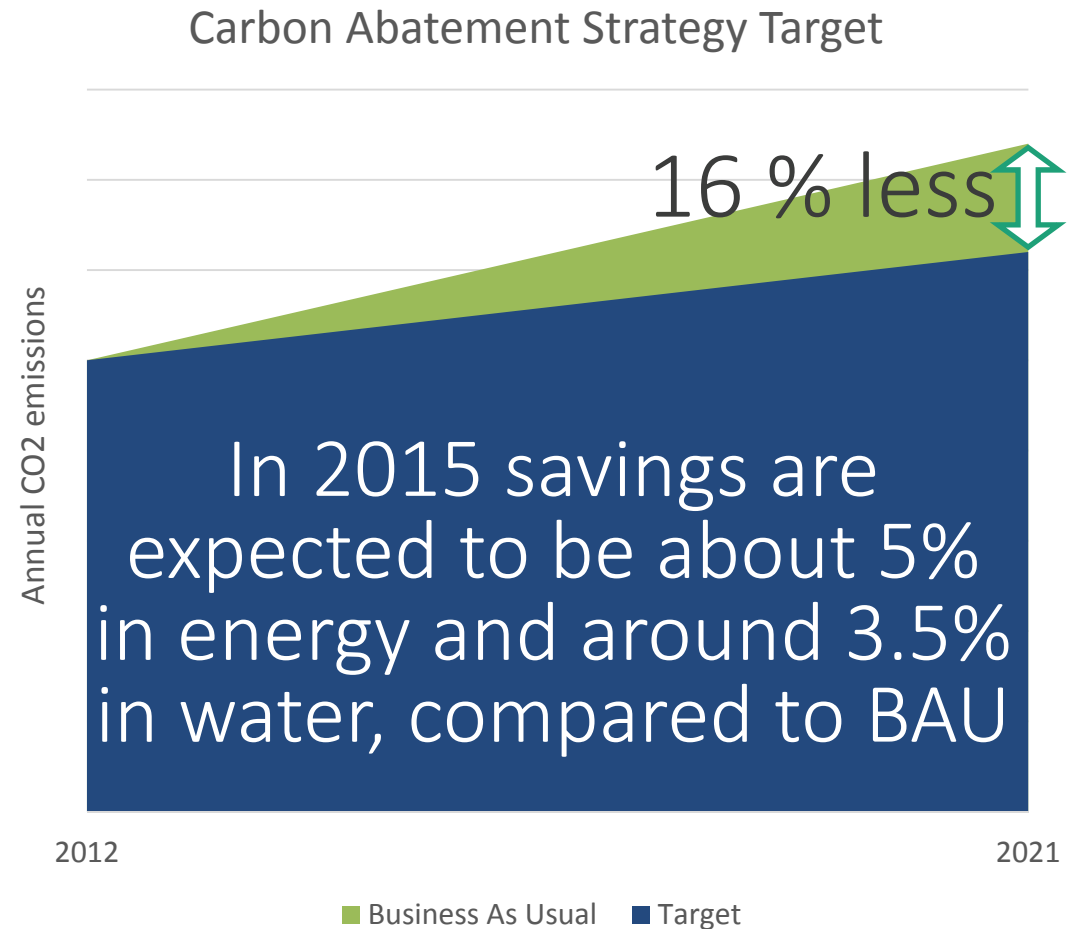
## Elements





# Carbon Abatement Strategy (CAS)

> Target in  
2021

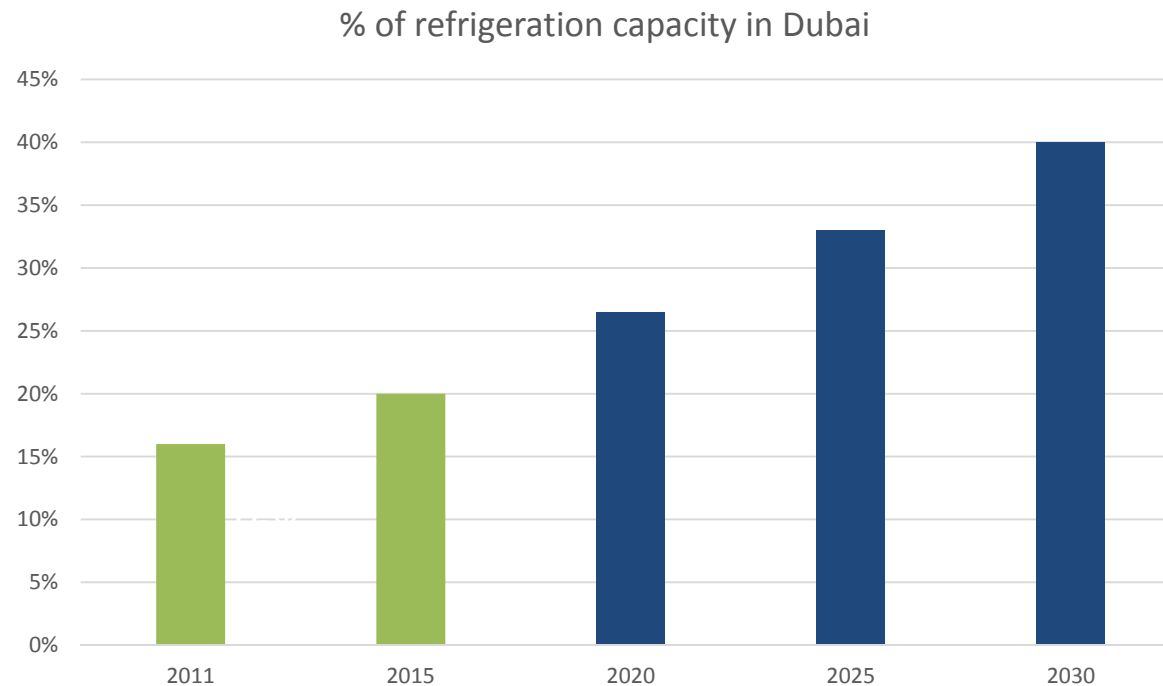




# District cooling programme



# District cooling programme



> Target:

Increase penetration of district cooling from 16% of refrigeration capacity in 2011 to 40% in 2030 by regulating the district cooling

# District cooling programme



Increase efficiency of cooling through regulating the district cooling (DC) industry and supporting the connection of existing buildings to district cooling

## Scope / Objectives

### DC for new developments

- **Task:** Develop regulations that promote higher efficiency and penetration of DC in Dubai
- **Objective:** Save 1.8 TWh in 2030 by connection of new buildings to DC
- **Target customers:** New building developments with sufficient cooling load density

### DC retrofit

- **Task:** Connect existing buildings to DC networks to improve their energy efficiency and increase the utilization of available capacity in Dubai
- **Objective:** Save 1.5 TWh in 2030 by connecting existing buildings to DC
- **Target customers:** Existing buildings with high cooling load density, hydronic system and are located near existing DC plants





# Cooling Market Share and Efficiency Comparisons report



# Cooling Market Share and Efficiency Comparisons report



مكتب التنظيم والرقابة لقطاع الكهرباء و المياه  
**RSB FOR ELECTRICITY & WATER**

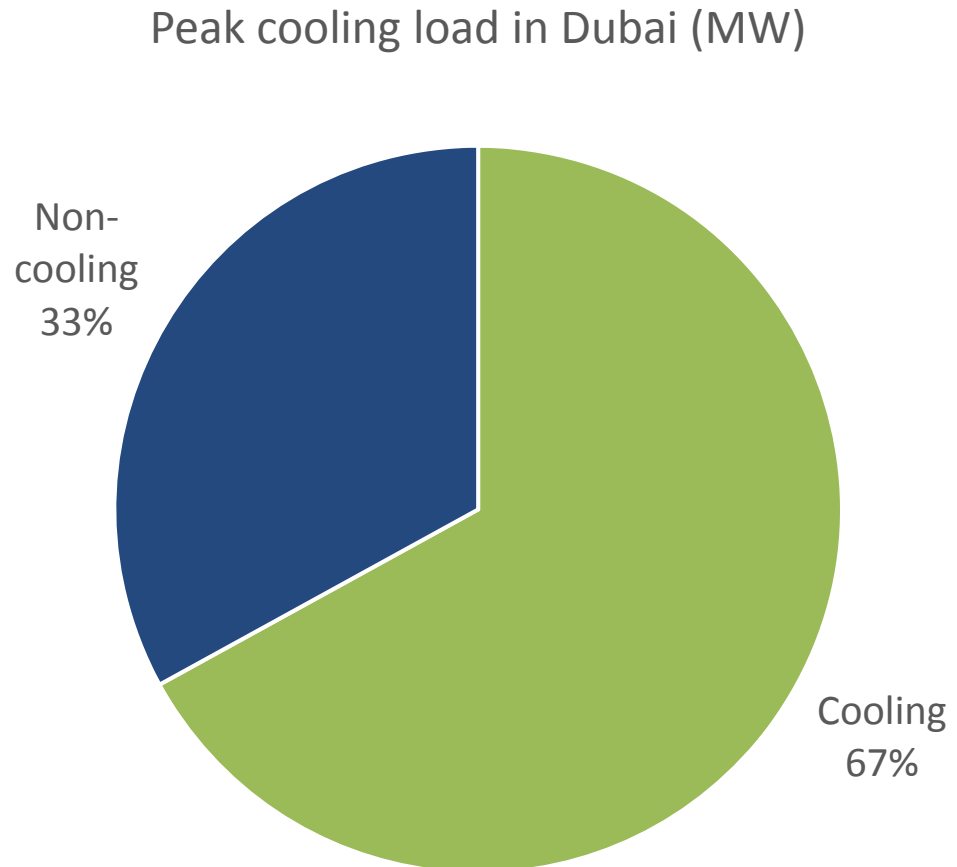
## Objectives

- 1) Assess the current market share of the different cooling technologies in operation in Dubai;
- 2) Assess the “on-site” efficiency of the different technologies in use and indicate how that efficiency might vary with time; and
- 3) Determine the overall cooling load in Dubai.

Cooling Market  
Share and Efficiency  
Comparisons report

# Cooling Market Share and Efficiency Comparisons report

> Why is this important?



# Cooling Market Share and Efficiency Comparisons report

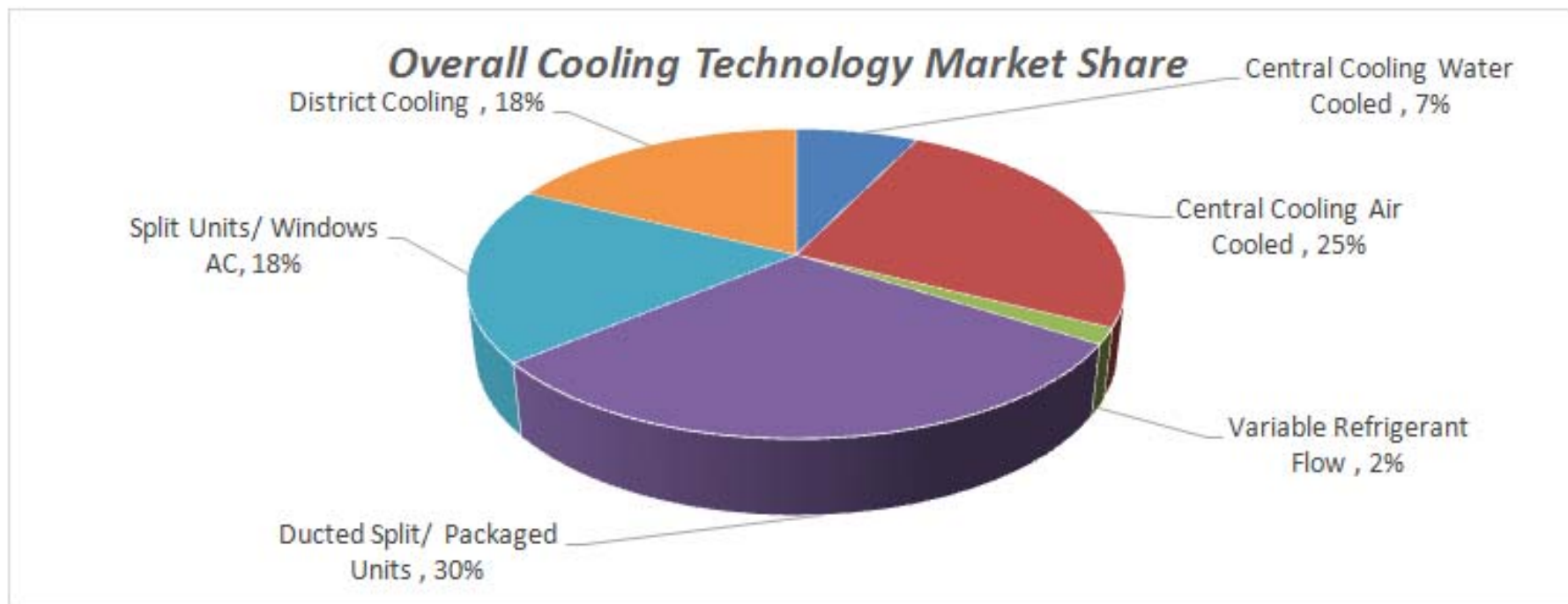


Figure 2: Market Share of Cooling Technologies in Dubai



# Cooling Market Share and Efficiency Comparisons report

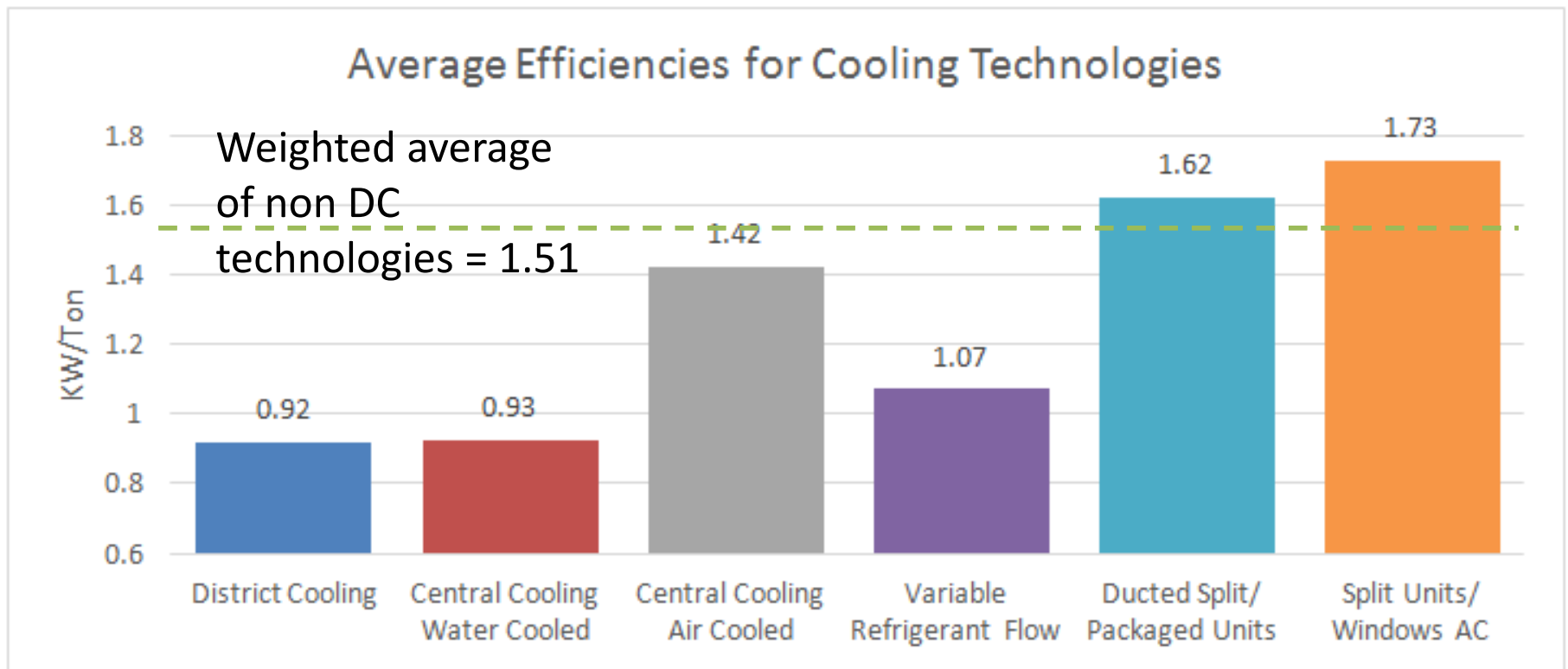


Figure 3: Average Efficiencies for Cooling Technologies Operating in Dubai

# Cooling Market Share and Efficiency Comparisons report

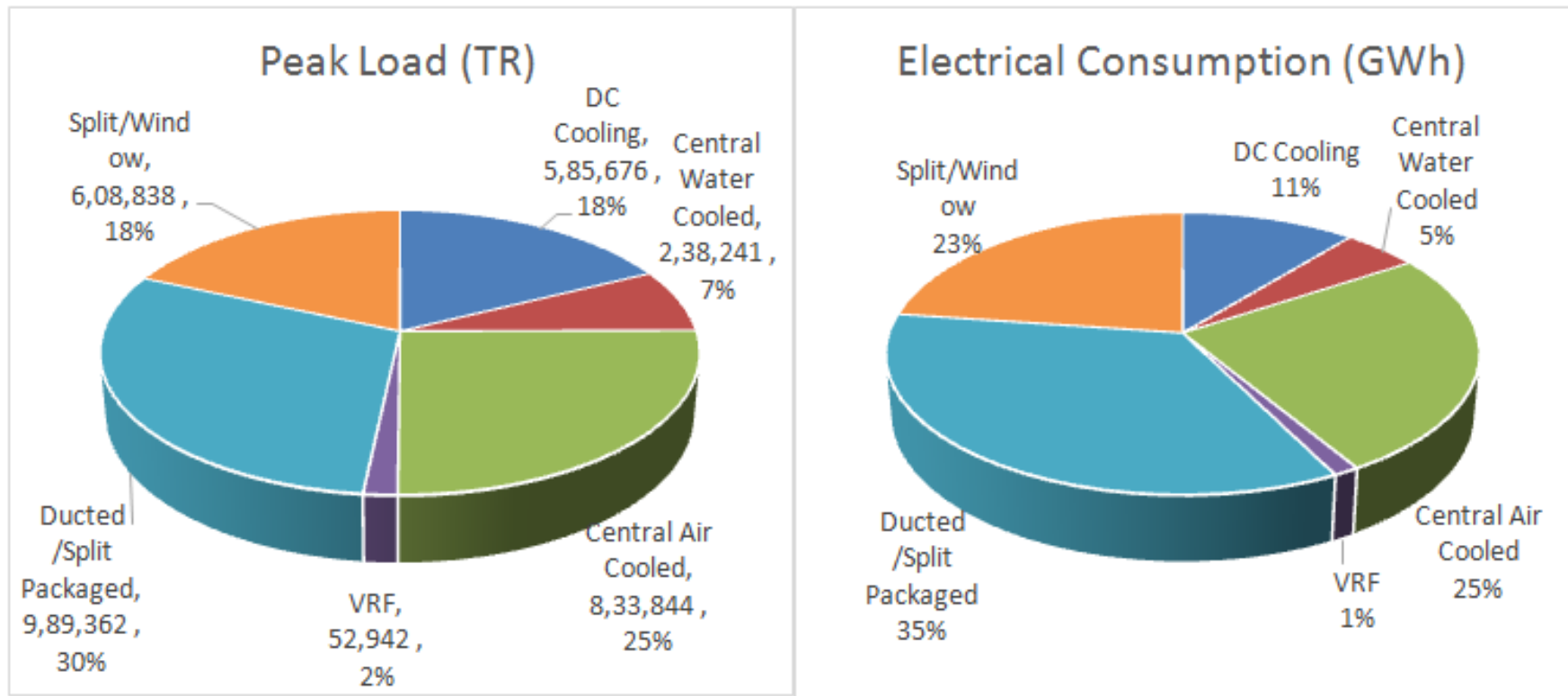


Figure 4: Peak cooling loads and corresponding annual electrical demands



# CO2 and District Cooling

# CO2 and District Cooling

> Estimated  
CO2 savings  
by district  
cooling in  
2016

2,119 GWh/annum

- Current electricity used by District Cooling (@0.92 kW/TR)

3,479 GWh/annum

- Electricity required if cooling was provided by average mix of other cooling technologies (@1.51 kW/TR)

576,000 tonnes of CO<sub>2e</sub> per annum

- CO<sub>2</sub> emissions saved (@0.424 kgCO<sub>2e</sub>/kWh)



# CO2 and District Cooling



> Estimated  
CO2 savings  
by district  
cooling in  
2021

18 % 2015 market penetration

- Cooling Market Share and Efficiency Comparisons report

28 % 2021 target market penetration

- District cooling programme target

18% market growth forecast 2016 to 2021

- <http://www.thenational.ae/business/energy/uae-district-cooling-sector-to-grow-by-18-in-five-years-says-emicool>

751,000 additional tonnes of CO<sub>2e</sub> per annum

- CO<sub>2</sub> emissions saved (@0.424 kgCO<sub>2e</sub>/kWh)

## > Contribution to CAS targets

The 750.000 tonnes per annum of CO<sub>2e</sub> saved by achieving the district cooling penetration target represent 14.5% of the power sector target in CAS

# CO2 and District Cooling



## Clean Development Mechanism

Dubai Carbon Centre of Excellence has developed a methodology that has recently been approved by the UNFCCC that enables registered programmes to earn Certified Emission Reductions (CER) per each tonne of CO2 saved and trade them under the Clean Development Mechanism of the Kyoto Protocol



**BE THE CHANGE  
YOU WANNA SEE IN  
THE WORLD**



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