



**Dubai Demand Side
Management Strategy
2020 Annual Report**





H.H Sheikh Khalifa bin Zayed Al Nahyan
President of the United Arab Emirates



HH Sheikh Mohammed bin Rashid Al Maktoum

Vice President and Prime Minister of
the United Arab Emirates and Ruler of Dubai

المجلس الأعلى للطاقة Supreme Council of Energy



ABOUT THE DUBAI SUPREME COUNCIL OF ENERGY

The Dubai Supreme Council of Energy was formed in August 2009 under Law 19 of 2009, issued by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, and Ruler of Dubai.

His Highness Sheikh Ahmed bin Saeed Al Maktoum was appointed Chairman for the Council, His Excellency Saeed Mohammed Al Tayer as Vice Chairman, and His Excellency Ahmad Al Muhairbi as Secretary General.

The Council consists of the following members: the Director General of the Department of Petroleum Affairs, the President and Chief Executive Officer of DUBAL Holding, the Chief Executive Officer of Emirates National Oil Company and a single representative from the Dubai Supply Authority, Dubai Petroleum Establishment, Dubai Municipality, Dubai Nuclear Energy Committee and Roads and Transport Authority.

The Council has an Advisory Committee from competent and specialised workforce.

The Governing body seeks to ensure that the Emirate's growing economy will have sustainable energy while preserving the environment. The Authority is developing alternative and renewable energy sources for the Emirate, while increasing energy efficiency to reduce demand.

Under the visionary guidance of His Highness Sheikh Mohammed bin Rashid Al Maktoum, the Dubai Integrated Energy Strategy 2030 was developed in 2010 and deployed in 2011 to set the strategic direction of Dubai towards securing sustainable supply of energy and enhancing demand efficiency (for electricity, water and transportation fuel).

TABLE OF CONTENTS

- 1. **Executive Summary** _____ (7)
- 2. **Objectives and Scope of this Report** _____ (9)
- 3. **Context and Overview of the Demand Side Management (DSM) Strategy** _____ (11)
 - 3.1 Policy Context
 - 3.2 Demand Side Management Strategy and Targets
 - 3.3 Institutional Framework
- 4. **DSM Strategy Achievements** _____ (18)
 - 4.1 Overall Performance in 2020
 - 4.2 Carbon Abatement and Cost Savings
 - 4.3 Overview of Main DSM Achievements to Date

1

EXECUTIVE SUMMARY



This report, in its seventh year of publication, presents the progress and performance of the Dubai Demand Side Management (DSM) Strategy 2030 for 2020.

The DSM strategy aims to deliver 30% annual savings in electricity and water by 2030 compared to the business as usual consumption.

By the end of 2020, the DSM Strategy implementation resulted in 5.4 TWh of annual electricity savings and 9.9 billion imperial gallons of annual water savings, corresponding to 11.8% and 7.9% of the baseline consumption, respectively. The achieved electricity savings surpass the 5.2 TWh target for electricity by 4%, while the achieved water savings exceed the annual target of 8.1 billion imperial gallons by 21%.

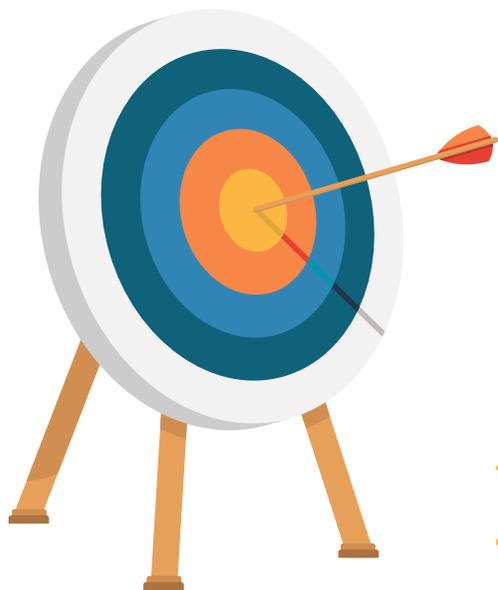
As most programmes are rapidly expanding, the results show a substantial growth from the savings achieved in 2019, an increase of 21% for electricity and 45% for water.

Avoided cost in generation capacity and natural gas consumption from DSM electricity and water savings since the initiation of the strategy in 2011, are estimated at around AED 7.1 billion.

These important achievements are a combination of efforts from all programme owners, who are committed to annual targets and a roadmap that extends to 2030, and for whom the DSM Strategy is increasingly becoming part of their core activities.

The coming years will continue to see a steep increase in saving targets as well as a broadened scope for DSM with newly introduced programmes becoming more active namely Consumer Behaviour, Efficient Mobility & Smart Charging, Fuel & Engine Efficiency to accelerate Dubai's transformation into one of the smartest cities in the world.

The DSM Strategy plays an important role in the sustainable growth of Dubai. It is generating real savings, improving awareness, building capabilities, and developing the energy efficiency market. The ongoing support received from the Dubai leadership and institutions gives confidence that the ambitious goals of the DSM Strategy will be achieved.



30%
by
2030

المجلس الأعلى للطاقة
Supreme Council of Energy



2

OBJECTIVES AND SCOPE OF THIS REPORT



The objective of this report is to present the progress and performance of the Dubai Demand Side Management (DSM) Strategy 2030: a strategy spearheaded by the Dubai Supreme Council of Energy (DSCE), implemented by key government entities in Dubai, and supported by a dedicated Program Management Office.

The report comprises a description of the Updated DSM Strategy (issued in January 2020), and a presentation of the achievements in 2020. It highlights achievements in electricity and water savings attained from implementing DSM programmes in comparison with pre-set target savings, along with other performance indicators, such as changes in per capita consumption and monetary benefits of the strategy.

Data presented in this document are the result of a reporting system that the DSCE maintains in collaboration with the DSM programme owners: Dubai Electricity and Water Authority, Dubai Municipality, Roads and Transport Authority, the Regulatory and Supervisory Bureau for Electricity and Water in Dubai, Etihad Energy Services, Emirates Authority for Standardization and Metrology (ESMA) and Dubai Free Zone Council (DFZC).

Note that the results reported are based on the most recent data available at the date of report publication. As DSM measurement and verification is a continuous improvement process, annual reports may include changes in reported historical figures year to year.



3

CONTEXT AND OVERVIEW OF THE DSM STRATEGY



3.1 POLICY CONTEXT

The Demand Side Management (DSM) Strategy is part of the Dubai Integrated Energy Strategy (DIES) 2030, whose main goals are to secure Dubai’s uninterrupted energy supply and moderate its growing electricity and water demand (see exhibit 1).

Optimising energy demand is a strategic priority for Dubai to reduce the need for next generation capacity and free up resources for strategic investments that promote economic growth. At the same time, DSM supports the growth of a green economy and the creation of green jobs, aligns with smart city objectives through the employment of smart technology, and contributes to a safer environment by reducing carbon emissions.

Building on the success of DSM Strategy implementation since 2013, the Dubai Supreme Council of Energy (DSCE), in collaboration with relevant stakeholders, refreshed the strategy in 2019 to ensure new developments in Dubai’s social and economic landscapes are reflected and to address the need for evolving DSM measures and programmes. In fact, the Updated DSM Strategy aligns with the Dubai 50-year Charter and Dubai’s Eight Principles of Governance announced by His Highness Sheikh Mohammed bin Rashid al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, and supports the Dubai Integrated Water Resources Management Strategy 2030, the Dubai Green Mobility Initiative as well as well other key national and local strategies and policies.

The Updated DSM Strategy was officially announced in January 2020 by H.H. Sheikh Ahmed bin Saeed Al Maktoum, Chairman of DSCE through “Directive No. 1 of 2020 on the Updated Dubai Demand Side Management (DSM) Strategy 2030” (see exhibit 2). The implementation period for the Updated Strategy is from 2020 to 2030.

CONTEXT AND OVERVIEW OF THE DSM STRATEGY



Exhibit 1: Demand Side Management Strategy as part of the Dubai Integrated Energy Strategy 2030



Exhibit 2: DSCE Directive No.1 of 2020 on the Updated DSM Strategy 2030



3.2 DEMAND SIDE MANAGEMENT STRATEGY AND TARGETS

DSM Strategy

The Updated DSM Strategy 2030 reinforces Dubai’s goal of becoming a leader and role model in energy and water efficiency and comprises eleven programmes that address different aspects of electricity and water consumption in Dubai. Programmes are supported by seven implementation mechanisms, to stay on track through policies and regulations, data and measurement and verification, government support & leadership, boost programs through communication & engagement, and financing, and accelerate Dubai’s translation into a smart city (see exhibit 3 and 4).



Exhibit 3: Architecture of the Updated Dubai Demand Side Management Strategy

CONTEXT AND OVERVIEW OF THE DSM STRATEGY



Programme	Scope
1 Green Building Regulations	Increase energy and water efficiency in new buildings through building regulations and compliance (positioning Dubai to transition towards NZEB in the long-term)
2 Building Retrofits	Retrofit existing building stock & infrastructure with electricity & water efficiency measures
3 Outdoor Lighting	Adopt high efficiency lighting in public spaces in Dubai
4 Efficient Cooling	Promote efficient cooling technology use in Dubai buildings
5 ESMA Standards & Labels	Drive adoption and compliance with Minimum Energy Performance Standards (MEPS) and labels for airconditioners (ACs), home appliances and industry equipment in Dubai
6 Consumer Behaviour	Engage main user groups (residential and commercial) in electricity and water conservation through the promotion of smart devices and appliances delivered through new business models in Dubai
7 Shams Dubai	Promote use of building-level solar energy systems across Dubai building stock
8 Tariffs	Adjust tariff structure to be cost reflective, promote energy efficiency and give the right signal to reduce consumption
9 Recycled & Ground Water Demand Management	Promote recycled and ground water management based on network expansion and use of recycled water in line with the Integrated Water Resource Management Strategy (IWRMS)
10 Efficient Mobility and Smart Charging	Encourage the uptake of efficient mobility and smart charging in Dubai
11 Fuel & Engine Efficiency	Promote efficiency and demand abatement of transportation (fossil) fuels in Dubai

Exhibit 4.A: Scope of the Dubai Demand Side Management Strategy programmes

Implementation Mechanism	Scope
1 Policies and Regulations	Enforce policies and regulations to drive the implementation of the updated DSM Strategy
2 Data and M&V	Ensure proper measurement, evaluation and monitoring of DSM savings to assess performance against targets. Consider the implementation of verification element
3 Government Support and Leadership	Ensure that Government entities lead-by-example the implementation of the updated DSM Strategy
4 Communication and Engagement	Develop and execute general and targeted information campaigns as well as education, home reporting and labelling schemes to change consumers' behaviour
5 Financing	Develop financing mechanisms that support the implementation of DSM initiatives in Dubai
6 DEWA Collaboration	Leverage DEWA's activities in developing Smart Grid capabilities, consumer analytics, sustainable consumer behaviour and technology research
7 Technologies and Innovation	Introduce and localize new efficient technologies and conduct key studies for DSM and enable DSCE to play a leadership role in supporting Dubai overall sustainability and smart cities strategy

Exhibit 4. B. Dubai Demand Side Management Strategy Implementation Mechanisms



DSM Targets

The Government of Dubai remains committed to achieving ambitious electricity and water savings by implementing the 11 DSM programmes. Based on the Updated Strategy, Dubai targets overall electricity savings of about 19.2 TWh and water savings of 46.3 billion imperial gallons, which correspond to 30% savings versus business as usual by 2030 (see exhibit 5).

THE DSM STRATEGY TARGETS
30% SAVINGS BY 2030
VS. BUSINESS AS USUAL CONSUMPTION




CONTEXT AND OVERVIEW OF THE DSM STRATEGY

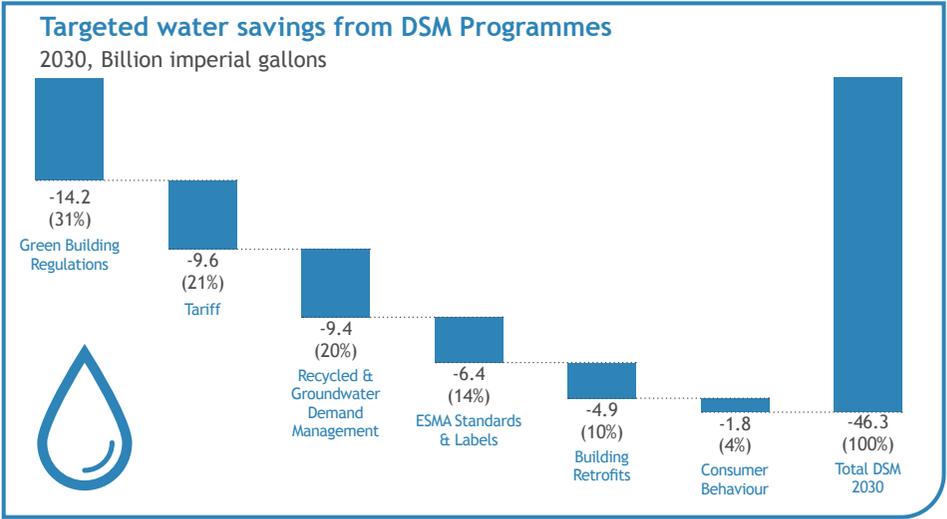
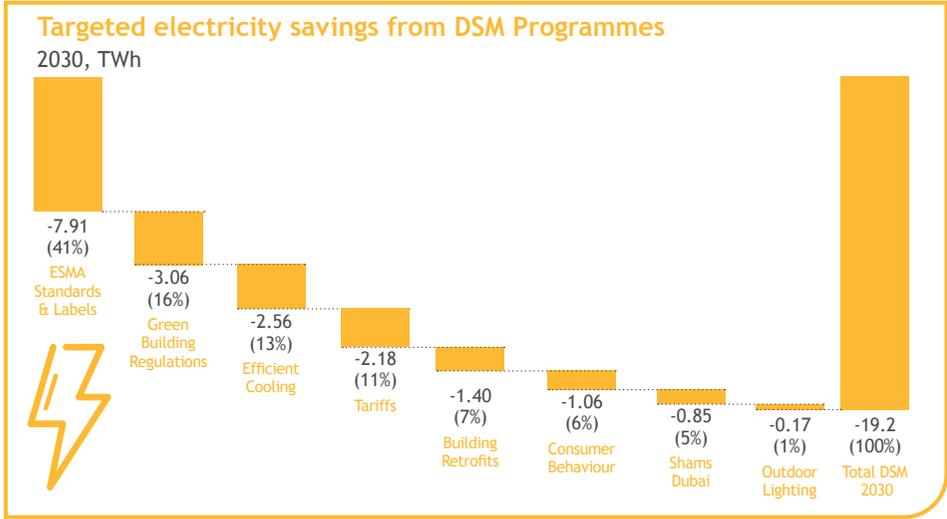


Exhibit 5: Electricity and water saving targets of the Updated Dubai Demand Side Management Strategy 2030



3.3 INSTITUTIONAL FRAMEWORK

CONTEXT AND OVERVIEW OF THE DSM STRATEGY



Exhibit 6: Governance structure of the Dubai Demand Side Management Strategy

The DSM Strategy is managed by the DSCE, the policymaking entity for Dubai's energy sector. The DSCE is chaired by His Highness Sheikh Ahmed bin Saeed Al Maktoum and comprises top executives from key Dubai Government institutions, namely: Dubai Electricity and Water Authority (DEWA), Roads and Transport Authority (RTA), Dubai Municipality (DM), Emirates Global Aluminium (EGA), Emirates National Oil Company (ENOC), Dubai Supply Authority (DUSUP), Dubai Petroleum Affairs, Dubai Petroleum Establishment (DPE), and Dubai Nuclear Energy Committee.

The DSM Executive Committee, chaired by the DSCE and comprising senior representatives from all programme owner entities, provides direction and ensures collaboration between key DSM related entities. On the date of publication of this report, members of the DSM Executive Committee are:

HE Ahmad Al Muhairbi
Secretary General, DSCE
Chairman

Faisal Rashid
DSM Senior Director, DSCE
Member

Faisal Al Raisi
COO & Acting CEO,
Etihad Energy Services
Member

Joyce Honeine
Acting Director,
DSM Programme Management
Office (previously TAQATI)
Member

Dr. Yousef Al Saadi
Director, ESMA
Member

Saeed Safar
Head of Irrigation Projects, DM
Member

Ebtesam Al Ameri
Permit Section Manager, DM
Member

Graeme Sims
Executive Director,
Regulatory & Supervisory Bureau
for Electricity and Water in Dubai
Member

Mohammed Al Shamsi
Chief Officer, Climate Change &
Sustainability, DEWA
Member

Sultan Al Zaabi
Sr. Manager, Demand Mangement,
DEWA
Member

Jason Pratt
Director, Health Safety and
Environment, DP World
Member (on behalf of Dubai Free Zones Council)

Bassel Saad
Director, Roads and Facilities
Maintenance, RTA
Member

Samer Khoudeir
Chief Sales and Marketing Officer,
Empower
Member

Alia Busamra
Manager, Group Sustainability,
ENOC
Member

Luka Lugaric
Project Manager, DSCE
Secretary

The DSCE DSM Directorate houses the Program Management Office for the DSM Strategy, established to manage the implementation of the DSM Strategy and to provide implementation support to Program Owners.

Programme Owner or Owners, is/are assigned for each DSM programme, and is/are responsible for executing the programme and managing its day-to-day operations. The entities are selected based on mandate and reach, and focused on delivering results and addressing challenges specific to the programme (*see exhibit 6*). In addition, Support entities are also assigned to programmes as needed.



4

DSM STRATEGY ACHIEVEMENTS



4.1 OVERALL PERFORMANCE IN 2020

Electricity and Water Savings

The Demand Side Management (DSM) Strategy performance continues to produce positive results in 2020. At the end of 2020, DSM programmes have exceeded both electricity and water targets and saved 5.4 TWh of electricity and 9.9 billion imperial gallons (BIG) of water. Compared to business as usual consumption, which is the reference for the 30% by 2030 target, those savings represent 11.8% and 7.9% of the total baseline consumption for electricity and water, respectively (see exhibit 7).

IN 2020



Savings of
5.4 Billion Kilowatt Hours (TWh)



Reduction of
11.8% vs. Business as usual



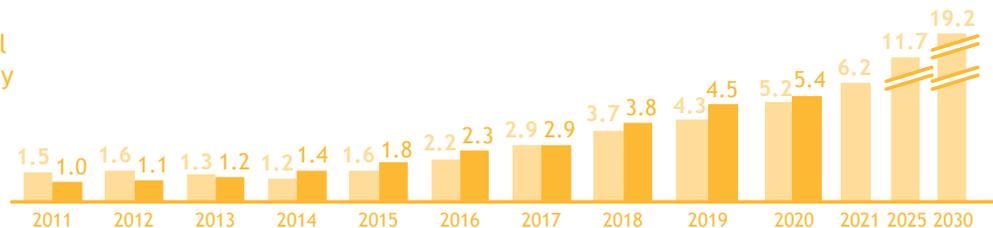
Savings of
9.9 Billion Imperial Gallons (BIG)



Reduction of
7.9% vs. Business as usual



A. Annual Electricity Savings (TWh)



Savings vs. BAU

+9.7%

+11.8%

Targets Actual



B. Annual Water Savings (Billion imperial gallons)



Savings vs. BAU

+5.6%

+7.9%

Targets Actual

Exhibit 7: Actual annual savings achieved from the implementation of the Dubai Demand Side Management Strategy programmes, versus target savings (A. Annual electricity savings B. Annual water savings)



Contribution of DSM Programmes to Savings

In terms of programme contribution to savings, we continue to witness an increasing contribution from individual DSM programmes, as compared to the 2011 picture, where all savings were attributed to tariffs (see exhibit 8).

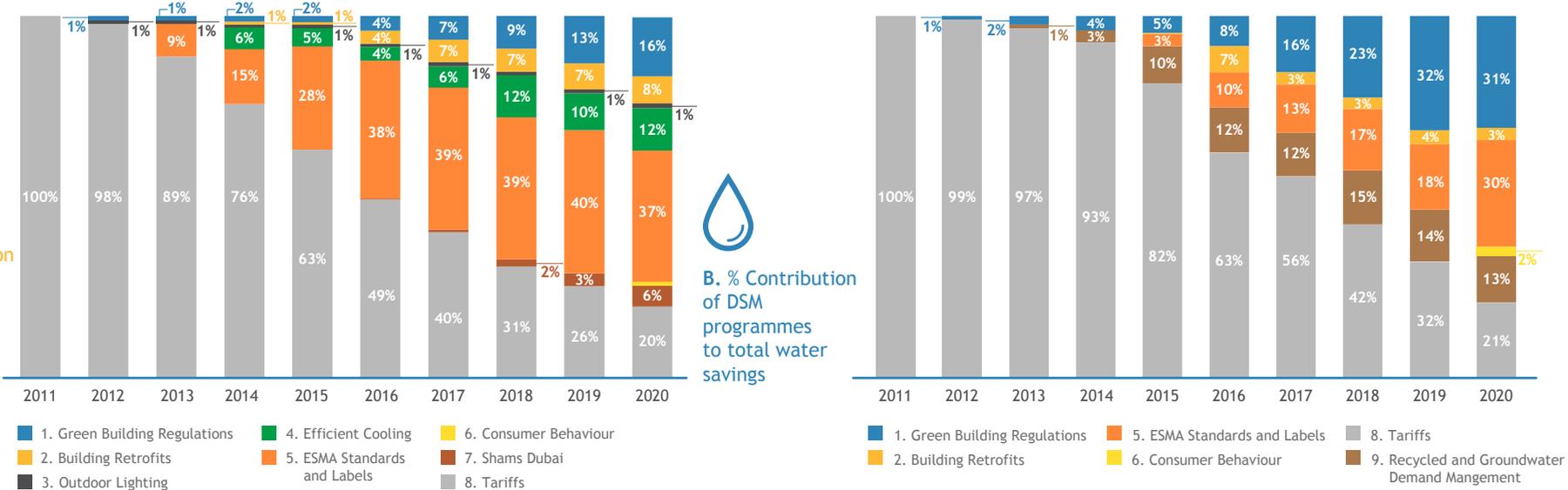


Exhibit 8: Percentage contribution of programmes to the total Dubai Demand Side Management Strategy savings, for years 2011 to 2020 (A. Electricity savings and B. Water savings)

DSM STRATEGY ACHIEVEMENTS IN 2020



A. % Contribution of DSM programmes to total electricity savings



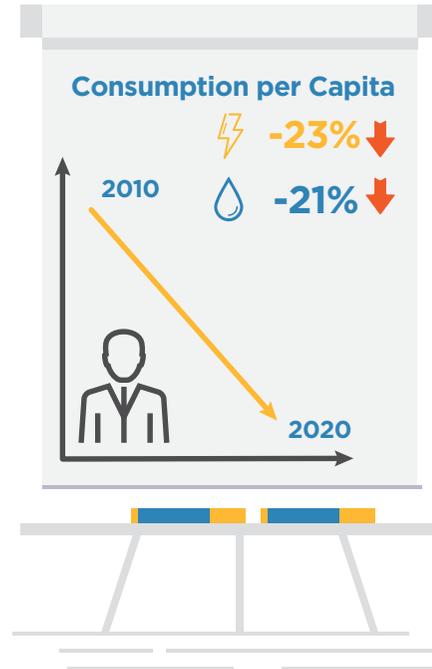
B. % Contribution of DSM programmes to total water savings

Reduction in Consumption per Capita

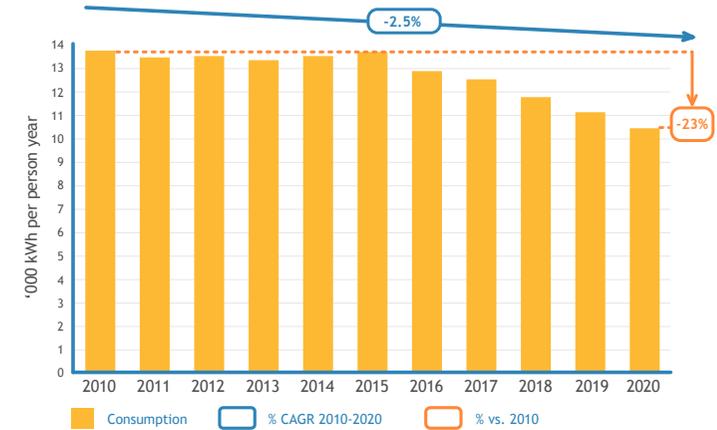
Unitary consumption confirms the positive impact of the DSM programmes, as per capita consumption for both electricity and water continues to decrease in line with previous years. Looking at long term trends, since the inception of the DSM Strategy, consumption per capita has decreased by an annual average of 2.5% for electricity and 2.3% for water (see exhibit 9), a total reduction of 23% for electricity and 21% for water vs. 2010 consumption.



1. Annual population used in the calculation is an estimate of the average Dubai population taking into account residents of Dubai, and a weighted contribution from people working in Dubai but residing in neighbouring emirates and from tourists.
2. Total consumption used is the consumption at end-user level and excludes power stations and desalination auxiliaries, as well as losses in the transmission and distribution networks.



A. Overall consumption per person - Electricity ('000 kWh, 2010-2020)



B. Overall consumption per person - Water ('000 IG, 2010-2020)

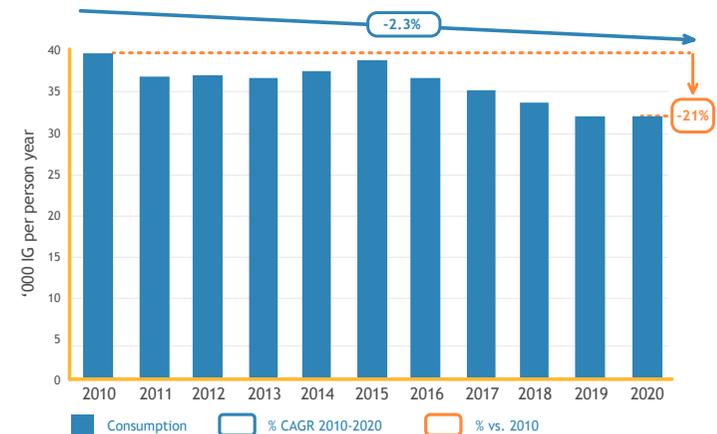


Exhibit 9: Trends of per capita consumption in Dubai, showing the compounded annual growth rate (CAGR) and total decrease in consumption from 2010 to 2020 (A. Electricity B. Water)





A. Annual Electricity Savings by DSM programme

DSM Programme	2020 Savings (GWh)	2020 Target (GWh)	2020 Savings vs. Target	2019 Savings (GWh)	2020 vs 2019 Savings (%)	Notes on the results
 Green Building Regulations	889	484	+84%	592	+50%	Savings based on commissioned green building data received by DM, Trakhees, DSO, Dubai South and DDA
 Building Retrofits	431	347	+24%	320	+35%	Savings result from steady growth in electricity retrofits executed by Etihad Energy Services (Etihad ES) and accredited energy services companies (ESCOs) in Dubai
 Outdoor Lighting	42	31	+35%	33	+29%	Savings include outdoor lighting installations and retrofits executed by Roads and Transportation Authority (RTA), Dubai Municipality (DM) and selected Free Zone Authorities
 Efficient Cooling	648	420	+54%	458	+42%	Savings based on data received from the five main district cooling operators in Dubai
 Standards and Labels	1,986	2,352	-16%	1,793	+11%	Savings result from enforced efficiency standards by the Emirates Authority for Standardization and Metrology (ESMA), for unit air conditioners (mostly), indoor lighting, refrigerators, washing machines, and water heaters
 Consumer Behaviour	40	213	-81%	N/A	N/A	Savings result from DEWA My Sustainable Living Programme (MSLP)
 Shams Dubai	311	244	+28%	142	+119%	Savings result from connected capacity of 261.9 MW in 2020
 Tariffs	1,076	1,144	-6%	1,145	-6%	Savings based on the price response to the 2011 DEWA tariff review
Grand Total	5,423	5,235	+4%	4,483	+21%	
Total as % of baseline	11.8%			9.7%		

Exhibit 10: A. Actual annual electricity savings by programme of the Dubai Demand Side Management Strategy in 2020, in comparison to 2020 targets and 2019 savings
 Note: Results reported are based on the most recent data and knowledge available; historical results may be altered due to changes in assumptions and/ or new data availability.





B. Annual Water Savings by DSM programme

DSM Programme	2020 Savings (MIG)	2020 Target (MIG)	2020 Savings vs. Target	2019 Savings (MIG)	2020 vs 2019 Savings (%)	Notes on the results
 Green Building Regulations	3,059	1,682	+82%	2,152	+42%	Savings based on commissioned green building data received by DM, Trakhees, DSO, Dubai South and DDA
 Building Retrofits	339	451	-25%	258	+31%	Savings based on water retrofits carried out by Etihad ES and accredited-ESCOs 2020 target not met due to low focus on deep water retrofits in retrofit projects
 Standards and Labels	2,914	1,854	+57%	1,240	+135%	Significant increase in savings result mostly from enforcement of ESMA efficiency standards for water fixtures
 Consumer Behaviour	241	438	-45%	N/A	N/A	Savings result from DEWA My Sustainable Living Programme (MSLP)
 Tariffs	2,051	2,667	-23%	2,183	-6%	Savings based on the price response to the 2011 DEWA tariff review
 Recycled & Groundwater Demand Management	1,292	1,065	+21%	976	+32%	Savings from water efficiency measures applied to the irrigation of public landscapes by Dubai Municipality, use of treated water instead of desalinated water in other applications such as district cooling
Grand Total	9,896	8,157	+21%	6,809	+45%	
Total as % of baseline	7.9%			5.6%		

Exhibit 10: B. Actual annual water savings by programme of the Dubai Demand Side Management Strategy in 2020, in comparison to 2020 targets and 2019 savings

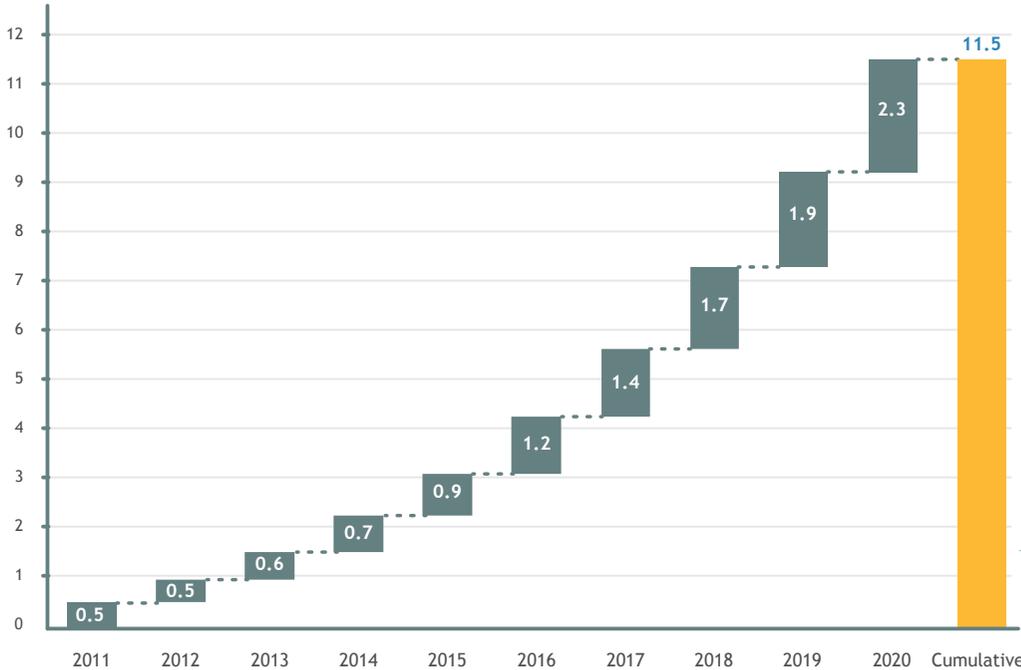
Note: Results reported are based on the most recent data and knowledge available; historical results may be altered due to changes in assumptions and/ or new data availability.



4.2 CARBON ABATEMENT AND COST SAVINGS

Reduction in Carbon Emissions

An important impact of savings on electricity and water consumption is the reduction in carbon dioxide (CO₂) emissions resulting from avoided electricity and water generation, which today relies in large part on non-renewable sources (see exhibit 11).



CO₂
CO₂ Emission Abatement
(million metric tons)

SINCE 2011

Avoided
11.5
Million Metric Tons of CO₂

Equivalent to emissions from
1.2
Million cars taken out of Dubai roads for 2 full years



Exhibit 11: Cumulative carbon dioxide emission abatement from the implementation of the Dubai Demand Side Management Strategy, from 2011 to 2020

DSM STRATEGY ACHIEVEMENTS IN 2020



Monetising Demand Side Management Savings

Savings in electricity and water consumption from the DSM Strategy lead to economic savings in the form of avoided cost and freed up resources that can be diverted to other purposes.

The benefits of the DSM Strategy are determined as part of a Total Resource Cost (TRC) Test, i.e., from the perspective of all participants, including DSM programme owners (with DEWA as both utility and programme owner), implementing entities (developers, ESCOs, district cooling operators), and end users (DEWA customers).

Reduced demand in electricity and water since strategy initiation in 2011 and up to 2020, translate into approximately AED 7.1 billion: AED 1.5 billion of avoided capital investments and AED 5.6 billion of avoided operational costs. This is the equivalent of 5 x 200MW open cycle turbine units and more than 226,000 million standard cubic feet of natural gas.

Since 2011

Saved

7.1 Billion AED in operational costs and capital investments



Equivalent to

226,000 Million Standard Cubic Feet of natural gas
5 x 200 Megawatt open cycle gas turbine units



In addition to its direct benefits, the DSM Strategy brings several indirect benefits to Dubai. This more extended set of advantages includes, environmental conservation, positive impact on residents' health, job creation, reinvestment of saved resources, and higher attractiveness to investors resulting from a more sustainable and efficient city.

With all the valuable environmental, socio-economic, and financial benefits, Dubai Government is strongly committed to addressing any challenges the DSM Strategy may face along the way.

4.3 OVERVIEW OF THE MAIN ACHIEVEMENTS TO DATE

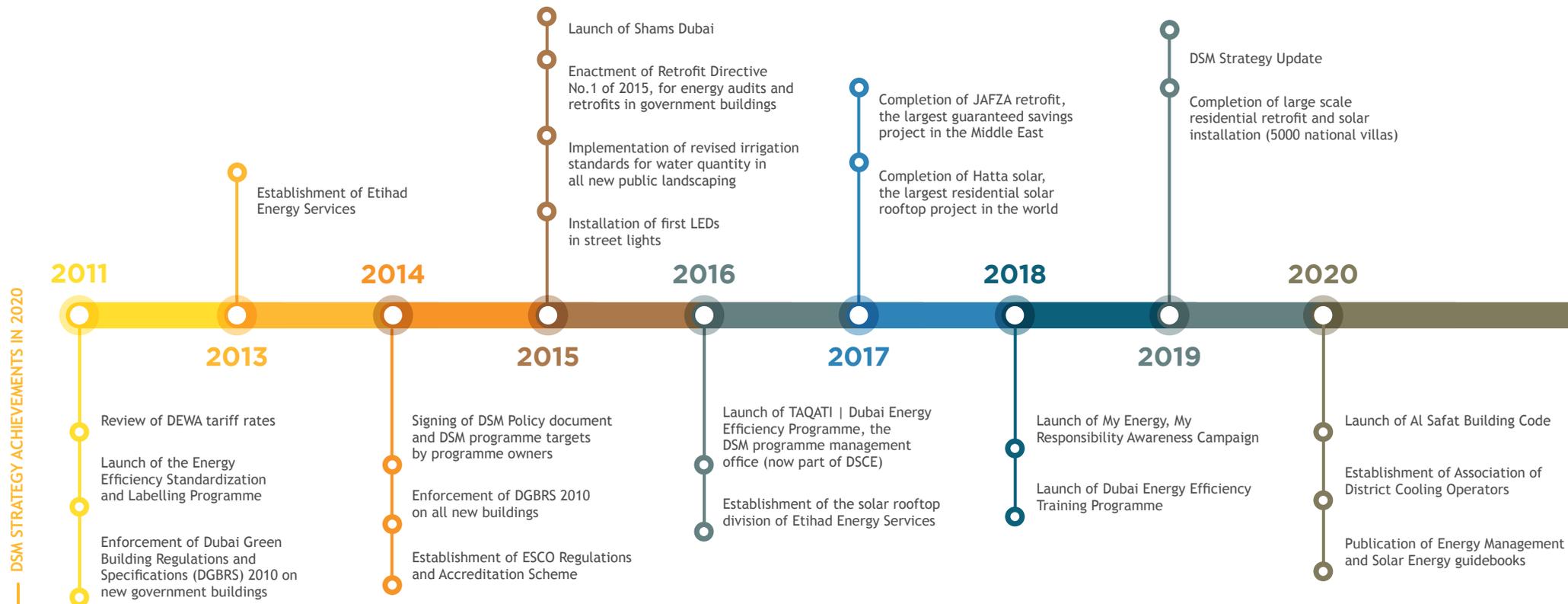


Exhibit 12: Timeline of main Dubai Demand Side Management Strategy achievements, from 2011 to 2020

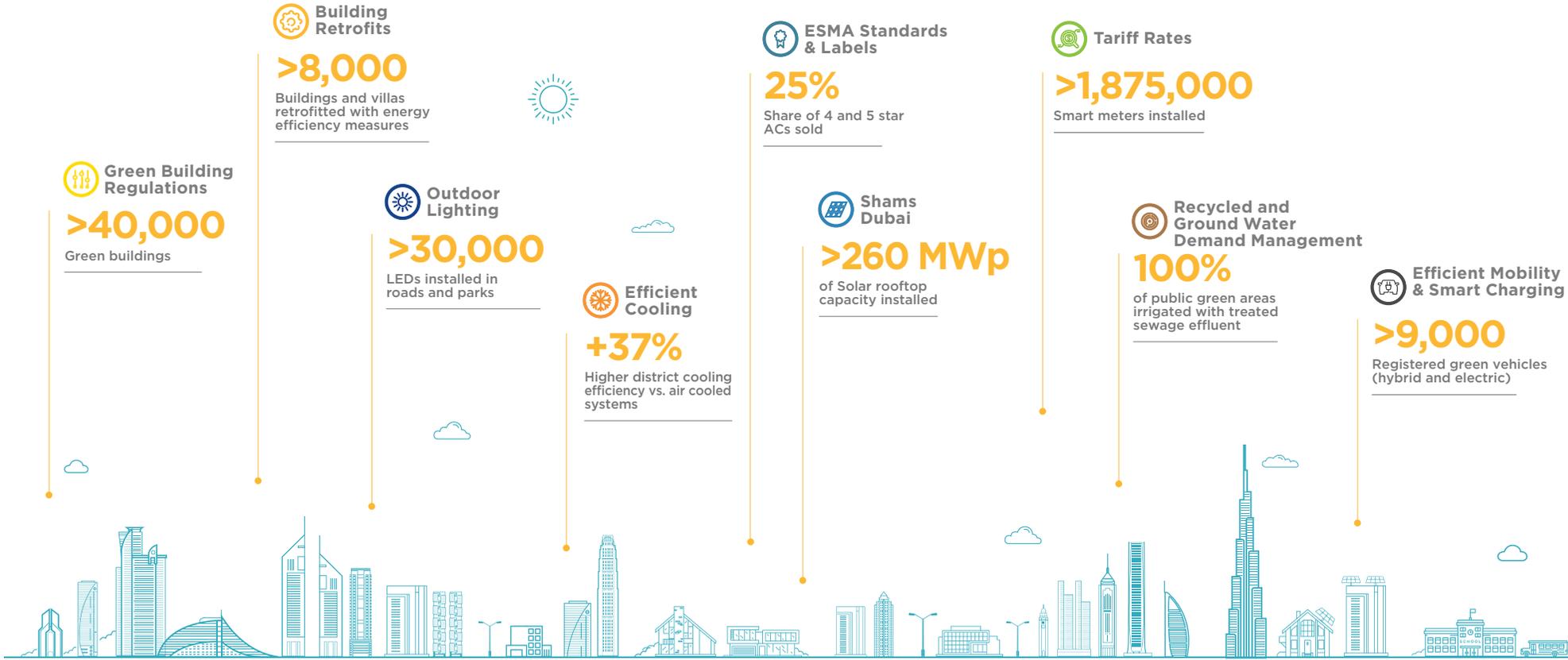


Exhibit 13: Key DSM Programme Achievements to Date



المجلس الأعلى للطاقة
Supreme Council of Energy



Dubai Supreme Council of Energy

P.O. Box. 121555, Dubai,

United Arab Emirates

Tel: +971 4 820 9000

Email: Info1@dubaisce.gov.ae