



# 20<sup>TH</sup> ERRA ANNUAL CONFERENCE

EN ROUTE TO SUSTAINABLE REGULATION  
UNDER NEW MARKET PARADIGMS

09-10 October, 2023  
BUDAPEST, HUNGARY



## Regulatory mandates for the energy transition under new market conditions – Abu Dhabi

[PJ McCloskey](#)

MCC Economics & Finance

[www.mcceconomics.co.uk](http://www.mcceconomics.co.uk)

#ERRAConference2023

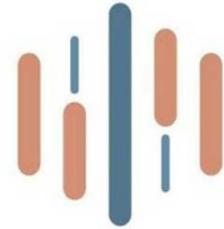
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# Main Stakeholders in Abu Dhabi



دائرة الطاقة  
DEPARTMENT OF ENERGY



**EWEC**  
شركة مياه وكهرباء الإمارات  
Emirates Water & Electricity Co.



وزارة التغير المناخي  
والبيئة  
MINISTRY OF CLIMATE CHANGE  
& ENVIRONMENT



هيئة البيئة - أبوظبي  
Environment Agency - ABU DHABI



ABU DHABI GLOBAL MARKET  
سوق أبوظبي العالمي



سوق أبوظبي للأوراق المالية  
Abu Dhabi Securities Exchange



# Regulatory Roles in Abu Dhabi's Energy Sector



## دائرة الطاقة DEPARTMENT OF ENERGY

Established in 2018, DOE serves as the single regulator, organizing, controlling, and licensing the energy sector.



A government corporation focusing on energy project investment and subsidiaries.



The sole provider of water and electricity, EWEC is mandated to diversify sources for sustainability, encouraging private sector partnerships.



Established to bolster the UAE's global energy presence, Masdar engages in renewable energy projects and partnerships, recently consolidating efforts with TAQA, Mubadala, and ADNOC.



## وزارة الطاقة والبنية التحتية MINISTRY OF ENERGY & INFRASTRUCTURE

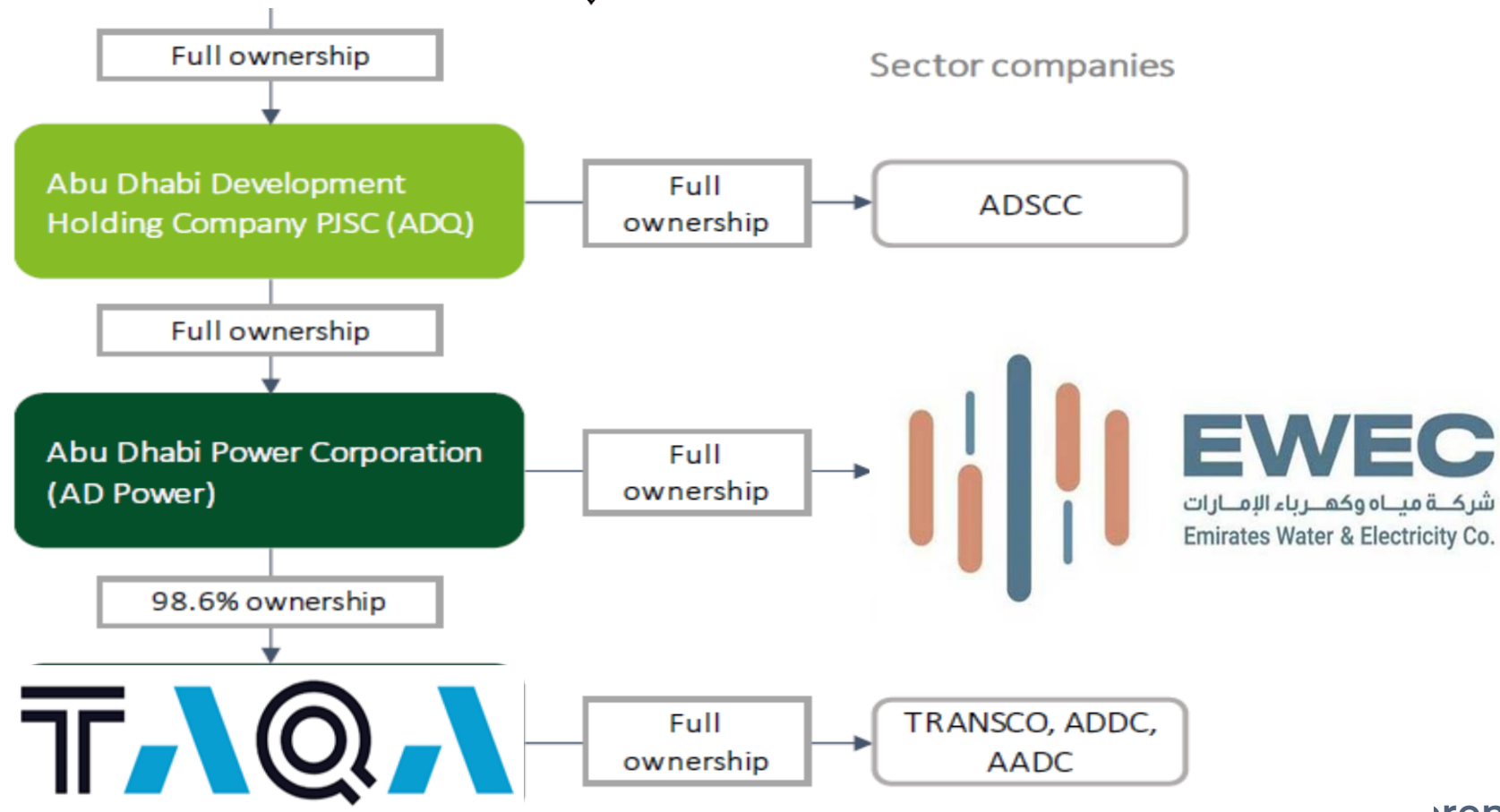
Governed by a comprehensive regulatory framework at both federal and emirate levels, including the Federal Distributed Energy Law (2022) for distributed renewable energy units.



Formed in 2021, it includes Mubadala, ADNOC, and ADQ, aligning with global trends and emphasizing the role of green hydrogen.

# Ownership

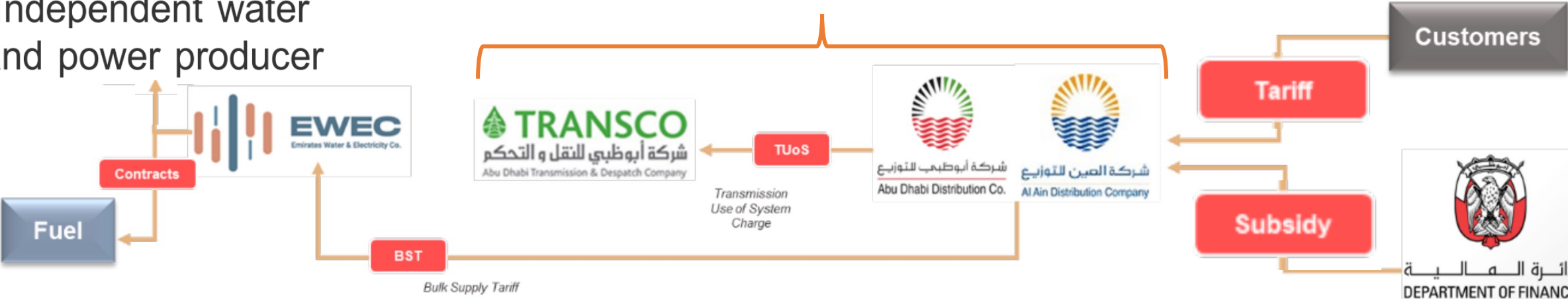
حكومة أبوظبي  
GOVERNMENT OF ABU DHABI



# Follow the money

## T.A.Q.A

Independent water and power producer



# Regulatory Mandates



- **Legal basis for PPA market:** in existence since 1998 ([law #2 1998](#)) in Abu Dhabi. Not much has changed since then. No major change expected. Not much potential for wholesale markets.
- **New climate strategy:** The comprehensive climate strategy aims to reduce emissions across key sectors, with a primary focus on power generation, where nuclear, natural gas, and solar energy significantly contribute to clean energy goals.
- **Estidama project:** The purpose of Estidama is to create a new sustainability framework that will direct the current course of development while allowing adaptation as new understanding evolves.
- **Low carbon Hydrogen Policy and Regulations:** This policy aims to set and clarify the governance and regulatory frameworks that will support sustainable development of Low carbon Hydrogen activities in the Emirate of Abu Dhabi.
- **Regulate trade of petroleum:** DoE has been assigned the responsibility to regulate petroleum product trade in the emirate, involving the development of a comprehensive regulatory framework covering law, collaboration, permitting, inspection, and enforcement, in alignment with federal and local laws
- **Electric vehicles charging Regulations:** The regulatory policy for EV charging infrastructure in the Emirate of Abu Dhabi ('The Policy') sets out the fundamental principles for ownership, installation and management of Electric Vehicle Supply Equipment (EVSE), the electricity supply to EVSE, and pricing mechanism to End Customers.
- **Demand side Management Regulations:** These Regulations form a comprehensive framework for designing, implementing, and evaluating energy and water efficiency initiatives related to demand side management.
- **Building Retrofit programme:** This programme aims to drive significant cost reductions while enhancing system reliability and benefitting the environment, in line with Abu Dhabi and the UAE's vision and strategies for sustainability.

EMIRATES  
الاتحاد العربي  
الإمارات

### Towards a New Energy Era

Ahmed Al Rumaithi: DoE adopts innovative policies to achieve Abu Dhabi's vision for a more sustainable future

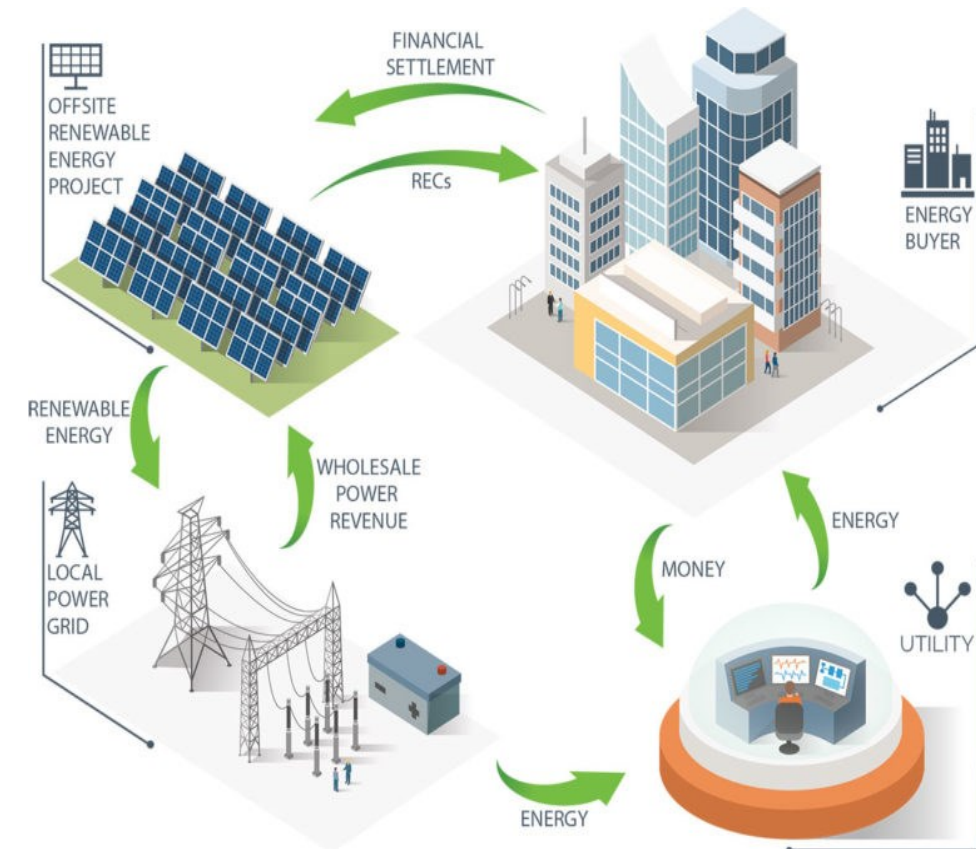
- H<sub>2</sub>**  
A new Hydrogen Policy and Regulatory Framework in Abu Dhabi this year
- EV**  
Electric vehicles are an important means for promoting environmental sustainability and reducing emissions
- Lightbulb**  
Abu Dhabi aims to invest at least **AED80 billion** in the energy sector by 2050, of which **more than two-third** will be coming from clean and renewable energy
- EV with P**  
Standards set for establishing a network of charging stations for electric vehicles in Abu Dhabi in public, private, and home parking
- Power tower**  
In 2021 alone, Abu Dhabi invested **AED18 billion** in the electric power generation sector
- Water drop**  
Some **195 million cubic metres** of recycled water was used for irrigation in 2021
- Lightbulb with plug**  
Raising awareness about electricity distribution network and refurbishing buildings for charging electric vehicles in Abu Dhabi

Instagram, YouTube, Facebook, Twitter, WAMNEWS

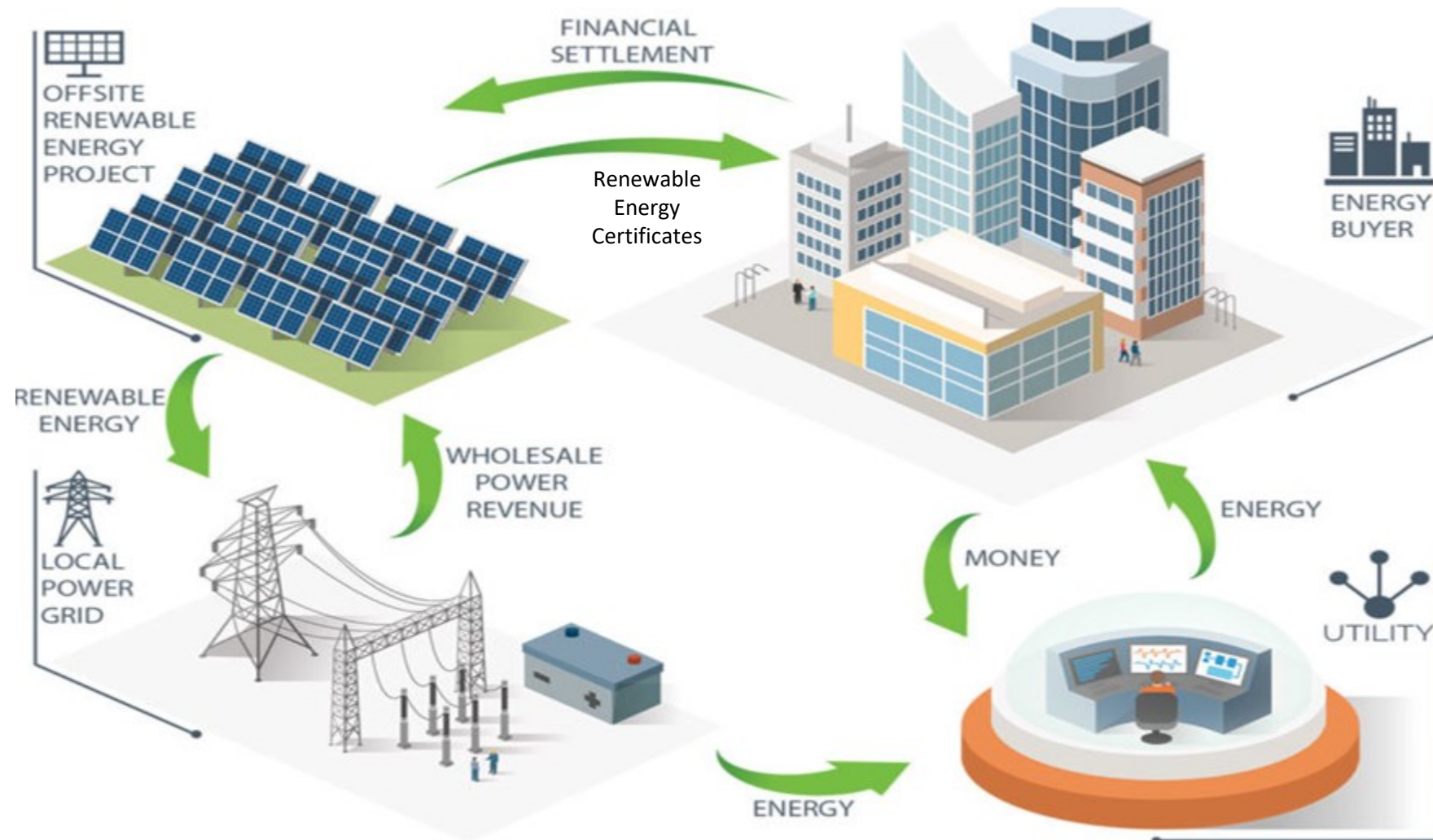


# Regulatory Mandates

- **Clean energy certificates:** Clean Energy Certificates in Abu Dhabi are voluntary, tradeable market-based instruments that signify ownership of the environmental attributes of a specific quantity of renewable energy, facilitating support for sustainability goals. [EWEC administers auctions.](#)
- **Record-Low Tariff for PPA for Al Dhafra solar project:** The 2 GW [Al Dhafra solar project](#) in Abu Dhabi secured a record-low tariff of AED 0.0497 (USD 0.0135) per kWh in a power purchase agreement signed by the [Emirates Water and Electricity Company](#). Led by [TAQA](#) and [Masdar](#), with [EDF SA](#) and [Jinko Power](#), the winning consortium aims for financial closure in Q3 2020 and initial power generation by H1 2022, making it the world's largest solar park with bifacial module technology.
- **PPA Agreement for Barakah Nuclear Energy Plant:** [Barakah One](#), a subsidiary of [ENEC](#) and [KEPCO](#), signed a 60-year PPA with [EWEC](#) (Previously ADWEC) on 01.11.16 for nuclear-generated electricity from the [Barakah plant](#). A key move in supporting UAE's clean energy goals and reducing emissions, the plant aims to meet up to 25% of the country's electricity needs, with construction progress surpassing 72%.
- **Innovative Financing Approaches:** [Shams 1](#) demonstrated innovative financing approaches, showcasing that private banks could be engaged successfully for project financing in the renewable energy sector, thereby contributing to the diversification and resilience of financing structures in the industry.

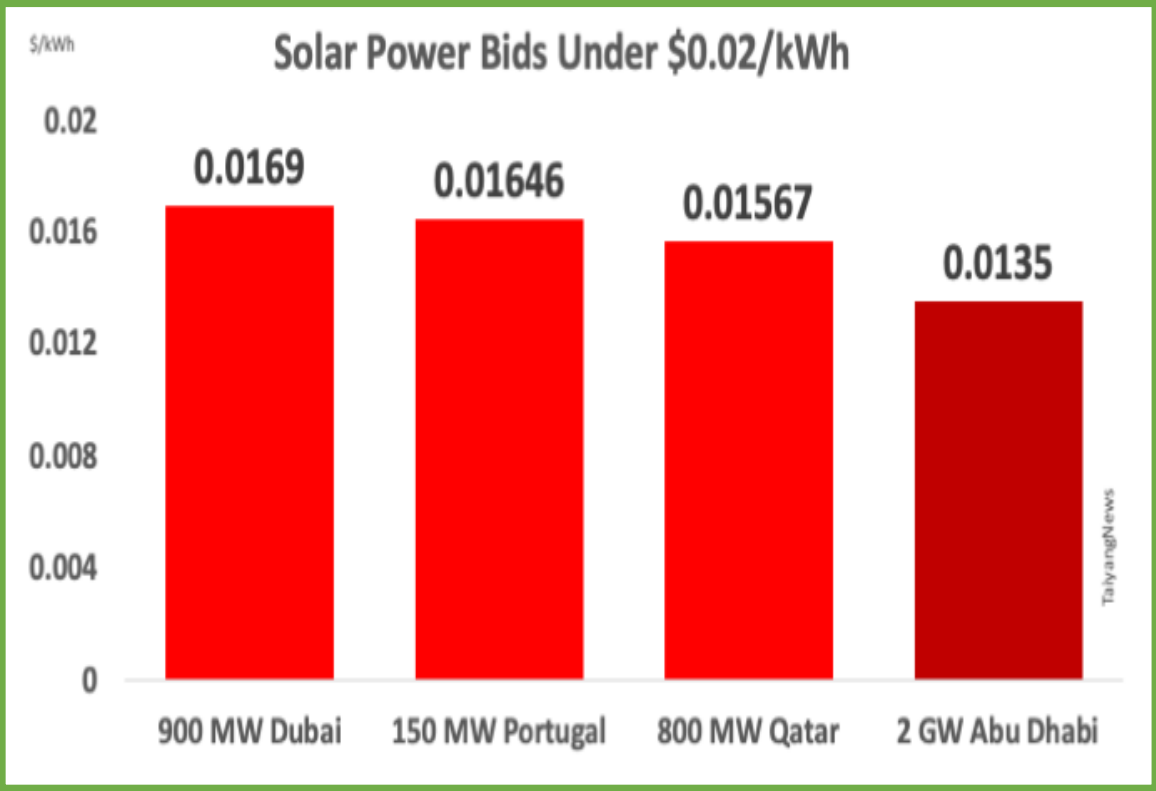


# Regulatory Mandates



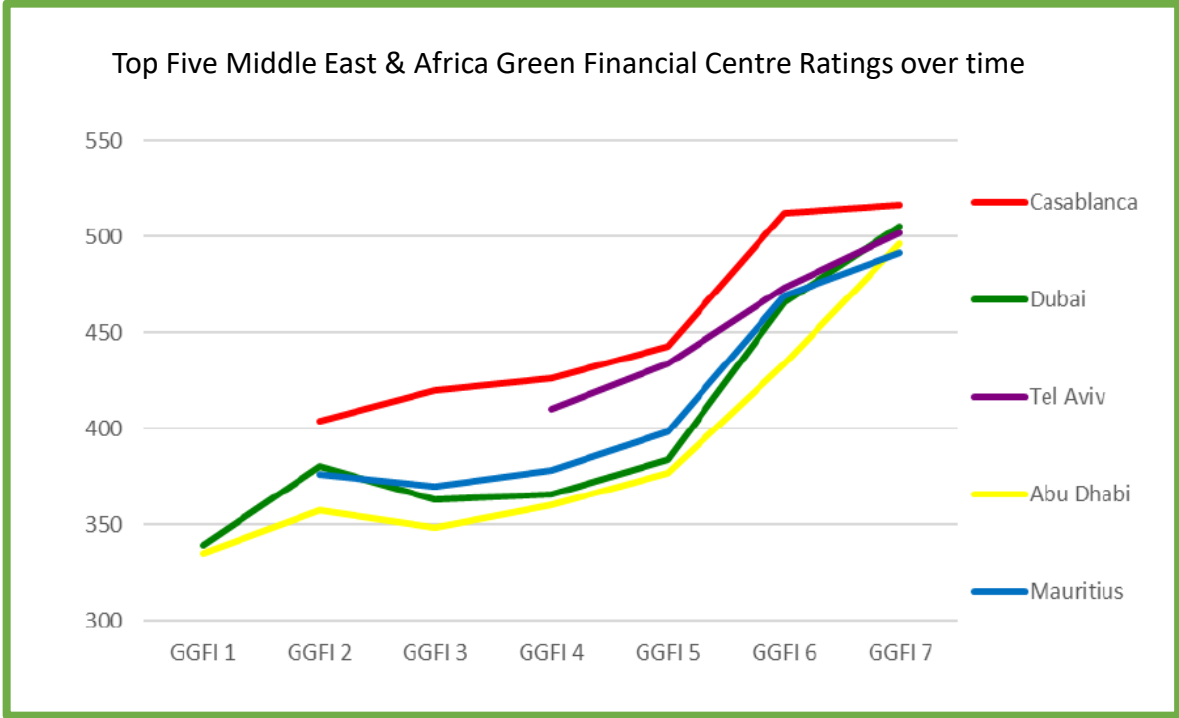


# Schemes

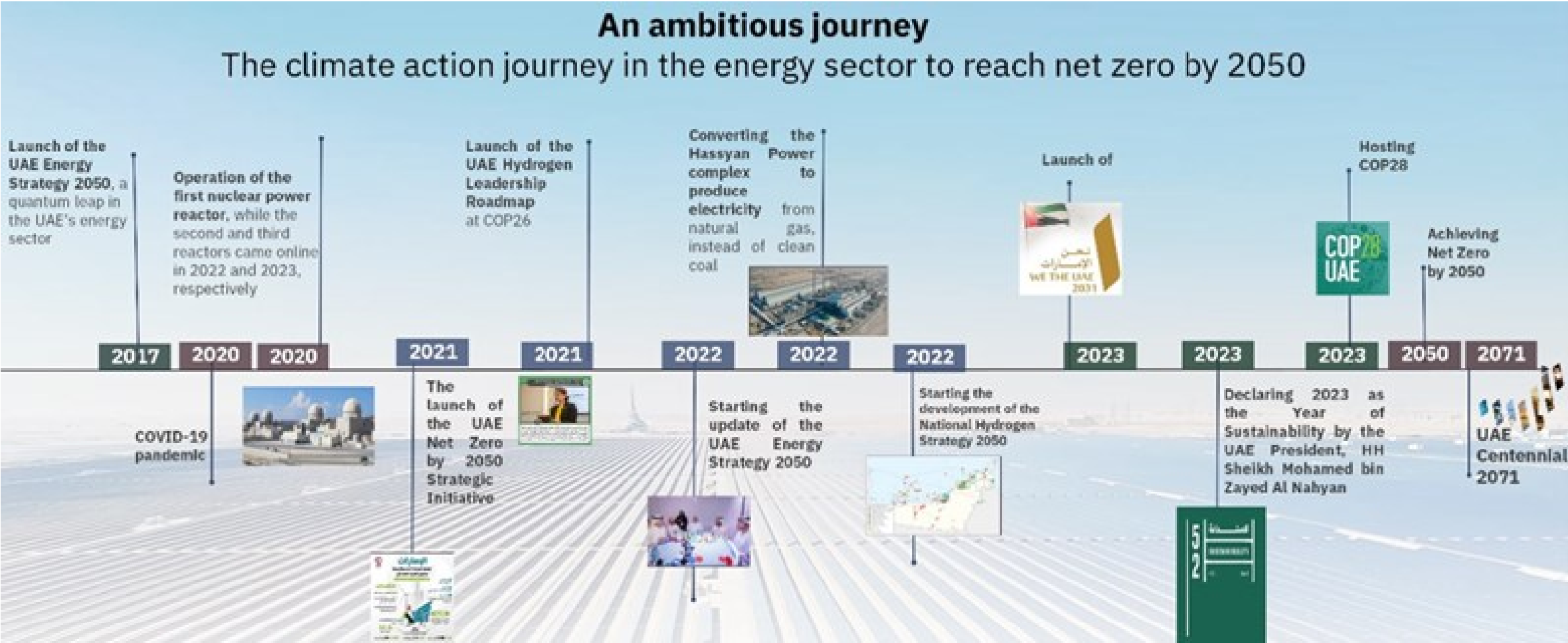


a new world record for utility-scale PV solar production

## Green Financing



# Energy Transition in UAE



# The nature of Transition



# Challenges

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Weather Challenges



Financial Barriers



Technological Barriers



Market-Related Challenges



Policy and Legalisation Challenges



Resource Limitations



Climate Risks



Geopolitical Tensions



# Energy Transition in UAE

## UAE

By 2050

- 40% Increase consumption efficiency of individuals and corporates
- 50% Clean Energy
- 70% Reduction in carbon footprint

## Ras Al Khaimah

By 2040

- 20% Water savings
- 20% Renewable energy
- 30% Energy savings

## Sharjah

By 2040

- 30% Water savings
- 30% Power savings

## Dubai

By 2030

- 25% Renewable energy
- 30% Energy savings
- 30% Water savings

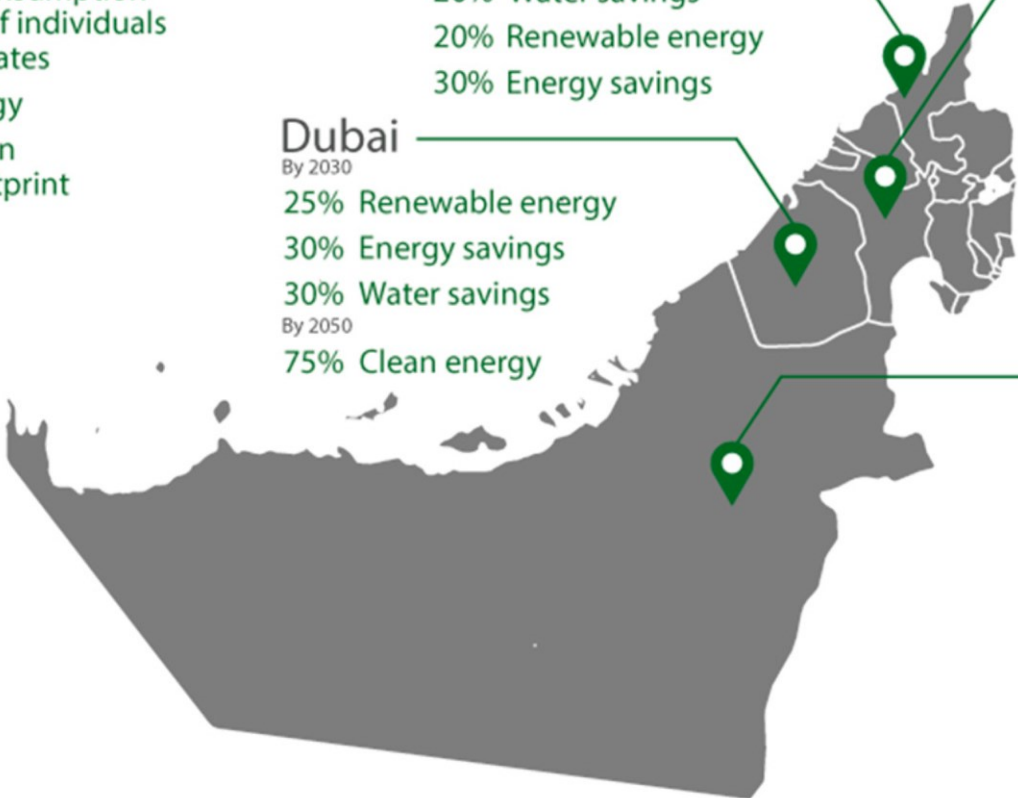
By 2050

- 75% Clean energy

## Abu Dhabi

By 2030

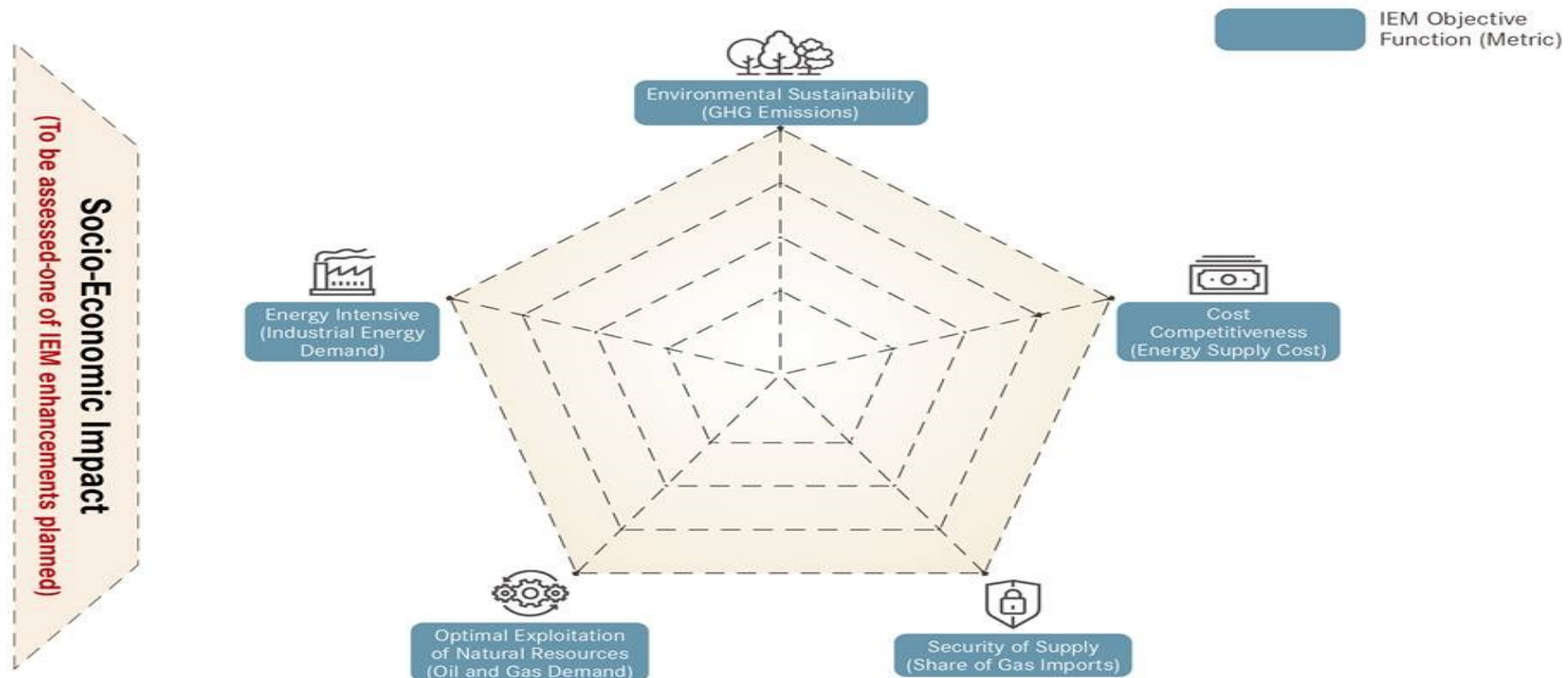
- 15% Waste diversion
- 22% Power savings
- 32% Water savings
- 50% Renewable and clean energy





# Abu Dhabi Integrated Energy Model (IEM)

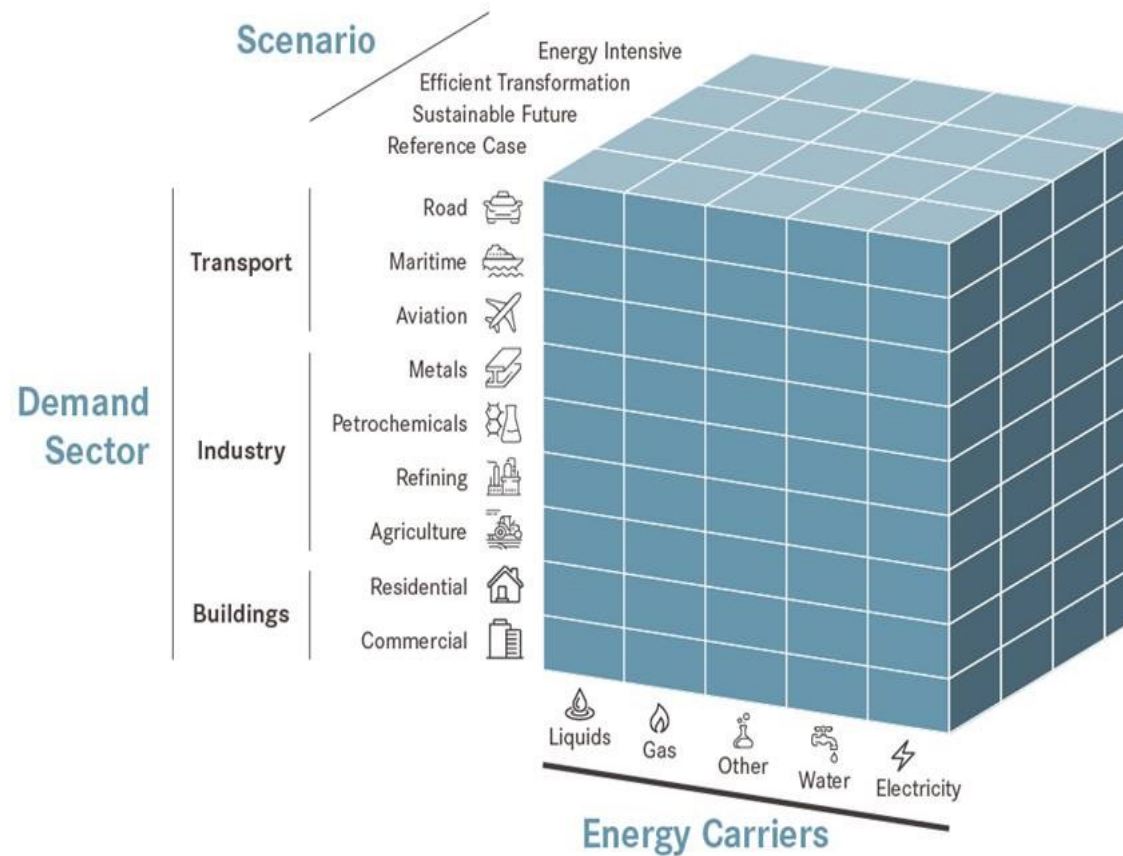
The [Abu Dhabi Integrated Energy Model \(IEM\), or 'Energy Cube,'](#) by the Department of Energy (DOE), is a collaborative platform providing a comprehensive overview of the energy sector. Aligned with the DOE's mandate, the selected objective functions and metrics, illustrated in the Radar chart (Energy Cube 2020), enable a thorough assessment of energy supply and demand dynamics up to 2050, aiding decision-makers in navigating complex trade-offs.



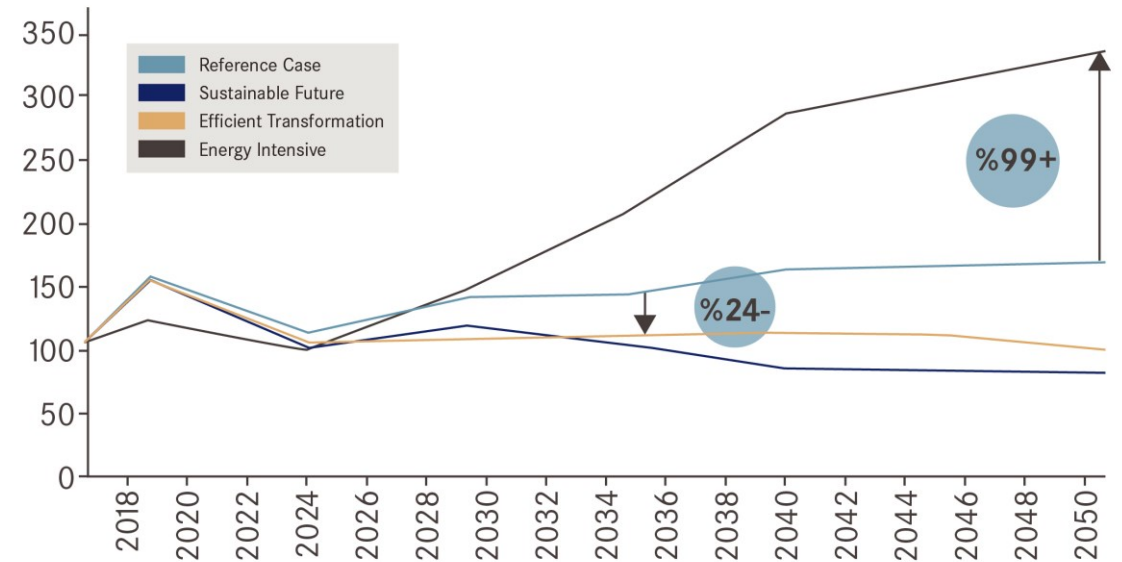
Energy Sector Objective Functions against Energy Cube output metrics

# Abu Dhabi Integrated Energy Model (IEM)

The IEM consists of five distinctive modules with time horizon up to 2050 namely gas, liquids, electricity and water, demand, and output module.



Total energy system cost evolution in each scenario, index to 100(=) 2018)





**THANK YOU  
FOR YOUR ATTENTION!**

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