POLICY

دائـــــرة الـــطـــاقـــة
DEPARTMENT OF ENERGY

CLEAN ENERGY STRATEGIC TARGET 2035 FOR ELECTRICITY PRODUCTION IN ABU DHABI

EFFECTIVE DATE: 19/07/2022

P.O. Box 32800, Abu Dhabi, U.A.E | T+ 971 2 2070777

www.doe.gov.ae

OPEN

Contents

Changes History Sheet

DOC. CHANGE REQUEST NO. & DATE	PAGE NO.	SUMMARY OF CHANGE	NEW EFFECTIVE DATED

1. Foreword

1.1 Context

1.1.1 The Department of Energy ("**DoE**") is established pursuant to Abu Dhabi Law No. (11) of 2018 as a policy maker and regulatory entity for the energy sector in the Emirate of Abu Dhabi (the "**Emirate**"). The DoE's mandate includes enacting policies and regulations and developing strategies to enable an effective energy transition to ensure the Emirate's sustainable growth while protecting consumers and the environment.

1.1.2 The UAE's National Energy Strategy 2050 has a target to increase the contribution of clean energy (primarily through renewables and nuclear sources) to fifty percent (50%) of the installed power capacity mix by 2050.

1.1.3 Through its adoption of the Paris Agreement (international treaty on climate change), the UAE has issued its Second Nationally Determined Contribution, whereby it commits to reduce its greenhouse gas emissions for the year 2030 by twenty-three and a half percent (23.5%), relative to a Business-As-Usual scenario with a designated start year of 2016.

1.1.4 On 7 October 2021, the UAE announced its net zero goal to achieve climate neutrality by 2050 through an ambitious strategic initiative to reduce carbon emissions.

1.1.5 Renewable or clean energy targets are an integral part of the global energy landscape. By the end of 2020, 137 countries had some form of target for electricity generation from renewable sources.

1.2 Objective

1.2.1 This Policy's purpose is to adapt the Emirate's regulatory framework to enable Abu Dhabi to meet the UAE's decarbonization goal. This Strategic Target is an additional criteria to consider in the planning and procurement of production capacity and network reinforcement investments required to meet the Emirate's electricity needs.

1.3 Principles

1.3.1 Establishing a Clean Energy Strategic Target for 2035 for Electricity Production in Abu Dhabi ("Strategic Target 2035") will provide certainty for investments, encouraging further implementation, technology development and innovation to generate energy from all types of clean sources.

1.3.2 The Strategic Target 2035 is defined by a production/output measure as it is considered more rigorous than targets set in capacity terms. Framing targets in output terms helps ensure that the magnitude of the target automatically tracks overall growth in energy demand over time.

1.3.3 The DoE will regularly monitor the clean electricity production in the Emirate to ensure progress against this Strategic Target 2035 is achieved.

1.4 Analysis undertaken

1.4.1 The introduction of solar PV and nuclear in the Emirate systems brings significant challenges. These challenges are based on the continuous requirements to balance demand and supply and the transitioning from a conventional thermal power plants-based electricity system into a system dominated by renewables and nuclear plants. Additionally, the current thermal coupling of the electricity and water sector increases the challenges in the Emirate.

Addressing these challenges will require optimizing the whole integrated electricity and water system, underpinned by the principle of finding least-cost solutions. Additionally, the growing deployment of innovative electricity systems utilizing real-time energy pricing, smart grids, demand response, energy storage, and other emerging technologies, further amplifies the need for ever-finer levels of compatibility across system components.

1.4.2 To respond to these challenges from the perspective of a policy and regulatory framework, the system integration of renewable energy and nuclear has been studied by the DoE, enabling it to develop a robust proposal for establishing the Strategic Target 2035.

1.4.3 The study carried out contemplated different scenarios and performed techno-economic analyses, while accounting for all other technical aspects that could impinge on the outcomes.

The alternative scenarios and sensitivities modelled explored the optimum options that would enable higher contribution of renewables in the future generation mix. Different perspectives taken into consideration include:

(a) On the power supply side: Technologies included Solar “Photovoltaic”, Carbon capture, utilisation, and storage, Battery Energy Storage Solutions “BESS” or low carbon hydrogen.

(b) On the demand side: Smart energy use and efficient exploitation of renewable energy sources, either driven by anticipated deployment of new technologies over the proposed time horizon (distributed generation, smart microgrids) or by specific actions (energy efficiency).

(c) On the gas subsystem side: Gas price sensitivity and gas flexibility, including electricity and water decoupling, take or pay gas contracts terms and gas storage availability.

(d) On the operational side: Land availability and site selection criteria cognizant of standards in security, capacity of the solar power plants and hybrid systems (PV+BESS) and system operability to address consecutive cloudy days.

The techno-economic analysis carried out has identified feasible solutions to meet the requirements below:

(a) The target provides an economically justifiable solution, which would not lead to unwanted overall costs (Economic Assessment).

(b) The target provides feasible short-term dispatch in all the operational conditions (Dispatchability).

(c) The target is feasible from the organizational, operational, and logistic perspective (Feasibility).

(d) The target is compatible with the Transmission System (Power System Simulation compatibility check, including Static and Dynamic Analyses).

1.5 Refrences

This Strategic Target 2035 is established by DoE pursuant to:

- Law No. (2) of 1998 concerning the organisation of the Water and Electricity Sector in the Emirate of Abu Dhabi and its amendments.
- Law No. (11) of 2018 concerning the establishment of the Department of Energy, and in particular:
  - Article 4.1 related to the strategic and implementation of plans for the energy sector in the Emirate.
  - Article 4.4 related to the regulation of the energy sector through development of policies and regulations; and
  - Article 4.7 related with proposed pricing mechanism for energy.
- Law No. (20) of 2018 concerning the establishment of the Emirates Water and Electricity Company (EWEC).

1.6 Revision

Any changes to this document must be initiated through the Document Change Request Form (DoE-QMS-F-05).

Planning & Energy Markets Directorate is responsible for revising this document.

1.7 Distribution

The approved version of this Policy will be distributed to the MDs of the following entities:

- Ministry of Infrastructure and Energy (MOIE)
- Environment Agency - Abu Dhabi (EAD)
- Department of Municipalities and Transport (DMT)
- Abu Dhabi Development Holding Company (ADQ)
- Abu Dhabi National Energy Company (TAQA)
- Emirates Water and Electricity Company (EWEC)
- Abu Dhabi Transmission and Dispatch Company (TRANSCO)
- Abu Dhabi Distribution Company (ADDC)
- Al Ain Distribution Company (AADC)
- Abu Dhabi National Oil Company (ADNOC)
- Masdar

2. Definition and Abbreviations

For the purposes of this Policy, the following definitions apply:

- **Clean Energy Strategic Target** means a support scheme requiring the entity acting as sole procurer of electricity within the Emirate of Abu Dhabi (Emirates Water and Electricity Company ("**EWEC**") to include a given proportion of electricity produced from clean sources in their production mix within the Emirate.
- **Electricity from Clean Sources** means electricity generated from nuclear, solar, low-carbon hydrogen[1], thermal generation with fossil fuels and carbon capture, utilisation, and storage (CCUS), wind, geothermal, tidal energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases.
- **Electricity Production in the Emirate** means the electricity produced within Abu Dhabi which is injected into the Abu Dhabi electricity grid.
- **DoE:** Department of Energy
- **EWEC:** Emirates Water and Electricity Company
- **TRANSCO:** Abu Dhabi Transmission and Despatch Company
- **ADDC:** Abu Dhabi Distribution Company
- **AADC:** Al Ain Distribution Company

[1] Low-carbon hydrogen include hydrogen produced from renewable and nuclear electricity, biomass, and fossil fuels with CCUS. CCUS includes CO2 captured for use (CCU) as well as for storage (CCS).

3. Statement

3.1 Clean Energy Strategic Target 2035 for Electricity Production.

3.1.1 The Clean Energy Strategic Target is set for sixty percent (60%) of Electricity Production in the Emirate to be generated as Electricity from Clean Sources by 2035.

(a) This target will be calculated as the ratio (%) of Electricity from Clean Sources in the Emirate in the year 2035 against the total electricity production in the Emirate in that year.

(b) The data for the calculation of this ratio will be obtained from the Electricity Production in the Emirate and reported as such by EWEC to the DoE.

3.2 Implementation.

3.2.1 From 2023 onwards, EWEC's Statement for Future Capacity, TRANSCO's Transmission 7-year Planning Statement and ADDC's and AADC's 5-Year Planning Statement should include the following:

(a) An indicative trajectory tracing a path towards the achievement of the Clean Energy Strategic Target.

(b) Generation, transmission, distribution, and storage projects required to achieve the Clean Energy Strategic Target.

(c) Estimated costs and benefits of the investments and projects envisaged including the extension or reinforcement of the existing grid infrastructure and/or necessary flexibility and operability services (frequency, stability, voltage, thermal and restoration).

(d) Estimated costs and benefits compared with the base case scenario (based on the Statement for Future Capacity assumptions without the Clean Energy Strategic Target and without making operational interventions).

(e) Potential opportunity. Estimated costs and benefits to develop Electricity from Clean Sources in excess of the level required by the indicative trajectory.

3.3 System operation.

3.3.1 EWEC, TRANSCO and the distribution companies (ADDC and AADC) shall take the appropriate steps to develop advanced control systems, transmission and distribution grid infrastructures, smart grids and storage facilities in order to allow the safe, secure and reliable operation of the electricity/water system as it accommodates the further development and generation of Electricity from Clean Sources. All these developments should be either increasing the operability envelope where secure system operation is possible or enabling clean energy suppliers to provide services that the system needs.

3.3.2 Appropriate grid flexibility and operational measures should be taken to minimise the curtailment of Electricity from Clean Sources. If, due to unforeseen circumstances, significant measures are required to be taken to curtail the renewable energy sources to guarantee the security of the electricity system and security of energy supply, EWEC, in co-ordination with TRANSCO and distribution companies, will report to DoE on those measures and indicate what capabilities and operability services they need to avoid and/or minimise curtailments.

3.4 Periodic Assessment

3.4.1 This Strategic Target 2035 will be reviewed periodically by the DoE to adapt it to the UAE international commitments and the evolution of energy production and storage technologies.