

Unleashing the Power of Green: The UAE's Clean Energy Transition Journey

October 2023

Preface



Context

- The UAE is leading global efforts to combat climate change and has committed to achieving net-zero emissions by 2050
- The year 2023 is particularly significant as the country is hosting the COP28 UN Climate Change Conference in November
- The government's proactive policies and robust regulatory framework have spurred investment and innovation in clean energy

Objective

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- To assess the progress of the clean energy transition and its implications for businesses in the UAE
- To understand the challenges and the underlying opportunities that lie ahead along with effective strategies to mitigate them

Methodology

- Conducted surveys with large and medium businesses and in-depth interviews with various stakeholders of the ecosystem
- Produced a report summarizing UAE's energy transition, green finance, infrastructure (digital and non-digital), and the sustainable path forward

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Green Economy - Clean Energy Transition Progress



Availability of Green Financing Products and Services - A Blessing or Curse?



Sustainable Path Forward

Infrastructure - Roadblock or Enabler?

Executive Summary

Green Economy - Clean Energy Transition Progress	UAE ranks 2 nd in the energy transition of Green Future Index 2023	62% Target contribution from clean energy by 2050	1007. Businesses are aware and seen tangible impact created by transition initiatives	30% Businesses say they are in the process of transition
Availability of Green Financing Products and Services - A Blessing or Curse?	Slow adoption of green financing products, likely to gain traction in the future	87% Businesses are either still exploring or formalizing green financing products	Cost savings is a key Rol indicator while making decision for green finance	Businesses are concerned about long pay-back periods in green project investments
Infrastructure - Roadblock or Enabler?	Grid infrastructure still raises concerns about energy transmission and distribution	EV adoption is rising, but charging stations are a concern among consumers	Demand for green hydrogen in the manufacturing, logistics, and chemicals sector	Data management and integration are major concerns in digital infrastructure
Sustainable Path Forward	Key actions in innovation, capacity, framework, and market access are expected	80% Businesses are actively seeking innovative solutions from external partners	Businesses seek investments in manufacturing, energy, and transport sectors for energy transition	67% Businesses strive for global leadership, while others target regional leadership

Green Economy - Clean Energy Transition Progress

The Green Future Index 2023 global rankings



The current state of transition among businesses



Awareness of government initiatives among businesses

UAE climbs 8 positions up the ladder and ranks 2nd in the energy transition pillar in the Green Future Index

UAE is set to achieve its net zero target first in its region. The production of renewable energy is growing quickly and contributes a higher share of the overall energy mix

Countries	Energy Transition Rankings*			Net-zero target
	2023	Rank	2022	year
Iceland	1	1	13	2040
UAE	2		10	2050
Norway	3	1	25	2030
Sweden	4	1	18	2045
Kuwait	5	1	8	2060
Finland	6	1	20	2035
Uruguay	7	1	16	2050
KSA	8	1	12	2060
Brazil	9	1	24	2050
South Korea	10	₽	8	2050

The structure of the Green Future Index** 2023 is made up of 5 pillars



Pillar 1: Carbon emissions - Measures how effectively countries are curbing carbon dioxide emissions overall



Pillar 2: Energy transition - Assesses the contribution and growth rate of renewable and clean energy



Pillar 3: Green society - Measures the efforts made by government, industry, and society to promote green practices



Pillar 4: Clean innovation - Measures the penetration of green patents, investment in cross-border and food technology



Pillar 5: Climate policy - Measures the ambition and effectiveness of climate policies and initiatives

*The ranking Is based on Pillar 2 of GFI 2023

*Energy transition – a shift from fossil-based systems of energy production and consumption to renewable energy sources

**The Green Future Index is a research program by MIT Technology Review Insights

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Source: Share of RE, IEA, WEF, Government Office of Sweden, Argus Media, Global Climatescope, BBC, Climate Action Tracker, Asia Society, Nordic Energy, Climate Action

UAE continues to build further on diversifying energy mix – targets 62% contribution from clean energy by 2050



- The UAE has announced a revision to its clean coal percentage in the 2050 energy mix
 - The updated strategy no longer includes the previous goal of achieving a 12%** clean coal target by 2050
 - The *Hassyan coal-fired power plant* in Dubai was initially designed for dual-fuel operation
 - In February 2022, the UAE declared its decision to transition away from coal as a source of energy for the Hassyan power plant

*Renewable energy referred to as clean energy, comes from natural sources or processes that are constantly replenished

*Clean coal refers to capturing carbon emissions from burning coal and storing them in underground pockets of porous rock or carbon capture and storage (CCS)

**The UAE has not disclosed the revised percentage of the clean coal target for 2050 (12% of clean coal)

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Source: World Data, Energy intensity, Green hydrogen production, IEA, EV charger, Investor Navigator, Carbon Credits, Dual-fuel operation, Revision on clean coal

Businesses are contributing to the nation's target by integrating renewable sources to reduce its reliance on natural gas and oil

30% of the businesses are already in the process of clean energy transition

100% of businesses are widely sourcing their energy needs from grid electricity from the local utility provider

- 77% source from on-site generation such as solar panels and wind turbines and 43% are purchasing renewable energy certificates (RECs)
- Only 3% of the business are sourcing its energy needs from natural gas or other fossil fuels



More than 90% of businesses are all aware of government initiatives

100% of businesses feel that the government's initiatives had a tangible impact at the grassroots level





Q: Are you aware of the government incentives or policies in the UAE that support businesses in transitioning to clean energy?

The UAE Green Agenda 2015-2030

Competitive knowledge economy

- Natural green innovation
- Green diversification



Social development and quality of life

- Integrated green infrastructure
- Green workforce and talent



- Sustainable environment and valued natural resources
- Natural capital and resilience
- Environmental goods and services



- Clean energy and climate action



Green life and sustainable use of resources

- Integrated power and water management
- National renewable energy
- National green economy data
- National energy and water efficiency
- National waste-to-resource
- National sustainable transport

Availability of Green Financing Products – A Blessing or Curse?





Recent developments in green finance

Impactful green finance products such as green project finance, green loans, and green bonds are also being considered – likely to gain traction in the future

Green transactions continue to be the most prominent form of green finance products among businesses

- Abu Dhabi Global Market (ADGM) and the Z/Yen Group co-hosted the launch of the tenth edition of the GGFI report in October 2022
- According to the Global Green Finance Index 10 (GGFI 10)
 - Dubai ranks 1st place in the region ranking 28th in the GGFI 10 (vs. 44th in the GGFI 9), rising 16 rank places
 - Abu Dhabi ranks 2nd place in the region (33rd rank in GGFI 10), up five rank places from GGFI 9



Q: What type of sustainable financing products have you utilized/considered for your energy projects?

utilized them The adoption of green finance products is relatively slow among businesses; however, the recent policy

All businesses in the UAE have explored green financing products while only 13% have

developments seem to boost adoption over the next 7 years

- As per the ADL report, the green and sustainable finance issuance, aimed at environmentally friendly projects, grew 32% in 2022 (vs. 2021)
- The UAE is promoting investor confidence and creating transparency through initiatives that enable the *listing of green bonds on the Abu Dhabi Securities Exchange (ADX)*
- In the consultation paper, the UAE government has become one of the *first movers in articulating a Framework for Climate Transition Funds (or equivalent)*

Recent frameworks approved for reporting sustainability efforts

Year	Framework	Issued/adopted by	Nature
2021	Annual Sustainability report (publicly listed company)	Securities and Commodities Authority (SCA)	Mandatory
2021	Sustainable Finance Framework	Ministry of Climate Change and Environment (MoCCE)	Voluntary
2019	ESG Reporting Guide	Dubai Financial Market	Voluntary



Businesses across entities are increasingly considering green financing products owing to their concern for the planet and saving costs

Regulatory push for sustainability disclosures is likely to boost the adoption of green financing products across entities

Public companies are relatively more influenced by regulatory compliance and push from investors and stakeholders

 Encouraging companies to share financial information related to the integration of sustainability initiatives is likely to stimulate greater adoption

Market demand is not much of the most preferred factor among businesses as:

• The green sukuk and bonds market in the UAE has been around AED 62.4 billion (USD 17 billion) in recent years

Key factors that influence the decision to adopt green financing products **Environmental benefits Cost savings and investment** resilience Access to capital and financing **Regulatory compliance** Market demand and customer preferences Push from investors/stakeholders Innovation and competitive advantage Lowest Highest The pointer reflects the average score on a scale of 1-10

Q: What key factors influence your decision to adopt green financing options? (This was a ranking question, where 1 is the most important and 5 is the least important challenge)

Altogether businesses in UAE are measuring their cost savings for assessing their return on sustainable initiatives

KPIs such as risk reduction, and reduced waste to landfill is also gaining traction among businesses especially the state-owned firms which are also in the light of their sustainability commitments

- Public companies and state-owned firms prioritize sustainability initiatives preferably more when they benefit in terms of cost
- Private firms are measuring KPIs such as increased sales and employee recruitment and satisfaction to evaluate benefit



Higher transaction cost and the perception of higher uncertainties attached to such finance is limiting businesses from utilizing green finance products

Long payback period to date continues to be a challenge for businesses to avail products such as green loans

The market has the presence of a variety of green finance products but there exists challenges such as:

- The payback period for renewable projects may vary from >5 years to <10 years depending on the construction/installation of the infrastructure
- However, the recent developments in 2023 such as the *exemption of registration fees on bonds* and sukuk for the purpose of listing have opened the door for businesses to invest in green products

Expert cites that other aspects of transaction costs still require attention from a regulatory standpoint for example:

- The *technical service fees* come at a rate of 0.01% of the value of the debt issue
 - It is subject to a maximum size of AED 30,000 (~USD 8,200)



Q: What are the key challenges in the field of green financing? (This was a ranking question with 1 being the most important and 5 being the least important challenge)

*A higher payback period will take longer to cover its initial investment made by a business

Source: Payback period, ESG bonds, Benori Analysis

Key Recent Developments in Green Finance

Company Type	Companies	Recent Developments
State-owned		 In 2022, Masdar and ENBD launched a sustainable real estate investment trust fund In 2023, Masdar raised USD 750 million and also planned to issue additional green bonds
Public/Public Joint Stock	درجی البجاری Commercial Bank of Dubaiدرجی البجاری درجی Commercial Bank of Dubaiدرجی البدانی 	 In 2022, ADIB cut its carbon footprint by 26% and allocated USD 1.7 billion for green financing FAB commits USD 10 billion loan and issues green bonds of USD 587 million CBD's five-year bond is set to raise USD 500 million to finance projects in 2023 Aldar partnered with HSBC to launch a sustainability-linked loan, consisting of AED 300 million (USD 81.5 million)
Private	المشرق mashreq WE NARY POSSION	 In July 2023, FAB, DIB, ADCB, ADIB, Mashreq, and Emirates NBD, jointly committed more than AED 190 billion (USD 51.8 billion to green financing initiatives)



Electricity transmission and distribution E-Mobility Green fuel Digitization and technology transformation in clean energy transition Key developments in infrastructure and technology

Significant growth in the UAE's electric power transmission and distribution industry driven by energy sector investments

The UAE's highest per capita electricity consumption globally makes it an attractive market for companies in the power transmission and distribution industry

- The electric power transmission and distribution infrastructure is managed by the state-owned company, Emirates National Grid (ENG)
- ENG manages the UAE's high-voltage transmission network, linking all six Emirates via substations and transmission lines
- The company has additionally put resources into cutting-edge technology, such as smart grids, to ensure efficient and reliable electricity delivery



Total revenue of the UAE's electricity transmission and distribution market



~USD 2.7 billion in 2021

~USD 3.74 billion by 2030

The growth numbers for DEWA's electricity transmission and distribution grids in 2022

Total length of electricity transmission and distribution lines is **42,586.71 km**



Inaugurated **17 new substations** including fifteen 132 kilovolt(kV) stations

Commissioned **1,113 - 11 kV distribution substations** across Dubai

Currently, there are **73** - **33** kV substations in service and **42,771 medium voltage** (11 kV or 6.6 kV) substations

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Source: <u>Transmission and Distribution</u>, <u>Transmission and Distribution Infrastructure</u>, <u>Dubai Grid Growth</u>

While clean energy capacity continues to rise, reliable transmission and distribution remain a concern owing to the changing energy mix

Need for scale of capital and innovation across all aspects of grid resiliency to transform completely

- Inefficient integration within the existing grid systems leads to unauthorized consumption, over-consumption, and energy congestion
- □ Unlike traditional power plants, *renewable power sources have intermittent production*, and the supply varies as per:
 - Location
 - Weather
 - Time

□ Need for building battery energy storage at grid scale

- i.e., both national and regional to accommodate the variable nature of renewable energy sources
- Other areas that need resolution include widespread charging systems and the development of standard laws for charging



Major consumers of renewable energy in the UAE are households and industries and opportunity likely to extend in transportation sector with the growing EV demand

The UAE market has experienced a consistent increase in electric vehicle (EV) demand, and it is anticipated to maintain a CAGR of 30% from 2022 to 2028

Consumption by Sectors	2015	2020
Households (TJ)	396	7384
Industry (TJ)	135	3730
Transport (TJ)	0	0

Transition to clean transportation

- □ The UAE Cabinet has given its initial approval for *the first national license for AVs* (powered by electric motors and batteries), with Chinese firm WeRide
- Dubai's RTA initiated "Zero-Emissions Public Transportation in Dubai 2050" to transition 10% of buses and taxis to electric or hydrogen power by 2030, reaching full 100% by 2040
- By 2050, Etihad Rail is set to decrease per capita road transport emissions by 40% by serving ~16 million passengers and 50 million tonnes of freight



Dynamic efforts are required to ensure charging infrastructure keeps up with the EV adoption rate while preventing range anxiety from discouraging users

Increased public-private partnerships may likely support addressing the gaps in investment



Renewable hydrogen capitalization will help heavy industries reduce carbon emissions and support the transition to a carbon-neutral future

Businesses prioritize policy reforms and innovation for successful execution of National Hydrogen strategy by 2031

Green hydrogen is widely tipped as a *fuel of the future* because it produces water vapor and not carbon dioxide



Roadblocks such as data management and integration coupled with cybersecurity are hindering the digitization process in the energy transition

Businesses prioritize investment in capacity building, technology and cyber infrastructure to streamline digitization

Integrating ESG data into existing models and workflows while ensuring data quality

- Managing and integrating data from diverse sources can be complex
- ESG data is often self-reported by companies, and there exist inconsistencies due to a lack of a clear governance structure

□ Increasing cyber risks in energy space

- As cyber risks continue to rise across the globe, posing risks to critical infrastructure and other sectors of the economy
- Emirates Nuclear Energy Corporation (ENEC) partnered with the UAE Cyber Security Council to develop strategies for enhancing cybersecurity in the energy sector

□ Interoperability and compatibility

- Both businesses and consumers demand smooth interoperability across usage/switch of energy source
- This also requires developing robust energy management systems



Areas that are being prioritized for improved digitization



Cost and investment (infrastructure, technology)



Skill gaps and workforce training

Q. What are the top five challenges that your organization is facing in the process of digitizing your clean energy transition? (This was a ranking question, where 1 is most important and 5 is least important challenge)

Technology partnerships are being done to build low-carbon industries of future



Sustainable Path Forward



Suggestion/expectation among businesses



Collaboration and investment opportunity in decarbonization



Commitment to sustainability among businesses

Key actions suggested or expected by businesses in the UAE

Fields	Suggestion/Expectation	Importance
	Enhancing education and skills development	
Capacity	Strengthen incubation and acceleration programs	
	Managing the socio-economic impacts of the energy transition (job transitions and retentions)	
	Overcoming the dependency on oil and gas revenue and transitioning to a diversified economy	
Market Access	Ensuring extensive financial support and incentives	
	Engaging various stakeholders in the transition projects	
	Mitigating the environmental impacts of renewable energy (hydrogen) technologies	
Innovation	Addressing the technical and infrastructure challenges in integration and distribution	
	Creating demonstration projects such as waste management	
	Streamlining approval processes through regulatory reforms and technological advancements	
Policy Framework	Balancing the need for rapid decarbonization with ensuring energy security and reliability	
Q: What steps can be taken to (This was a ranking question,	o encourage entrepreneurship and innovation and attract investment in clean energy space? High High	Medium 🛑 Low

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Source: Benori Analysis

Systematic shift required for full-scale decarbonization in UAE's energy, manufacturing, and transport sectors to offer opportunity for low carbon sustainable economic development

- Businesses cite sectors such as energy generation, production, and distribution, construction, industrials, and transportation offer untapped opportunities for investors
- Business are actively seeking opportunities for collaborating with external partners or other stakeholders in the ecosystem to integrate clean energy transition components

Collaboration for innovative solutions

■ Yes, actively seeking opportunities

- Yes, established collaborations
- Not currently, but open to potential collaborations

Q: Are you collaborating with external partners or startups to explore emerging digital technologies and innovative solutions?



*The percentage pies represent the number of respondents opted the option in the survey

Q: In which specific sectors or areas within the UAE do you think investments in clean and renewable energy should be prioritized?

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Recent investments made in industries for clean energy transition

UAE paving the way for leading the global energy transition ecosystem

Businesses demonstrate a strong commitment to sustainability, whether through achieving targets, abiding regulations or implementing initiatives





Appendix



Research Scope and Methodology

Research Scope and Methodology

Research Methodology

- Comprehend the industries' viewpoint on the effectiveness of significant government initiatives aimed at promoting the adoption of green finance and clean energy transition infrastructure
- Understand the industries' suggestions to the government regarding challenges or barriers that they face in adopting new initiatives
- We conducted online surveys comprising 28 questions pertaining to the UAE's economic outlook and transition progress, green financing, and infrastructure in the clean energy transition
- Collated responses from industries such as construction and real estate, consumer goods, food and agriculture, industrials and manufacturing, oil and gas, tourism and hospitality, and transport and logistics







*This is a preliminary assessment, and the insights are all directional. These findings have been corroborated and refined through in-depth interviews.

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Abbreviations

ACX	Air Carbon Exchange	ENBD	Emirates National Bank of Dubai
ADCB	Abu Dhabi Commercial Bank	ENG	Emirates National Grid
ADGM	Abu Dhabi Global Market	ESG	Environmental, Social and Corporate Governance
ADIB	Abu Dhabi Islamic Bank	EV	Electric Vehicle
ADNOC	Abu Dhabi National Oil Company	FAB	First Abu Dhabi Bnak
ADX	Abu Dhabi Securities Exchange	GFI	Green Future Index
AV	Autonomous Vehicle	GGFI	Global Green Finance Index
CAPEX	Capital Expenditure	КРІ	Key Performance Indicator
CBD	Commercial Bank of Dubai	MoCCE	Ministry of Climate Change and Environment
CBD CCS	Commercial Bank of Dubai Carbon Capture And Storage	MoCCE PV	Ministry of Climate Change and Environment PhotoVoltoic
CBD CCS CNG	Commercial Bank of Dubai Carbon Capture And Storage Compressed Natural Gas	MoCCE PV REC	Ministry of Climate Change and Environment PhotoVoltoic Renewable Energy Certificates
CBD CCS CNG CSP	Commercial Bank of Dubai Carbon Capture And Storage Compressed Natural Gas Concentrated Solar Power	MoCCE PV REC ROI	Ministry of Climate Change and Environment PhotoVoltoic Renewable Energy Certificates Return on Investment
CBD CCS CNG CSP DEWA	Commercial Bank of Dubai Carbon Capture And Storage Compressed Natural Gas Concentrated Solar Power Dubai Electricity and Water Authority	MoCCE PV REC ROI SCA	Ministry of Climate Change and EnvironmentPhotoVoltoicRenewable Energy CertificatesReturn on InvestmentSecurities and Commodities Authority

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