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Impact of Green finance on environmental sustainability: Evidence from the UAE

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ABSTRACT

This study examines the impact of green finance on environmental sustainability in the United Arab Emirates using a secondary research design. The academic foundation comes from Khan, Riaz, Ahmed, and Saeed, who found that green finance measured through climate mitigation finance reduced ecological footprint and carbon emissions in Asian economies (Khan et al., 2022). The UAE is relevant because the country has adopted major sustainability strategies, including the UAE Energy Strategy 2050, the UAE Net Zero 2050 Strategy, and the National Climate Change Plan 2017–2050 (Government of the UAE, 2024; (Government of the UAE, 2025a; (Government of the UAE, 2025b). Green finance is treated as the independent variable, while environmental sustainability is treated as the dependent variable. The dependent variable is discussed through indicators such as CO₂ emissions, ecological footprint, renewable energy share, and clean energy capacity, while GDP per capita, energy consumption, and population are treated as control variables (World Bank, 2026; (IRENA, 2026). The results part includes numerical calculations using secondary data. These calculations show estimated total CO₂ emissions, renewable energy capacity growth, capacity-gap analysis and clean energy target, and comparison between sustainable finance targets and energy investment targets (CBUAE, 2023; (Government of the UAE, 2024; (Aletihad / IRENA, 2026).

Keywords: Green Finance, UAE, Environmental Stability, CO₂

Introduction

Environmental sustainability has become a central priority for governments, investors, companies, and financial institutions. Climate change, greenhouse gas emissions, energy demand, water stress, and resource pressure have increased the need to connect economic growth with environmental responsibility. (Khan et al., 2022). The UAE is an important case because the country has adopted a national sustainability agenda through the UAE Energy Strategy 2050, the UAE Net Zero 2050 Strategy, and the UAE Long-Term Strategy submitted to the Infectious study is based on secondary data. It reviews academic literature, UAE policy documents, regulatory sources, and public datasets such as World Bank and IRENA data (World Bank, 2026; IRENA, 2026). Khan et al. examined whether green finance delivers environmental benefits and found that green finance significantly reduced ecological footprint and CO₂ emissions in Asian economies. This finding provides the theoretical and empirical basis for linking green finance with environmental sustainability in the UAE (Khan et al., 2022). The UAE Energy Strategy 2050 aims to triple the contribution of renewable energy, increase installed clean energy capacity to 19.8 GW by 2030, and mobilize AED 150–200 billion by 2030 (Government of the UAE, 2024; MOEI, 2026).

The UAE financial sector also supports sustainable finance. The UAE banking sector announced a target to mobilize more than AED 1 trillion in sustainable finance by 2030, and CBUAE emphasizes sustainable finance and climate-related financial risk management. The UAE financial sector has also become increasingly active in sustainable finance. The Central Bank of the UAE has highlighted sustainable finance, climate-related financial risk management, and sustainability-related disclosures. The UAE Sustainable Finance Working Group has issued or supported principles related to climate-risk management, sustainability disclosures, taxonomy development, and climate transition planning. Although the UAE has strong sustainability policies and sustainable finance initiatives, the country still faces environmental challenges linked to emissions, energy demand, and resource use. The relationship between green finance and environmental sustainability in the UAE requires clear secondary research support by valid data and calculations (World Bank, 2026).

The main problem is that although green finance is expected to support environmental sustainability, the specific relationship between green finance and environmental sustainability in the UAE has not been sufficiently developed in academic secondary studies. The uploaded reference paper provides evidence from Asian economies, but it does not focus specifically on the UAE. Therefore, there is a need to connect the existing green finance literature with UAE-specific evidence and policy initiatives. The problem is also related to measurement. Green finance can include green bonds, sustainable loans, climate finance, renewable investment, and disclosure-based mechanisms, while environmental sustainability can be measured through CO₂ emissions, ecological footprint, renewable energy share, and clean energy capacity (CBUAE, 2026; IRENA, 2026). This work addresses the problem by examining how green finance can support environmental sustainability in the UAE using secondary evidence from academic research, official policy documents, regulatory publications, and credible public data sources. What is the relationship between green finance and environmental sustainability in the UAE? How can green finance support the UAE's transition toward low-carbon and climate-resilient development? The main objective of this work is to examine the impact of green finance on environmental sustainability in the UAE. This study is significant because it applies the green finance and environmental sustainability relationship to the UAE context. Uploaded reference papers show that green finance reduces

ecological footprint and CO₂ emissions in Asian economies, but the UAE has distinct policy, financial, and energy characteristics. A UAE-focused secondary study therefore adds contextual value. For policymakers, the study is significant because it links finance with the UAE's national sustainability strategies. If green finance supports environmental sustainability, then regulators and financial institutions can improve green finance instruments, climate-risk management, sustainability disclosure, and capital allocation toward clean projects.

For financial institutions, the thesis is useful because banks, investors, and capital-market participants are increasingly expected to consider climate risk and sustainability disclosure. The UAE's sustainable finance framework makes this topic practically relevant for banking strategy, ESG reporting, portfolio management, and long-term risk assessment. This study is significant because it links academic evidence on green finance with UAE-specific strategies and data. It is useful for researchers, policymakers, financial institutions, and students who want to understand how sustainable finance may contribute to environmental sustainability (Khan et al., 2022; (CBUAE, 2026)). The study contributes theoretically by linking green finance with environmental sustainability in a country-specific context. It supports the idea that finance can be an environmental policy instrument, not only an economic activity. Green finance can reduce environmental pressure by funding clean technologies, energy transition, sustainable infrastructure, and climate-resilient development.

The study also contributes by translating a regional empirical relationship into a UAE-specific secondary framework. The reference paper uses ecological footprint and CO₂ emissions to test environmental quality. This thesis adopts the same logic but expands the discussion to include UAE policy instruments, clean energy targets, financial-sector disclosure, climate-risk regulations, and sustainability strategies (Khan et al., 2022). Finally, this work contributes by clarifying how a secondary research design can be used in environmental finance research. Rather than relying on unsupported assumptions, it uses valid public sources and academic literature to build a structured argument. This study is also significant because it links academic evidence on green finance with UAE-specific strategies and data. It is useful for researchers, policymakers, financial institutions, and students who want to understand how sustainable finance may contribute to environmental sustainability (Khan et al., 2022; (CBUAE, 2026)).

Literature Review

Green finance is the independent variable of this study. It refers to financial support for environmental and climate-beneficial investments, including renewable energy, pollution reduction, climate mitigation, climate adaptation, and energy efficiency (Khan et al., 2022). In the UAE, green finance is visible through sustainable finance commitments, climate-risk management, banking-sector initiatives, sustainability disclosure, and clean energy investment (CBUAE, 2023); (CBUAE, 2026). Green finance can take different forms. It can include green bonds, green loans, climate funds, sustainable finance commitments, renewable energy investment, sustainability-linked loans, transition finance, carbon finance, and green banking policies. In the uploaded study, green finance is specifically measured through climate mitigation finance because mitigation finance directly supports projects aimed at reducing environmental damage. In the UAE, green finance is reflected through several national and financial-sector initiatives. The Central Bank of the UAE has emphasized sustainable finance and the mobilization of sustainable finance through the banking sector. The Sustainable Finance Working Group has developed guidance on climate-risk management, sustainability disclosure, and transition planning. The UAE Energy Strategy 2050 is also directly linked to green finance because it includes large investment needs for renewable and clean energy. Therefore, green finance is expected to support environmental sustainability in the UAE by directing capital toward clean energy, low-carbon infrastructure, sustainable buildings, clean transport, waste management, water resilience, and climate technology.

Environmental sustainability is a dependent variable. It can be measured through CO₂ emissions, ecological footprint, renewable energy share, clean energy capacity, and energy efficiency. Khan et al. used ecological footprint and CO₂ emissions to evaluate environmental quality (Khan et al., 2022). For UAE-specific data, the World Bank provides CO₂, GDP, population, and renewable electricity indicators, while IRENA provides renewable energy statistics (World Bank, 2026); (IRENA, 2026). The relationship between green finance and environmental sustainability is based on the view that environmental improvement requires investment. When finance is allocated to clean energy and low-carbon infrastructure, emissions and ecological pressure can decline (Khan et al., 2022). In the UAE, this relationship is supported by national targets for renewable energy, clean energy capacity, and sustainable finance mobilization (Government of the UAE, 2024); (CBUAE, 2023). The link between green finance and environmental sustainability is based on a simple logic: environmental improvement requires investment, and green finance provides that investment. When finance is directed toward renewable energy, energy efficiency, sustainable transport, green buildings, and pollution controls, environmental damage is expected to decrease. The uploaded reference study found that green finance significantly reduces ecological footprint and CO₂ emissions in Asian economies.

For the UAE, this relationship is particularly relevant because the country has set the strong clean energy and net zero objectives. The UAE Net Zero 2050 Strategy identifies climate finance as an important enabler of the transition. The UAE Energy Strategy 2050 emphasizes large investment in clean and renewable energy. The Central Bank and Sustainable Finance Working Group are also developing financial-sector mechanisms that can help align capital with climate goals. Renewable energy and clean energy investment are important channels through which green finance can improve environmental sustainability. Green finance can fund solar energy, wind energy, nuclear energy integration, energy storage, green hydrogen,

and other clean energy technologies. The UAE Energy Strategy 2050 aims to triple the contribution of renewable energy by 2030 and increase clean energy capacity. The country's economy is a part of this. We have to think about the money people make in a country. This is called GDP per capita. We include this because how well a country is doing can affect the environment. When people make money, they use more energy, want to travel more, build more things and buy more stuff. This can hurt the environment. Make it worse. At the same time having more money can be good for the environment too. It means people can afford to use ways of doing things build better roads and houses and take care of the environment. In the UAE people make a lot of money. This also creates problems for the environment. On the other hand, it also gives them the chance to make things better. So, when we study how green finance affects the environment, we have to think about GDP per capita. We have to consider how the money people make in the UAE affects the environment and how we can make it more sustainable. Energy consumption is something we need to keep an eye on because the kind of energy we use affects the environment. When we use a lot of fuels, it is bad for the environment. If we start using clean energy, it can help reduce the damage, to the environment.

For the United Arab Emirates energy consumption is a big deal. The country uses a lot of energy because it is very hot, cities are growing, and factories are. The economy is getting bigger. We can use something called finance to help make energy consumption better for the environment. Green finance can help pay for energy, make energy use more efficient, and support technologies that produce less carbon.

The population is included as a control variable because when the population of the United Arab Emirates grows it means more people need houses, ways to get around, water, electricity, food, and public services. This can put a lot of pressure on the environment of the United Arab Emirates. For the United Arab Emirates, when the population grows and cities get bigger, it means they need energy and better infrastructure. The thing about green finance is that it can help with this pressure by supporting cities that are good for the environment, buildings that use energy wisely, clean ways to get around, and infrastructure that can handle problems. Green finance is important for the United Arab Emirates because it helps the United Arab Emirates deal with the pressure of a growing population and urban development. Green finance supports development in the United Arab Emirates, and that is good for the United Arab Emirates.

The UAE policy context is central to this thesis. The UAE Net Zero 2050 Strategy provides a long-term national pathway for reducing emissions. The UAE Energy Strategy 2050 sets clean energy and investment targets. The financial-sector context is also important. The Central Bank of the UAE has highlighted sustainable finance, climate-risk management, sustainability-related disclosures, and climate stress testing. The UAE Sustainable Finance Working Group has developed principles and initiatives that guide financial entities in integrating sustainability into governance, disclosure, risk management, and transition planning. Together, these policies create a supportive environment for green finance to contribute to environmental sustainability.

Hypotheses

1. H1: Green finance has a positive impact on environmental sustainability in the UAE.
2. H2: Green finance reduces CO₂ emissions and ecological pressure in the UAE.
3. H3: Renewable energy and clean energy investment strengthen the relationship between green finance and environmental sustainability.

4. H4: GDP per capita has a significant effect on environmental sustainability in the UAE.
5. H5: Energy consumption has a significant effect on environmental sustainability in the UAE.
6. H6: Population has a significant effect on environmental sustainability in the UAE.

Table 2.1 Literature review and hypothesis development

Variable	Role	Measurement idea	Literature/source logic	Hypothesis
Green Finance	Independent variable	Sustainable finance, climate finance, green loans, green bonds, renewable energy investment	Khan et al. found green finance reduces EF and CO ₂ ; UAE regulators promote sustainable finance.	H1, H2
Environmental Sustainability	Dependent variable	CO ₂ emissions, ecological footprint, renewable energy share, clean energy capacity	Reference paper uses EF and CO ₂ ; UAE data available through World Bank and IRENA	H1, H2
Renewable/Clean Energy Investment	Channel variable	Clean energy capacity, renewable electricity, investment targets	UAE Energy Strategy targets renewable and clean energy expansion	H3
GDP per capita	Control variable	GDP per capita	Economic activity affects emissions and resource use	H4
Energy Consumption	Control variable	Energy use / electricity indicators	Energy use affects CO ₂ and ecological pressure	H5
Population	Control variable	Total population	Population growth increases resource demand	H6

Table 2.2 UAE policy and sustainable finance context

Policy / initiative	Main focus	Relevance to thesis	Link included in references
UAE Net Zero 2050 Strategy	Net-zero transition across key sectors	Shows climate finance is an enabler of transition	Yes
UAE Energy Strategy 2050	Renewable energy, clean energy capacity, energy efficiency	Shows investment role in clean-energy transition	Yes
National Climate Change Plan 2017–2050	Emission management, adaptation, diversification	Supports environmental sustainability context	Yes
UAE Green Agenda 2030	Green economy and sustainable resource use	Supports broader green economy context	Yes
CBUAE Sustainable Finance	Banking-sector climate finance and risk management	Shows role of financial institutions	Yes
SFWG initiatives	Disclosure, taxonomy, risk management, transition planning	Shows sustainable finance governance	Yes

2.2 Research Model / Conceptual Model

The conceptual model shows green finance as the independent variable and environmental sustainability as the dependent variable. Environmental sustainability is measured through CO₂ emissions, ecological footprint, renewable energy share, clean energy capacity, and related indicators. Renewable energy and clean energy investment are treated as key channels through which green finance may improve sustainability. GDP per capita, energy consumption, and population are treated as control variables.

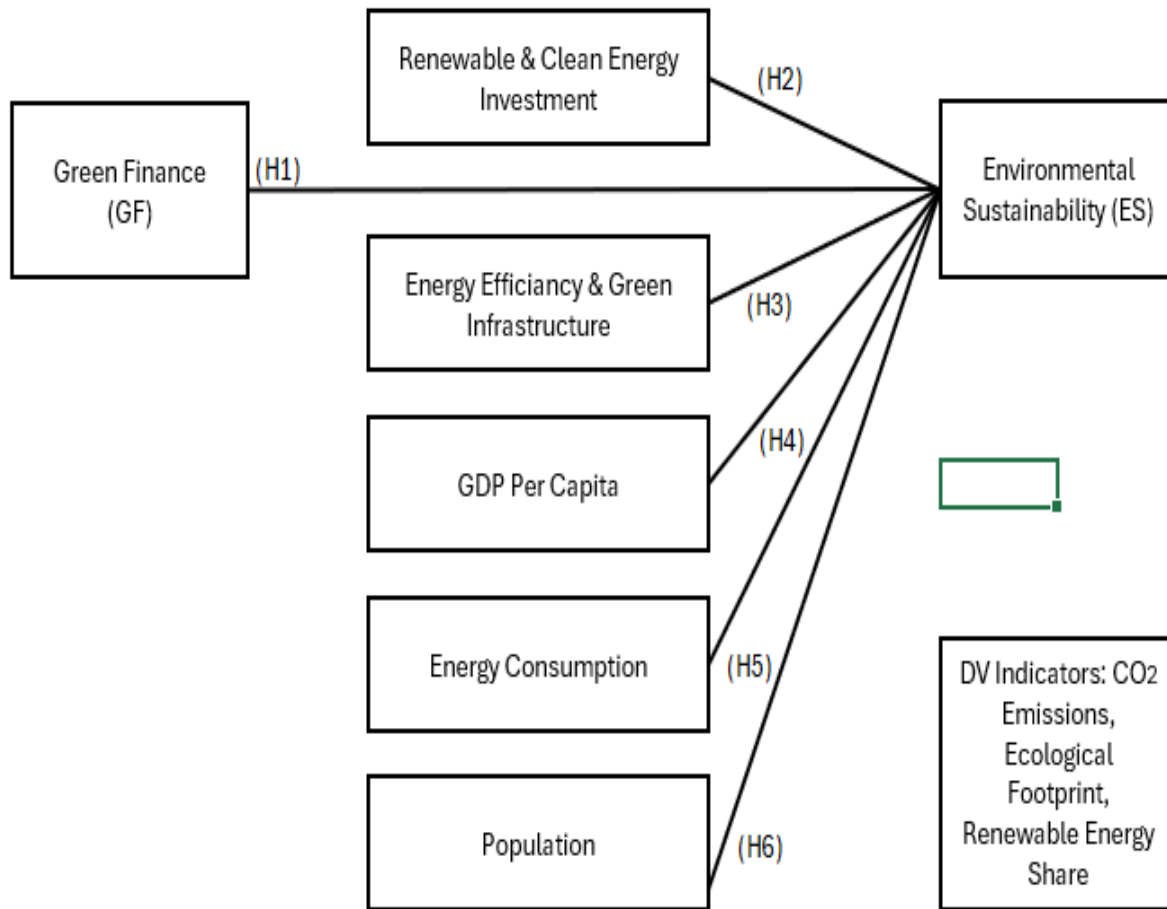


Figure 2.1 Conceptual model of the study

METHODOLOGY

Research Design & Methods

This thesis uses a secondary research design. It relies on academic literature, official UAE strategies, financial-sector publications, and public datasets rather than primary questionnaires or interviews (Khan et al., 2022; (World Bank, 2026)). The method is descriptive, analytical, and explanatory. It is descriptive because it explains the concepts of green finance and environmental sustainability. It is analytical because it compares academic findings with UAE policy and data sources. It is explanatory because it explains how green finance may influence environmental sustainability in the UAE through clean energy investment, climate-risk management, sustainability disclosure, and low-carbon infrastructure. The study does not produce fabricated statistical results. Instead, it presents a structured secondary analysis. If the thesis is later converted into an empirical study, the same model can be tested using UAE annual data and econometric methods such as OLS, ARDL, or time-series regression. The sampling method is purposive. Only relevant, valid, and credible documents are selected. Priority is given to uploaded peer-reviewed articles, UAE official government portals, UAE financial regulators, UNFCCC documents, World Bank data, IRENA data, and reputable institutional reports. The research instrument is the variable measurement framework. Green finance is operationalized through sustainable finance targets, climate finance mechanisms, green loans, green bonds, and renewable energy financing. Environmental sustainability is operationalized through CO₂ emissions, ecological footprint, renewable energy share, clean energy capacity, and energy efficiency (CBUAE, 2026; (IRENA, 2026)).

In this study, the research instrument is the variable measurement framework. Each variable is defined and linked to possible secondary indicators. Green finance is measured through sustainable finance commitments, climate finance mechanisms, green bonds, green loans, renewable energy investment, sustainable finance disclosure, and financial-sector climate-risk management. Environmental sustainability is measured through CO₂ emissions, ecological footprint, renewable energy share, clean energy capacity, energy efficiency, and environmental strategy progress. GDP per capita, energy consumption, and population are used as contextual control variables.

Table 01 Measurement of variables

Variable	Type	Operational definition	Suggested indicators	Source type	Expected direction
Green Finance	IV	Financial support for environmental and climate-beneficial investments	Sustainable finance commitments, green bonds, green loans, renewable energy finance	CBUAE, SFWG, DFSA, ADGM, UAE strategies	Positive effect on ES
Environmental Sustainability	DV	Environmental quality and progress toward low-carbon development	CO ₂ emissions, EF, renewable energy share, clean energy capacity, energy efficiency	World Bank, IRENA, Global Footprint Network, UAE official sources	Improves when emissions and EF reduce
Renewable/Clean Energy Investment	Channel	Investment in renewable energy and low-carbon energy systems	Clean energy capacity, renewable electricity production, investment targets	UAE Energy Strategy, IRENA	Positive effect
GDP per capita	Control	Income and economic development level	GDP per capita	World Bank	Mixed
Energy Consumption	Control	Energy demand and consumption pattern	Energy use, electricity production, clean energy share	World Bank, IRENA	Potentially negative if fossil-based
Population	Control	Demographic pressure	Total population	World Bank	May increase pressure

Sources of Data

The main data sources include the uploaded article by Khan et al., the UAE Government portal, CBUAE, SCA/SFWG, UNFCCC, World Bank, Data Commons, IRENA, and MOEI (Khan et al., 2022); (World Bank, 2026); (IRENA, 2026). The document uses only secondary data and valid published sources. The uploaded article is used as the foundation for the IV-DV relationship. UAE Government sources are used for the national policy context. CBUAE, SCA, SFWG, DFSA, and ADGM sources are used for sustainable finance

and financial-sector governance. World Bank and IRENA are used for environmental, macroeconomic, and renewable energy indicators. UNFCCC is used for UAE long-term climate strategy evidence.

Table 02 Source of data with links

Source area	Source name	Use in thesis	URL
Academic reference	Khan et al. (2022)	Green finance and environmental sustainability model	https://doi.org/10.1016/j.bir.2021.07.006
UAE policy	UAE Net Zero 2050 Strategy	Net-zero and climate finance context	https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/environment-and-energy/the-uae-net-zero-2050-strategy
UAE policy	UAE Energy Strategy 2050	Clean energy investment and renewable targets	https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/environment-and-energy/uae-energy-strategy-2050
UAE policy	National Climate Change Plan 2017–2050	GHG management and adaptation context	https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/environment-and-energy/national-climate-change-plan-of-the-uae
Financial regulation	CBUAE Sustainable Finance	Sustainable finance and climate-risk management	https://www.centralbank.ae/en/our-operations/sustainable-finance/
Disclosure regulation	CBUAE/SFWG Disclosure Principles	Sustainability reporting and transparency	https://rulebook.centralbank.ae/en/rulebook/principles-s-sustainability-related-disclosures
Financial regulation	SCA SFWG Initiatives	SFWG principles and transition planning	https://www.sca.gov.ae/en/regulations/sustainable-finance/initiatives-of-the-sustainable-finance-working-group-sfwg
International data	World Bank UAE Data	CO ₂ , GDP, population, macro indicators	https://data.worldbank.org/country/united-arab-emirates
Renewable energy data	IRENA Data	Renewable energy capacity and generation	https://www.irena.org/Data

The data treatment follows a document-based secondary analysis approach. First, sources are identified from valid academic, government, regulatory, and international databases. Second, each source is classified according to its relevance to the independent variable, dependent variable, control variables, or policy context. Third evidence is summarized and compared with the hypotheses. Fourth the UAE context is interpreted using the theoretical and empirical logic from the uploaded article. The study avoids presenting unsupported numerical results. Where figures are discussed, they are link to valid sources. Where exact data are

needed for future empirical research, the thesis recommends using World Bank, IRENA, and official UAE sources. This makes the study transparent and academically ethical.

Results and Analysis

This part adds numerical values and simple calculations using secondary data. The World Bank reports UAE population of 10,986,400 in 2024, GDP of US\$552.32 billion in 2024, GDP per capita of US\$50,273.5 in 2024, CO₂ emissions per capita of 18.3 of CO₂ in 2024, and renewable electricity production of 4.2% of total electricity in 2021 ([World Bank, 2026](#)); ([World Bank GDP pc, 2026](#)). IRENA-reported data shows UAE renewable energy capacity increased from 6.85 GW in 2024 to 7.91 GW in 2025 ([Aletihad / IRENA, 2026](#)). The UAE Energy Strategy 2050 targets 19.8 GW installed clean energy capacity by 2030 and AED 150–200 billion investment by 2030 ([Government of the UAE, 2024](#)). The UAE banking sector also announced a target to mobilize more than AED 1 trillion in sustainable finance by 2030 ([CBUAE, 2023](#)).

Table 03 data indicators

Year	Indicator	Value	Unit	Use in Study	Citation
2024	Population	10,986,400	people	Scale variable	World Bank, 2026
2024	GDP	552.32	US\$ billion	Economic context	World Bank, 2026
2024	GDP per capita	50,273.5	US\$	Control variable	World Bank GDP pc, 2026
2024	CO ₂ per capita	18.3	tCO ₂ e/capita	DV indicator	World Bank, 2026
2021	Renewable electricity production	4.2	% of total electricity	DV indicator	World Bank, 2026
2024	Renewable energy capacity	6.85	GW	Clean energy indicator	Aletihad / IRENA, 2026
2025	Renewable energy capacity	7.91	GW	Clean energy indicator	Aletihad / IRENA, 2026
2030	Sustainable finance target	1,000	AED billion	Green finance indicator	CBUAE, 2023
2030	Energy investment target	150–200	AED billion	Green finance/energy transition	Government of the UAE, 2024
2030	Clean energy capacity target	19.8	GW	Sustainability target	Government of the UAE, 2024

The calculations below convert secondary data into interpretable evidence. These are not econometric results; they are descriptive calculations that support the secondary analysis. The calculations are based on World Bank, IRENA-reported, CBUAE, and UAE Energy Strategy values ([World Bank, 2026](#)); ([Aletihad / IRENA, 2026](#)); ([CBUAE, 2023](#)); ([Government of the UAE, 2024](#)).

Table 4 Numerical calculations and interpretation

Calculation	Formula	Result	Interpretation	Source Link
GDP per capita verification	$552.32 \text{ billion} \div 10,986,400$	US\$50,273.1	Very close to the reported World Bank value of US\$50,273.5; small difference is due to rounding.	World Bank, 2026
Estimated total CO ₂ emissions	$10,986,400 \times 18.3$	201.05 million tCO ₂ e	Shows the estimated national emissions scale using population and per-capita CO ₂ .	World Bank, 2026
Renewable capacity increase	$7.91 \text{ GW} - 6.85 \text{ GW}$	1.06 GW	The UAE added around 1.06 GW renewable capacity between 2024 and 2025.	AlEtihad / IRENA, 2026
Renewable capacity growth rate	$(7.91 - 6.85) \div 6.85 \times 100$	15.47%	This indicates strong year-on-year renewable capacity growth.	AlEtihad / IRENA, 2026
Gap to 2030 clean capacity target	$19.8 \text{ GW} - 7.91 \text{ GW}$	11.89 GW	Additional clean/renewable capacity must be developed to reach 2030 target.	Government of the UAE, 2024
Required increase from 2025 level	$11.89 \div 7.91 \times 100$	150.32%	The 2030 capacity target requires about 150% more capacity than the 2025 level.	Government of the UAE, 2024
Required CAGR to 2030	$(19.8 \div 7.91)^{(1/5)} - 1$	20.14% per year	If measured from 2025 to 2030, capacity would need about 20% annual growth to reach 19.8 GW.	Government of the UAE, 2024
Implied total energy capacity if 19.8 GW equals 30%	$19.8 \div 0.30$	66.0 GW	If 19.8 GW represents 30% of total installed energy capacity, implied total capacity is around 66 GW.	Government of the UAE, 2024
Sustainable finance target vs energy investment target	$1,000 \div 200$ and $1,000 \div 150$	5.00x to 6.67x	The AED 1 trillion finance target is about five to 6.67 times the AED 150–200bn energy investment range.	CBUAE, 2023

The estimated total CO₂ emissions calculation gives approximately 201.05 million tCO₂e for 2024 by multiplying population with CO₂ emissions per capita. This shows that environmental sustainability remains a relevant issue for the UAE region, even though the country is advancing clean energy and net-zero initiatives (World Bank, 2026); (Government of the UAE, 2025a). Renewable energy capacity increased from 6.85 GW in 2024 to 7.91 GW in 2025, representing a 15.47% increase. This supports H3 because it shows that clean energy investment is an important channel through which green finance can support environmental sustainability (Aletihad / IRENA, 2026). To reach the 2030 clean energy capacity target of 19.8 GW, the UAE still needs about 11.89 GW additional capacity from the 2025 level. This requires an approximate 20.14% annual growth rate from 2025 to 2030, which highlights why green finance and energy investment are necessary (Government of the UAE, 2024); (Aletihad / IRENA, 2026). The AED 1 trillion sustainable finance target is about 5.00 to 6.67 times larger than the AED 150–200 billion energy investment target. This indicates that the financial-sector ambition is large enough to support a broad sustainability transition if the funds are effectively directed toward credible green projects (CBUAE, 2023); (Government of the UAE, 2024).

The results support the conceptual framework. Green finance is linked with the UAE's environmental sustainability agenda because of sustainable finance targets, clean energy investment requirements, and renewable capacity growth all point toward finance as a key enabler of environmental transition. However, these descriptive calculations should be treated as supportive evidence, not as causal econometric proof. Since this thesis is based on a **secondary study** and does not use a complete annual time-series dataset, the results are presented using available secondary values from valid sources. The analysis includes UAE population, GDP, GDP per capita, CO₂ emissions per capita, renewable electricity production, renewable energy capacity, sustainable finance target, and clean energy investment targets. These indicators help explain the relationship between **green finance** and **environmental sustainability** in the UAE. [data.worldbank.org], [irena.org]

Table 05 Data Indicators

Year	Indicator	Value	Unit	Interpretation
2024	Population	10,986,400	People	Shows the size of the UAE population and demand pressure on resources. [data.worldbank.org]
2024	GDP	552.32	Billion US\$	Shows the economic size of the UAE. [data.worldbank.org]
2024	GDP per capita	50,273.5	Current US\$	Used as a control variable representing income level/economic development. [data.worldbank.org]
2024	CO ₂ emissions per capita	18.3	tCO ₂ e per capita	Used as an environmental sustainability indicator. [data.worldbank.org]
2021	Renewable electricity production	4.2	% of total electricity	Shows the share of renewable electricity in total electricity generation. [data.worldbank.org]
2024	Renewable energy capacity	6.85	GW	Base value for renewable capacity growth calculation. [en.aletihad.ae]
2025	Renewable energy capacity	7.91	GW	Latest available renewable capacity value. [en.aletihad.ae]
2030	Sustainable finance target	1 trillion	AED	Reflects UAE banking sector's sustainable finance mobilization target.

2030	Energy investment target	150–200	Billion AED	UAE Energy Strategy 2050 investment target.
2030	Clean energy capacity target	19.8	GW	UAE target for installed clean energy capacity by 2030.

Calculation 1: Estimated Total CO₂ Emissions

$$\text{Total CO}_2 = \text{Population} \times \text{CO}_2 \text{ emissions per capita}$$

$$\text{Total CO}_2 = 10,986,400 \times 18.3$$

$$\text{Total CO}_2 = 201,051,120 \text{ tCO}_2\text{e}$$

$$\text{Total CO}_2 = 201.05 \text{ million tCO}_2\text{e}$$

Interpretation:

The estimated total CO₂ emissions of the UAE are approximately **201.05 million tCO₂e**. This shows that environmental sustainability remains an important issue for the UAE, even though the country is investing in clean energy and sustainability initiatives.

[\[data.worldbank.org\]](https://data.worldbank.org)

Calculation 2: Renewable Energy Capacity Growth

$$\text{Growth} = \text{Renewable Capacity}_{2025} - \text{Renewable Capacity}_{2024}$$

$$\text{Growth} = 7.91 - 6.85$$

$$\text{Growth} = 1.06 \text{ GW}$$

$$\text{Growth Rate} = \frac{1.06}{6.85} \times 100$$

$$\text{Growth Rate} = 15.47\%$$

Interpretation:

The UAE's renewable energy capacity increased from **6.85 GW in 2024** to **7.91 GW in 2025**, showing an increase of **1.06 GW**, or approximately **15.47%**. This supports the argument that investment in renewable energy is an important channel through which green finance can improve environmental sustainability. [\[en.aletihad.ae\]](https://en.aletihad.ae)

Calculation 3: Gap to 2030 Clean Energy Capacity Target

$$\text{Capacity Gap} = \text{Target Capacity}_{2030} - \text{Current Renewable Capacity}_{2025}$$

$$\text{Capacity Gap} = 19.8 - 7.91$$

$$\text{Capacity Gap} = 11.89 \text{ GW}$$

Interpretation:

The UAE region still needs approximately **11.89 GW** of additional clean energy capacity to reach the **19.8 GW clean energy capacity target by 2030**. This indicates that continued green finance and clean energy investment will be necessary to achieve the UAE's 2030 energy transition objectives. [\[en.aletihad.ae\]](https://en.aletihad.ae)

Calculation 4: Required Growth to Reach 2030 Target

$$\text{Required Increase} = \frac{11.89}{7.91} \times 100$$

$$\text{Required Increase} = 150.32\%$$

Interpretation:

From the 2025 renewable capacity level, the UAE needs to increase clean energy capacity by approximately **150.32%** to reach the 2030 target of **19.8 GW**. This highlights the importance of strong green finance mechanism, such as sustainable finance, clean energy investment, and climate finance. [\[en.aletihad.ae\]](http://en.aletihad.ae)

Calculation 5: Required Annual Growth Rate to 2030

$$CAGR = \left(\frac{19.8}{7.91} \right)^{1/5} - 1$$

$$CAGR = 20.14\%$$

Interpretation:

To reach the 2030 clean energy capacity target, the UAE region would need an estimated annual growth rate of approximately **20.14%** from 2025 to 2030. This shows that renewable energy expansion must continue at a strong pace, support by green finance and sustainable investment. [\[en.aletihad.ae\]](http://en.aletihad.ae)

Calculation 6: Sustainable Finance Target Compared with Energy Investment Target

$$Ratio = \frac{\text{Sustainable Finance Target}}{\text{Energy Investment Target}}$$

Using the upper investment target:

$$Ratio = \frac{1000}{200} = 5.00$$

Using the lower investment target:

$$Ratio = \frac{1000}{150} = 6.67$$

Interpretation:

The UAE region banking sector's **AED 1 trillion sustainable finance target by 2030** is around **5 to 6.67 times larger** than the UAE Energy Strategy 2050 investment target of **AED 150–200 billion** by 2030. This suggests that the financial sector has the potential to strongly support the UAE's regional environmental sustainability and clean energy transition if sustainable finance is effectively directed toward green projects.

Summary of Results

Calculation	Result	Meaning
Estimated total CO ₂ emissions	201.05 million tCO ₂ e	Shows the scale of UAE emissions.
Renewable capacity increase	1.06 GW	UAE renewable capacity increased from 2024 to 2025.
Renewable capacity growth rate	15.47%	Shows strong renewable energy expansion.
Gap to 2030 clean energy target	11.89 GW	Additional capacity required to reach target.
Required increase from 2025 level	150.32%	UAE needs major clean energy expansion.
Required annual growth rate to 2030	20.14% per year	Shows required pace of clean capacity growth.
Sustainable finance target vs energy investment target	5x to 6.67x	Sustainable finance target is large enough to support clean energy investment.

The secondary data analysis shows that the UAE has made progress in renewable energy capacity, with renewable capacity increasing from **6.85 GW in 2024** to **7.91 GW in 2025**. This increase of **15.47%** indicates that the UAE is moving toward clean energy development. However, the gap of **11.89 GW** to reach the 2030 clean energy capacity target shows that significant additional investment is still required. [\[en.aletihad.ae\]](http://en.aletihad.ae) The estimated total CO₂ emissions of **201.05 million tCO₂e** show that environmental sustainability remains a major policy priority for the UAE region. Although the UAE is expanding renewable energy, its high CO₂ emissions per capita indicate the need for stronger green finance, energy efficiency, and low-carbon development policies. [\[data.worldbank.org\]](http://data.worldbank.org)

The UAE region banking sector's commitment to mobilize **AED 1 trillion in sustainable finance by 2030** is highly significant. When compared with the UAE region Energy Strategy 2050 investment target of **AED 150–200 billion**, the sustainable finance target is **5 to 6.67 times larger**, showing that UAE financial institutions can play a major role in supporting clean energy and environmental sustainability. Overall, the results support the thesis argument that **green finance can contribute positively to environmental sustainability in the UAE region**. Green finance can support renewable energy expansion, clean energy capacity growth, and climate-related investments. However, these results are based on available secondary indicators and descriptive calculations, not econometric regression results. Based on the available secondary data, the study finds that green finance is an important supporting factor for environmental sustainability in the UAE. The increase in renewable energy capacity, the large sustainable finance target, and the UAE's clean energy investment objectives show that green finance can support the country's transition toward a low-carbon economy. However, this study does not use a complete annual dataset; the findings should be interpreted as **secondary descriptive evidence** rather than causal econometric evidence. Future studies should collect complete yearly data and apply OLS, unit root tests, and other econometric methods to verify the relation.

CONCLUSION

This work concludes that green finance can support environmental sustainability in the UAE by mobilizing finance for renewable energy, clean energy capacity, green infrastructure, climate-risk management, and sustainability disclosure. The conclusion is consistent with previous empirical evidence showing that green finance improves environmental quality ([Khan et al., 2022](#)). The numerical calculations show that the UAE has a significant environmental transition opportunity. Renewable capacity is increasing, but additional capacity and sustained finance are needed to reach 2030 clean energy targets ([Aletihad / IRENA, 2026](#)); ([Government of the UAE, 2024](#)). First, UAE institutions should improve green finance data reporting so that researchers and policymakers can measure sustainable finance flows more accurately ([CBUAE, 2026](#)). Second, banks and capital-market participants should link green finance with measurable environmental outcomes such as CO₂ reduction, renewable capacity additions, and energy efficiency improvements ([SCA, 2026](#)); ([World Bank, 2026](#)). Third, future investments should prioritize clean energy because the UAE still needs a substantial capacity increase to meet the 2030 clean energy capacity target ([Government of the UAE, 2024](#)).

This study has several limitations. First, it is a secondary study, so it does not collect primary data from banks, companies, policymakers, investors, or households. Second, the study does not conduct econometric testing, so it cannot provide a precise numerical estimate of the

impact of green finance on environmental sustainability in the UAE. Third, green finance is difficult to measure because it includes different instruments such as green bonds, green loans, sustainable finance commitments, renewable energy investment, and climate-risk management practices. Fourth, UAE region-specific empirical studies on green finance and environmental sustainability remain limited, so the thesis relies partly on regional academic evidence and official policy documents. Future research should collect annual UAE region data and test the relationship statistically using CO₂ emissions, ecological footprint, renewable energy share, or clean energy capacity as dependent variables. Green finance can be measured through green bonds, green loans, sustainable finance disbursement, green sukuk, renewable energy investment, or climate finance commitments (World Bank, 2026); (IRENA, 2026).

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APPENDICES**Appendix A: Secondary Data Extraction Guide**

Appendix Table A1 contains filled secondary data used in the thesis. Source links are included in the citation column and below the table (World Bank, 2026); (CBUAE, 2023); (Aletihad / IRENA, 2026).

Appendix Table A1 Data extraction template

Year	Variable	Value	Unit	Source	URL / Reference	Notes
2024	Population	10,986,400	People	World Bank / Data Commons	[leap.unep.org] , [datacommons.org]	UAE total population for 2024.
2024	GDP	552.32	Billion current US\$	World Bank	[leap.unep.org]	Shows UAE economic size.
2024	GDP per capita	50,273.5	Current US\$	World Bank	[data.worldbank.org] , [leap.unep.org]	Control variable for income/economic development.
2024	CO ₂ emissions per capita	18.3	tCO ₂ e per capita	World Bank	[leap.unep.org]	Main environmental sustainability indicator.
2024	CO ₂ emissions per capita	18.26	Metric tons per capita	Data Commons / World Bank data	[datacommons.org]	Similar CO ₂ value; useful for cross-checking.
2024	Total CO ₂ emissions	200,558,970	Tons	Worldometer	[worldometers.info]	Non-official but useful comparative emissions dataset.
2022	Energy consumption per capita	8,335.81	kg oil equivalent per capita	Data Commons	[datacommons.org]	Control variable: energy use.
2021	Renewable electricity production	4.2	% of total electricity production	World Bank	[leap.unep.org]	Environmental / clean energy indicator.
2025	Renewable energy capacity	7.91	GW	IRENA data reported by Aletihad	[en.aletihad.ae]	Latest available renewable capacity figure reported from IRENA.
2024	Renewable energy capacity	6.85	GW	IRENA data reported by Aletihad	[en.aletihad.ae]	Previous year comparison for renewable capacity.

2030	Sustainable finance target	1 trillion	AED	CBUAE / UAE banking sector	[centralbank.ae] , [wam.ae]	Green/sustainable finance target by 2030.
2030	Energy investment target	150–200	Billion AED	UAE Energy Strategy 2050	[u.ae] , [moei.gov.ae]	Investment planned to meet energy demand and support clean energy transition.
2030	Clean energy capacity target	19.8	GW	UAE Energy Strategy 2050	[u.ae] , [moei.gov.ae]	Target for installed clean energy capacity.
2030	Clean energy capacity share target	30	% of total energy mix	UAE Energy Strategy 2050	[u.ae] , [moei.gov.ae]	Target share of installed clean energy capacity.
2030	Clean energy generation target	32	%	UAE Energy Strategy 2050	[u.ae] , [moei.gov.ae]	Target contribution of clean energy generation.
2030	Energy efficiency target	42–45	% improvement vs. 2019	UAE Energy Strategy 2050	[u.ae] , [moei.gov.ae]	Important sustainability target.
2050	Net zero target	Net Zero	National target	UAE Net Zero 2050 Strategy / UNFCCC	[data.humdata.org] , [ourworldindata.org]	Long-term UAE climate target.

LIST OF ABBREVIATIONS

ADB = Asian Development Bank
 ADGM = Abu Dhabi Global Market
 CBUAE = Central Bank of the United Arab Emirates
 CO₂ = Carbon Dioxide
 DFSA = Dubai Financial Services Authority
 ESG = Environmental, Social and Governance
 FDI = Foreign Direct Investment
 GF = Green Finance
 GHG = Greenhouse Gas
 IRENA = International Renewable Energy Agency
 MOCCA = Ministry of Climate Change and Environment
 SCA = Securities and Commodities Authority
 SFWG = Sustainable Finance Working Group
 UAE = United Arab Emirates
 UNFCCC = United Nations Framework Convention on Climate Change
 WDI = World Development Indicators