

Built to last:

sustainable buildings frameworks for
Saudi Arabia, Turkey and the UAE



In collaboration with





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About the report

This report is the result of a research collaboration between HSBC and the Green Building Council of the United Arab Emirates, Saudi Arabia, and Singapore, aimed at informing and inspiring the building sector to further embrace green building practices. The report offers a snapshot of the current state of green buildings in the United Arab Emirates, Saudi Arabia, and Singapore, and highlights the key strategic, financial, and operational enablers for green buildings in these markets. It particularly looks at how green buildings can contribute to environmental and socio-economic goals, improve the built environment and achieve net-zero emissions, and address climate change. The report also covers the challenges of green buildings, delving deep into the value chain, and offering practical advice for policymakers, financial institutions, and tenants to harness the potential of green buildings in the transition to a more sustainable and resilient building sector.

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Foreword

By 2050, it is estimated that 70% of the world's population will live in cities.¹ This increasingly urban lifestyle will require new and better buildings to be built globally. Sustainable building practices can help cities meet this demand in a way that allows them to both honour their own climate change pledges and the Nationally Determined Contributions of their countries, whilst also helping to create future-proof infrastructure that may otherwise be at risk due to the effects of climate change.

Although the transition to sustainable building practices is possible and desirable, there are many challenges that hinder green building practices becoming business-as-usual, mainly because changes are required in every aspect of the building sector value chain. What ensures that this ambition remains on the table is the fact that direct measures in buildings (e.g. energy efficiency and renewable energy) could (by some calculations) account for potential savings in greenhouse gas emissions of up to 84 gigatonnes of carbon dioxide by 2050 on a global level, the equivalent to planting 467 billion trees.² When considering energy efficiency alone, cost savings of up to USD 459 billion are possible with an investment of USD 16-270 billion. To set this in context, even at the highest end of this estimation, this investment is still less than a third of the USD 850 billion expected to be spent in fossil fuel subsidies globally by 2050.³

It is clear that the benefits of a transition to sustainable building practices make sense. They are also widespread. Policy-makers can reap significant environmental and socio-economic benefits by integrating sustainable building considerations in urban planning and re-thinking the subsidies to energy and water. Financial institutions and investors can capitalise from the growing market by creating dedicated products to finance green buildings. Developers and owners can align their business and sustainability strategies, and engage with their stakeholders, to design, build and operate more efficient buildings. And tenants, as the ultimate drivers of the buildings market, can choose to opt for more sustainable living and working spaces.





Executive Summary

A “green building” is often a building with a lower carbon footprint and resource consumption rate than a traditional building. To develop the market for green building practices, countries like the UAE, KSA and Turkey have relied on labelling systems and global best practice standards to classify and identify “green buildings”.

The enablers developed can be broadly classified into strategic enablers, financial enablers, and market enablers. Strategic enablers are policies, strategies and regulatory frameworks, such as the countries’ national development plans. The UAE, KSA and Turkey have issued codes and standards for green buildings, focusing on energy, climate change, and water, currently at different rates of implementation. Financial enablers refer to instruments and mechanisms aimed at tapping the USD 24.7 trillion potential for green buildings during the next decade, according to an estimate by the International Finance Corporation (IFC).⁵ Private initiatives have included, for example, a USD 600 million green Sukuk issued by Majid Al Futtaim, a major developer in the UAE, as well as other mechanisms to attract USD 30-50 billion for green buildings in KSA by 2030. In Turkey, green finance is driven mostly by international development funds and financial institutions. Market enablers refer to tools that facilitate the design, sourcing, construction, operation and decommissioning of green buildings. Technology has been a key enabler in the UAE and KSA, while Turkey has had a stronger focus on softer mechanisms such as standards, certifications, and registers.

The benefits of green buildings are environmental, economic and social, and are spread throughout the value chain. Benefits at the design and construction phase include optimised resource and time management, which can increase the asset value and the returns received by investors and developers. Operational benefits include cost savings, workplace health, and productivity, as well as risk mitigation. It is estimated that environmental benefits include the avoidance of 129 million tonnes of CO₂ per year in the UAE and KSA, as well as a 14% reduction in primary energy consumption in Turkey. Social and economic benefits of green buildings include an estimated USD 313 to USD 459 billion in savings on global energy spending, a 7% increase in asset value, and two new jobs created for every USD 1 million invested in energy efficiency.

Although the benefits of making the building sector more sustainable are clear, challenges remain.

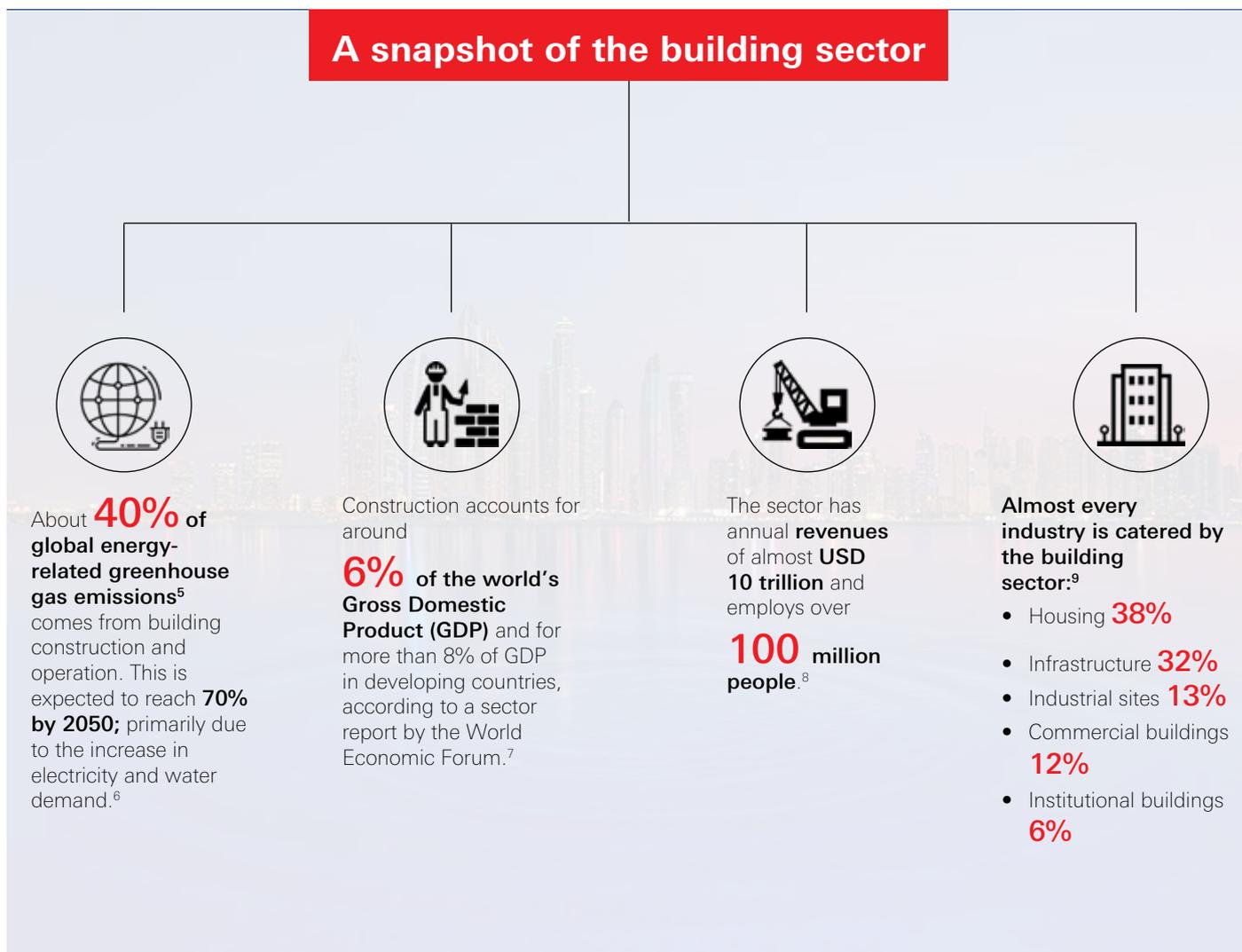
Strategic challenges are mostly related to the irregular coverage of green building strategies: they often lack alignment with major urban planning strategies and are not implemented consistently. Financial challenges refer to the low attractiveness of existing financial mechanisms, due to their generic nature (i.e. they do not accommodate for the specific conditions of the real estate and construction market), their long payback periods (i.e. subsidies on energy and water use lower the operational cost of inefficient buildings), and their higher cost when compared to other mechanisms. Market challenges include the lack of public awareness on the affordability of green buildings, the limited commitment of private sector strategies, the low implementation of integrated design and development, and the insufficient data available to quantify and verify the benefits of green buildings. The market is also affected by the existing stock of less sustainable buildings, environmental risks such as climate change, and the limited transfer of benefits between owners and tenants (i.e. owners lack an incentive to invest in green practices since they do not cover the operational costs, while tenants have limited decision power in the design and construction of the building).

To address these challenges, all stakeholders must play their part and actions should be more integrated. Policy-makers could develop integrated urban planning strategies which encompass green building practices, and could gradually phase-out subsidies associated with the use of water and electricity. Financial institutions can focus on the development, introduction and promotion of dedicated products and incentive mechanisms, which could tap the potential for green investment. Developers and owners can align their corporate and sustainability strategies to optimise green investment, and undertake a life-cycle analysis and a more stakeholder-led approach to increase efficiency. Customers, as ultimate drivers of the market, can be better informed of the benefits and cost-savings of green buildings, which would drive the demand and push for the transfer of benefits between owners and tenants.

There are many paths to support a transition to a greener built environment, but they all require technical, operational, organisational and regulatory measures. An integrated framework that articulates supply, demand and financing is critical to increase the rate of adoption of green building practices in the UAE, KSA and Turkey.



1. Building Sector: An Overview



According to the World Bank and the UN Food and Agriculture Organisation data¹⁰, the built environment – from rural infrastructure to densely populated cities – occupies less than 1% of the world's area. According to a report by the International Renewable Energy Agency (IRENA), the building sector is estimated to cover 270 billion m² by 2050, with the estimated contribution to greenhouse gas emissions from the sector due to increase by up to 70%. Yet, built environments are where people live and work. As such, making the sector more sustainable is incredibly important for a transition to a low carbon future.¹¹

These changes are also a priority for signatories of the UN 2015 Paris Climate Agreement, given that the global average building energy intensity needs to decrease by 30% from what it is today¹² to reach the objective of limiting climate change to 2 °C. It is also a low-hanging fruit - it is estimated that pursuing the implementation of strategic low-carbon technologies in buildings would avoid the emission of 4.9 gigatonnes of CO₂ globally every year.¹³ The cost-savings associated with these

efficiencies are also key drivers for the greater adoption of green building practices.

For these opportunities to be realised, stakeholders throughout the building sector value chain – e.g. designers, developers, contractors, owners and tenants – rely on enablers. Strategic enablers to set the ground rules, financial enablers to leverage investment and market enablers to streamline the project delivery. This report will analyse how these enablers affect the conditions for green building practices in the United Arab Emirates (UAE), Saudi Arabia (KSA) and Turkey.

While there is no overarching and singular definition of green building financing, given the varying standards and requirements across different nations, most countries define this type of financing as that related to commercial, residential and related building assets that are of sufficiently low carbon intensity (and certified as such) to qualify for such a label and financing.



Furthermore, the thresholds for certifications also vary depending on the certification type. As such, the way different buildings meet specific certification thresholds may differ in terms of energy conservation, energy efficiency, emissions data etc.

This report consolidates research conducted on the topic of green buildings and green finance in the MENAT region to gain a better understanding of the enablers and players of the buildings sector, and complements secondary research with insights from industry experts.

The report uses a three-pronged approach to analyse the green financing enablers in the building sector for the three countries of focus, and builds upon this approach to build a business case for green buildings in the region and provide recommendations for key stakeholders. A description of these enablers is shown below:

Strategic enablers refer to the national and local government priorities that translate into policies, strategies and regulatory frameworks, laying the groundwork for green building projects. These include strategies for energy efficiency, green buildings, and nation-wide infrastructure development plans.

Financial enablers refer to the institutions and products that provide finance to support the green building markets such as green bonds, green mortgages, and other green finance mechanisms. They play a key role as instruments for the implementation of green practices in the buildings sector and could come from commercial or development banks, as well as funds or other governmental institutions.

Market enablers refer to operational players that facilitate the development of a building project from design and planning, sourcing of products, construction, operations to decommissioning. This includes, among others, technology, voluntary standards, and other aspects throughout the value chain.

1.1. Strategic Enablers

Globally, the development of policy and regulatory frameworks for green building practices has been increasing. During the last 20 years, there has been a major increase in the number of programmes encouraging the inclusion of sustainability measures within the design, operation, and construction of buildings. For example, the Efficient World Scenario, developed by the International Energy Agency World Energy Outlook, highlights the potential for global building energy demand to decline between now and 2040, despite total building floor area growing by a further 60%.¹⁴

In the three countries of focus, the building sector is essential for the national economies. The sector is driven by market demands, a consequence of changing demographics, and is built upon the support of governments.¹⁵ With an increasing number of national development plans and objectives focusing on energy, climate change and water; green building practices have become key enablers for these countries to achieve these goals.¹⁶



Country snapshots

United Arab Emirates

Is the sector considered in national strategies and international agreements?

- The UAE's **Nationally Determined Contribution (NDC)** - includes green building regulations, efficiency standards, retrofit programmes and support structures for energy service companies (ESCO).¹⁷
- The construction sector – comprising **14.5% of the GDP** in 2018¹⁸ – is one of the pillars of the UAE's national development plan.
- The **UAE Vision 2021** sets energy and water consumption targets, and emirate-level visions often set green building objectives.
- The **UAE Green Growth Strategy** – 1 of the 6 main areas of focus relates to developing urban planning policies and to raise the efficiency of housing and buildings environmentally.¹⁹

What are the existing government and regulatory enablers in the sector?

- Abu Dhabi **Estidama Pearl** rating - first mandatory sustainability rating system in the Arab World launched in 2008, for proposed new-construction villas, buildings and community projects that fall under the ownership of developers.²⁰
- **Dubai Green Building Regulations and Specifications** (2010²¹) – Applicable to all new constructions and buildings; re-issued as **Al Sa'fat green building evaluation system (2016)**.²²
- **Ras al Khaimah: Barjeel** (2019²³) - Applicable to all new buildings, extensions or refurbishments in the emirate, including economic and free zones.
- **Dubai Integrated Energy Strategy (DIES) 2030** - aims to reduce electricity and water consumption by 30% by 2030.
- **Abu Dhabi Demand-Side Management and Energy Rationalisation Strategy 2030** – targeting a 22% reduction in energy consumption and a 32% reduction in water consumption by 2030.



Estidama 'Pearl' Rating has regulated the design of approximately **15,000** houses and the construction of approximately **2,000** houses and buildings.



Country snapshots



Is the sector considered in national strategies and international agreements?

- **KSA's NDC** aims to attain mitigation co-benefits of up to 130 million tonnes CO₂e avoided by 2030²⁴ - through strengthening the **Saudi Energy Efficiency Programme (SEEP)** and giving special attention to the buildings, industry and transportations sector.²⁵
- **Investments in green buildings** in the Kingdom is currently the **third biggest investment** of its kind, and the kingdom is set to become the industry's world leader.²⁶
- Focus on real estate stems from one of the **Saudi Arabia Vision 2030 goals** - doubling the contribution of real estate to GDP from 5% to 10%.
- **Saudi Building Code (SBC)** – set of legal, administrative and technical regulations and requirements to specify minimum standards of construction to ensure public safety and health.

What are the existing government and regulatory enablers in the sector?

- **SEEP** launched in 2012 by the **Saudi Energy Efficiency Centre (SEEC)** - offers guiding principles and directions to the construction sector.
- **Sustainability Quality and Evaluation System** launched in 2018 - sets national standards for the development and evaluation of the green buildings.
- **Decarbonising initiatives** - the Innovation Initiative for Sustainable Buildings, the Global Methane Initiative and the Carbon Dioxide Initiative.²⁷

Kingdom of Saudi Arabia



For KSA, the construction sector is a pillar for diversification, offering long-term investment opportunities for government to boost their infrastructure and capacities, and strengthen the capacities of the country in sectors such as technology and hospitality.

Country snapshots



Is the sector considered in national strategies and international agreements?

- **Turkey NDC** - dedicates a section to the country's Buildings and Urban Transformation, with a focus on energy efficiency.
- Mandated the development and **enforcement of Energy Performance of Buildings Regulations and Energy Performance Certificates** for residential and service buildings.
- Energy management and green building standards have been in force for almost 2 decades.²⁸
- Energy-related policies include:
 - **Energy Efficiency Law**
 - **Regulations on buildings' energy Performance**²⁹

Turkey

What are the existing government and regulatory enablers in the sector?

- A reasonable level of maturity in green construction – partly due to the availability of some supporting governmental regulations and policies, as well as the incentive to reduce the country's national energy consumption.³¹
- Reducing energy demand in buildings is a national priority - buildings consume 42% of the national energy demand, of which only 5% produced domestically. As such, it is the government's focus to **reduce energy consumption across all strategic sectors, i.e., building, transport, and industry.**
- **Regulation on 'Increasing Energy Efficiency in the use of Energy Resources'** requiring a minimum 20% reduction in energy intensity by 2023 compared to 2010.
- **National Energy Efficiency Action Plan (NEEAP) 2017-2023, 10th National Development Plan, National Climate Change Action Plan, National Climate Change Strategy, and the National Energy Efficiency Action Plan**³² - existing sustainability strategies launched by Turkey's government.
- NEEAP 2017-2023 specifically addresses the ESCO market, as well as the 2023 Energy Efficiency Strategies and Targets and the recent Public Procurement Process.³³



Turkey ranks 6th in the world in US Green Building Council's annual list of the top 10 countries and regions for LEED. Turkey has recently decreased its domestic spending on infrastructure, after the sector being an engine for employment and economic growth for more than 20 years. However, the sector still plays a key role in the country's economy as Turkey remains the world's second largest contractor in the world.

1.2. Financial enablers



The International Financial Corporation has identified a potential of USD 24.7 trillion for green buildings in emerging markets over the next 11 years, of which 70-80% of the required financial investment is expected to be contributed by the private sector.³⁵

As a largely market-driven sector, decision-making in the building sector is mostly driven by financial benefits. There are multiple aspects of a green building project that can generate value for stakeholders, such as higher quality, operational savings, higher property and rent values, lower vacancy rates, and reduced risks and capital costs.³⁴

Sustainable finance presents itself as an innovative alternative to traditional finance since it can offer investors more attractive, risk-adjusted returns that align with the long-term horizon of asset managers. For issuers, sustainable finance helps tap into new methods of funding from a broader investor base.

In the UAE and KSA, finance for sustainable projects is recently gaining momentum in the form of bonds (i.e. green bonds and Sukuks, sharia law-compliant bonds) and other credit instruments. For example, Masdar, a subsidiary of Mubadala Investment Company, recently announced the launch of UAE's first green sustainable real estate investment trust (REIT) at a valuation between AED 950 million and AED 1 billion. The aim of the REIT is to offer investors an option to invest in sustainable income-generating real-estate assets, thereby ultimately contributing to the long-term sustainable growth and development of the economy.³⁵

Other major green infrastructure financing examples in the UAE include the financing agreements between the utilities and Independent Power and Water Producers (IWPPs) for large scale solar and reverse osmosis projects, and the Dubai Green Fund (launched by the Dubai Energy and Water Authority – DEWA), which sets a AED 100 billion fund (USD 27 billion) to stimulate investment in clean energy and other green projects by providing seed financing.

In KSA, Sedco Capital (the first Saudi asset manager and first fully sharia-compliant asset manager in 2014 to become a signatory of the United Nations Principles of Responsible Investment) recently launched an investment strategy combining environment-conscious and sharia-compliant principles, embracing socially responsible investing in the region.

In Turkey, initiatives have been led by development banks and private financial institutions, due in part to a different cash-flow dynamic from the one seen in KSA and UAE. Turkey's Garanti BBVA, for example, recently executed the country's first Green Loan agreement with Zorlu energy by linking the margin of their loan to their ESG performance. This, to complement a USD 300 million investment by the International Finance Corporation (IFC) for green mortgages and green bonds through five banks^{36,37} which constitutes a strong market signal.³⁸



A growing number of signatories are adopting the United Nations Principles for Responsible Investment (UN PRI), with assets-under-management now standing at almost USD 82 trillion. In terms of more specific financing vehicles, green bonds are also on the rise, with total capitalisation in the green bond market rising from USD 87 billion to USD 167 billion over the last two years.

Country snapshots



Key drivers and existing sustainable finance enablers

- UAE aims to become a hub for tourism, financial activities, and innovation.³⁹
- Legislation came in force in 2018 for the issuance of federal sovereign bonds and Sukuks.
- Sustainable Finance Agenda - Announced by Abu Dhabi Global Market (ADGM); this is a pledge from 25 signatories among major financial institutions to drive sustainable finance and investment forward through the Abu Dhabi Sustainable Finance Declaration.
- Sustainable Finance Hub – to be developed by ADGM to support capital formation, raising and deployment as well as the creation and issuance of products to achieve positive economic, social and environmental objectives.⁴⁰
- Dubai Financial Market (DFM) and the Dubai International Financial Centre (DIFC) launched the 'Dubai Sustainable Finance Working Group' – aiming to bring together representatives of leading banks, financial institutions, as well as public and private companies in Dubai to build a sustainable financial services sector in Dubai.⁴¹
- Abu Dhabi Security Exchange - announced joining the UN's Sustainable Stock Exchanges initiative to encourage sustainable investment.
- Dubai Government plans to make Dubai a hub for green finance in the region - Dubai Financial Services Authority - together with a group of leading authorities in the UAE, has published the UAE's first Guiding Principles on Sustainable Finance (the Guiding Principles), which will serve as a catalyst for the implementation of the UAE's sustainability priorities.⁴²

United Arab Emirates

What have organisations and businesses achieved so far?

- National Bank of Abu Dhabi (now First Abu Dhabi Bank) - The first and only green bond issued in the region back in 2017 for a total of USD 587 million.⁴³
- Majid Al Futtaim - became the first corporate signatory in the region to the Net Zero Carbon Buildings Commitment.
- Majid Al Futtaim - Marked its listing of the world's first benchmark corporate Green Sukuk and the first-ever Green Sukuk issued by a corporate in the region. The bond is valued at USD 600 million and the investment is to be used for financing existing and future green projects. They are also set to raise a 2nd Green Sukuk, valued at USD 600 million, with the bonds due by February 2030.⁴⁴
- Middle East's first green revolving credit facility (RCF) – launched in 2018, where Masdar City raised AED 75 million to fund sustainability projects.⁴⁵
- Leading banks have launched incentive mechanisms such as Green Home Loans for LEED and GBCI certified houses⁴⁶ and Green Auto Loans^{47,48} in the UAE.
- Refinancing by bond markets – 1) USD 2.3 billion Ruwais Power Co. PJSC (Shuweihat 2) refinancing in 2013, where USD 825 million of existing debt was refinanced via a project bond and 2) Emirates Sembcorp Water & Power Co. refinanced some of its existing debt via a USD 400 million project bond.



Country snapshots



Key drivers and existing sustainable finance enablers

- The government is in the process of diversifying economic structure and tax regimes - including the introduction of White Land Taxes⁴⁹ and Value Added Tax (VAT).
- Sovereign investment fund – Public Investment Fund (PIF) - to develop around 70% of all renewable energy projects in the country.⁵⁰
- Government expects to attract USD 30-50 billion to invest in renewable energy and green building by 2030.⁵¹

Kingdom of Saudi Arabia

What have organisations and businesses achieved so far?

- The Islamic Development Bank (IsDB) has recently priced its largest sukuk issuance ever, raising USD 2 billion in 5-year trust certificates under its USD 25 billion Trust Certificate Issuance Programme. This adds to their first-ever green sukuk launched in 2019, which raised EUR 1 billion with KSA being the largest share-holding member state with 26.67%.⁵²
- The Ministry of Housing conducted the Sustainable Houses Forum in 2018 to boost the market and the quality standards of the industry and facilitate the communications between developers and investors.
- “Expand Learning Networks for Capacity-building” under UN Environment Inquiry - to build capacity and raise awareness about green financing benefits and existing international practices in the Kingdom.⁵³
- SoftBank is planning to invest approx. USD 25 billion in Saudi Arabia’s NEOM project over the next three to four years, which will be a new and sustainably built city.⁵⁴





Key drivers and existing sustainable finance enablers

- Global Compact Turkey - launched a Declaration on Sustainable Finance to introduce sustainability benchmarks into the credit facility policies of financial institutions.
- A recent update to the Declaration asks all banks to evaluate the environmental and social impacts of the projects that they finance if their respective contribution is USD 20 million or higher.⁵⁵
- Received support from Spain in the funding of the National Energy Efficiency Action Plan (NEEAP) and the National Renewable Energy Action Plan (NREAP).
- The Government of Turkey's emphasis on the development of financial mechanisms - loans and tax reductions - to foster green building activity; promote the dissemination of passive energy and zero-energy housing design.
- Sustainable Finance Forum – annual collaborative platform in cooperation with UNEP FI and Global Compact Turkey – the focus is on sustainable finance in the banking sector, non-banking finance sector, and real estate sector.

Turkey

What have organisations and businesses achieved so far?

- NEEAP, funded by the European Union and developed with support from the European Bank for Reconstruction and Development (EBRD)⁵⁶ - suggests 55 actions across 6 categories, including buildings and services sector, to reduce energy consumption by 14% by 2023.⁵⁷
- Turkey's First Green Project Finance Agreement signed with Akfen Renewable Energy - Garanti BBVA is the facility agent and green loan coordinator while İşbank is the security agent in the financing package.
- In 2016, Türkiye Sınai Kalkınma Bankası A.S. (TSKB) launched the first Turkey-issued Green/Sustainable bond, with a value of USD 300 million to be invested in energy efficiency and renewable energy, as well as socially responsible projects. The bond received an international demand of USD 4 billion, 13 times its size, showing a growing appetite and confidence on these types of financing.⁵⁸ This was followed by a second Sustainable bond, targeting sustainable infrastructure projects, as well as projects for climate change mitigation and adaptation.⁵⁹
- Turkey's Clean Technology Fund (CTF) – one of the first initiatives was IFC's Commercialising Sustainable Energy Finance Programme (CSEF), financed with roughly USD 21 million of CTF funds "blended" with almost USD 100 million of IFC's own funds.
- Turkey Sustainable Cities Additional Financing Project (USD 560.6 million) – Approved in May 2019 by the World Bank Board – aims to improve the sustainability of Turkish cities by enabling interested municipalities to access financing for their priority investments.⁶⁰ This follows the launch of the Sustainable Cities Project (versions 1 and 2), which offered USD 132.7 million and USD 91.54 million respectively to Turkish cities for projects related to energy efficiency, renewable energy and urban environments, among other municipal priorities.⁶¹
- To target the potential of residential energy efficiency measures, the European Bank of Reconstruction and Development (EBRD), supported by the Clean Technology Fund (CTF) and the European Union (EU), launched TuREEFF, the Turkish Residential Energy Efficiency Financing Facility, to provide finance to residential consumers who wish to invest in Energy Efficiency projects in their homes.⁶² TuREEFF has financed over 430 projects since 2015, reaching 50,000 homes and investing over USD 350 million through 4 local banks.⁶³
- EBRD also launched the Green Cities initiative to help fund the adoption of the Green City Action Plan in Izmir. The plan addresses environmental challenges such as waste management and air quality.⁶⁴
- In the next 15 years, Turkey expects to renovate 6-7 million buildings and add 100,000 buildings annually.⁶⁵
- This additional investment could potentially boost the green and sustainable buildings market in the country.

1.3. Market enablers

The building sector tends to adopt innovation at a slower pace than more dynamic sectors like finance or transportation: most developers and contractors will choose reliable and widely tested alternatives over innovative, but sometimes uncertain, methods, materials, and technologies.⁶⁶ However, the pressure to deliver complex projects under time and resource constraints has driven the modernisation of the building sector. Sustainable building practices, such as voluntary building standards and digital technologies, emerge in this context as instruments to make buildings more efficient. The focus so far has been on the design, construction, and operation of buildings, with less emphasis on aspects like procurement and decommissioning, but examples can be found throughout the MENAT region.

1. Design and planning

Sustainable building practices implemented at the design stage help developers avoid inefficiencies. Voluntary standards such as Leadership in Energy and Environmental Design (LEED), Building Research Establishment Environmental Assessment Method (BREEAM) and Green Key, have proven effective to reduce operational costs and increase the value of the property. LEED-certified buildings, for example, offer 30-40% savings in water and energy and can be leased at a rate of up to 20% higher than the average.⁶⁷

Number of certified projects per country			
	UAE	KSA	Turkey
LEED ⁶⁸	242	52	366
BREEAM ⁶⁹	5	1	63
GREEN KEY	42	9	97

When it comes to technology, 3D-printing, Artificial Intelligence (AI) and Building Information Modelling (BIM) are being tested at a large scale, especially in KSA and UAE. These countries have taken the lead, in part, due to the cash-flow dynamic in the Gulf, allowing for actors in the supply chain to have a more even access to software, capacity building, and advanced equipment.

These technologies have sustainability benefits because they reduce inefficiencies. BIM consolidates information in 3D and in real-time, reducing material waste that currently adds up to 30% of construction resources. AI enables blueprints to adapt to ground conditions and changes in design, while 3D-printing enables designers to create complex structures with optimal material use and fewer safety risks for workers.

UAE

The Louvre Abu Dhabi Museum was designed and executed using iterative BIM⁷⁰, and the Museum of the Future in Dubai used BIM and 3D-printing techniques.

KSA

NEOM, a city under construction on the Red Sea coast, is being designed and planned using technologies like BIM and AI.

Turkey

Turkey has widely adopted the EDGE software, certifying 97,182 m² of floor space under this initiative, including 400 residential units.⁷¹

2. Sourcing

There is a significant opportunity in transforming procurement in the building sector, from using materials with a lower environmental footprint to decarbonise the building sector to reducing operational and decommissioning costs. Yet, it is not currently a focus of most sustainability practices seen in these countries.

There is also significant potential in directly tackling the processes related to the production and manufacturing of materials. According to the United Nations Global Status Report 2017, the buildings and construction sector accounted for 36% of final energy use and 39% of energy- and process-related emissions in 2017.⁷² Combining processes, for example, has proven effective in achieving enhanced efficiencies, reducing costs and emissions.

UAE

In 2018, Al Naboodah became the first manufacturing plant of concrete in the MENA region to launch a facility integrating software to issue Environmental Product Declarations (EPD), to comply with the environmental standards of the Expo 2020 site.⁷³ Gulf Cement Company operates one of the world's biggest waste heat recovery-based power plant at a single site and is certified by Carbon Trust, UK, to use the Carbon Trust Carbon Footprint Label.⁷⁴

KSA

AlSafwa Cement Company has implemented a Waste to Energy & Resource Recovery system, in combination with renewable energy generation. The company is also in the process of expanding its green materials catalogue.⁷⁵

Turkey

11 steel manufacturers have obtained the CARES Sustainable Constructional Steel (SCS) certification⁷⁶ and 247 products have been registered under a dedicated Environmental Product Declaration (EPD) registration system.⁷⁷

3. Construction

The construction phase offers an opportunity to tackle inefficiencies at the core. Technology and innovation can facilitate this process by reducing human error and streamlining the use of resources, material and time. Modular building, for example, allows multiple sections to be built simultaneously and in parallel with the preparation of the site. By building the modules in controlled conditions, modular building can reduce the delivery time by up to 50% and offer more efficient use of materials, a lower carbon footprint associated with transportation, and a higher material recycling and reuse rate.⁷⁸ 3D printing has also scaled up as a technology that could bring sustainability benefits such as allowing for more precise design for heating or cooling efficiency, as well as reducing material waste. 3D printing allows structural optimisation and functional hybridisation features that can enable reducing environmental impact by allowing use of material only where structurally or functionally needed.

In addition, government initiatives such as the Dubai 3D printing strategy support the uptake of this technology by setting targets such as 25% of buildings in Dubai to be constructed using 3D printing by 2030 - following assessment studies indicating that 3D printing technology can reduce construction costs by 50-70%, cut labour costs by 50-80% and reduce waste produced by construction operations by up to 60%.⁷⁹

The Middle East is projected to be the fastest-growing market for 3D concrete printing from 2018 to 2023.⁸⁰ In Turkey, uptake of new technologies for construction has been slow, with more focus on efficient design and operation.

UAE

The Dubai 3D printing strategy states that every new building needs to be 25% 3D-printed by 2030.⁸¹ The Dubai Opera and the Dubai Mall were built remotely in modules.⁸²

Considering the size of the construction market, industrial facilities that manage construction and demolition waste are scarce in the UAE⁸⁵ and KSA⁸⁶. Turkey, in comparison, has three operational facilities throughout the country, the first one established in 2006.⁸⁷

KSA

The Saudi government recently unveiled a 3D-printed house built in under 48 hours.⁸³ The world's largest 3D printer was also recently purchased by a private Saudi company in 2019.⁸⁴

Turkey

'Greenox' is a residential building in Istanbul with a vertical forest, which saves up to 35% energy, 42% water, and 41% energy in materials compared to a conventional apartment building.



How can owners and tenants make a difference?

Market and client demands are among the critical triggers of green building activity. In the UAE, client demands are ranked as the second most important driver, after environmental regulations. In KSA, drivers are related closely to competitiveness: market demands and better 10-year costs.⁸⁸

In this context, the demand created by owners – and their future tenants – is crucial. A key example of this is Expo 2020, which established effective sustainable practices related to sustainable sourcing and construction for their site, including the issue of a Sustainable Materials Guideline, the formation of a Contracts and Tender Committee that overlooks material selection, and the requirement to comply with sustainability certifications for steel, timber, and concrete, among others. As a major project in the UAE⁸⁹, Expo created a market for materials certified under EPD, BES6001 and CARES, among other certifications.

Expo's standards also helped enhance construction and demolition waste management practices among contractors, leading to the reuse and recycling of 99% of the construction and demolition waste generated on-site.

4. Operations

The sustainable operation of buildings has the potential to significantly reduce the cost and carbon footprint of buildings. In the Middle East, for instance, space cooling can consume over 70% of peak residential electrical demand on extremely hot days. This demand could be reduced by approximately 22% if building codes were to be introduced effectively by 2030.⁹⁰

For this reason, most decarbonising initiatives focus on improving the performance of cooling, heating, and appliances. The 'Advancing Net Zero' project, one of the most widely adopted projects worldwide to promote net zero carbon buildings, is a call of action to increase efficiency and introduce on-site and off-site renewable energy, looking for new and existing buildings to cleanly generate all the energy that they consume. The initiative has been signed by 51 organisations and local governments around the world and is driven by national Green Building Councils.⁹¹



In 2017, Majid Al Futtaim became the first developer in the Middle East to launch a Net Positive Strategy, committing to net positive operations by 2040, through implementing a series of projects across all assets in the region, ranging from small scale energy efficiency measures and on-site renewable energy installations to on-site rainwater harvesting and grey water recycling as well as providing more accessible high-quality water to the local communities from which they extracted water.

A method called integrated facility management is currently being used to increase the efficiency of day-to-day business operations. The method consolidates all organisational facility services and functions under one team of experts. With integrated facility management growing at a faster rate in the UAE (15.5%), KSA (21.8%) and Turkey (9.1%) than the global average (8.4%), working alongside companies with stronger sustainability practices could lead to major savings for owners and tenants down the line.⁹²

There is also great potential in improving the direct energy and water consumption of tenants. The roll-out of smart meters, for example, is expected to peak in 2020,⁹³ helping occupants modify their consumption behaviours and reduce their average electricity consumption by 10% per customer.⁹⁴ Significant efforts are being made to mainstream smart metering: KSA has plans to install 10 million smart meters by 2020⁹⁵, Turkey expects to install 3.6 million smart meters annually⁹⁶ and the UAE had over 1.3 million smart meters installed by 2018.

Even mainstream technologies, such as low-flow faucets, movement sensors, and LED lighting can make important differences in overall resource efficiency. An initiative to replace residential lighting with 110,000 LED lights decreased the homes' electricity consumption by 80% in a community in the UAE.⁹⁷ The uptake of appliances labelled as energy-saving can have similar benefits: using EnergyStar[®] appliances can reduce energy consumption by up to 30%.⁹⁸

Finally, retrofitting also presents a number of opportunities for efficiency gains. It is estimated that basic retrofits in UAE and KSA could deliver to USD 4 billion in energy savings every year, with deep retrofits reaching savings of USD 22 billion per year.⁹⁹

The retrofitting market has significant governmental support in the UAE, KSA, and Turkey, creating demand for a previously untapped market: energy service companies (ESCOs). Part of the success of the business model lies in creating an incentive for cost-effectiveness: ESCOs usually cover the initial investment costs and are paid based on the savings that they achieve.

What is the state of the retrofitting market?

UAE

60% of the ESCO activity is led by the public sector¹⁰⁰ (for example, Dubai's Etihad ESCO), but systems to accredit and register ESCOs have been emerging in the country since 2015¹⁰¹, with the support of several government initiatives^{102,103} that have led to the strengthening of the market.

KSA

A 'Super ESCO', announced by PIF, was established in 2017 to fund and manage the retrofit of government and public buildings with a capitalisation of USD 510 million.¹⁰⁴

Turkey

In 2018, amendments were made to the Energy Efficiency Law allowing the public sector to engage in energy performance contracts with ESCOs. By 2019, all ESCOs in Turkey were private. But in the next 10 years, collaboration between the public and private sector is expected to jointly invest USD 10 billion in the energy efficiency areas.¹⁰⁵

What is the state of the decommissioning market?

UAE

Existing regulation and voluntary green building codes state that at least 30-50% of the construction and demolition waste of a project should be reused and recycled.¹⁰⁷

KSA

Currently, less than 10% of the waste from construction and demolition is recycled. A new construction debris recycling facility, led by the Saudi Investment Recycling Company, is in development, expected to recycle half of this quantity by 2035.¹⁰⁸

Turkey

European Bank for Reconstruction and Development (EBRD)'s Near Zero Waste - NØW programme is a strategic initiative to promote waste minimisation and pollution prevention projects in various sectors – program to support EBRD waste minimisation investments for approx. USD 125 million.¹⁰⁹

5. Decommissioning

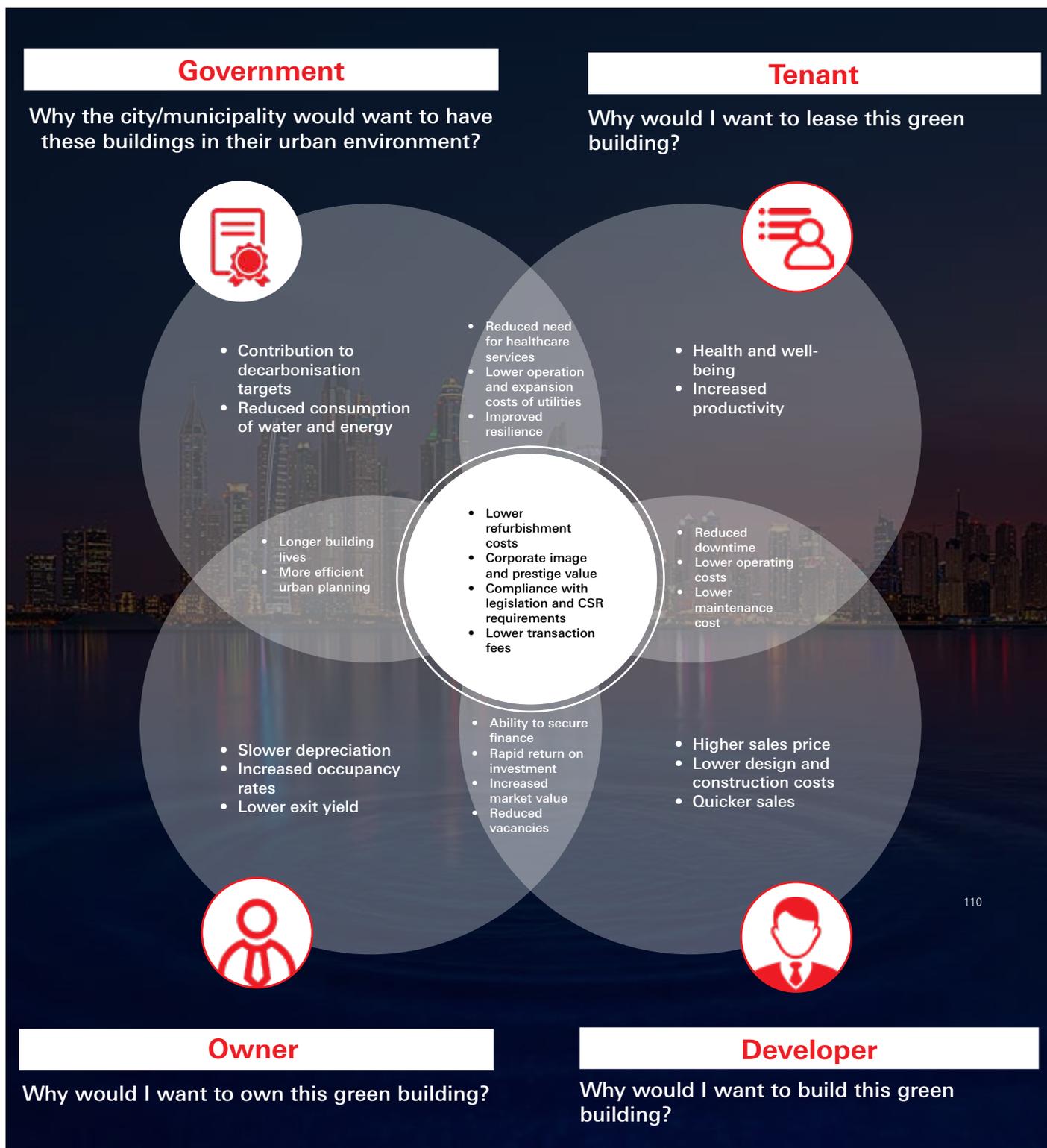
The end of a building's life can pose several environmental risks related to pollution and waste generation. It can, too, be an opportunity for owners, developers, and contractors to re-purpose materials and equipment in new projects. The idea of a circular economy in construction – one where the waste and surplus materials are re-purposed or recycled in other parts of the value chain – has been explored but is still in its infancy in most regions of the world.

Regulation on decommissioning is often sector-focused¹⁰⁶ – e.g. oil and gas, nuclear energy, industrial facilities – with limited regulation on buildings in general. Nonetheless, strengthening the market for re-purposed building materials and recycling of demolition waste would be beneficial for developers and owners, as it could help reduce the cost of landfilling and raw materials.

2. Business Case for Green Buildings in the Region

In general, the benefits of green buildings can be grouped into three categories: environmental, economic and social. These benefits spread across the different phases of the building sector life-cycle. Starting with the benefits that are gained during the design and construction phase, it then shifts to the

asset value and returns received by investors and developers. This is followed by the operational benefits such as cost savings, workplace health, and productivity, and finally the issue of risk mitigation, which plays a role in every stage of a building's economic life.



2.1. Environmental benefits

Globally, the greenhouse gas emissions savings potential is said to be as much as 84 gigatonnes of CO₂ by 2050 (almost twice the estimated total carbon emissions from all human activities in 2019¹¹¹) through direct measures in buildings such as energy efficiency, fuel switching and the use of renewable energy. The building sector has a significant potential for reducing greenhouse gas emissions in the three countries of focus; whose ecological footprint per capita (in global hectares) ranks 3rd, 20th and 75th for the UAE, KSA and Turkey respectively.¹¹² The Ecological Footprint per person is a nation's total ecological footprint divided by the total population of the nation; and measures how much demand human consumption places on the planet. Since 2000, energy consumption in residential and commercial buildings has risen by over 213% and 170% in the UAE and KSA respectively alone.¹¹³

Energy efficiency can reduce consumption by up to 180,000 gigawatt-hours (GWh) per year of energy consumption - (equivalent to the average annual consumption of approximately 16.4 million UAE residents according to the UAE State of Energy Report 2015) - with 56% and 26% of this potential in Saudi Arabia and the UAE respectively.¹¹⁴ This amounts to avoiding around 129 million tonnes of carbon dioxide per year - a key step towards helping these countries achieve the Paris Climate Agreement targets. Green buildings achieving the LEED certification can deliver in energy savings of 30 to 50% and water savings of 25 to 35% compared to conventional buildings.

Turkey's National Energy Efficiency Plan which runs till 2023 is expected to reduce primary energy consumption by 14%. This accounts for 23.9 million tonnes of oil equivalent by 2023.

2.2. Economic and social benefits

Global energy efficiency measures could save an estimated USD 313 to USD 459 billion in savings on energy spending. Research which looked at the energy efficiency of the building stock of UAE and KSA suggests that there is an investment potential of between USD 4 billion for the most basic energy efficiency measures up to USD 22 billion for more comprehensive or deep retrofits. While basic retrofits are still economical at current prices, without further domestic price reform or energy efficiency subsidies, the payback time-frame for individual houses and buildings from deep energy efficiency retrofits is still too long and cost prohibitive.¹¹⁵

Deeper retrofits become much more attractive once the wider benefits of energy efficiency are accounted for. For example, up to 43 gigawatts (GW) per year of generation capacity could be avoided across the GCC as a result.¹¹⁶ This could potentially reduce the cost of electrical generation capacity by USD 73 billion at a time when GCC countries are looking for external investments in large-scale utility projects via Independent Water and Power Producer (IWPP) operating models.¹¹⁷

Turkey's industry sector, which accounts for the biggest share of energy consumption at 32% after housing, also has the potential to save USD 10 billion by energy efficiency improvement projects and encouraging the use of combined heat and power. Additionally, the Turkey government is planning to replace 30% of the total 7.5 million streetlights with more energy-efficient ones by 2023. This will save more than USD 45 million by 2023 and USD 123 million by 2033.¹¹⁹

Building owners report that green buildings - whether new or renovated - command a 7% increase in asset value over traditional buildings. Although there are not enough regional statistics for social benefits; global studies indicate that workers in green, well-ventilated offices record an increase in cognitive scores i.e. brain function. Employees in offices with windows slept an average of 46 minutes more per night. Research suggests that better indoor air quality (low concentrations of carbon dioxide and pollutants, and high ventilation rates) can lead to improvements in performance of up to 8%. These are just some of the criteria assessed as part of well established green building rating schemes such as LEED and BREAAAM. For every USD 1 million invested in energy efficiency, approximately two jobs can be created per year in building energy systems management and construction.¹²⁰

3. Challenges: What is holding us back from having a sustainable building sector?

In the UAE, KSA, and Turkey, green building practices have been gaining some momentum over the past few years, but there is still room for significant growth. There is increasing awareness of how green building practices can serve as a vehicle to address many of the building sector's challenges.

Even so, certain strategic, financial, and market barriers hinder the implementation of green building practices from becoming a common practice.

3.1. Strategic challenges

1. Lack of effective alignment of the green building strategies with urban planning

Although there are numerous governmental strategies to promote the growth of green buildings in the three countries, they are not necessarily a result of an integrated urban plan but rather developed in a siloed way. While the energy utilities are instrumental in developing demand-side management strategies for electricity and water consumption, municipalities or ministries formulate the infrastructure plans and road-transport authorities are tasked with the transportation strategies. Often, there is no coordinated approach in the region to provide the infrastructure required to achieve the greatest efficiency of green buildings.

There are several good examples of green buildings in the region, but these are often built in isolation, without having the community structure or transit system in place to make the efforts worthwhile. This is largely applicable in the KSA and to a good extent in the UAE. Green building standards such as LEED emphasise an integration approach and incentivise the buildings (through rating points) if they are better connected to public transportation systems, bicycle routes, and pedestrian-oriented development.



Nearly 30% of the LEED credit points are in relation to the integrative process, regional priority, location and transportation.



2. Insufficient coverage throughout the value chain by the green building strategies

Strategies by governments to promote green buildings are largely focused on the operational phase of buildings and, to a certain extent, on the design phase of new buildings, but not effectively on the construction, operation and maintenance, and waste management aspects. The targets of these strategies are primarily for electricity and water consumption. Also, there are no binding regulations nor incentives (and penalties) on sustainable design, green procurement, and sustainable waste management. In the KSA and the UAE, the government's drive towards establishing green building policy is relatively recent, whereas, in Turkey, policy towards energy efficiency has existed for over 20 years but has only recently started to include aspects such as the use of materials. A considerable portion of the building stock in the region has been constructed prior to the introduction of sustainable building codes and are inherently resource inefficient.

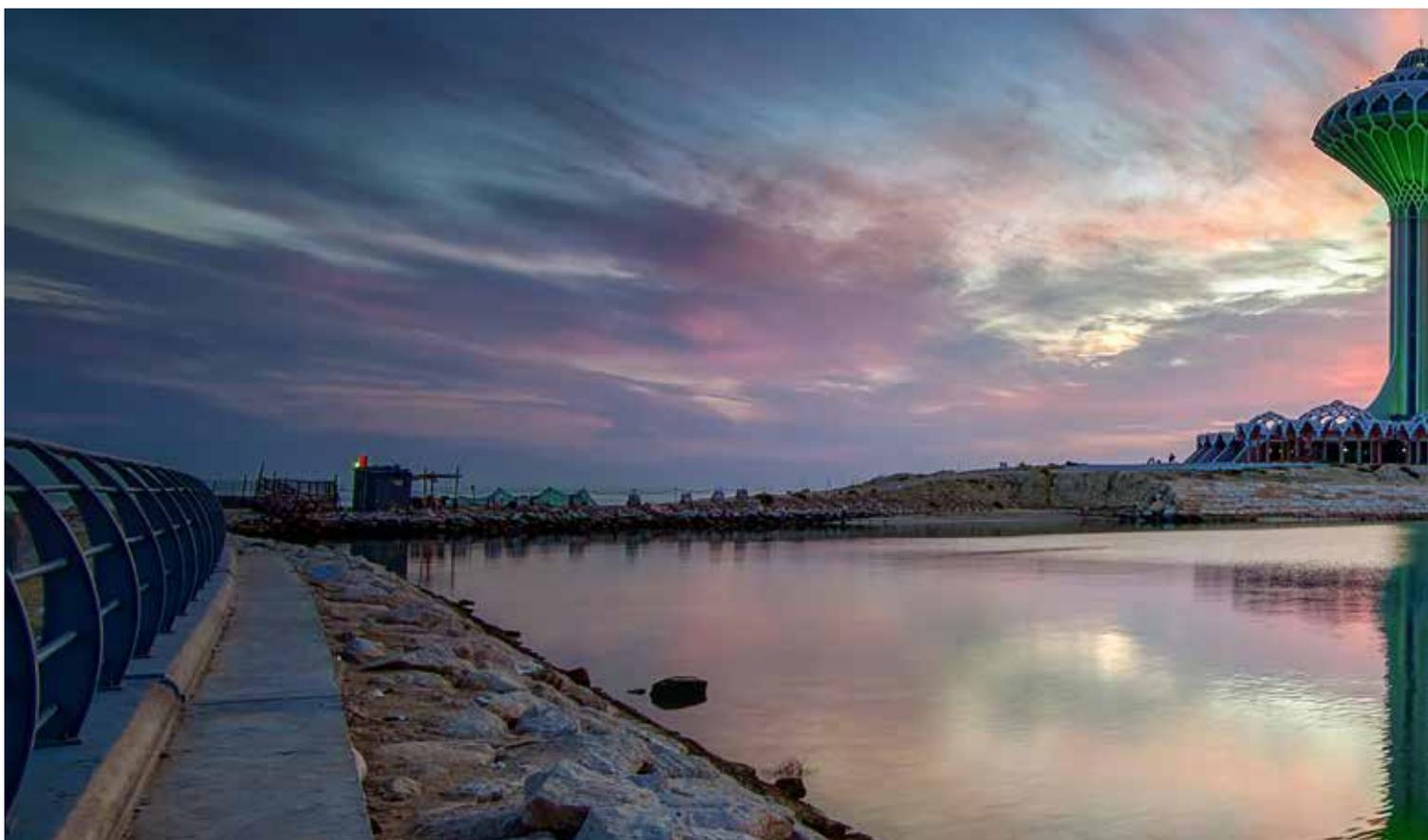
Construction companies, developers and facility management firms often struggle to source green products; the prime reason being that the green building strategies by the

governments do not effectively set an environment to foster green procurement. 'Materials and Resources' category in LEED certification amounts to 10% of the total possible credit ratings. This is an area where all the three countries score relatively low. For instance, Turkey's By-law on Energy Performance of Buildings refers to building materials in terms of energy efficiency but not in relation to the environmental or disposal specifications of materials. Examples of materials with EPDs in KSA and UAE are still uncommon and, although both countries have made statements towards implementing circular economies, these are not directly related to building materials.



Construction and demolition waste accounts for approximately 50 to 60 percent of total solid waste generated in KSA, Turkey and the UAE, in comparison to 23 percent in Hong Kong and 29 percent in the US.¹²¹





3.2. Financial challenges

1. Limited availability of financial instruments and incentive mechanisms that support the adoption of green building practices

For all three countries, most of the existing financial incentives or tax benefits and green funding mechanisms seem to mainly focus on investments related to renewable energy projects – such as the Dubai Green Fund, Saudi Public Investment Fund (PIF), Turkey’s Clean Technology Fund, Funding of the Turkey National Energy Efficiency Action Plan (NEEAP) and the National Renewable Energy Action Plan (NREAP) in Turkey, Afken Renewable Energy Project Finance Agreements by Turkey’s Garanti BBVA and İşbank. Although these mechanisms do provide benefits and include green buildings considerations, they are majorly focused on the energy efficiency and renewable energy aspects of the buildings, leaving out other green building practices.

Examples of financing models are mostly voluntary; such as Majid Al Futtaim becoming a signatory to Net Zero Carbon Buildings Commitment, Masdar’s revolving credit facility for funding sustainability projects, Sedco Capital’s sustainability strategy combining environment-conscious and sharia-compliant principles, or Turkey’s Sustainable Cities Additional Financing Project. There is a need for investors, issuers, private funders and other developers and financial institutions to work towards addressing this issue and further promoting the financing of green building practices.

2. Longer payback period due to subsidies on electricity and water usage

The existing energy and water subsidies in the region create an additional barrier to the cost competitiveness of energy-efficient systems and green buildings. When compared to Turkey, UAE and KSA are markets where investors are even more concerned about capital expenditures and payback periods. Therefore, financing of green buildings continues to struggle in the region, especially when financial incentives and premiums in rent and asset value remain unclear. Furthermore, subsidies from the government will distort the market and consumer behaviour.

Both the UAE and KSA recently reduced the subsidies and established plans for further reductions. However, the challenge is that this is moving too slowly, especially when compared to other countries in the world. The KSA government, to soften the impact of the drive, has decided to take longer than planned to balance its budget and will cut energy subsidies on a more gradual basis than that originally planned – such as linking of residential electricity prices to international benchmarks to be done by 2025 instead of 2017; and that for industrial and commercial electricity prices will be done by 2025 instead of 2018.¹²² Turkey’s government spends approximately USD 300 million to USD 1.6 billion per year in fossil fuel producer subsidies and provides USD 250-400 million in support to hard coal enterprises.

With artificially low-priced utilities and support for conventional electricity production, there are fewer incentives for consumers to conserve resources and for developers to adopt sustainable building practices, leading to national development and environmental consequences.¹²³



3. Investment in green projects is still perceived as a high-cost option

Building sector actors in the region continue to show interest in projects that have low initial capital requirements; especially in the UAE and KSA. It is a common practice in the region that funds are appropriated for real estate acquisitions independently from funds for property operations. This separation creates a scenario where the savings from the operation of green buildings are not used to offset any initial higher construction costs.

The long-term benefits of initially more expensive construction are often not fully explored, and this short-sightedness affects the prioritisation for green buildings. It has been proven that energy-efficient buildings, that require up to 90% less primary energy for cooling and heating, can be constructed cost-effectively.¹²⁴

This is an obstacle because decision-making related to the selection of designers, contractors and projects is still done based on fee bidding and tendered price; and often the lowest bidder wins the project which leads to risk in terms of sustainability characteristics. Understanding the life-cycle costs is still a significant challenge in the region and there are limited tools to illustrate the life-cycle analysis. There is very little collaboration between the public and private sectors to develop methodologies to quantify and communicate how profits can be enhanced by adopting sustainable building practices.



38% of respondents of the World Green Building Council survey consider 'perceived higher first costs' as one of the top challenges in the UAE and Saudi Arabia.



4. Lack of enough returns for the pricing benefits from sustainable finance

Currently, there is no obvious pricing benefit in a green loan versus a conventional loan. This dissuades borrowers from selecting a green loan if they are uncertain as to any potential monetary benefits notwithstanding the extra work and expense that goes into achieving green certification. Whilst it is generally accepted that loans under criteria allow borrowers to tap conventional investors as well as green investors, there is limited data or research for the region quantifying precisely what this additional liquidity entails for borrowers which would incentivise them to go down the green finance route. Lack of binding environmental regulations or penalties and the longer payback due to energy subsidies further aggravate the problem in this nascent regional green building market.

3.3. Market Challenges

1. Lack of public awareness, perceived concerns about the affordability of green and lack of experts

The level of owner, occupant and operator awareness about the cost-effectiveness of energy-efficient buildings is still lacking. In addition, building occupant behaviour is also a major challenge to promote green buildings. In the three countries of focus, there are no significant awareness programmes except for the occasional events by the respective Green Building Councils or the government authorities. The Emirates Green Building Council, for example, regularly offers professional training programmes on topics like building retrofitting, WELL and LEED. These programmes, however, largely cater to the developers and consultants and their reach to the public i.e. the eventual consumers or building owners, is not effective.

According to the World Green Building Council survey, the top challenge in the UAE is lack of public awareness, selected by 45% survey respondents; whereas this figure is 28% for Saudi Arabia. The perception that green is for high-end projects only is a widely reported obstacle, by 41% in the UAE and 30%

in Saudi Arabia. These numbers are well above the global average, making it particular to this market.¹²⁵

Architectural and engineering education provided in universities also lacks an emphasis on sustainable design and operations. All three countries lack enough trained and educated green building professionals. Except for Turkey, training for programmes, such as Certified Energy Manager, Certified Energy Auditor, and Certified Measurement and Verification Professional, only started in the last few years. The lack of availability of experts and relevant technical know-how is also one of the reasons for the low number of Energy Service Companies (ESCOs) being established in the region. Finally, there is also a low level of understanding amongst banks and financial institutions about the concept of energy performance contracting for retrofitting.

2. Insufficient corporate commitment and corporate sustainability strategies

National and local agendas across all three countries provide, to a certain extent, a clear set of sustainable development goals and objectives. However, many organisations in the region still lack a holistic sustainability strategy that help to align their corporate strategy with the national sustainability agendas. This results in inconsistencies in being able to effectively embed and customise the national level development objectives according to their business requirements. Only a select example of corporates have sustainability targets and performance management systems. In the UAE and KSA, regulations are primarily imposed on the government sector, and penetration in the private sector is relatively low.

Benchmarking studies conducted by the regional green building councils have demonstrated that there is also a significant deviation in the energy intensity performance between the best and worst performers.¹²⁶ This also indicates that a large pool of players is still far behind the optimal performance.¹²⁷



Sustainable Development Goals (SDG) global ranks of the UAE, Saudi Arabia, and Turkey are only 65, 98 and 79 respectively. Though this is a country-level index and not for corporates, it is an indication that the implementation of national-level sustainability agendas is currently not effective enough.

3. Concerns over sharing of benefits between owners and tenants

One of the major reasons green buildings have not been prioritised is that it's not necessarily the owners who are the tenants in these buildings. Often the people paying the electricity and water bills are not the same as those enjoying the benefits. A developer or an owner may not be interested in paying for green features unless they are able to recover the additional costs of the green features in sale price or by charging the tenants more. And tenants often do not want to pay extra for the owner's investment in green buildings as they are not usually aware of its benefits such as energy savings and better indoor air quality.

Close to 89% of the population in the UAE are expatriates¹²⁸, all of whom are either renting their residences or bought them from a local owner or a developer. Additionally, travel and tourism constitute 12.1% of UAE's Gross Domestic Product (GDP).¹²⁹ In the case of Saudi Arabia, expats account for 30%¹³⁰ whilst the share of tourism in the GDP is 3%.¹³¹ However, the country is heavily investing in tourism and is poised for steep growth. Turkey is also an economy whose 12% contribution comes from the tourism sector.¹³²

The split incentive problem is even more important for new buildings, non-owner occupied existing commercial buildings, and for tourist accommodations where, because of the high turnover rates, owners ask for shorter payback periods on green building investments.

4. Significant existing building stocks which are not green

The vast stock of older buildings presents a much larger opportunity to reduce environmental impact. New construction will have more impact on the environment than renovating an existing building. Currently, about 25% of the existing buildings are considered 'inefficient' in studies conducted by the regional green building councils.¹³³ Many of these were built several years or decades before the concept of green buildings emerged. The major measure to green these buildings is retrofitting; however, the market maturity for Energy Service Companies (ESCOs) and Energy Performance Contracting (EPC) is relatively low, especially in the UAE and Saudi Arabia.



Out of the total LEED-certified buildings, the share of certifications for Operations & Maintenance (O&M) categories i.e. for existing buildings is only about 6%, 13% and 5% for the UAE, Saudi Arabia and Turkey respectively.



5. Insufficient data and lack of effective measurement and verification practices

This challenge is more prevalent in the UAE and Saudi Arabia. The electricity and water reduction targets are not based on a bottom-to-top approach as there is not enough data classified by each building, its type and for each type of customer. Energy intensity and benchmarking data are based on a small number of samples. Lack of coordination among the data owners for electricity and water use and buildings' gross floor area contributes largely to this. Additionally, there are no submeters and even main meters in a good number of existing buildings (usually towers) to understand the energy usage of tenants.

Apart from the lack of data, there are no matured frameworks or localised protocols for energy performance measurement and verification, except in Turkey and Dubai. Energy performance is therefore often estimated by direct comparison of energy bills over the time-period without considering external influences or changes in operating conditions. Not having a solid measurement and verification framework is a hindrance to secure funds from the banks for energy performance contracting in retrofit projects.

6. Impact of climate change

Impacts of climate change are also increasing the initial investments for green buildings. In the UAE and Saudi Arabia, buildings consume up to 80% of all electricity generated during the summer peaks, with the great majority going to power air conditioning systems.¹³⁴ Such conditions require building materials to benefit from exceptional physical properties to withstand such extremely high temperatures. But there's also the nature of the soil to contend with in these two countries, as the soil is, by its nature, far from being appropriate for supporting such structures, since its surface is composed mainly of sand.

In hot countries, concrete sets very quickly and is subject to a faster deterioration because of severe weather conditions. Glazing is another point to be considered: it is essential that glass provides thermal insulation to avoid indoor temperatures soaring to unbearable levels. About 70% of the existing buildings lack proper thermal insulation due to the absence of regulatory norms when they were built. The instances of floods are also on the rise in all three countries, which calls for more resilient and expensive construction techniques.¹³⁵



Strategic



- Lack of effective alignment of the green building strategies with urban planning
- Insufficient coverage throughout the value chain by the green building strategies

Financial



- Limited availability of financial instruments and incentive mechanisms that support the adoption of green building practices
- Longer payback period due to subsidies on electricity and water usage
- Investment in green projects is still perceived as a high-cost option
- Lack of enough returns for the pricing benefits from sustainable finance

Market



- Lack of public awareness, perceived concerns about the affordability of green and lack of experts
- Insufficient corporate commitment and corporate sustainability strategies
- Concerns over sharing of benefits between owners and tenants
- Significant existing building stocks which are not green
- Insufficient data and lack of effective measurement and verification practices
- Impact of climate change

4. Moving forward: recommendations

4.1. What can policy-makers do?

1. Develop integrated urban planning models and policies that incorporate elements related to green building practices across the value chain

Stand-alone instruments and building codes exist in KSA, UAE and Turkey, which has paved the way for green building practices to be implemented. These frameworks, however, establish green infrastructure plans as a separate priority, distinct from other issues and development agendas – thereby not encouraging a mature level of integration with overall urban planning models and throughout the value chain.

To ensure a greater uptake, the decision-making and policy planning authorities need to integrate and connect existing city planning objectives with their green building plans. Incorporating water features and shade in all new constructions, for instance, and into master city planning considerations, can significantly reduce the “heat island” effect and reduce the overall need for artificial cooling.

For example, the city of Toronto, Canada, made green roofs mandatory in 2009. Requirements for green roof coverage increased with increasing building footprint sizes and can only be reduced with a financial penalty and permission from the chief planners.

Integrated urban master planning frameworks can also be aligned to the future ‘smart’ plans and development agendas by the government. For example, ‘Smart Dubai 2021’¹³⁶ envisions a city where all resources are optimised for maximum efficiency and services are integrated seamlessly

into daily life. Green building considerations in such smart city master-plans can allow these sustainable development agendas to be met effectively and efficiently and also further incentivise and promote such investments across the value chain.

2. Gradual phase-out of existing subsidies for conventional energy and water utilities can promote investments in sustainable infrastructure practices.

The existing government energy subsidies in the region create an additional barrier to the cost competitiveness of energy efficient systems and green buildings. Implementing policies to reduce and eventually phase out these subsidies can help avoid distortion of market and consumer behaviour and encourage more of the right outcomes.

For example, a study by the Institute for Sustainable Development recommends that for governments aiming to develop sustainable energy management systems and achieve sustainable development for the region, reforming fossil-fuel subsidies is an important consideration - so that renewable energy and fossil-fuel-based power can compete on equal terms.¹³⁷ Market distortion caused by fossil-fuel subsidies needs to be corrected so that the cost of power is fully reflective of the costs associated with each generation type, thereby facilitating the development of an energy mix based on the true costs of each generation type.

Such subsidy reforms can further allow investors and financial institutions to increase the uptake and penetration of green finance products in the market, which can then pave the way for owners and tenants to prioritise green building practices.





Singapore made early policy choices to reduce their GHG emissions – by pricing their energy at market costs without any subsidy so that all households and businesses were encouraged to use energy judiciously.¹³⁸ Due to such efforts, Singapore’s Carbon Intensity, or carbon dioxide (CO₂) emissions per dollar of economic output, is among the lowest in the world. The country ranks 123rd out of 141 countries, placing it among the 20 best-performing countries in this index.¹³⁹

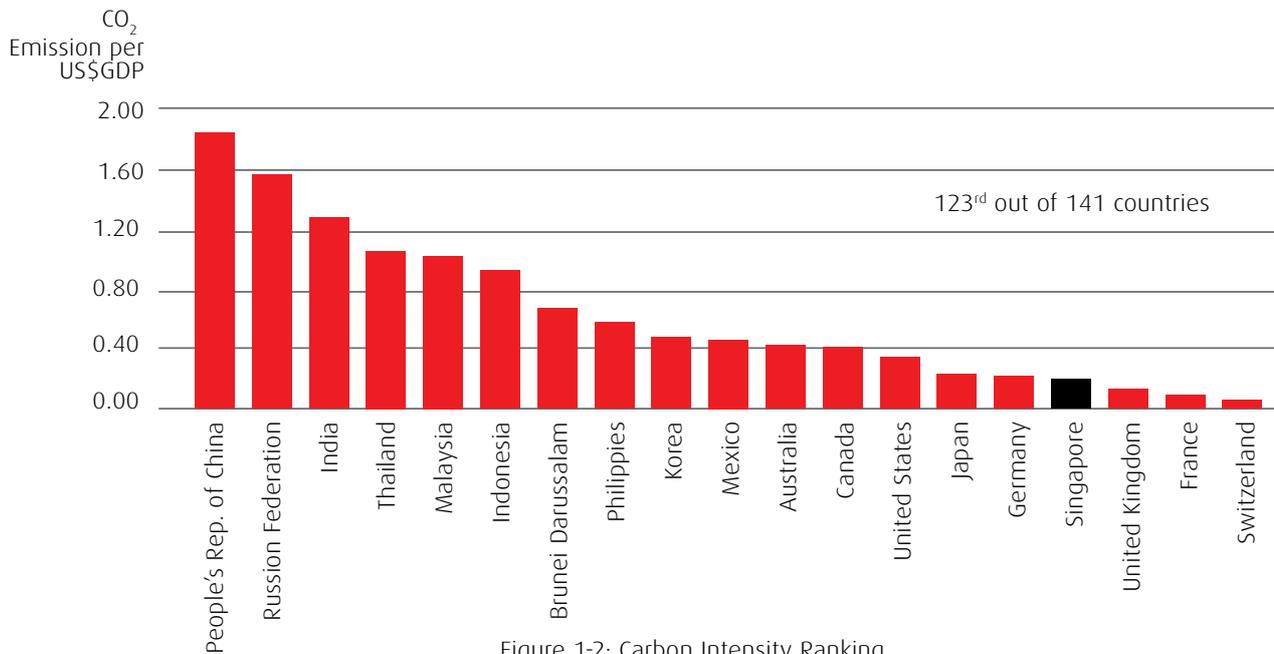


Figure 1-2: Carbon Intensity Ranking

4.2. What can financial institutions and investors do?

1. Financial institutions, public funding agencies and investors need to focus on introducing and promoting financial products and incentive mechanisms aimed specifically at green building-related projects.

For the UAE, KSA and Turkey, with the government agendas focusing on sustainable development and economic diversification through reduced dependence on oil-based economies (more specific to the UAE and KSA), both public and private sector financial institutions have developed incentive mechanisms and financial instruments promoting green projects. Examples include tax rebates and exemptions, refinancing mechanisms, green bonds and Sukuks, and clean technology funds, among others. However, most of these instruments focus on financing renewable or clean energy projects - with no clear integration defined on financing such clean energy projects embedded within green building projects.

With the construction sector being a key sector for the economic development across all three countries, it is important that financial institutions and governments develop

incentive mechanisms that are focused specifically on promoting sustainable development for this sector.

For example, Turkey recently received approval from the World Bank’s Board of Executive Directors for the ‘Sustainable Cities Project II – Additional Financing’ project. The project financing aims specifically at improving economic, financial, environmental, and social sustainability of Turkish cities by enabling interested municipalities to access financing for their priority investments and to deliver improved services to their citizens.¹⁴⁰

4.3. What can developers and owners do?

1. Align business strategies and priorities with sustainability strategies that also embed sustainable infrastructure elements across the value chain.

Much of today’s construction in the three countries still relies upon multiple entities all largely working independently from each other until forced to work together due to project overlaps. In this process, sustainable design issues are tackled on an as-they-come basis and it gives the perception that everything is an additional step. Alongside the role of regulatory and strategic drivers in promoting the

implementation of green building practices, it is necessary for the private sector to consider sustainable infrastructure as a key part of their business priorities and development plans. Investors in the real estate and construction market in UAE, KSA and Turkey mainly focused on initial capital expenditures and payback periods, often resulting in the long-term cost-savings and benefits from green buildings not being fully explored. It is important for the sector players to embed the considerations for sustainable infrastructure as a part of their corporate business strategies or develop bespoke sustainability strategies that account for green building elements.

Through standards for water and carbon efficiency, renewable energy generation, circular economy, and implementation of green building standards such as LEED, MAF has reduced its water use and carbon emissions, and collected significant cost savings.¹⁴¹ To finance these initiatives, MAF recently established a Green Finance Framework and a Green Finance Steering Committee, which issued two USD 600 million Green Sukuks in 2019. Such corporate commitments can play a key role in encouraging owners, developers, buyers and investors to shift their focus on sustainable infrastructure development and working towards the greening of the sector.



2. Including different stakeholder groups across all phases of the project (design, planning, construction, operations etc.) can help avoid issues related to lack of decision-making and implementation expectations.

Another recommendation for the building sector developers and owners would be to plan for and include green building related measures throughout the phases of development projects, right from the initial planning and design phases.

This will support the building sector players in the region, including those in the three countries of focus, to project

and highlight the long-term cost savings from green building operations to investors and other stakeholders and address their concerns related to initial relatively higher construction costs. As decision-making and investments related to green buildings are still done based on fee-bidding and lower-price wins, it is important for companies to start incorporating the life-cycle costs and benefits of green building projects right from the planning phases. Such life-cycle analyses of the green projects will support sector players to promote the advantages of the projects to investors and regulatory authorities and also communicate to the public at large, about how profits are driven by adopting sustainable building practices.



Case study

District 2020: designing for an overall sustainable community¹⁴²

The Expo 2020 site, in the UAE, has taken a design-oriented approach to make the infrastructure more sustainable for future use. The future community (District 2020¹⁴³) is designed to rely on public transport and shared mobility (e.g. electric shuttles) and will use green spaces and close-set pedestrian and bicycle paths to reduce the use of cars within the community.

In addition to master planning considerations, standards were added to integrate sustainability across the value chain more effectively:



3. Life-cycle assessments of green building projects can aid in supporting investment decisions and promoting uptake of green building projects.

A key requirement observed in the region for the building sector is to reduce the disconnect between the broad understanding of sector players and stakeholders about the benefits of green building practices and the specifics intended to foster appropriate development and investment decisions. One of the ways to enable this is to clearly define 'sustainable materials' and encourage their use and promote their long-term payback and benefits to the sector players - Better integration of life-cycle assessment (LCA) techniques and LCA-based decision support tools can aid in terms of providing an upfront estimate and analysis on the cost-vs-benefit aspects of investing in developing green building projects.

One of the approaches, as recommended by LEED Technical Advisory Groups (TAG), is to develop a matrix that would integrate metrics usually associated with green buildings such as durability, expected life of building, reusability etc. with the amount of product or material in a building, with a variable outcome based on project inputs.

Another approach would be to undertake life-cycle inventory (LCI) analysis involving detailed tracking of all of the flows in and out of the system of interest — raw resources or materials, energy by type, water, and emissions to air, water and land by specific substance. The LCI data can then be characterised in terms of impact potentials (e.g., for global warming, ozone depletion, etc.) and included in a series of measures called mid-point indicators for the environmental implications of design alternatives. The indicators can provide a convenient way to summarise and compare the masses of inventory data, and make decisions on the basis of whether an alternative is likely to result in a reduction of flows from and to the environment.

Some of the already existing globally used LCA-based building-oriented decision support tools include Envest (UK), EcoQuantum (Netherlands) and ATHENA (North America).

Recently, AESG, a specialist consulting and commissioning firm headquartered in Dubai, announced the launch of its 'Pathway to Net Zero' tool that it plans to kick-off by 2020. The tool is a digital application that the firm aims to apply across all its projects, without any additional cost, to demonstrate how developers can achieve increased eco-friendly structures.¹⁴⁴



4.4. What can customers do?

1. Institutions should aim to spread increased awareness of sustainable infrastructure amongst the public at large, to drive the demand and uptake for green building projects.

Institutions such as the local Green Building Councils should undertake regular training and awareness programmes for the public at large. While most Green Building Councils currently conduct training programmes for the building sector owners and developers on topics relevant to their field, it is also important to promote the importance of green buildings among the general public, who would eventually be the end-users of the building development projects. For example, the Turkish Green Building Council organises training sessions for raising public awareness on the benefits of highly efficient, healthy and comfortable buildings, thereby encouraging the construction industry to build in line with these principles.

The Emirates Green Building Council conducts monthly workshops to improve awareness and build capacity. Also in the UAE, the Dubai Energy Efficiency Training Programme, mandated by Dubai Supreme Council of Energy and led by TAQATI (part of Etihad Energy Services Company), is another programme that caters to a wide and diverse network of stakeholders, including the general public. The programme brings together internationally and locally certified training programmes and modules to cater to the learning and development needs of different audiences in Dubai's energy sector.

The objective is to build the right capabilities to support a reduction in Dubai's energy consumption by 2030. The innovative aspect of this training programme is the different training tracks developed for different groups including executives, technical engineers, technicians and financiers.¹⁴⁵

2. Resolving the 'split incentive' barrier between owners and occupants is key to promoting green buildings uptake.¹⁴⁶

Split incentives are typically regarded as a major barrier to investments in green building practices. This stems from the fact that benefits do not accrue to the person who pays for them. A successful approach, tested and implemented across multiple building projects globally, involves splitting costs and benefits in a balanced way. For instance, a share of energy cost savings should be allowed to be used for investment repayments. While this means that tenants could be subject to a repayment fee in their utility bills, property owners should also accept part of the investment cost in view of the property's value increase as a result of the energy efficiency upgrade.

Another recommendation is to introduce an on-bill finance programme to create incentives for all stakeholders – tenants, landlords, utilities and also financial institutions by extension. High transaction costs linked to the realisation of investments in green building practices currently deter landlords from upgrading their rented property; as such, a small incentive to landlords should be considered in on-bill finance programmes specifically designed to target rented properties in the private and/or social housing sectors.



Case-study:

Deterring landlords from renting out low energy efficiency properties

The United Kingdom adopted an approach in 2011 wherein landlords were forbidden by law to lease out properties of energy label F or below after 2018. Together with this, tenants were going to be allowed to demand energy efficiency upgrades on their properties from 2016 onwards and a tax break scheme was going to be developed in order to provide financial support to residential landlords in the transitional period from 2014 to 2017.

5. Conclusions

Buildings are critical for urbanisation, infrastructure development and economic prosperity. Yet addressing climate challenges at the same time as delivering growth means a rethink of operational processes and value creation across all the stakeholder groups. The three countries analysed in the report play a critical role in the region's infrastructure development and therefore it is vital they take a lead role in the implementation of green buildings. Definitely, the region is at a crossroads. They can continue with the same carbon-intensive growth model and keep contributing to the climate problem. Or, they can transition to a new, zero-carbon path that secures future health and prosperity. But the transition needs to start now: in 2018, 70% of the total energy demand growth was still met with fossil fuels.

As this report shows, there is more than one route to greening the buildings. A global phase-out of fossil fuels by 2030 could account for a 2.5% relative increase in GDP, create 0.2% more jobs, and improve the global welfare indicator in 17% compared to business-as-usual.¹⁴⁷

Taking the zero-carbon path in the buildings sector has its own challenges. However, there are numerous best practices within the region itself, offering solutions to these challenges.

There is significant scope for greater cooperation between policy-makers, financial institutions, developers, owners and tenants to bring more green buildings projects online and also to further improve the efficiency of the existing building stock. The financial sector can offer a host of different ways to raise the capital required for transition, even for authorities with less access to capital markets.

The solutions are not only technical but rather organisational and ecosystem related: policy-makers can integrate sustainable building practices in their urban plans and reduce the proportion of subsidies for energy and water, financial institutions can further explore mechanisms to support and profit from greener investments of potentially lower-risk, owners and developers can adopt a more comprehensive approach to find efficiencies and increase the value of their assets, and tenants can learn to leverage their power as consumers and demand more resource-efficient properties. The three countries should adopt a framework which ties together these critical elements – supply, demand, and financing – using market-based rewards, paving the way for a more sustainable built environment.



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