حكومة رأس الخيمة
Government of Ras Al Khaimah

بلديـــــــة رأس الخيمـــــــة
Ras Al Khaimah Municipality

RAS AL KHAIMAH INTEGRATED SUSTAINABILITY STRATEGY

ANNUAL REPORT
2025 EDITION

His Highness Sheikh Saud bin Saqr Al Qasimi

UAE Supreme Council Member and Ruler of Ras Al Khaimah

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Our nation is on a critical journey towards a sustainable future. It is a path that commenced with our Founding Fathers and is rooted in the way our people have always lived; in harmony with their surroundings. Building a prosperous and resilient Ras Al Khaimah, while protecting our natural environment, is a shared responsibility, and one that we all must embrace.

His Highness Sheikh Mohammed bin Saud bin Saqr Al Qasimi

Crown Prince of Ras Al Khaimah and Chairman of the Executive Council

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Ensuring cost-competitive energy and water supply, along with environmental sustainability, is vital to the long-term growth of our Emirate. Therefore, these are key priorities to which the Government of Ras Al Khaimah is firmly committed.

His Excellency Munther Mohammed bin Shekar Al Zaabi

Director General, Ras Al Khaimah Municipality and
Chairman, RAK Sustainability Committee

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Building on the success of the Energy Efficiency and Renewables Strategy 2040, Ras Al Khaimah Integrated Sustainability Strategy 2050 takes a more holistic approach to maximise impact across sectors and deliver long-term value to residents and businesses in the emirate, while supporting the UAE's broader sustainability agenda.

Foreword

This marks the seventh year of environmental and energy progress reporting in Ras Al Khaimah, reflecting our continued commitment to advancing energy efficiency, renewable energy, and sustainable development across the emirate.

Established under the patronage of His Highness Sheikh Saud bin Saqr Al Qasimi, UAE Supreme Council Member and Ruler of Ras Al Khaimah, the Efficiency and Renewable Energy Strategy 2040 (EE&R Strategy) continued to play a vital role in supporting Ras Al Khaimah's competitiveness and long-term growth through energy efficiency measures and the integration of cost-effective renewable energy solutions.

The year 2024 marked a significant milestone for green development in Ras Al Khaimah with the launch of Ras Al Khaimah Integrated Sustainability Strategy 2050 (RIS Strategy). Building on the success of the EE&R Strategy, the RIS Strategy expands beyond energy transition into broader sustainability challenges, including emissions reduction, climate adaptation, and biodiversity protection.

The RIS Strategy is about achieving long-term environmental and economic resilience, with the overarching objectives to:

- Maintain a secure and cost-competitive supply of energy and water to drive Ras Al Khaimah's sustainable development
- Protect and enhance the environment to preserve Ras Al Khaimah's unique natural heritage and support a high quality of life for residents
- Reduce greenhouse gas emissions to support competitiveness of Ras Al Khaimah's economy in a low-carbon global market

On a national level, 2024 was a year of continued growth. Following the UAE's Net Zero 2050 commitments, significant investments were made in renewable energy, industrial decarbonisation, and hydrogen development. The year also saw the expansion of energy efficiency initiatives and regulatory advancements. Ras Al Khaimah's concerted efforts with the EE&R Strategy and the introduction of the RIS Strategy complement and reinforce the UAE's long-term ambitions, underlining the importance of local action in effectively contributing to federal sustainability goals.

As sustainability remains at the core of RIS Strategy, 2024 saw the expansion of key projects within Ras Al Khaimah, including the continued development of Barjeel-compliant buildings, urban planning projects, and energy efficiency initiatives for businesses and homeowners. More than 1,400 new Barjeel-compliant buildings were completed, and more than 60 existing buildings were contracted for retrofit. Key industries joined the industrial energy efficiency initiative, representing over 50% of Ras Al Khaimah's industrial consumption.

Andrea Di Gregorio
Executive Director, Reem,
Ras Al Khaimah Municipality

Several new initiatives were also activated in 2024. An Energy Management Guidebook was published to support government entities and private bodies in effectively applying and benefiting from energy management initiatives by simplifying the process of ISO 50001 energy management certification.

The Manzily Energy Advice Service continued to provide free energy advice for homeowners. Since its launch, around 160 homeowners have benefitted from the service.

RAK Energy Summit 2024 was another highlight of the year. Building on the success of the inaugural edition, the event brought together global energy experts, policymakers, and industry leaders to discuss emerging trends, innovative technologies, and best practices in the energy transition. The summit strengthened Ras Al Khaimah's position as a regional hub for sustainability dialogue and reinforced our commitment to driving meaningful change in the sector.

As part of our commitment to fostering innovation and entrepreneurship, we were proud to announce three winners in RAK Energy Innovation Competition (SME Edition), recognising their contributions to responsible growth and energy efficiency. We have also supported them in establishing their operations in Ras Al Khaimah, further strengthening the local green economy and encouraging sustainable business practices.

With these achievements, Ras Al Khaimah's energy transition is gaining momentum, and our collective efforts are driving positive change at the local, national, and global levels. As we move forward, we remain committed to strengthening our sustainability programmes, fostering innovation, and engaging with stakeholders to build a greener and more resilient future.

We hope you find this report insightful and look forward to even more milestones in our next edition.

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Executive Summary

Executive Summary

This seventh annual sustainability report marks the introduction of Ras Al Khaimah's Integrated Sustainability Strategy 2050 (RIS Strategy), a comprehensive framework designed to transform the emirate's energy sector and environment. Aligned with the UAE's net-zero commitments and Ras Al Khaimah Vision 2030, RIS Strategy sets the foundation for a more sustainable future.

Building on the Energy Efficiency & Renewables Strategy 2040 (EE&R Strategy), the RIS Strategy expands and deepens its scope to address energy security, environmental protection, industrial competitiveness and decarbonisation.

The strategy focuses on enhancing the reliability and cost-effectiveness of energy and water through gas supply enhancements, utility-scale and distributed renewable energy projects, and regulatory improvements. It prioritises environmental sustainability by strengthening air quality measures, protecting natural resources, and preserving biodiversity and marine ecosystems. Additionally, it takes a proactive approach to climate change mitigation by promoting energy-efficient buildings, sustainable transport solutions, industrial decarbonisation, and low-carbon agricultural practices.

Implementing the strategy is contingent on the setup of the RAK Sustainability Committee, which comprises key government entities. The committee will drive implementation of the RIS Strategy, and will be responsible for working with Programme Owners to achieve the targets for each programme.

The strategy projects significant economic, social, and environmental benefits, including an estimated ₱ 6.5 billion in net gains, reduced greenhouse gas emissions, lower energy costs, and job creation across green industries.

Delivery of the efforts outlined in the strategy will position Ras Al Khaimah as a leader in sustainability, ensuring long-term resilience, economic growth, and environmental stewardship.

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Background

RAK Energy Efficiency and Renewables Strategy 2040 (EE&R Strategy)

Issued in 2018, the Ras Al Khaimah Energy Efficiency and Renewables Strategy 2040 (EE&R Strategy) was a crucial step in aligning with key international, federal, and regional policies. It was designed to support global commitments like the Paris Agreement, national initiatives such as the UAE Energy Strategy 2050, and Ras Al Khaimah Vision 2030, the emirate's strategic blueprint for sustainable development.

The strategy's main objective was to ensure reliable and cost-competitive access to energy and water resources for Ras Al Khaimah's consumers. This was achieved by reducing the economy's energy intensity and increasing the use of renewable energy resources.

The EE&R Strategy targeted reducing electricity and water consumption by 30% and 20%, respectively, by 2040 compared to business as usual. It also targeted generating electricity from renewable energy sources equivalent to at least 20% of Ras Al Khaimah's electricity demand by 2040. Such targets were fully aligned with RAK Vision 2030 targets of 10% electricity savings and 5% of electricity demand met by solar power by 2030.

The EE&R Strategy consisted of nine programmes supported by five enablers. Each programme addressed a different efficiency or renewable energy generation measure.

These programmes addressed a wide range of sectors, including government facilities, residential communities, industrial operations, and both existing and new buildings. From retrofitting older structures to implementing energy-efficient design standards in new developments, the strategy aimed to reduce energy consumption across the entire built environment. It also promoted the adoption of solar energy, encouraged sustainable construction practices, and supported the transition toward a more energy-resilient emirate.

Progress Achievements of the EE&R Strategy

Main achievements

Significant progress has been achieved towards the goals of the EE&R Strategy since its launch in 2018. A summary of the main milestones is listed below:

2017

- Creation of **Reem**
- **Energy Efficiency and Renewables Committee** formed

2018

- Pilot waste to energy initiatives launched
- Amiri Resolution #15 of 2018 on energy management issued
- Launch of the **first government retrofit project** (Municipality buildings)
- Launch of **incentives** for ESCOs and Energy Auditors

2019

- Launch of **Barjeel**, the Green Building Regulations of Ras Al Khaimah (voluntary phase)
- Kick-off of group energy management roadmap for all government entities
- Start of **EV charging stations** installation in Ras Al Khaimah
- Kick-off of Phase 1 of the Supply Market Development Strategy
- Contracting of Solar Carport project at Ras Al Khaimah Municipality
- Completion of ISO 50001 implementation at Ras Al Khaimah Municipality

2020

- Consumer campaign **#EnergyInYourHands**
- RAK Energy Innovation Competition (School Edition) **#rakinnovates**
- Energy Management Quick-Wins Initiative
- Award of retrofit project for 37 buildings of Ras Al Khaimah government
- **First aggregated solar tender** in Ras Al Khaimah
- Launch of **Green Public Procurement** in Ras Al Khaimah

2021

- **Award of retrofit project for 101 villas** of Ritz-Carlton, Al Wadi Desert Resort
- **Pilot industrial energy audits** of cement plants
- Launch of green financing offers by **RAKBANK**
- Retrofit of **all streetlights to LED in PSD managed roads**
- Launch of **Upskill** - Ras Al Khaimah Sustainable Energy Training Program
- Launch of **Rafah**, the guidelines for sustainable communities in Ras Al Khaimah

2022

- Launch of green procurement initiatives (Go paperless, Single-use plastic no more)
- Outdoor thermal comfort trial installations
- Launch of industrial audit initiative
- Launch of RAK **Energy Innovation Competition (SME Edition) (#rakinnovates)**
- **1st RAK Energy Summit**
- Launch of **Manzily Energy Advice Service** and **youth educational game**
- Start of **wind resource assessment study**
- Establishment of **RAK Center for Outdoor Comfort** (RAKCOC)

2023

- **Implementation of industrial audit initiative** (50% of industrial consumption audited)
- Activation of EE&R Strategy review
- **Implementation of a home audit service (Manzily Energy Advice)** with incentives from EtihadWE (about 60 homes audited)
- Launch of the first sustainable community in Ras Al Khaimah **(Awafi Sustainable District)**
- **Installation of first wind measurement mast** in Ras Al Khaimah
- Close of application deadline for SME competition (over 75 participants, 25 countries)
- Wide-scale participation by Ras Al Khaimah in COP28

2024

- Launch of **RAK Integrated Sustainability Strategy 2050 (RIS Strategy)**
- 2nd RAK Energy Summit
- **Amiri Resolution #18 of 2024** on energy management
- **Amiri Resolution #19 of 2024** on green public procurement
- **Amiri Resolution #20 of 2024** on industrial audits
- Launch of **Energy Management Guidebook**
- Launch of **Outdoor Comfort Guidelines**
- Award of the 1st RAK Energy Innovation Competition (SME Edition)

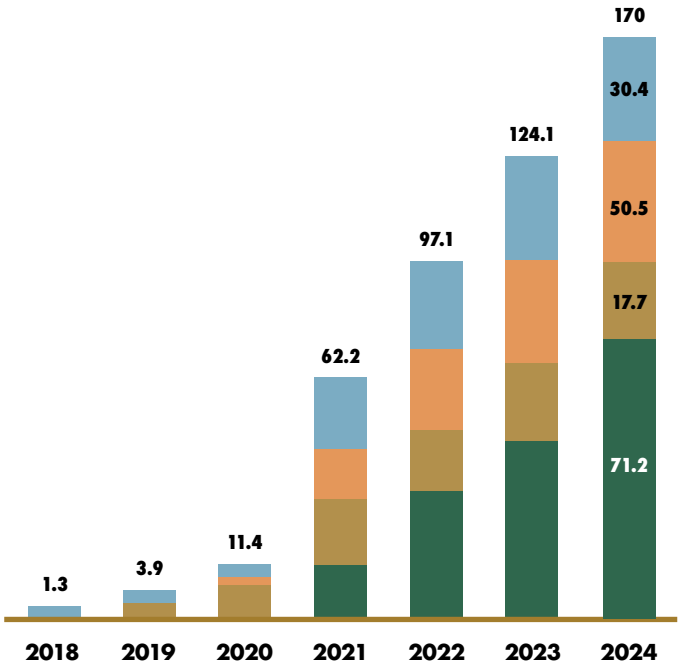
Implementation of the strategy has resulted in a series of achievements up until 2024, the most notable of which are:

- Capacity development to locally treat 100% of Ras Al Khaimah's hazardous and medical waste;
- Conversion of 100% of street lighting to LED;
- Significant improvements in wastewater treatment and landscaping, leading to 70% treated sewage effluent (TSE) reuse and replacement of 0.4 million cubic meters per year of potable water with TSE;
- Master planning of wastewater, landscaping and stormwater systems, supporting visibility of current and future urban infrastructure needs;
- Development of best-in-class government capabilities in energy management, with the government of Ras Al Khaimah being recognised as the first in the world to achieve ISO 50001 certification across all of its entities;
- Completion of more than 4,500 Barjeel-compliant buildings in Ras Al Khaimah;
- Contracting of more than 400 buildings for retrofits with more than 100 additional buildings in the pipeline;

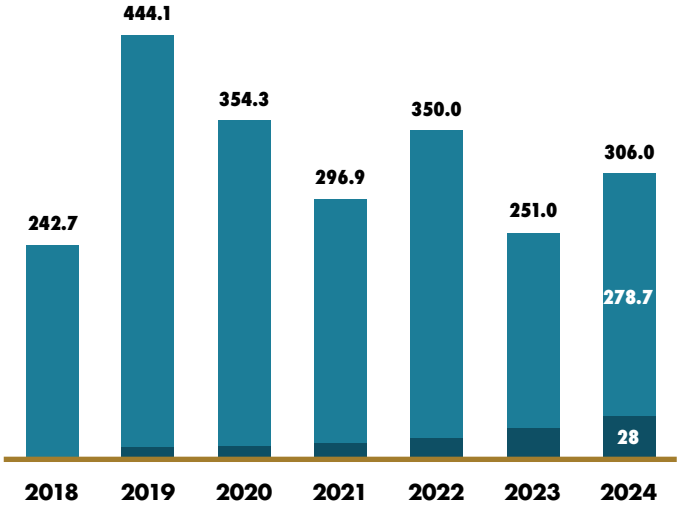
Energy and Water Savings

In total, nearly 170 GWh of electricity and over 2 million m^3 of water were saved in Ras Al Khaimah throughout 2024. Apart from electricity and water, 306 GWh thermal of fossil fuels energy were saved by the Energy from Waste and Efficient Vehicles programmes. These direct savings of fossil fuels are equivalent to more than 10,000 cars being taken off the road for a year. A detailed breakdown of the measured and verified savings by programme is provided in Figure 1.

Annual Electricity Savings (GWh)



Annual Direct Fuel Savings (GWh thermal)



Annual Water Savings (million m^3)

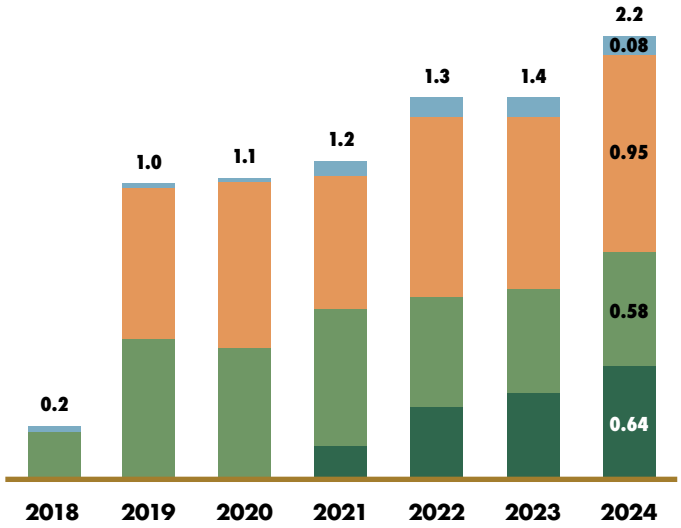


Figure 1: Annual energy and water savings achievements by programme

GHG Inventory

Reem completed a GHG inventory of Ras Al Khaimah for the year 2024 in accordance with the GHG Protocol for Cities. The BASIC level of reporting was adopted for 2024, covering three main target sectors; stationary energy use (i.e. buildings), internal transportation and waste generated in Ras Al Khaimah. In addition to the requirements of the BASIC level, emissions from industrial processes (referred to as IPPU) were also estimated and included this year. Notable exclusions include emissions from international transportation, land use, agricultural activities and GHG capture by vegetation.

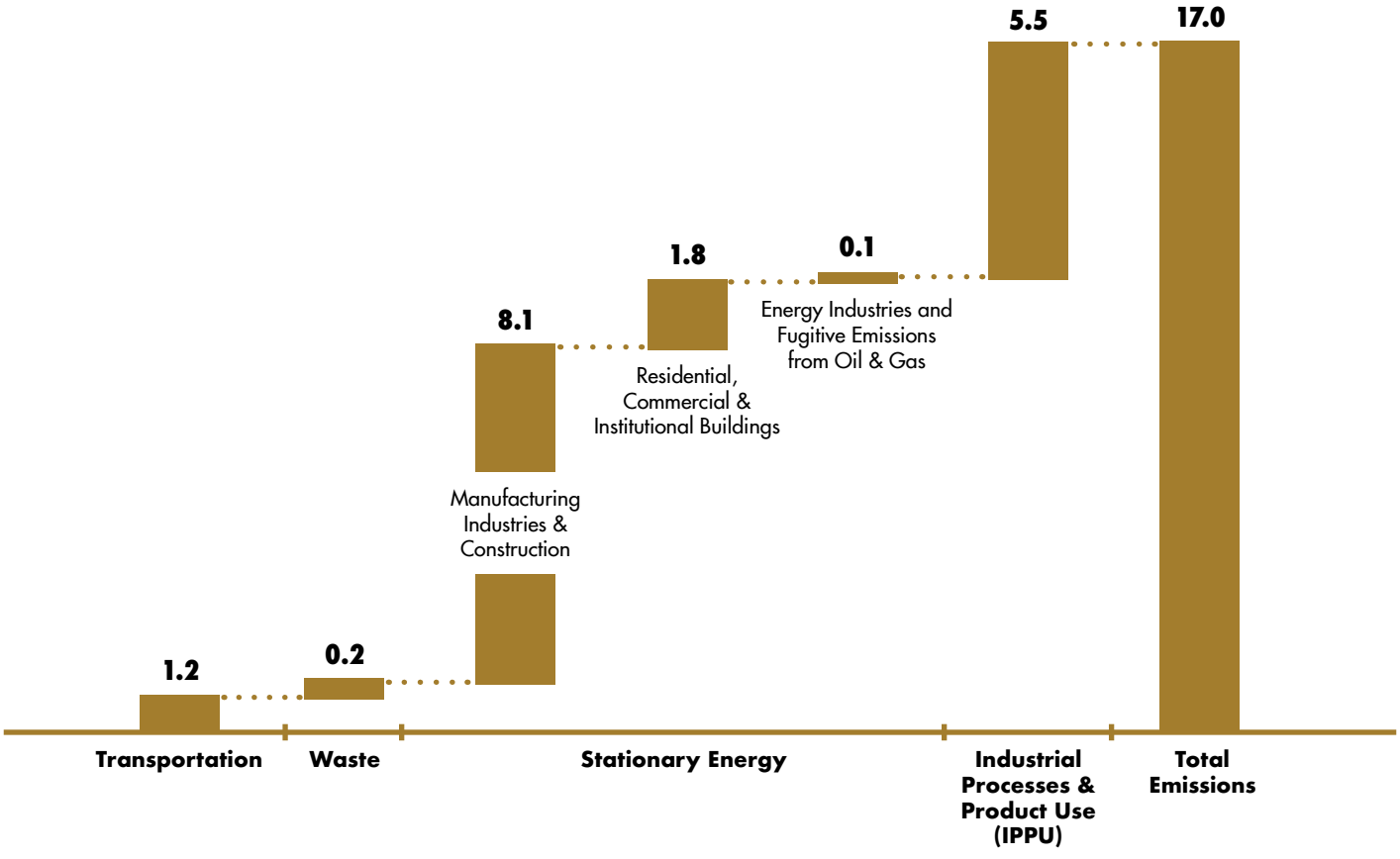


Figure 2: Carbon footprint of Ras Al Khaimah by sector in 2024 (million tonnes of CO_2 equivalent)

3

Pathway Forward: RAK Integrated Sustainability Strategy 2050

Opportunity for Strategy Expansion

Attracting New Industry and Tourism

Ras Al Khaimah is going through an unprecedented growth in industry and tourism, resulting in the construction of new infrastructure, communities and buildings. This presents a unique opportunity to embed sustainability at the core of new projects, ensuring long-term competitiveness and resilience. By strengthening sustainability efforts, Ras Al Khaimah has the chance to position itself as a leading destination, attracting more businesses to the region and enhancing the emirate's economic potential.

Expanding the strategy to focus on air quality, water and soil management, and biodiversity conservation will enhance the emirate's appeal as a destination for environmentally conscious tourism as well as contribute to the long-term health and well-being of its communities.

As an industry-driven economy, Ras Al Khaimah is home to the largest bulk handling port in the Middle East and serves as a key manufacturing and logistics hub for the UAE, with leading facilities in cement, glass, ceramics, metals, and pharmaceuticals. This presents a strategic opportunity to accelerate industrial decarbonisation. Strong action in energy-intensive sectors will enhance the competitiveness of local businesses in an increasingly carbon-conscious global market. Aligning with national and international net-zero commitments will also prepare industries for evolving regulations and trade policies, ensuring that Ras Al Khaimah remains a competitive and attractive destination for investment and economic growth.

Modernising the Urban Environment

The ongoing accelerated urban development in Ras Al Khaimah presents a pivotal opportunity to modernise the built environment by integrating sustainability, energy efficiency, and smart technologies into new and existing buildings and infrastructure.

As the city expands, adopting climate-responsive designs, high-performance building materials, and renewable energy solutions will significantly enhance resilience while reducing operational costs and environmental impact.

An expansion of Barjeel, the green building regulations of Ras Al Khaimah, will give a broader approach that includes adopting smart construction techniques and low carbon materials that will shape a more sustainable urban landscape.

Modernising the built environment also means leveraging digital innovations, such as energy monitoring systems and data-driven building management tools, to optimise performance and reduce waste. By embedding these principles into ongoing urban expansion, Ras Al Khaimah will create a future-ready emirate that balances rapid development with long-term sustainability, economic growth, and improved quality of life for its residents.

Supporting Federal Net Zero Commitments

Hosting COP28 triggered an expansion of the UAE's federal net zero commitments, including tripling renewables capacity and doubling energy efficiency by 2030.

Additionally, the UAE has introduced a comprehensive plan, targeting a cumulative reduction of 2.9 gigatons of industrial carbon emissions by 2050. The industrial sector contributes 30% (Đ11 billion)[1] of Ras Al Khaimah's GDP.

Accordingly, the EE&R Strategy required a comprehensive review with a focus beyond energy and water efficiency and an increased focus on industrial efficiency and decarbonisation to ensure alignment with national targets.

The new strategy will support the transition to cleaner fuels, while utility-scale and distributed renewables, complemented by storage will advance the shift towards 50% clean energy by 2050. Ras Al Khaimah actively aligned with the UAE's National Hydrogen Strategy, which aims to position the country as a leading producer of blue and green hydrogen by 2031. Our initiatives are designed to complement these national efforts, focusing on sustainable hydrogen solutions that support the broader energy transition of the emirate.

[1] *Data as of 2017*

INTERNATIONAL AGREEMENTS

Paris Agreement (2016)
Including UAE's commitments and revised UAE NDC 3.0, 2024

COP28 (2023)
Including commitments to triple renewables capacity and double energy efficiency by 2030

UAE FEDERAL STRATEGIES

وزارة الصناعة والتكنولوجيا المتقدمة
MINISTRY OF INDUSTRY & ADVANCED TECHNOLOGY

Operation 300bn

وزارة الطاقة والبنية التحتية
MINISTRY OF ENERGY & INFRASTRUCTURE

UAE Energy Strategy 2050

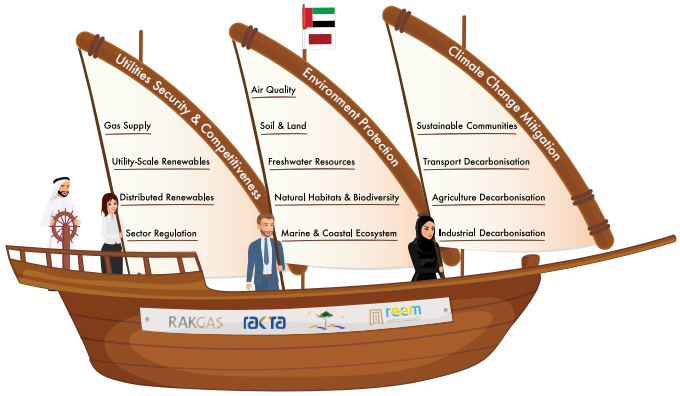
وزارة التغير المناخي والبيئة
MINISTRY OF CLIMATE CHANGE & ENVIRONMENT

UAE Net Zero 2050 Strategy

RAS AL KHAIMAH STRATEGIC PLANS

Ras Al Khaimah Vision 2030
Long-term priorities and goals for Ras Al Khaimah in various focus areas

Energy and Environment



Ras Al Khaimah Integrated Sustainability Strategy 2050

Figure 3: Summary of RIS Strategy alignment

RAK Integrated Sustainability Strategy 2050

RAK Integrated Sustainability Strategy 2050 was established in 2024 under the patronage of His Highness Sheikh Saud bin Saqr Al Qasimi, UAE Supreme Council Member and Ruler of Ras Al Khaimah. It was built upon the EE&R Strategy, expanding its scope to cover more sectors in line with the growing demand for a comprehensive approach to sustainability. The strategy is designed to drive long-term sustainability across key sectors, ensure economic resilience, environmental protection, and energy security. Its overarching objectives are the following:

- **Maintain a secure and cost-competitive supply of energy and water** to drive Ras Al Khaimah's sustainable development.
- **Protect and enhance the environment to preserve Ras Al Khaimah's unique natural heritage** and support a high quality of life for residents.
- **Reduce greenhouse gas emissions** to support competitiveness of Ras Al Khaimah's economy in a low-carbon global market.

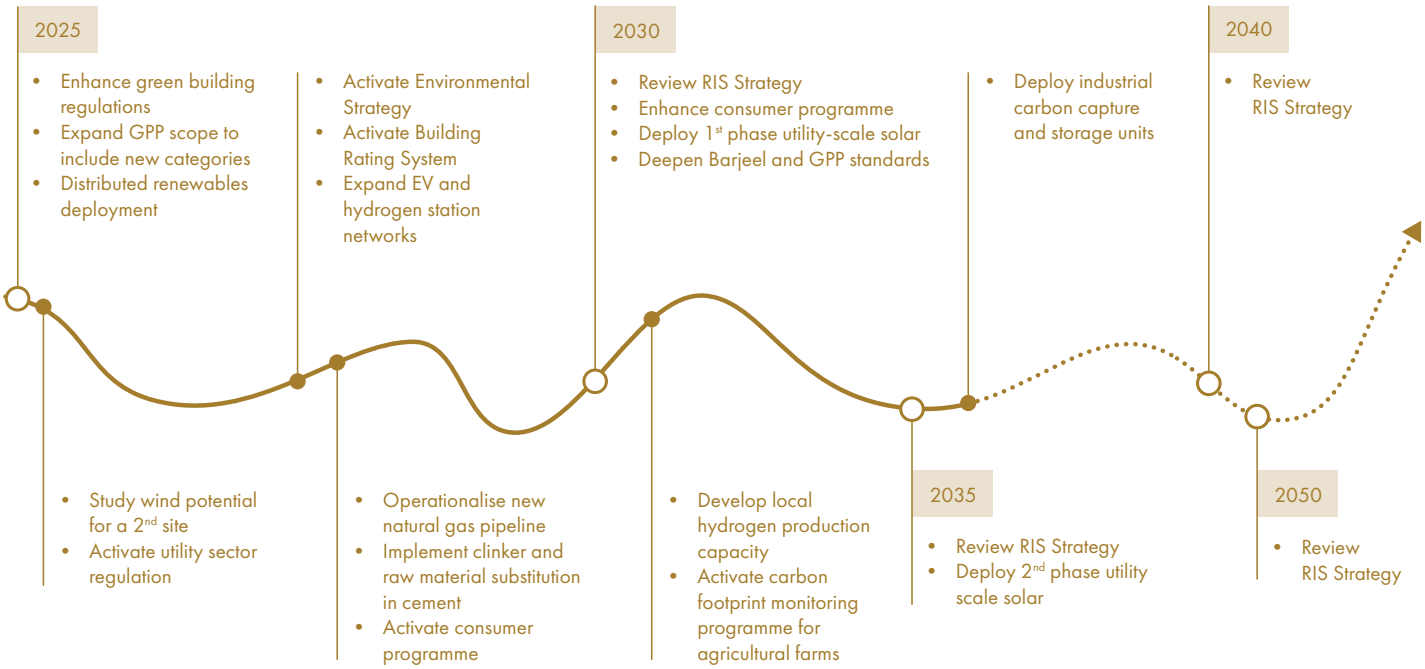
Maintain a cost-competitive energy & water supply

Protect Ras Al Khaimah's natural heritage

Reduce greenhouse gas emissions

Roadmap for Implementation

RIS Strategy will guide future efforts, building on the past progress to drive sustainable impact. The roadmap below outlines the key phases and milestones for its implementation, highlighting expected outcomes until 2050:



Benefits of RIS Strategy

The benefits of the RIS Strategy were comprehensively evaluated to ensure a well-rounded assessment of its long-term impact. Its economic impact was assessed by comparing the incremental costs of the proposed measures with those of the ongoing EE&R Strategy. In addition to cost considerations, the RIS Strategy is expected to deliver several other benefits as outlined below:

Social Benefits

In addition to advancing Ras Al Khaimah's decarbonisation efforts, the implementation of RIS Strategy will also enhance its reputation nationally and internationally as a leader in climate action. This aligns with the UAE's commitments under the Paris Agreement and the United Nations Framework Convention on Climate Change.

By improving air, soil, and water quality and fostering a sustainable built environment, Ras Al Khaimah will become an increasingly attractive place to live and work in. The strategy will drive local capacity-building, technological advancements, and a heightened social awareness of conservation, delivering wide-ranging benefits. Additionally, it is expected to generate employment opportunities across various sectors, including green buildings, energy-efficient retrofits, industrial energy management, low-carbon transport, public transit, waste-to-energy projects, renewable energy development, and alternative fuel supply, benefiting both national and expatriate communities.

Economic and Market Benefits

RIS Strategy will drive economic resilience, market growth, and private sector development by lowering energy and water costs across all consumer segments in Ras Al Khaimah. By reducing dependence on coal, petroleum, and natural gas, the emirate will be better protected against volatility in global energy markets. Lower energy costs for both government and private consumers will also enhance economic competitiveness. The strategy will also stimulate local markets for energy efficiency and renewable energy products and services, contributing to GDP growth and creating new business opportunities. Improved work environments, efficient equipment, and better maintenance practices will further boost overall economic productivity.

Real estate will benefit in specific sectors as energy-efficient buildings gain value, gradually reflecting higher property prices and rental premiums. Residents who actively participate in the strategy will experience lower energy and water bills, and it will support the industrial and commercial sectors in advancing their cost optimisation programmes. The tourism sector will benefit from enhanced sustainability practices, leading to cost savings and strengthening Ras Al Khaimah's position as a preferred destination for environmentally conscious travellers.

Furthermore, the emirate has the potential to lead in green cement production, positioning itself as a frontrunner in sustainable construction materials. As a significant cement producer for domestic and export markets, Ras Al Khaimah can leverage its industrial base to adopt low-carbon technologies, alternative fuels, and eco-friendly materials. This will reduce emissions and enhance its global competitiveness, catering to the rising demand for sustainable building solutions.

Environmental, Health & Safety Benefits

RIS Strategy will enhance living and working conditions in Ras Al Khaimah by fostering a healthier indoor and outdoor environment while improving safety. Upgrading outdated equipment, implementing systematic maintenance practices, and reducing the use of hazardous substances will contribute to a higher quality of life.

The strategy's environmental benefits will be driven by a strong focus on air quality, freshwater conservation, and the protection of terrestrial and marine ecosystems. This includes improved waste management, the treatment and reuse of wastewater, and the promotion of low-carbon transportation. Additionally, Ras Al Khaimah's biodiversity will be strengthened through the use of native plant species and proactive measures to develop and manage protected areas, providing a safe habitat for endangered species.

Technological Benefits

Furthermore, the RIS Strategy supports the adoption of economically viable green technologies, most notably energy efficiency technologies for buildings and industrial facilities, renewable energy technologies, and efficient transportation technologies. It also further encourages academic research, commercial studies, and prototype or pilot projects of emerging technologies in related fields.

RIS Strategy Governance

A dedicated organisational set-up has been established to ensure effective strategy implementation. This includes Reem, RAK Sustainability Committee, and the entities responsible for the implementation of each of the programmes and initiatives of the RIS Strategy.

Reem

Reem, the Energy Efficiency & Renewables Office of Ras Al Khaimah Municipality, is the government office dedicated to driving and reporting on implementation and continuous update of the RIS Strategy. Its main organisational functions are shown in Figure 4.

Figure 4: Main functions of Reem

RAK Sustainability Committee

Successful implementation of the RIS Strategy requires a dedicated organisational framework to ensure efficient and timely execution. This includes establishing the RAK Sustainability Committee and designating government entities responsible for delivering each programme and initiative within the strategy as mandated by Amiri Decree No. 8 of 2025.

The committee meets periodically to discuss the status of strategy implementation and the development of new initiatives. The Chairperson of the committee is HE Munther Mohammed bin Shekar Al Zaabi, Director General of Ras Al Khaimah Municipality.

Members of RAK sustainability committee

HE Munther Mohammed bin Shekar Al Zaabi
Director General,
Ras Al Khaimah Municipality,
Chairman

HE Dr. Abdulrahman Al Shayeb Al Naqbi
Acting Executive Director,
Environment Protection & Development Authority,
Member

HE Eng. Khaled Fadel Al Ali
Director General,
Public Services Department,
Member

HE Eng. Esmaeel Hassan Al Blooshi
Director General,
Ras Al Khaimah Transport Authority,
Member

Manu Verma
Chief Executive Officer,
RAKGAS,
Member

Nitin Johar
Chief Financial Officer,
RAK Investment and Development Office,
Member

Dr. Ali Alani
Director of Engineering Department,
Ras Al Khaimah Economic Zone,
Member

Andrea Di Gregorio
Executive Director,
Reem, Ras Al Khaimah Municipality,
Member/Secretary

Implementation Responsibilities

Each programme of the RIS Strategy is assigned to a Programme Owner, selected based on its mandate and expertise. The Programme Owner is responsible for the overall execution of the initiatives of that programme and is accountable for achieving programme targets and operational objectives.

In most cases, Supporting Entities are also identified to assist the Programme Owner through the activation of programme enablers or the execution of some initiatives within the programme. The Programme Owners and Supporting Entities are shown in Figure 5.

Pillar	Programme	Programme Owner	Supporting Entities
Utilities Security & Competitiveness	**Gas Supply Enhancement**	RAKGAS	RAK Municipality, Reem, RAKPA
	Utility-Scale Renewables	RAK Municipality	Reem, EtihadWE, MOEI
	Distributed Renewables	Reem	EtihadWE, MOEI
	Sector Regulation	Reem	IDO
Environment Protection	**Air Quality**	EPDA	PSD, MOHAP
	Soil & Land	EPDA	PSD
	Freshwater Resources	EPDA	PSD, RAK Municipality
	Natural Habitats & Biodiversity	EPDA	PSD, RAK Municipality
	Marine & Coastal Ecosystem	EPDA	PSD, RAK Ports
Climate Change Mitigation	**Sustainable Communities**	RAK Municipality	RAKEZ, RAK Ports, PSD, MOIAT, EtihadWE
	Transport Decarbonisation	RAKTA	RAK Police, RAKGAS, RAK Municipality
	Agriculture Decarbonisation	EPDA	Reem, MOCCAE
	Industrial Decarbonisation	Reem	RAKEZ, RAKGAS, MOEI, MOCCAE, MOIAT

Figure 5: The Programme Owners and Supporting Entities

Some Supporting Entities are assigned to develop and run cross-programme enablers that support the foundations of multiple programmes and the strategy as a whole. Figure 6 shows supporting entities for each strategy enabler.

Enabler	Supporting Entities
Awareness & Capacity Building	Ras Al Khaimah Municipality; reem; rakez Ras Al Khaimah Economic Zone; Environment Protection & Development Authority; RAKGAS; Government of Ras Al Khaimah Department of Economic Development; RAK Transport Authority
Financing Mechanisms	Ras Al Khaimah Government Department of Finance; IDO Investment & Development Office of Ras Al Khaimah
Research & Innovation	Government of Ras Al Khaimah
Information Systems	Ras Al Khaimah Municipality; Electronic Government Authority
Policy & Regulation	Government of Ras Al Khaimah

Figure 6: Supporting entities for each strategy enabler

4

The Programmes

4

Pillar 1: Utilities Security & Competitiveness

Programme 1: Gas Supply Enhancement

Programme Owner: RAKGAS

Supporting Entities: Ras Al Khaimah Municipality, reem, RAK Petroleum Authority

Natural gas continues to play an important role in Ras Al Khaimah's energy landscape, serving as a reliable and lower-emission fuel to support the emirate's industrial growth during the transition to a more sustainable future. The Gas Supply Enhancement Programme is designed to ensure the availability of competitive and sustainable sources of natural gas, further strengthening Ras Al Khaimah's position as an attractive destination for industrial investment.

To meet growing demand, significant infrastructure projects are underway to expand supply capacity and diversify access.

This includes:

- **Capacity expansion of the existing ADNOC pipeline originating in Sharjah (ESTIDAMA),** which will increase capacity by approximately 30%, enabling a greater volume of gas delivery to Ras Al Khaimah's key industrial zones.
- **Development of a new RAKGAS-owned pipeline (ZIYADA),** also originating in Sharjah, to enhance supply resilience and reduce reliance on third-party networks.

These enhancements will significantly improve gas availability for industrial consumers and support broader adoption of cleaner fuel sources across the emirate's industrial sector.

To strengthen long-term energy resilience, the programme also supports ongoing local exploration and production to supply and source locally, as well as evaluation of alternative gas sources of liquefied and compressed gas.

In parallel, efforts are being made to enhance efficiency in natural gas consumption. RAKGAS, in collaboration with Reem, is preparing a series of initiatives targeting equipment and process upgrades, ensuring that natural gas is used as effectively and sustainably as possible.

Deep Dive:
RAKGAS: Exploring Natural Hydrogen and Carbon Mineralisation in South Ras Al Khaimah

"This groundbreaking initiative positions Ras Al Khaimah at the forefront of natural hydrogen and carbon mineralisation research. It's a bold step toward unlocking sustainable energy solutions and supporting the UAE's journey to net zero

Manu Verma
Chief Executive Officer
RAKGAS

Establishment and Significance

Established in 1984, RAKGAS is a state-owned integrated energy company, dedicated to ensuring energy security and supporting the sustainable economic growth of Ras Al Khaimah. Initially established with a strong foundation in natural gas operations and distribution, the company's portfolio now includes fuels, power solutions, and upstream development. RAKGAS utilises the unique geology of Ras Al Khaimah to advance its hydrocarbon exploration and production efforts. The company's focus is on providing clean and transitional energy solutions. As a trusted energy partner, RAKGAS plays a crucial role in delivering the region's long-term sustainable energy needs.

Unique Geological Setting of Hajar Mountains

In 2024, RAKGAS initiated a pioneering project to explore the potential of natural hydrogen occurrence and carbon mineralisation in the southern region of the emirate, situated within the Hajar Mountains. This project leverages the unique geology of the area to support the emirate's journey toward sustainability and net-zero emissions.

The southern region is characterised by ancient ultra-mafic rocks formed over 80 million years ago. These rocks differ significantly from the limestone formations found in northern Ras Al Khaimah and have inherent properties that enable the natural generation of hydrogen gas and the permanent storage of carbon dioxide through mineralisation.

Natural Hydrogen: A Clean Energy Opportunity

Natural hydrogen is produced deep underground through chemical reactions between water and iron-rich minerals in these rocks, a process known as serpentinisation. This clean, zero-emission hydrogen has the potential to become a low-cost energy source, offering a new pathway to decarbonise industrial sectors.

This initiative represents one of the UAE's earliest formal explorations of natural hydrogen resources and is closely aligned with national clean energy strategies.

Carbon Mineralisation: Secure and Permanent Carbon Storage

The ultra-mafic rocks also provide an opportunity for carbon mineralisation, a process that transforms carbon dioxide into stable mineral forms, ensuring long-term and safe storage. With major industrial CO_2 sources located nearby, this process could directly support emission reduction efforts in heavy industries such as cement and steel manufacturing.

Project Highlights

- 3D geological modelling of promising zones completed in 2024
- Test drilling planned to confirm the presence and quality of hydrogen
- Collaboration with international experts and institutions underway
- One of the UAE's early pioneering initiatives in this field

Looking Ahead

In the coming year, the project will advance toward pilot testing and potential partnerships, laying the groundwork for large-scale deployment if results prove favourable. By harnessing the emirate's unique geology, Ras Al Khaimah is positioning itself as a regional leader in innovative, sustainable energy solutions.

Figure 7: Ultramafic rocks of the Hajar mountains, Ras Al Khaimah

Figure 8: Measuring hydrogen anomalies in soil

Programme 2: Utility-Scale Renewables

Programme Owner: بلديـــــة رأس الخيمـــــة Ras Al Khaimah Municipality

Supporting Entities: بلديـــــة رأس الخيمـــــة Ras Al Khaimah Municipality; reem; وزارة الطاقة والبنية التحتية MINISTRY OF ENERGY & INFRASTRUCTURE; EtihadWE الاتحاد للماء والكهرباء

The Utility-Scale Renewables Programme facilitates the large-scale development of Ras Al Khaimah's renewable energy resources to supply and store low-cost, clean electricity for the emirate and the UAE. Led by Ras Al Khaimah Municipality, the programme supports studies and discussions with federal entities to expand renewable energy and storage capacity.

The programme builds upon the steady and concerted efforts to evaluate Ras Al Khaimah's wind energy potential. In 2022, Reem initiated a wind resource assessment study to identify areas with high wind energy potential. The first stage, a desktop assessment, was completed, leading to the installation of a wind mast at Wadi Shawka in 2023 for on-site measurements. By 2024, the study at this site was completed, yielding promising results. Building on this momentum, installation at a second site is planned for 2025 to further explore wind energy opportunities.

In addition to wind energy, studies have been conducted to assess land availability for utility-scale solar projects, with deployment planned for the coming years. Further assessments are ongoing for pumped-storage hydro power potential in Ras Al Khaimah's mountain areas.

To ensure a stable and reliable energy supply, the programme will explore additional storage solutions and more weather-independent sources, such as geothermal energy, to complement solar and wind resources.

Figure 9: Wind measurement mast in Wadi Shawka, Ras Al Khaimah

Programme 3: Distributed Renewables

Programme Owner: بلدية رأس الخيمة Ras Al Khaimah Municipality reem

Supporting Entities: وزارة الطاقة والبنية التحتية MINISTRY OF ENERGY & INFRASTRUCTURE EtihadWE الاتحاد للماء والكهرباء

The Distributed Renewables Programme focuses on advancing the deployment of distributed renewable technologies, such as rooftop and carport solar PV installations, as well as other suitable solutions, across buildings and industries in the region. Previous assessments indicate a potential 600 MWp of solar PV capacity could be installed on the rooftops of Ras Al Khaimah.

The first distributed renewable installation, a 230 kWp solar carport at Ras Al Khaimah Municipality's head office, currently meets approximately 15% of the building's energy requirements. The Federal Decree-Law No. 17 of 2022, which enables EtihadWE to support the connection of distributed renewables to their grid, is expected to drive growth in the distributed renewables market in Ras Al Khaimah and the wider Northern Emirates.

In 2024, the Reem Solar Calculator was developed to empower users with solar potential estimates. Through an easy-to-use platform, users can assess energy savings, environmental benefits, and system feasibility for their properties, driving greater adoption of solar energy across the emirate.

Many new buildings completed as of 2024 are already prepared for future renewable energy installations, in line with solar readiness guidelines outlined in Barjeel. EtihadWE's Distributed Solar System Initiative (DSS) is expected to further activate the market, with additional regulations in 2027 likely to accelerate the pace of deployments. Alongside regulatory efforts, Ras Al Khaimah Municipality will introduce additional measures to foster market growth and increase awareness of renewable energy adoption.

Figure 10: Solar carport at Ras Al Khaimah Municipality

Deep Dive:
RAK Sailing Association: A Pioneering Journey to an Off-Grid Solar Future

Sustainability is not just about reducing our footprint; it is about setting an example for future generations. Our off-grid solar system proves that renewable energy is both viable and essential for long-term resilience. Our transition to off-grid solar shows that energy independence is not just a future ambition, it is a reality today. We hope this serves as an inspiration for others to explore similar solutions.

Grant McCreadie
Commodore
RAK Sailing Association

20 kWp
Installed solar PV capacity

20 kWh
Battery storage

100%
Powered by solar energy

A Legacy of Community and Sustainability

Founded in 1977, RAK Sailing Association (RAKSA) is a member-based organisation dedicated to promoting sailing, water sports, and community engagement in Ras Al Khaimah. The association was established as a hub for marine activities. Today, it continues to foster a vibrant community, offering sailing lessons, kayaking, paddleboarding, and family events.

RAKSA operates with a mission to promote water sports and outdoor activities, the association provides training opportunities for both children and adults, ensuring accessibility to a variety of recreational experiences.

Transitioning to Off-Grid Solar

When initially planning for their new facility in 2013, RAKSA saw an opportunity to embrace a self-sufficient and renewable energy model that would showcase the potential of off-grid solar solutions. In the following years, the association embarked on their journey to find the best solution and align with the relevant entities as part of its commitment to making its new facility a green building powered entirely by renewable energy. RAKSA also ensured compliance with Ras Al Khaimah's Green Building Regulations "Barjeel", when it was introduced in 2020. These regulations played a key role in facilitating the move to solar energy, as they set the framework for energy-efficient design and construction with sufficient space for the installation of solar panels. With the support of both Ras Al Khaimah Municipality and Reem Office, RAKSA installed an off-grid solar system to power the facility.

This initiative not only supports environmental sustainability but also serves as a showcase for renewable energy solutions in remote areas. By transitioning to off-grid solar energy, RAKSA is contributing to Ras Al Khaimah's sustainable future, aligning with the region's broader goals to promote renewable energy and lower carbon footprints.

The Solar System: Phased Implementation and Performance

RAKSA's solar system currently operates at 20 kW and is expected to reach its full capacity of 30 kW by the end of 2025. This expansion follows a carefully phased rollout designed to balance cost and performance. Once completed, the system will fully support the facility's operational needs, including air conditioning, security lights, and gate systems, demonstrating the success of a gradual, results-driven approach to energy independence.

A Model for Renewable Energy in Ras Al Khaimah

By going off-grid, RAKSA has significantly reduced operational costs, ensuring long-term financial sustainability for a non-profit organisation. The shift to renewable energy has also enhanced energy resilience, eliminating reliance on external power sources while contributing to environmental sustainability as a model for green energy adoption. Beyond operational benefits, the facility serves as an educational hub, teaching students and visitors about solar technology and its real-world applications. RAKSA's success has inspired local homeowners and developers to explore similar solutions, demonstrating that off-grid solar is a practical and viable alternative for remote areas.

Figure 11: Solar installation at RAK Sailing Association

Programme 4: Sector Regulation

Programme Owner: بلديـــــة رأس الخيمـــــة Ras Al Khaimah Municipality reem فريق رأس الخيمة لكفاءة الطاقة والطاقة المتجددة RAK ENERGY EFFICIENCY AND RENEWABLES TEAM

Supporting Entity: IDO Investment & Development Office of Ras Al Khaimah

Reliable electricity and water services are essential for the well-being of residents and businesses in Ras Al Khaimah. To ensure these services remain efficient, fair, and transparent, the Sector Regulation Programme was developed as part of a proactive effort to strengthen utility regulation.

Under this programme, Ras Al Khaimah is working to establish clear rules and standards for private electricity, water, and district cooling providers operating in the emirate to protect consumers, promote investment, and ensure high-quality service across the sector.

The programme is built on three key actions:

Developing a Local Regulatory Framework

Establishing clear guidelines for how private utility providers are licensed, prices are set, and service quality is maintained. This will also introduce a fair system for resolving any disputes between customers and service providers.

Direct Regulation of Private Utilities

Implementing oversight to ensure that electricity, water, and district cooling providers meet the necessary standards and operate in the best interest of the public.

Collaborating with MOEI on Federal Regulations

Engaging with the UAE Ministry of Energy & Infrastructure to ensure alignment with federal regulations and to access regulatory support where necessary.

The initial framework is already in development and is expected to be approved in 2025. Once in place, it will create a more structured and transparent utility sector that encourages investment, protects consumers, and supports the emirate's long-term sustainability goals.

4

Pillar 2: Environment Protection

Programme 5: Air Quality

Programme Owner: Environment Protection & Development Authority

Supporting Entities: Ministry of Health & Prevention; Public Services Department

The Air Quality Programme focuses on monitoring and improving air quality across Ras Al Khaimah, with a particular emphasis on industrial areas such as Rams, Khor Khwair, and the Al Hamra Industrial Zone.

The Environment Protection & Development Authority (EPDA) has deployed six air quality monitoring stations strategically located across key industrial zones. Additionally, industrial entities have integrated 15 monitoring stations within their facilities, directly linked to EPDA's monitoring system. These stations provide real-time data, allowing for continuous air quality monitoring across the emirate. Emirati Air Quality Index (EAQI) is a key tool used in assessing air quality. The AQI is designed to provide clear and accessible information about air pollution levels, making it easier for businesses and policymakers to understand and respond to air quality conditions.

Looking ahead, EPDA has outlined a series of key initiatives to further enhance air quality within the emirate, which includes plans to develop an air quality modelling tool to predict air quality patterns throughout the emirate and identify pollution hotspots. This will enable a more effective air quality forecast trend. Based on the insights from the study, EPDA will develop and implement region-specific regulations along with efficient enforcement methods to mitigate pollution levels as part of a comprehensive environmental strategy.

Plans are also in place to expand the air quality monitoring network to cover more areas across Ras Al Khaimah, to cultivate a more expansive understanding of air quality trends within the emirate. Through these efforts, Ras Al Khaimah aims to enhance its air quality management capabilities, ensuring a sustainable and healthy environment for all residents and businesses.

Figure 12: Air quality monitoring systems across Ras Al Khaimah

Programme 6: Soil & Land

Programme Owner: هيئة حماية البيئة والتنمية
Environment Protection & Development Authority

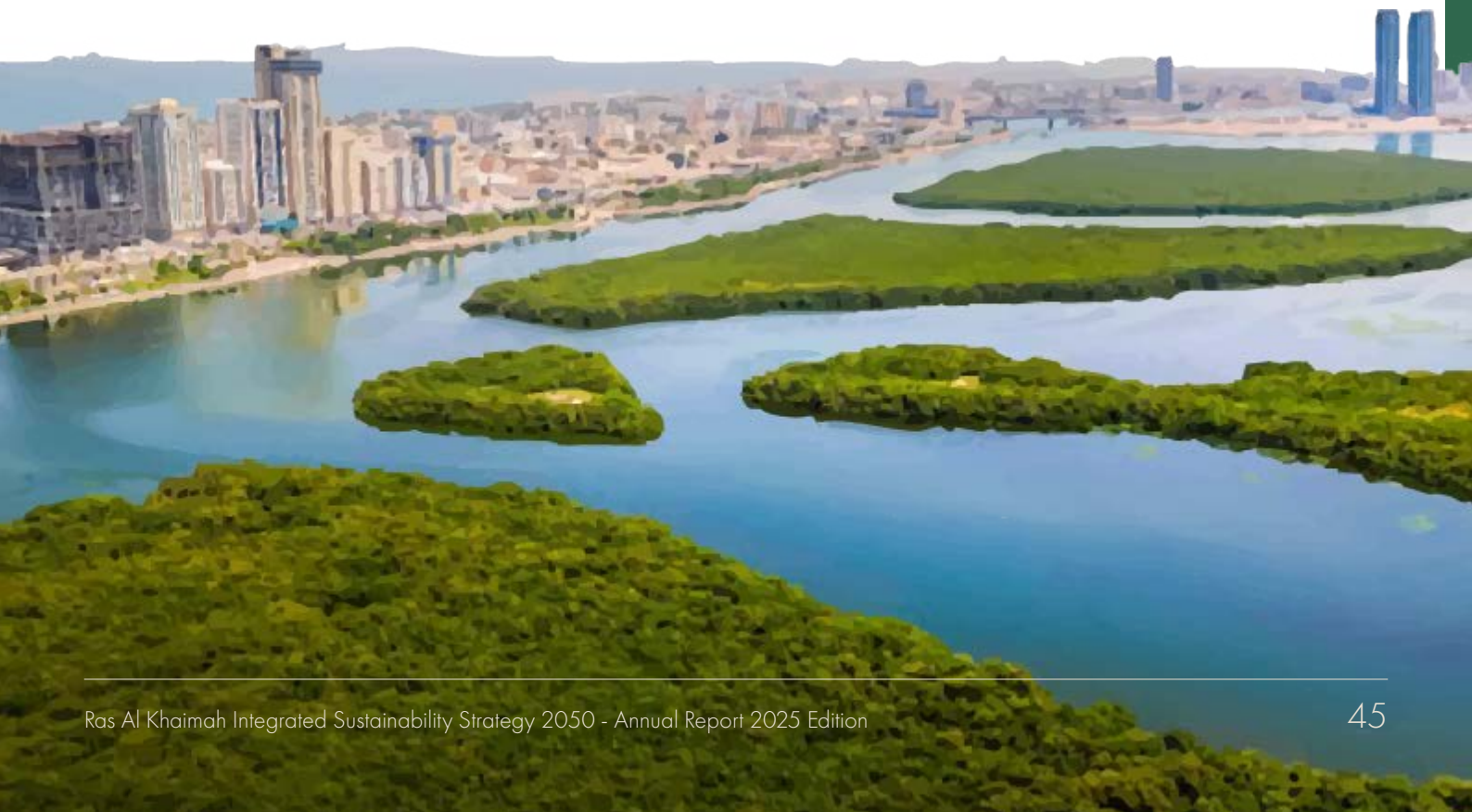
Supporting Entity: دائرة الخدمات العامة
Public Services Department

Soil quality is fundamental to ecosystem health, agriculture, and sustainable land use. Pollution and degradation not only threaten biodiversity and food production but also contribute to land instability and contamination of water sources. Addressing these challenges is critical to ensuring long-term environmental sustainability in Ras Al Khaimah.

The Soil & Land Programme aims to enhance the emirate's ability to monitor and reduce soil pollution while improving soil quality. By strengthening data collection, analysis, and regulatory measures, the programme will help safeguard natural resources and mitigate the impacts of urbanisation and industrial activity.

In 2025, EPDA will begin a comprehensive study to gather and maintain soil quality data, which will unfold in three phases. Phase 1 will involve conducting research and gathering existing data. In Phase 2, the focus will shift to identifying potential sampling locations, creating detailed sampling plans and analysing data to detect trends. In Phase 3, the insights from monitoring and modelling will guide targeted actions to curb littering and waste dumping in key areas.

EPDA is set to develop a comprehensive environmental strategy in collaboration with Public Services Department (PSD). The strategy will explore the development and implementation of targeted regulations alongside efficient enforcement mechanisms to reduce pollution levels.



Programme 7: Freshwater Resources

Programme Owner: هيئة حماية البيئة والتنمية Environment Protection & Development Authority

Supporting Entities: بلدية رأس الخيمة Ras Al Khaimah Municipality; دائرة الخدمات العامة Public Services Department

The Freshwater Resources Programme is dedicated to enhancing the monitoring and management of both groundwater and surface freshwater resources in Ras Al Khaimah. This initiative aims to strengthen capabilities in ensuring the long-term sustainability and quality of freshwater resources across the emirate. EPDA currently utilises farmers' wells as part of their monitoring methodology. Moving forward, the programme plans to drill approximately 30 dedicated wells across Ras Al Khaimah, significantly improving the accuracy and coverage of data collection efforts.

Additionally, the programme is focused on urban water management, with efforts underway to optimise the natural drainage of rainwater, ensuring that these resources are effectively managed and utilised in urban areas.

An important part of the programme's future development will involve the launch of an environmental strategy, which will include a comprehensive freshwater and groundwater strategy. This strategy will focus on the quality, quantity, and sustainability of groundwater resources, aiming to establish the necessary management tools and regulatory frameworks for long-term sustainability.

Through these initiatives, the goal is to foster a future where Ras Al Khaimah's water resources are managed with precision and foresight, ensuring their availability and health for future generations.

Programme 8: Natural Habitats & Biodiversity

Programme Owner: هيئة حماية البيئة والتنمية Environment Protection & Development Authority

Supporting Entities: بلدية رأس الخيمة Ras Al Khaimah Municipality; دائرة الخدمات العامة Public Services Department

The Natural Habitats & Biodiversity Programme is focused on conserving the emirate's unique ecosystems. Currently, Ras Al Khaimah has one officially designated protected area, with six additional sites proposed for protection. As urban development accelerates, there is an increasing need to protect key species such as the hawksbill turtle, green turtle, and Emirati leaf-toed gecko, as well as ecologically significant areas like Khor Al Hulaiyla and Wadi Mazraa.

The programme scope currently includes ongoing surveys to assess existing flora and fauna, reintroducing locally extinct species, and developing protected areas to ensure the survival of endangered resident species. Ras Al Khaimah Municipality is also working on implementing night-sky protection regulations, which will further support sensitive habitats over the long term.

Additionally, development of an environmental strategy will further refine the programme by identifying additional conservation priorities and outlining a comprehensive roadmap for implementation. This initiative underscores Ras Al Khaimah's commitment to preserving its unique biodiversity for future generations.

Deep Dive:
Khor Al-Muzahmi Reserve: A Thriving Hub for Biodiversity and Sustainable Tourism

هيئة حماية البيئة والتنمية
Environment Protection & Development Authority

A significant turning point in Ras Al Khaimah's commitment to environmental preservation is the Khor Al-Muzahmi Protected Area. The Environment Protection & Development Authority (EPDA), is bringing about revolutionary change by restoring mangrove habitats, protecting important ecosystems, and encouraging sustainable tourism. These initiatives support local communities as stewards of nature and increase biodiversity and climate resilience, which is in perfect harmony with the emirate's vision for a sustainable future.

HE Dr. Abdulrahman Al Shayeb Al Naqbi
Acting Executive Director,
Environment Protection & Development Authority

3.2 km²
Ecosystem supporting abundant biodiversity

10,000
Mangroves trees cultivated

475
Green turtles tagged

Establishment and Significance

The Environment Protection & Development Authority (EPDA) has firmly established itself as a leader in environmental protection and sustainable management of natural resources. Driven by a mission grounded in innovation and excellence, EPDA advances environmental preservation through education, awareness, and the development of legislation informed by specialised research.

A key milestone in these efforts is the establishment of the Khor Al-Muzahmi Reserve in 2018. The Khor Al-Muzahmi Reserve became the first officially designated protected area in Ras Al Khaimah under Amiri Decree No. (16) of 2018. Its declaration coincided with the UAE's hosting of the 13th Meeting of the Conference of the Contracting Parties (COP13) to the Ramsar Convention on Wetlands of International Importance, emphasising the country's commitment to environmental conservation.

Location and Ecosystem

Located 15 km south of Ras Al Khaimah city, Khor Al-Muzahmi spans 3.2 km^2 of intertidal mudflats, creating a rich ecosystem supporting abundant biodiversity. The reserve is home to flourishing grey mangrove (Avicennia Marina) forests, which serve as a vital breeding ground for marine species, including various fish such as the unique mudskipper fish, and crabs like the fiddler crab, blue crab, and mud crab.

Mangrove Restoration

To enhance mangrove restoration efforts, the Environment Protection & Development Authority (EPDA) has established a dedicated mangrove nursery within the Khor Al-Muzahmi Reserve. With a capacity to cultivate up to 100,000 seedlings, the nursery serves as a critical resource for large-scale planting initiatives. These efforts are focused on increasing the mangrove cover not only within the reserve but also in other ecologically suitable areas across Ras Al Khaimah. By expanding mangrove ecosystems, the initiative plays a vital role in improving coastal resilience, supporting biodiversity, and mitigating the impacts of climate change such as rising sea levels and coastal erosion.

Additionally, healthy mangroves act as carbon sinks, contribute to water purification, and provide essential nursery grounds for a variety of marine species, making their restoration a priority for long-term environmental sustainability.

Sustainable Tourism and Community Engagement

Khor Al-Muzahmi has also emerged as a model for sustainable tourism and community engagement. Recent mangrove planting initiatives have witnessed widespread participation from various sectors of society, reinforcing conservation awareness and ecological stewardship. These collaborative efforts have not only accelerated reforestation but also fostered a strong sense of environmental responsibility among participants. By encouraging hands-on involvement in conservation activities, the programme strengthens the bond between people and nature, laying the groundwork for long-term ecological stewardship. As Khor Al-Muzahmi continues to evolve as a model for responsible environmental management, it demonstrates the powerful impact of grassroots engagement and inclusive action in promoting sustainable development and preserving natural heritage.

Figure 13: Khor Al-Muzahmi Reserve, Ras Al Khaimah: A protected coastal ecosystem rich in biodiversity

Programme 9: Marine & Coastal Ecosystem

Programme Owner: هيئة حماية البيئة والتنمية Environment Protection & Development Authority

Supporting Entities: دائرة الخدمات العامة Public Services Department, RAK PORTS

The Marine & Coastal Ecosystem Programme is dedicated to protecting and sustaining the emirate's marine ecosystems. This initiative focuses on monitoring water quality, assessing biological indicators, and studying hydrological patterns to ensure the long-term health of coastal and marine environments.

As part of this programme, several key monitoring activities have already been undertaken. Existing seawater monitoring efforts by EPDA, RAK Ports, and Marjan are being integrated into a centralised seawater monitoring regime. Additionally, a detailed study on coastal water characteristics is underway, involving data collection from five dedicated marine stations and over 15 sampling sites in the creek. These efforts are supported by floating meters, which continuously monitor key parameters such as alkaline (pH), dissolved oxygen, salinity, and nutrient levels, providing real-time data to enhance water quality assessments.

Looking ahead, development of an environmental strategy set to begin in 2025 will guide EPDA in creating tailored regulations and implementing a structured roadmap for marine and coastal ecosystem sustainability. Future initiatives may also include the deployment of advanced monitoring technologies and habitat restoration projects to further strengthen marine conservation efforts in Ras Al Khaimah.

Figure 14: Floating water quality meter deployed to monitor marine conditions in Ras Al Khaimah

4

Pillar 3: Climate Change Mitigation

Programme 10: Sustainable Communities

Programme Owner: بلديـــــة رأس الخيمـــــــة Ras Al Khaimah Municipality

Supporting Entities: وزارة الصناعة والتكنولوجيا المتقدمة MINISTRY OF INDUSTRY & ADVANCED TECHNOLOGY; دائرة الخدمات العامة Public Services Department; rakez RAS AL KHAIMAH ECONOMIC ZONE; EtihadWE الاتحاد للماء والكهرباء; RAK PORTS

Buildings play a central role in Ras Al Khaimah's sustainability goals, with energy and water use in the built environment accounting for a significant share of overall consumption. High building performance is essential not only for reducing emissions and conserving resources, but also for lower operating costs, occupants' comfort and quality of life.

The Sustainable Communities Programme aims to address this sector through a series of coordinated initiatives. Ras Al Khaimah's green building regulations, Barjeel, have been in effect since 2020, setting minimum performance standards for new buildings. In parallel, an active retrofit programme is enhancing the energy and water efficiency of existing buildings, with a few hundred already upgraded and many more identified for future improvement. The programme also promotes energy management practices and the adoption of high-efficiency equipment across the residential, commercial and government sectors.

Building on these efforts, the programme is expanding its scope to take a more holistic approach that goes beyond individual buildings to include entire communities and infrastructure. Building codes will be updated periodically, and community-wide sustainability guidelines will be promoted to support the creation of energy-efficient, resilient developments. A key focus is also the expansion of retrofit efforts to all building types, including residential, commercial, and hospitality structures. To further embed sustainability in public sector operations, the programme promotes green procurement through the development and implementation of dedicated guidelines for government entities.

Green Building Regulations (Barjeel)

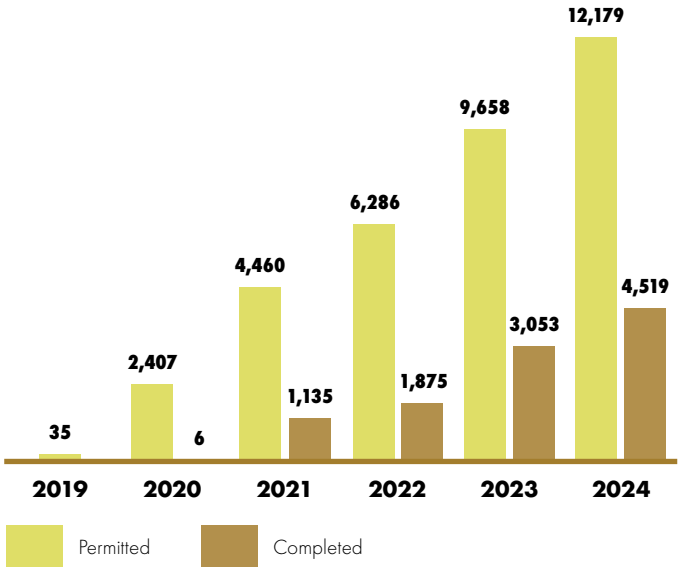
Barjeel, the Green Building Regulations of Ras Al Khaimah, sets minimum sustainability standards for new buildings in the emirate. Buildings permitted under these standards are expected to consume 30% less energy and water compared to a typical building in Ras Al Khaimah, resulting in lower utility bills. As of 2024, more than 4,500 Barjeel-compliant buildings have been built, and more than 7,500 will be permitted for construction in the coming years. Barjeel is undergoing periodic updates to ensure its standards follow the pace of global technology development.

In 2023, the development of a building energy rating system was initiated. This system will be used to incentivise the improvement of both new and existing buildings by providing recognition to highly energy-efficient buildings in the market. The first phase of this project (development of a regulatory approach) has been completed, and the second phase of survey and modelling has begun, which will support detailed design and calibration.

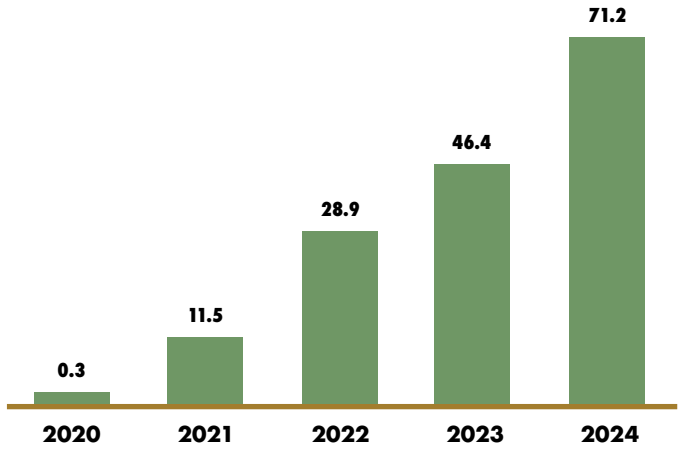
> **Barjeel reflects Ras Al Khaimah's strategic commitment to sustainable development and responsible urban growth. By setting clear standards for energy efficiency, water conservation, and environmental performance, Barjeel ensures that every new building contributes meaningfully to our long-term vision for a low-carbon, resource-efficient future. It stands as a foundational pillar in our journey towards environmental resilience and economic sustainability.**

Eng. Aaesha Alshehhi
Executive Director of Urban Development Sector,
Ras Al Khaimah Municipality

Cumulative Number of Barjeel-Compliant Buildings



Annual Electricity Savings (GWh)



Annual Water Savings (000's m³)

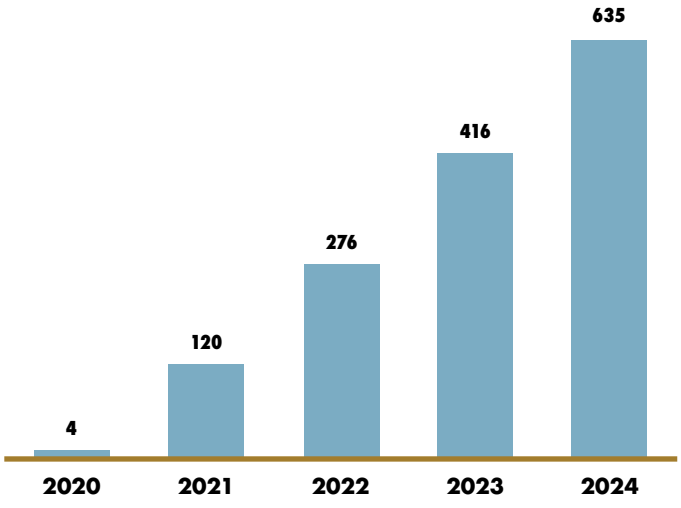


Figure 15: Main results of Barjeel

Building Retrofits

The Building Retrofits initiative was established to deliver energy savings in existing buildings through upgrades focused on major energy consuming systems. The initiative has developed rapidly following its first project in 2018. By the end of 2024, more than 400 buildings have been retrofitted.

The market is served by a group of reputable ESCOs. As of 2024, there were 19 accredited ESCOs involved in all project tenders managed by Reem.

Completed retrofits so far include most building types, such as government offices, malls, supermarkets, hotels, hospitals, private offices, schools, mosques and residential properties. These projects demonstrate strong economic benefits with average savings exceeding 25% and payback times averaging less than 4 years. The prevalent contract model in government projects is a guaranteed savings scheme, while in the private sector, there are a variety of methods where the standard engineering procurement construction model prevails.

Ongoing projects include, among others, the retrofit of a large pipeline of 100+ semi-government buildings and a number of mosques in the emirate, all of which are now in the tendering and contracting phase. Given the relevance of the hospitality sector and as part of the Sustainable Destination Certification achieved by Ras Al Khaimah, a plan is being developed to support hotels that want to become more energy efficient. While developing the pipeline of new projects, Reem is also exploring new contracting methods, such as Cooling as a Service (CaaS), and new approaches to address buildings of smaller sizes.

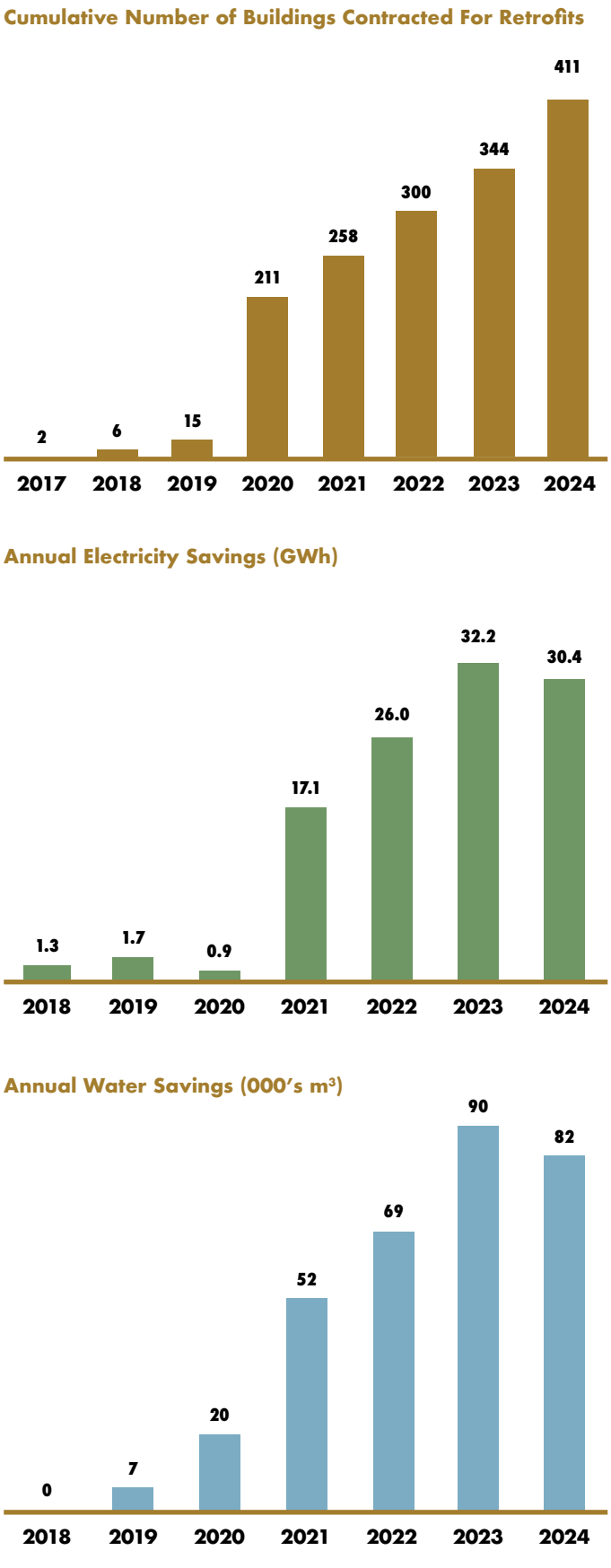


Figure 16: Main results of Building Retrofits

Energy Management in the Government

The Energy Management initiative aims to promote more systematic energy management practices, such as those defined by ISO 50001, among high-energy users in Ras Al Khaimah's industrial, commercial, and government sectors.

The EE&R Strategy envisaged the government as a champion of energy management practices. As a result, in 2023, Ras Al Khaimah government became the first in the world to achieve ISO 50001 energy management certification for all its entities. A total of 24 government entities are now certified. Reem has supported these government entities in establishing processes and methods, through a combination of training, advisory and project management. Results in terms of energy savings are already substantial, in excess of 23%

Building on the success of Amiri Resolution No. 15 of 2018 which aimed to achieve 20% energy and water savings by 2022, Ras Al Khaimah also introduced Amiri Resolution No. 18 of 2024 - energy management for government entities and state-owned enterprises to enhance energy efficiency and resource management further. This new resolution sets ambitious targets, including 30% electricity savings, 20% water savings, and 20% transportation fuel savings by 2030, compared to a 2017 baseline. These targets align with the emirate's long-term vision for resource optimisation.

In 2024, the Municipality published the Energy Management Guidelines to support government entities and private bodies in effectively applying and benefitting from energy management initiatives. The guidelines were developed to simplify the ISO 50001 energy management certification process, which comprises two levels. The first basic level enables organisations to reap the benefits of ISO 50001 without deep process changes while providing the documentation needed for certification. Level two, which is more advanced, supports organisations in reaching full certification compliance. The guidebook is available **here**.

Figure 17: ISO 50001 certified government entities by 2024

Energy Management Principals of Ras Al Khaimah

Ali Alhebsi
Environment Protection & Development Authority

Athari Alneaimi
Ras Al Khaimah Customs Department

Khaled Issa
Ras Al Khaimah Department of Finance (DoF)

Laila Issa
RAK Department of Knowledge

Fatima Al Kait
Electronic Government Authority

Ruqayya Ali Alshehhi
Human Resources Department

Nawal Alshimely
Ras Al Khaimah Courts Department

Paul Mckernan
RAK Mining & Exploration Holding LLC (Stevin Rock)

Sultan Alhammadi
Antiquities and Museums Department

Ahmed Fayez
Investment and Development Office

Haytham Mounir
RAK Hospitality

Moamen Madkour
RAKGAS and RAK Petroleum Authority

Rashid Hilal
Ras Al Khaimah Municipality

Lourens Jan Van Zyl
RAK Ports

Yaqoob Al Zaabi
Ras Al Khaimah Department of Economic Development

Sanjeet Dangi
RAK Transport Authority

Faten Awni Aljerjawi
Amiri Diwan

Amjad Jaradat
RAK Broadcasting Authority

Hareesh Chandran
RAK Hospital

Fadi Adwan
Marjan

Fatemah Altenaiji
Ras Al Khaimah Center for Statistics and Studies

Vishnu Girija
Ras Al Khaimah Chamber of Commerce

Muzaffar Razzaq
American University of Ras Al Khaimah (AURAK)

Shaikha Alneaimi
General Resources Authority

Samira Sulaiman
Ras Al Khaimah Public Services Department

Hiba Badran
Ras Al Khaimah Tourism Development Authority

John Emmanuel
RAK Medical & Health Sciences University

Ammar Adnan
Emirates Club

Jessica Kamau
RAK Media Office

Achraf Hassani
RAK International Airport

Akbar Shahid
Department of Protocol & Hospitality

Dr. Ali Alani
Ras Al Khaimah Economic Zone (RAKEZ)

Abdulla Alriyami
Public Prosecution Department

Abdul Raheem
RAK Academy

Esraa Nabil Al Awadi
Department of Civil Aviation

Heba Shaker Yonus
RAK Modern Private School

Althea Fernandez
Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research

Community Guidelines

Going beyond buildings, the Municipality has developed guidelines for sustainable communities that address the public realm in four areas of improvement: livability & mobility, energy, water, and resource efficiency. The guidelines are being implemented in a new and upcoming pilot community.

In 2024, Ras Al Khaimah Municipality also introduced a structured approach to enhancing outdoor thermal comfort, ensuring effective climate adaptation through research and practical applications. Pilot studies and simulations are being conducted to develop solutions tailored to the local climate. To support these efforts, the American University of Ras Al Khaimah (AURAK) have established the RAK Center for Outdoor Comfort (RAKCOC), the region's first dedicated research centre in this field. The centre provides design guidance, education, testing, and certification, with solutions already implemented in key locations such as Al Qawasim Corniche, Jebel Jais Viewing Deck, Wadi Shawka Dam Park, Bear Grylls Adventure Camp, Al Jazeera Al Hamra Heritage Village and others.

Findings from these studies have shaped the outdoor thermal comfort guidelines, helping consultants and developers integrate thermal comfort strategies from the early design stages.

Figure 18: Outdoor thermal installations across Ras Al Khaimah

Deep Dive:
Marjan: Cultivating Community, Commerce and Sustainability

RAK Central is part of our ambitious vision to leverage the emirate's natural resources to offer people a vibrant mixed-use destination to 'live, work and play.' Our aim is to set new benchmarks for sustainable urban development through our strategic global partnerships and local collaborations to help build a thriving, resilient community. By attracting investments, creating jobs and enhancing the quality of life for residents, we hope to create the blueprint for future development in the region. RAK Central's mixed-use commercial, residential and entertainment hub will further help attract and retain talent, boosting the local economy and solidifying Ras Al Khaimah's position as a desirable destination for all.

Abdulla Al Abdouli
Chief Executive Officer,
Marjan

0.77 km²
Total built-up area

0.27+ km²
Grade-A office space

1,000+
Hotel keys
(across four hotels)

A Smart, Sustainable Vision for Ras Al Khaimah

Marjan, the leading master developer for freehold land in Ras Al Khaimah, is in the process of developing RAK Central, which will bring together residential, commercial, hospitality, and retail spaces in a connected and sustainable community. The development by Marjan is designed to establish Ras Al Khaimah as a smart and accessible destination while keeping the emirate's cultural heritage at its core. Aligned with RAK Vision 2030, the project supports the emirate's ongoing transformation into a global hub for investment, tourism, and innovation. The project, conceived as a "Live-Work-Play" destination reflects Marjan's continued commitment to enhancing quality of life, economic diversity, and long-term environmental resilience.

Creating a Dynamic Commercial and Residential Ecosystem

Set across 289,000 square meters of land, RAK Central is a large-scale mixed-use development with a total built-up area of 778,000 square meters. The master plan includes more than 270,000 square meters of premium office space, over 4,000 residential apartments, four hotels with more than 1,000 guest rooms in total, as well as retail outlets, cinemas, and open green parks that foster community engagement. The site also includes interconnected buildings and over 1,000 parking spaces to ensure convenience and accessibility.

Its signature component, the RAK Central HQ Office Complex, is being developed in phases and will include five state-of-the-art, LEED Gold-certified office towers. Designed by global architecture firm Gensler, the complex will serve as headquarters for key entities including RAKEZ, Marjan, RAK Hospitality Holding, Al Hamra, and the Ras Al Khaimah Tourism Development Authority. The project is scheduled for completion in Q1 2027.

Leading with Sustainability

Sustainability is embedded in every aspect of RAK Central's design and development. From the use of environmentally responsible building materials to the adoption of smart infrastructure, Marjan is ensuring the project meets and exceeds green building standards.

Key measures include a commitment to comply with LEED Gold certification for office buildings. This is realised through the integration of energy-efficient technologies and water-saving systems, the implementation of on-site waste management and recycling programmes, and the use of AI and smart solutions to optimise energy use.

The development also emphasises the use of local materials to reduce embodied carbon and prioritises biodiversity conservation throughout the project. These measures not only reduce the environmental footprint of RAK Central but also demonstrate how large-scale development can coexist harmoniously with sustainability principles.

A Lifestyle-Driven Community

RAK Central is designed to be a destination built around people. In addition to office towers and residences, the development will include a shopping mall, a mix of restaurants, cafés, and convenience outlets, childcare facilities, wellness areas, and community zones.

In alignment with Ras Al Khaimah's outdoor thermal comfort guidelines, the project integrates climate-responsive design strategies that enhance comfort in outdoor areas year-round. Tree-lined boulevards, shaded walkways, landscaped courtyards, and open public plazas have been carefully planned to improve microclimatic conditions and encourage walkability. Residential clusters of two to six buildings provide scenic views and immediate access to parks and open spaces, encouraging healthier lifestyles and stronger community ties.

Shaping a New Urban Identity

RAK Central represents a major milestone in Ras Al Khaimah's journey toward becoming a thriving regional commercial and lifestyle destination. By integrating sustainability, smart technology, and inclusive design, the development is attracting global businesses, forward-thinking investors, and new residents.

Figure 19: RAK Central masterplan and development vision

Manzily Energy Advice Service

In order to truly cultivate sustainable communities and buildings and drive lasting change, raising awareness and empowering homeowners to identify energy-saving opportunities is essential. By equipping individuals with knowledge and tools to make smarter energy choices, we can foster more resilient neighbourhoods, reduce environmental impact, and create a foundation for a more sustainable future.

As such, a new initiative was launched in 2023 called Manzily Energy Advice Service, which provides free energy advice for homeowners. Homeowners can benefit from a quick assessment of opportunities for home improvements, such as energy and water savings, improved indoor air quality and thermal comfort. The assessment is conducted by an expert nominated by Ras Al Khaimah Municipality, while a database of suppliers and contractors supports the implementation of recommendations.

Since its launch, about 160 homeowners have benefited from the service. Ras Al Khaimah Municipality has also partnered with Etihad Water and Electricity (EtihadWE) to provide monetary incentives to residents who participate in the Manzily Energy Advice Service and achieve electricity savings. Under this partnership, EtihadWE provides Đ1 credit for every Dirham saved in the homes of UAE nationals enrolled in the service. Interested applicants can sign up for Manzily **here.**

> **Energy has been critical to our advancement in society. Today, buildings are increasing in size to meet the population's growing needs, all while ensuring global standards and the adoption of local climatic conditions. As a result, the world is witnessing a significant increase in energy consumption, especially in hot regions. In the UAE, we are fortunate to have access to an uninterrupted energy supply. However, fostering a culture of conservation is essential. I commend Ras Al Khaimah for its awareness initiative promoting energy efficiency and adoption of smart technologies. I urge all citizens and residents to actively participate and take meaningful steps toward responsible energy use and preservation.**

Mohamed Saqr Al Zaabi
Homeowner, Ras Al Khaimah

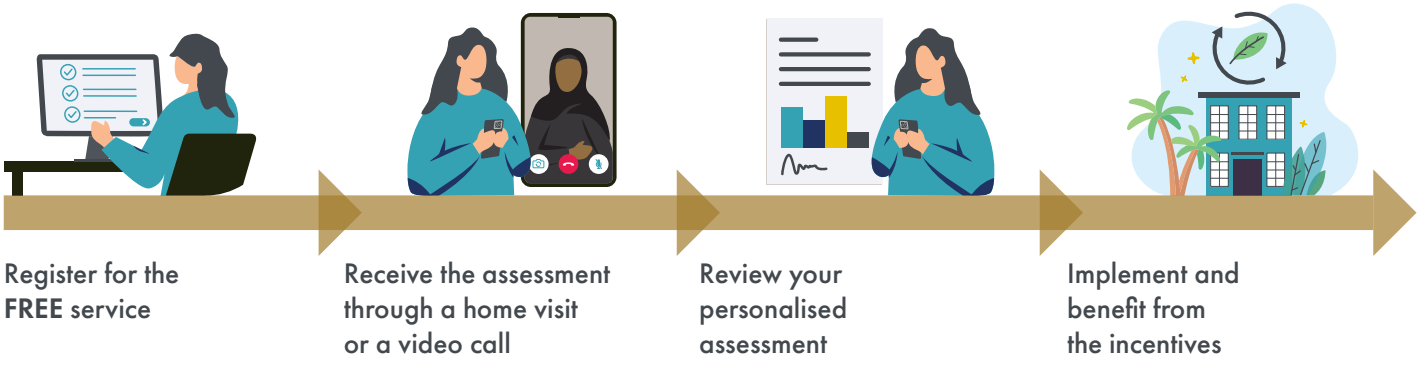


Figure 20: Manzily Energy Advice Service process: A step-by-step journey to a more efficient home

Efficient Appliances

Over 20% of electricity consumed in Ras Al Khaimah is attributed to the use of major household appliances such as air-conditioners, refrigerators and freezers, washing machines, and water heaters. The UAE Ministry of Industry & Advanced Technology (MOIAT) is responsible for establishing energy and water efficiency standards across the UAE, implementing the necessary conformity assessment scheme to ensure compliance, and promoting highly efficient appliances and maximising the benefits of these performance standards.

The adoption of efficient appliances is primarily driven by the performance standards enforced by MOIAT under the Energy Efficiency Standards and Labeling (EESL) programme. The EESL programme strategically combines Minimum Energy Performance Standards (MEPS), which set the minimum performance levels that appliances must meet before entering the UAE, and comparative labeling, showcasing a star rating scale of 1 to 5 stars, with 5 being the most efficient. These labels aid consumers in making informed decisions when purchasing appliances based on their performance. Launched in 2011, the EESL programme began regulating room air-conditioners and has successfully expanded to 12 major product categories.

The product categories included in the EESL programme are:

- Room air-conditioners
- Washing machines and dryers
- Refrigerators and freezers
- Electric storage water heaters
- Commercial air-conditioners
- Dishwashers
- Rotodynamic electric motors
- Television sets
- Elevators (Lifts)
- General lighting products: Lamps & control gears
- Outdoor lighting
- Water fixtures

The EESL programme, with standards and a conformity assessment system, is closely monitored and updated regularly to ensure alignment with the latest international performance levels. A key driver for the success of this programme is public awareness.

To further encourage the adoption of efficient appliances, Reem has launched the Mass Replacement Initiative, which targets small shops and helps them replace old air conditioners with energy-efficient models, reducing electricity consumption and costs. Through such efforts, Reem continues to drive energy efficiency and environmental responsibility across the community.

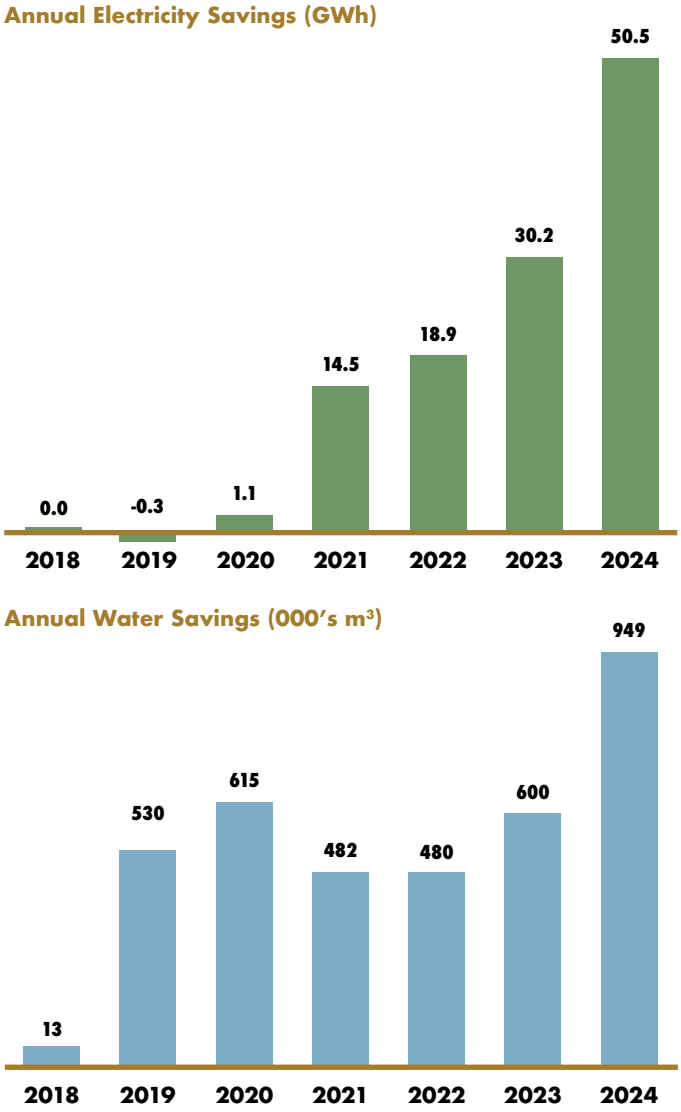


Figure 21: Energy and water savings from enforcement of efficient appliance standards

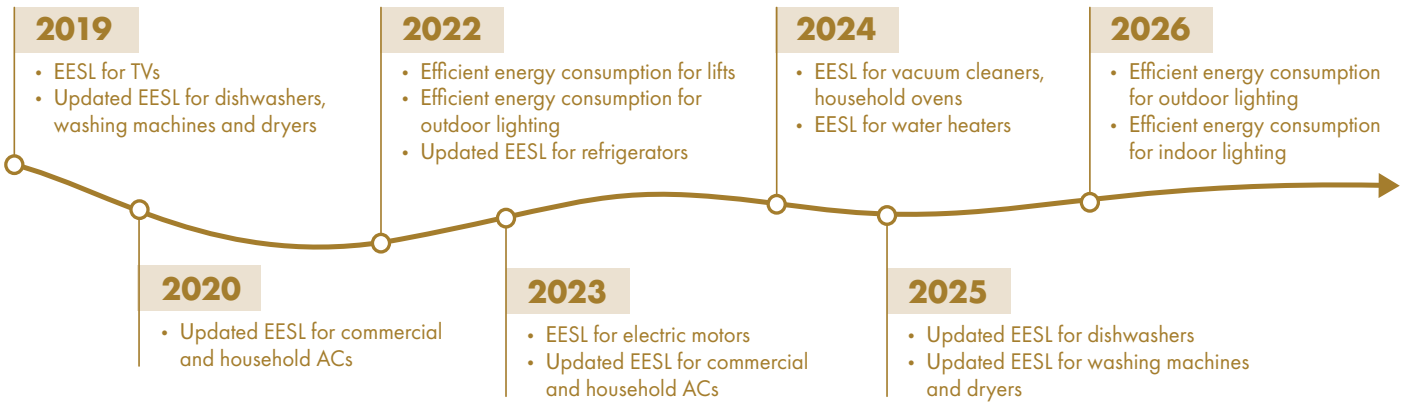


Figure 22: Timeline of EESL issuance and update

Figure 23: Examples of energy saving tips issued by Reem, Ras Al Khaimah Municipality in an ongoing awareness campaign on social media

Programme 11: Transport Decarbonisation

Programme Owner: هيئة رأس الخيمة للمواصلات RAK TRANSPORT AUTHORITY

Supporting Entities: بلديـــــة رأس الخيمـــــة Ras Al Khaimah Municipality; RAKGAS

The Transport Decarbonisation Programme addresses energy efficiency in Ras Al Khaimah's transportation sector by promoting the use of green vehicles, including conventional fuel-efficient, hybrid, and electric vehicles (EV). The programme aims for 80% of total vehicle sales in the emirate to be EVs and hybrids by 2050.

The Transport Decarbonisation Programme reflects our commitment to delivering sustainable and integrated transport solutions that improve quality of life and protect the environment. Through the development of intelligent infrastructure and smart mobility systems, we are translating our vision into practical progress that supports a more liveable and forward-looking emirate.

HE Eng. Esmaeel Hasan Al Blooshi
Director General,
Ras Al Khaimah Transport Authority

In 2023, Ras Al Khaimah Transport Authority (RAKTA) launched the RAK Mobility Masterplan 2023–2030, a comprehensive strategy to advance sustainable public transportation in the emirate. The masterplan leverages technology, infrastructure improvements, and operational enhancements to promote more efficient, low-emission mobility and support the emirate's vision of a vibrant and liveable sustainable city.

To support EV adoption, RAKTA signed Memoranda of Understanding (MOUs) with EtihadWE and UAEV to enhance the EV charging network. In 2024, eight DC fast chargers and seven AC chargers were added, bringing the total number of charging points in Ras Al Khaimah to over 100. Further expansion is planned to meet growing demand. A map of all public electric vehicle charging stations in Ras Al Khaimah is available on the Reem website and is continuously updated. Owners and operators of public charging stations in Ras Al Khaimah may have their stations advertised on the map free of charge by sending a request to Reem.

Figure 24: Map of public electric vehicle charging stations in Ras Al Khaimah

Of the 365 vehicles procured by the Government of Ras Al Khaimah in 2024, 91% were efficient, including 80% electric and hybrid vehicles. These numbers are expected to improve further as the Green Public Procurement guidelines establish higher criteria on light vehicle purchases in the government. Reem continues to facilitate such purchase decisions through market research and maintenance of a vehicle database and an integrated cost-comparison tool.

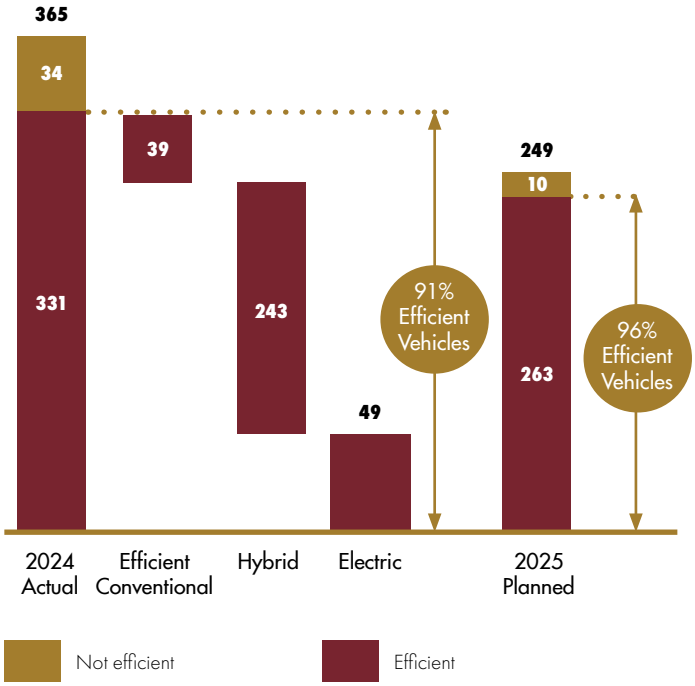


Figure 25: Government vehicle purchases in 2024 and planned purchases in 2025

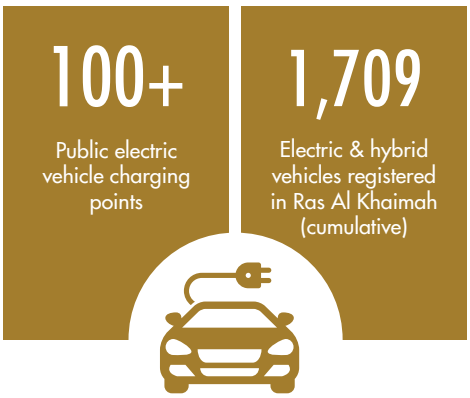


Figure 26: Total number of charging points in Ras Al Khaimah and total number of EVs and hybrids registered

Since the introduction of intracity bus lines in priority areas in 2022, public transport routes have played a key role in reducing individual transport and diverting traffic to more efficient transit options. In 2024, public transport usage saw significant growth during peak hours, with intercity bus ridership reaching 1,750 passengers per day and intra city bus ridership reaching 1,200 passengers per day. Further advancing sustainability efforts, air quality monitoring sensors were installed on public buses in 2024 to track and analyse air pollution levels, supporting data-driven environmental policies.

Looking ahead, RAKTA is developing a plan to expand the network of EV superchargers across the emirate. This initiative, in collaboration with key stakeholders, aims to promote greater adoption of electric vehicles in Ras Al Khaimah. By enhancing the EV infrastructure, RAKTA seeks to significantly reduce carbon emissions from the transportation sector, contributing to the emirate's sustainability goals.

Figure 27: Intracity buses in Ras Al Khaimah

Programme 12: Agriculture Decarbonisation

Programme Owner: Environment Protection & Development Authority

Supporting Entities: Ras Al Khaimah Municipality, reem, Ministry of Climate Change & Environment

The Agriculture Decarbonisation Programme is focused on reducing emissions in Ras Al Khaimah's agricultural sector. Emissions can be mitigated by transitioning to clean, renewable energy sources, and through more efficient management of agricultural activities, products, and equipment.

The programme focuses on three main areas to achieve emissions reductions:

- **Improving equipment and processes** to reduce energy consumption and emissions.
- **Transitioning to renewable energy sources** for agricultural operations.
- **Promoting sustainable farming practices** that focus on efficient fertiliser use, regenerative agriculture, and sustainable livestock management.

To support these efforts, a carbon footprint dashboard is under development. This tool will calculate and track the carbon emissions from agricultural activities, which will help identify key sources of emissions, such as energy use and transportation. The data collected will guide decision-making and help pinpoint areas for improvement, driving the sector toward more sustainable practices.

The programme will also assess the potential impacts of climate change on agriculture in Ras Al Khaimah, working with local businesses to identify opportunities for reducing emissions and improving sustainable operations. In addition, it will raise awareness on the link between sustainable practices and climate change, encouraging broader participation in decarbonisation efforts.

Programme 13: Industrial Decarbonisation

Programme Owner: Ras Al Khaimah Municipality, reem – RAK Energy Efficiency and Renewables Team

Supporting Entities: Ministry of Energy & Infrastructure; Ministry of Climate Change & Environment; Ministry of Industry & Advanced Technology; RAKGAS; rakez – Ras Al Khaimah Economic Zone

The Industrial Decarbonisation Programme targets a significant reduction in industrial emissions in Ras Al Khaimah, where industries account for over 80% of total emissions. The cement sector, a major emitter due to its hard-to-abate energy and process emissions, is a key focus. This programme seeks to enhance energy efficiency, explore sustainable cement substitutes, transition to alternative fuels, and deploy carbon capture, utilisation and storage (CCUS) where feasible to drive decarbonisation efforts.

The Industrial Energy Audit Initiative was developed to help companies in Ras Al Khaimah identify energy savings and emissions reduction opportunities. Reem offered participating industries an energy audit as part of this initiative in exchange for a commitment to report on implementation. Initially launched as voluntary, the initiative was strengthened in 2024 with Amiri Resolution No. 20 of 2024, mandating large industrial facilities to conduct periodic energy audits and report on progress.

To support the mandated audits, Reem engages with local industrial companies offering specialised audit support and a knowledge-sharing platform. To provide this service at minimal cost, Reem procures expert support at scale by empanelling capable auditing companies and defining a framework of competitive prices for their services. Auditing companies have been empanelled across various industrial sectors, including quarries, cement, ceramics, glass, packaging, and more. These external experts are accompanied by specialised personnel from Reem throughout the process.

By the end of 2024, nine industries completed energy audits in their facilities, covering a baseline of more than 1.1TWh of electricity consumption per annum representing over 50% of industrial electricity consumption in the emirate. These audits identified over 100 GWh of electricity savings, and over 60,000 m^3 of water savings, and significant reductions in diesel, coal, and natural gas consumption, with an overall payback time of under two years. Additionally, more than 120 industry employees participated in four knowledge-sharing sessions organised as part of the initiative. These sessions covered key topics for industries in Ras Al Khaimah and were delivered in collaboration with expert teams from organisations such as Taka Solutions on CaaS, GRFN and Siemens on variable frequency drives (VFDs), JCI on heat pumps, and Machinery People on compressed air systems.

Moving forward, the next steps include studying the feasibility of alternative fuels, supplementary cementitious materials (SCMs), and carbon capture, utilisation and storage (CCUS) in preparation for upcoming federal cement standards and carbon pricing policies.

Figure 28: Al Ghail Industrial Zone, Ras Al Khaimah

Figure 29: Al Hamra Industrial Zone, Ras Al Khaimah

Figure 30: Participating industrial companies at the end of 2024

Figure 31: Empanelled auditors at the end of 2024

Deep Dive:
RAK Ceramics: Showcasing a commitment to sustainable processes

At RAK Ceramics, sustainability is not just a goal—it is our responsibility. We are committed to innovation that enhances energy and water efficiency, integrates recycled materials, and minimises environmental impact, paving the way for a greener future.

Abdallah Massaad
Group CEO, RAK Ceramics

750+ MWh
Energy savings from power saving initiatives in 2024

46,000 m³
Water savings from wastewater reutilisation

6.2%
Decrease from 2023 to 2024

RAK Ceramics Philosophy

Founded in 1989 and headquartered in Ras Al Khaimah, RAK Ceramics is one of the world's largest manufacturers of ceramic and gres porcelain wall and floor tiles, sanitaryware, faucets, and tableware. Operating in over 150 countries across the Middle East, Europe, Africa, Asia, the Americas, and Australia, the company is publicly listed on the Abu Dhabi Securities Exchange and the Dhaka Stock Exchange, generating an annual turnover of approximately US$1 billion.

Sustainability is at the core of RAK Ceramics' mission, shaping its approach from product design to manufacturing. The company prioritises energy efficiency, pollution reduction, biodiversity conservation, and resource optimisation through recycling and clean development mechanisms (CDM) to minimise carbon emissions. Committed to continuous innovation, RAK Ceramics challenges industry norms to drive advancements in sustainability, design, and responsible manufacturing.

Sustainable Practices at RAK Ceramics

RAK Ceramics is committed to sustainability through a range of eco-friendly initiatives that reduce waste, conserve resources, and minimise environmental impact. The company focuses on recycling, reusing materials, and improving energy and water efficiency to support a greener future for its operations and the community.

Key initiatives include the use of recycled materials in the Re-Use tile series, reintegration of production waste into new products, and 100% reuse of rejected faucet pieces.

To reduce environmental footprint and increase operational efficiency, RAK Ceramics has implemented smart manufacturing processes that optimise resource consumption, enhance productivity, and lower emissions. In 2024, new energy-saving technologies and heat recovery systems led to a significant reduction in both electricity and gas use, achieving over 758,000 kWh and 45,000 MMBTU in energy savings.

On the water side, the company improved efficiency through the installation of a seawater reverse osmosis (SWRO) plant, reducing dependence on external water sources and saving 45,900 m³ of water through reuse in production. Process innovations such as increasing slip density have also reduced water use by 8% in tile manufacturing.

These efforts support RAK Ceramics' long-term commitment to sustainability, while directly contributing to Ras Al Khaimah's industrial decarbonisation goals.

Sustainability Strategy and Future Outlook

RAK Ceramics aligns its business practices with the United Nations Sustainable Development Goals (UN SDGs) and key UAE national strategies, including UAE Net Zero by 2050, the UAE Climate Change Plan 2017–2050, and the UAE Energy Strategy 2050.

To uphold transparency and accountability, the company integrates sustainability across operations and discloses progress through annual sustainability reports.

To further this commitment, RAK Ceramics is developing an ESG Strategy for 2024–2030, aligned with global and industry standards. This strategy focuses on key areas such as decarbonisation, circularity, and workforce development, ensuring long-term sustainability and business resilience. Additionally, the company has increased the production of gres porcelain tiles, a more resource-intensive process, while implementing resource reduction initiatives to optimise consumption.

Looking ahead, RAK Ceramics plans to implement a solar energy conversion system by 2025, reducing reliance on non-renewable energy sources. This initiative will enhance energy efficiency, lower overall consumption, and reinforce the company's long-term sustainability goals. It aligns with Ras Al Khaimah's industrial decarbonisation programme by minimising emissions and supporting cleaner production processes across the region's industrial sectors.

Figure 32: Waste heat recovery system at RAK Ceramics

5

RIS Strategy Enablers

Awareness

RAK Energy Summit 2024

Under the patronage of His Highness Sheikh Saud bin Saqr Al Qasimi, UAE Supreme Council Member and Ruler of Ras Al Khaimah, Ras Al Khaimah Municipality hosted the second edition of RAK Energy Summit. Held over two days in November 2024, the summit attracted high-ranking officials, industry experts, and key decision-makers from the UAE and around the world. The event was supported by Etihad Water and Electricity (EtihadWE) as Lead Partner, alongside the UAE Ministry of Energy & Infrastructure, the UAE Ministry of Climate Change & Environment, the Environment Agency – Abu Dhabi, the International Renewable Energy Agency (IRENA), and over 15 local government entities in Ras Al Khaimah.

Under the theme "Create and Contribute to the Sustainable Energy Goals of the Future," the first day featured a keynote address by the UAE Ministry of Energy & Infrastructure on the UAE Energy Strategy, followed by a keynote presentation from the COP28 Presidency on the role of finance in supporting a just, equitable, and orderly energy transition.

The opening day also welcomed distinguished speakers from EtihadWE, Oman's Authority for Public Services Regulation, Kuwait Municipality, and the Gulf Organisation for Research & Development (GORD).

The second day highlighted strong international participation, with presentations from the GCC Interconnection Authority, the International Energy Agency (IEA), and the Center for Worldwide Sustainable Construction – EPFL University, Switzerland focusing on decarbonising the cement industry.

In addition to executive panels, sessions covered smart technologies, future fuels and grids, decarbonisation of hard-to-abate industries, and sustainable mobility. Day two also celebrated national milestones, including the announcement of the winners of the 8th edition of the UAE Energy Management Awards and the launch of the National Industry Sustainability Initiative — a joint effort by the UAE Ministry of Energy & Infrastructure and the UAE Ministry of Industry & Advanced Technology (MoIAT). Central to this initiative was the introduction of the UAE Industry Registry Platform, supporting the implementation of the Federal Energy Management Regulation in Industrial Facilities. Significant upgrades to Ras Al Khaimah's energy and sustainability strategy were also announced, aimed at expanding the scope and impact of initiatives, with an exclusive preview of RIS Strategy.

1,500+ attendees

55+ visionary speakers

20+ innovative technology providers

35+ conference sessions

RAK ENERGY SUMMIT
قمة رأس الخيمة للطاقة


HE Suhail Mohamed Al Mazrouei
UAE Minister of Energy and Infrastructure


HE Yousif Al Ali
Chief Executive Officer
Electricity (EtihadWE)


OFFICIAL HOSPITALITY PARTNER
OFFICIAL MEDIA PARTNER
puro
SUPPORTING PARTNERS
UACA
Dii
MESIA


puro
OFFICIAL HOSPITALITY PARTNER
OFFICIAL VENUE PARTNER


puro
BRIDGE INSTITUTE
GWCN
EUROVENT
RCREEE
VestinGrow
RAK ENERGY SUMMIT


11.7%
15.4%


From awareness to ambition to action
Lucas Boehlé
Energy Efficiency Analyst
International Energy Agency
iea


Executive Panel Discussion: Thinking 20 years ahead – paths to regional energy sustainability
Moderator


UNITED ARAB EMIRATES
MINISTRY OF ENERGY & INFRASTRUCTURE
UAE Energy Management Award ISO 50001
RTA
Dubai Municipality
EMPCO INTERNATIONAL
RAK
RAKGAS


Panel Discussion: Decarbonising cement: how the construction value chain can accelerate
Moderator

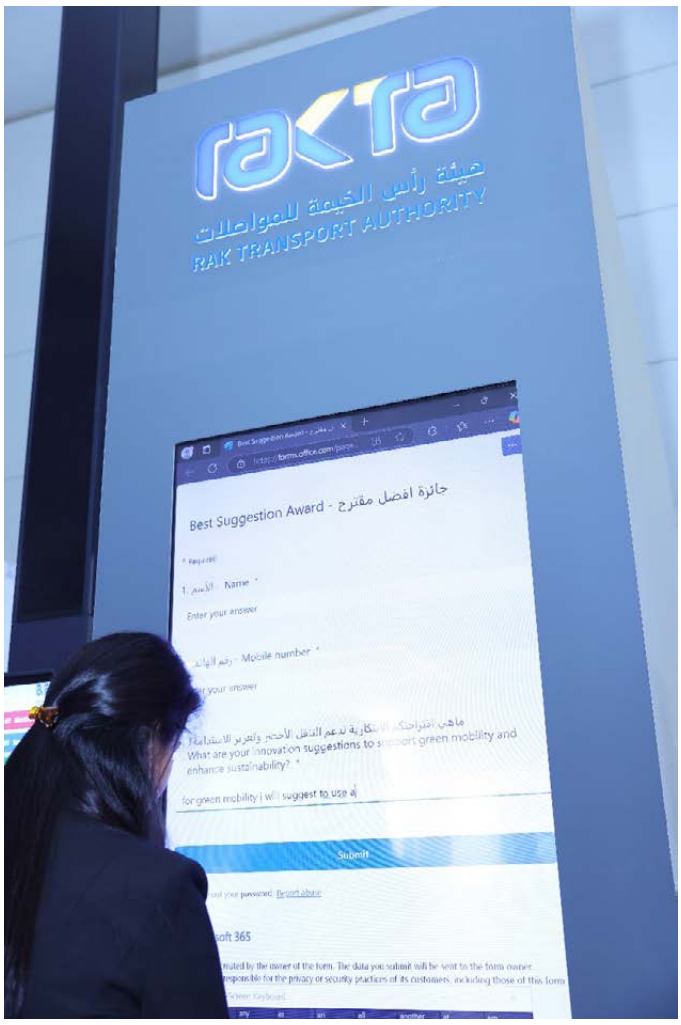

حكومة رأس الخيمة
Government of Ras Al Khaimah

Green Mobility Week

Another milestone event was the Green Mobility Week, launched by Ras Al Khaimah Transport Authority (RAKTA) on November 25, 2024. This initiative aims to highlight the importance of sustainable mobility, raise awareness about eco-friendly transport options, and showcase RAKTA's role in delivering innovative and smart solutions that align with Ras Al Khaimah's vision for environmental and developmental sustainability under its Green Mobility Strategy 2023-2040.

Green Mobility Week comes as part of RAKTA's Green Mobility Strategy, which seeks to reduce carbon emissions and balance urban development with environmental preservation. During this week, RAKTA announced a Free Public Transport Day on city buses, encouraging residents and visitors to embrace public transportation while promoting its environmental and social benefits.

They also held awareness workshops alongside exhibitions of the latest eco-friendly transport solutions, such as electric vehicles, innovative booking services, and public transport projects to emphasise the role of shared mobility in reducing traffic congestion and energy consumption.



EPDA Awareness Campaign

In 2024, the Environment Protection & Development Authority (EPDA) led a wide range of impactful environmental awareness campaigns and community initiatives across Ras Al Khaimah, reflecting the emirate's deepening commitment to sustainability. Key efforts included collaborative mangrove and ghaf tree planting drives, such as those at Khor Al-Muzahmi Reserve, Anantara Resort, and with the University of Umm Al Quwain, alongside public engagement events tied to national and international environmental occasions. EPDA also hosted a press conference marking World Press Freedom Day, distributed educational stories about mangroves through a UAE Ministry of Culture summer camp, and supported a blood donation campaign with local fishermen.

Further initiatives included a Thai Consulate reception at Khor Al-Muzahmi with mangrove planting, awareness workshops on air pollutants for institutions like the Ras Al Khaimah Police and Federal Authority for Identity, Citizenship, Customs & Port Security, and a community clean-up of Khor Al-Muzahmi. The year concluded with the announcement of results from EPDA's Feminine Monitoring for Sustainable Environment programme, underscoring a holistic and inclusive approach to environmental stewardship.

Manzily

While large energy consumers are addressed individually, awareness and educational programmes involving SMEs and residents are yielding encouraging results in relation to Manzily, which comprises two parts; the educational game Manzily, which was launched at RAK Energy Summit in 2022, and the Manzily Energy Advice Service, which was launched in 2023.

The game was built entirely on voluntary efforts from students of the American University of Ras Al Khaimah and a private partner, Footprints. In the game, players help a family improve their energy consumption at home through behavioural changes and equipment upgrades. Players, particularly children, can learn several sustainable practices by playing all the different levels, and be certified as a "Sustainable Energy Ambassador."

Hundreds of students have already experienced the game in several awareness sessions conducted by Reem. The game was also presented to visitors of COP28.

The Manzily Energy Advice Service was successfully launched through several awareness initiatives, such as through social media by way of a video series and strategic collaborations with Munther Almuzaki, a media personality with a large following. The service was also presented at COP28.

Figure 33: Manzily game awareness sessions

Capacity Building

Green Procurement

Green Public Procurement (GPP) is a process whereby government entities seek to procure products and services with lower lifecycle environmental impact compared to other functionally similar products and services.

GPP was launched in Ras Al Khaimah in November 2020. It supports the competitiveness of the economy by reducing energy and water consumption, avoiding greenhouse gas (GHG) emissions and stimulating a local market for sustainable products and services. The programme also plays a key role in building capacity among government procurement teams to integrate sustainability into purchasing decisions.

The GPP programme is supported by specific guidelines issued by Ras Al Khaimah Municipality. Ras Al Khaimah Department of Finance (DoF) serves as GPP Administrator, responsible for supporting and coordinating implementation of GPP in the government. Initially, implementation was voluntary to allow government entities to define their own pace and depth of participation.

To support the transition, the government's procurement management software has been upgraded to facilitate the recording and monitoring of green purchases. The first training on the upgraded system was conducted in January 2024 to help procurement teams effectively track green purchases.

In November 2024, the adoption of GPP was mandated through Amiri Resolution No. 19 of 2024, which extends the implementation of green procurement beyond government entities to include government-owned companies in Ras Al Khaimah. About 40 government entities and government-owned companies have started adopting GPP.

Additionally, a cross-learning forum has been established to encourage collaboration and knowledge sharing. This includes monthly progress meetings and quarterly fireside chats with regional and international experts, fostering continuous improvement in sustainable procurement practices.

The impact of GPP continues to grow, with a significant share of government purchase now meeting GPP criteria. In 2024, approximately Đ 11 million in government spending was directed toward green procurement.

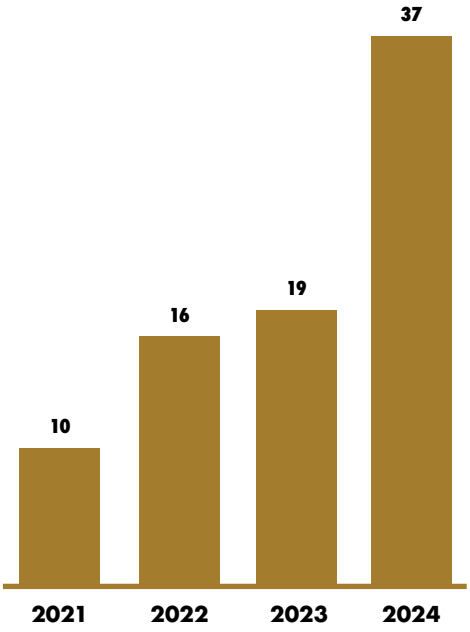


Figure 34: Government entities participating in the GPP programme of Ras Al Khaimah

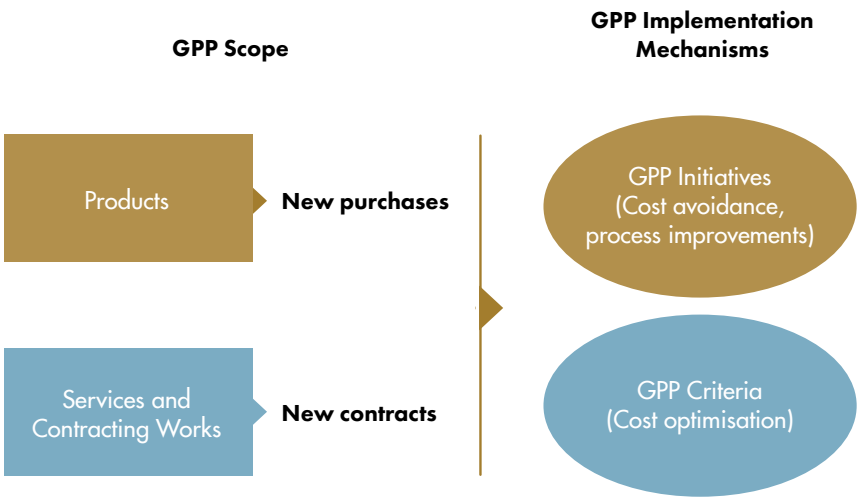


Figure 35: Scope of the Green Public Procurement Guidelines of Ras Al Khaimah

GPP Champions of Ras Al Khaimah

Najla Alshehhi
Ras Al Khaimah Municipality

Maryam Ahmed Alnaqbi
Ras Al Khaimah Department of Finance (DoF)

Areej Alaqrabawi
RAK Department of Knowledge

Javid Ali
RAK Medical & Health Sciences University

Hazem Kanaan
Public Services Department

Maryam Alshehhi
RAK Media Office

Ahmed Fayez
Investment and Development Office

Eman Sayed Ahmed
RAK Modern Private School

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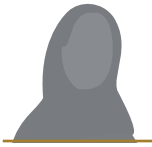

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Supply Market Development

Coordinated efforts are being made to develop the supply chain in support of the RIS Strategy. RAKEZ and RAK DED are leading this initiative. Multiple collaborations are already in place with trade councils from a wide range of countries, aimed at attracting new players and fostering a robust ecosystem for products and services functional to the energy transition.

In 2024, RAKEZ hosted several international delegations, including those from India, the Netherlands, Germany, the United States, Japan, Turkey, and the United Kingdom. The purpose of these visits was to explore investment and partnership opportunities in Ras Al Khaimah. These engagements included business networking events and sector-specific discussions, reflecting growing global interest in the emirate's sustainable development agenda.

As part of Reem's mandate, efforts are also underway to continuously expand and enhance the supply market for products and services functional to the energy transition. One of the key actions in this area is the RAK Energy Innovation Competition - SME Edition (#rakinnovates).

This competition is designed to attract innovative start-ups and SMEs from around the world, offering them a platform for market exposure and opportunities to form strategic partnerships in the power, water, and industrial sectors. Shortlisted companies are invited to engage in high-level discussions with an executive panel comprising top managers from leading government entities and multinational corporations.

The 1st edition of the SME competition brought together some of the most promising SMEs from across the globe, with over 75 applications from more than 25 countries. Winning companies are now involved in ongoing collaborations in Ras Al Khaimah, contributing innovative solutions and technologies to the local market.

RAK Energy Innovation Competition SME EDITION

Energy Management

Winner: i2Cool Limited
Country: Hong Kong, China
Now collaborating with:
RAK Ports and RAK Hospitality

Industrial Efficiency

Winner: Blue Snow Consulting & Engineering
Country: Malaysia
Now collaborating with:
RAKEZ, RAK Hospitality and RAK Ceramics

Decentralised Energy Systems

Winner: SolarisKit Ltd
Country: Scotland, UK
Now collaborating with:
RAK Ports, RAK Hospitality and RAK Ceramics

Upskill – Ras Al Khaimah Sustainable Energy Training Program

Upskill, Ras Al Khaimah's training programme in sustainable energy, was designed to expand capabilities and expertise in the field of energy efficiency and renewable energy in the emirate. The training programme offers trainings and certifications from reputed local and international providers such as Clean Energy Business Council (CEBC), The Green Spoon Management Consultancies and Emirates Green Building Council from the UAE, Direktin from Italy, Energy Institute from the UK and National Thermal Power Corporation Limited (NTPC) from India. Reem is also collaborating with Ras Al Khaimah Human Resources Department, RAK DED and RAKEZ to promote this initiative among government and private sector employees.

Upskill is featured on the Reem website where interested participants from Ras Al Khaimah can avail of a discount on one or more of the 40 listed training courses by simply filling a form. Courses range from technical topics such as sustainable buildings, industrial energy efficiency, renewable energy, and green mobility to finance, for management, technical personnel and students.

UPSKILL
Ras Al Khaimah Sustainable Energy Training Program

Clean Energy Business Council Middle East & North Africa
مجلس صناعات الطاقة النظيفة
EmiratesGBC
THE GREEN SPOON MANAGEMENT CONSULTANCIES
DIREKTIN connecting innovations
एनटीपीसी NTPC
energy institute

Figure 36: Upskill training programme providers

Partnerships & Collaboration

Throughout 2024, Ras Al Khaimah continued its efforts to build relationships to gain knowledge, share know-how, and forge strategic partnerships to gain support for the RIS Strategy. These efforts reflect a shared vision across government institutions to advance Ras Al Khaimah's sustainability and decarbonisation goals.

Key milestones demonstrated this momentum. Ras Al Khaimah Transport Authority (RAKTA) and Ras Al Khaimah Tourism Development Authority (RAKTDA) took a bold step toward transforming mobility and tourism by signing a future-oriented Memorandum of Understanding (MoU) with Skyports Infrastructure. This partnership will bring the emirate's first electric air taxi ecosystem to life, with commercial operations targeted for 2027. The eVTOL network will connect major tourist and economic hubs, positioning Ras Al Khaimah as a pioneer in sustainable, next-generation transport and aligning with RAK Mobility Masterplan 2023–2030.

During RAK Energy Summit 2024, Etihad Water and Electricity (EtihadWE) signed an MoU with the Investment and Development Office of Ras Al Khaimah to explore preferential electricity tariffs for industrial customers. This initiative seeks to enhance industrial competitiveness while supporting large-scale energy efficiency through a potential bulk supply arrangement.

Ras Al Khaimah Municipality and Azienda Regionale Attività Producttive (ARAP) also signed a Letter of Intent (LoI) to support sustainable industrial growth. The partnership focuses on building skills and promoting technologies in areas like renewable energy, efficient buildings, waste-to-energy, and smart systems. ARAP supports this by helping develop regional production areas and offering services to businesses and public bodies, encouraging innovation and public participation. This collaboration aims to boost industrial efficiency while supporting Ras Al Khaimah's energy transition and emission reduction goals.

Lastly, RAKGAS and PetroChina International (Middle East) Company Ltd. (PCIME) signed a Memorandum of Understanding (MoU) to collaborate on carbon capture, utilisation, and storage (CCUS) and other low-carbon initiatives on the sidelines of the Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC). This agreement highlights the two companies' alignment in pursuing sustainable growth and a net-zero future.

Figure 36: MoU signing between RAKGAS and PetroChina International during ADIPEC

Figure 37: MoU signing between EtihadWE and IDO during RAK Energy Summit 2024

Financing Mechanisms

Incentives for individuals

Group financing mechanisms such as those adopted in the Ras Al Khaimah government retrofit project, have proven to be beneficial as they guarantee attractive returns on investment due to scale. This approach also helps cover buildings that would not otherwise be targetable by individual projects.

A first set of green financing offerings for individuals have also been launched by RAKBANK. These include discounted terms for green mortgages, green vehicle loans, as well as favourable financing terms for home retrofit works and home renewable energy installations. Details of the offering and how to avail of it can be found **here.**

Ras Al Khaimah Municipality has also partnered with Etihad Water and Electricity (EtihadWE) to provide monetary incentives to residents who participate in the Manzily Energy Advice Service and achieve electricity savings. Under this partnership, EtihadWE provides Đ1 credit for every Dirham saved in the homes of UAE nationals enrolled in the service. Interested applicants can sign up for Manzily **here.**

Incentives for industries

Industrial companies are offered subsidised energy audits and access to technical support through the industrial audits initiative. In return, participants commit to reporting energy data and implementing efficiency measures. Financing options are available to help cover audit costs.

Incentives for set-up of new companies

Companies operating as ESCOs, Energy Auditors and companies recognised in industrial energy management and renewable energy continue to reap the benefits of incentives offered by RAKEZ and RAK DED in the form of highly discounted business set-up fees. This type of incentive was provided to 13 eligible companies by the end of 2024.

Information Systems

The GIS Center was established in 2016 within the Municipality and is responsible for integrating and managing all geospatial data of Ras Al Khaimah on a single platform. The GIS Center periodically collects data from more than 15 data custodians, including local and federal government entities and utility companies. This data is then made available to the Municipality and other partner entities for urban planning, development and studies.

The GIS Center has supported Reem since the development of the EE&R Strategy in 2017 and 2018. One of our first studies of building roof polygons and roof materials in Ras Al Khaimah supported the development of the renewable energy ambitions of the emirate. Following strategy roll-out, we have supported a number of exploratory and planning studies related to planning of utility networks including electricity, water and wastewater, besides techno-economic studies related to building energy ratings, solar energy, wind energy, and agrophotovoltaics.

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Future Outlook

Future Outlook

2025 is forecast to be a pivotal year, marking the activation of the RIS Strategy. Existing programmes from the EE&R Strategy, now integrated into the RIS Strategy, will continue to accelerate and expand in scope. Meanwhile, new programmes introduced under the RIS Strategy will begin making tangible progress.

Key Priorities for 2025

Hydrogen Exploration

Exploratory drilling for white hydrogen is scheduled to begin in the mountainous regions of Ras Al Khaimah, initiating assessment of the emirate's potential for this naturally occurring energy source.

Utility-Scale Renewable Energy Studies

Ongoing studies will deepen the understanding of Ras Al Khaimah's potential for utility-scale renewable energy, particularly in wind energy and pumped storage hydropower.

Distributed Solar PV Expansion

Recently published standards for distributed solar PV by EtihadWE are expected to drive increased adoption across the emirate, with implementation support provided by RAK Municipality.

Environmental Monitoring and Data Collection

Under the Environment Protection pillar, several new programmes will be introduced, with a strong emphasis on data monitoring and collection—critical for shaping future initiatives.

Energy Efficiency and Decarbonisation

- Building retrofits will be undertaken across several semi-government and commercial properties.
- In alignment with Amiri Resolution No. (20) of 2024 on Energy Audits in Large Industrial Facilities, the majority of the industrial sector's electricity demand is expected to undergo audits, with energy-saving actions identified.
- Decarbonisation efforts will focus on the cement and concrete sector, supported by the development of a targeted framework tailored to Ras Al Khaimah's specific context and challenges.

Regulatory Development

- The Building Energy Rating Scheme will enter Phase 2, focusing on calibration to prepare for future implementation.
- Development of utility sector regulations will continue throughout the year to ensure alignment with RIS Strategy's long-term goals.
- Barjeel, Ras Al Khaimah's green building regulations, will remain applicable to all new buildings. Studies to enhance these requirements will continue to inform potential future updates.

Capacity Building and Awareness

- Following the success of its inaugural edition in 2023, the RAK Energy Innovation Competition will return in 2025, once again targeting SMEs and start-ups to foster innovation in the sustainable energy sector.
- Public awareness and engagement will be strengthened through targeted communication campaigns, capacity-building initiatives, and incentive programmes.

As programme implementation gains momentum, Reem will continue to expand their activities in monitoring and supporting the RIS Strategy. Key focus areas include:

- Continuous enhancement of the regulatory framework supporting all programme areas;
- Support for new and existing building retrofit, energy management, and solar PV projects;
- Exploration of innovative business models and financing solutions for retrofit and solar initiatives;
- Development of local market capacity through pipeline development, incentives, training, awareness

campaigns, and events;

- Strengthening of service offerings for residential and industrial energy users;
- Continuous improvement of monitoring, reporting, and risk management processes within the RIS Strategy.

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Emirates Green Building Council

Emirates National Oil Company Group (ENOC)

Environment Protection & Development Authority

Etihad Water and Electricity Company

Executive Council of Ras Al Khaimah

Federal Authority for Identity, Citizenship, Customs & Port Security

Investment and Development Office of Ras Al Khaimah

Ras Al Khaimah Center for Statistics and Studies

Ras Al Khaimah Department of Economic Development

Ras Al Khaimah Department of Finance

Ras Al Khaimah Economic Zone

Ras Al Khaimah International Airport

Ras Al Khaimah Municipality

Ras Al Khaimah Police

Ras Al Khaimah Public Services Department

Ras Al Khaimah Ruler's Office

Ras Al Khaimah Transport Authority

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Glossary of terms

AC: Air Conditioner

Đ: UAE Dirhams

AQI: Air Quality Index

Barjeel: The Green Building Regulations of Ras Al Khaimah

BAU: Business as Usual

CCUS: Carbon Capture, Utilisation and Sequestration

COP28: 28th Conference of the Parties to the United Nations Framework Convention on Climate Change

DSS: Distributed Solar System

EE&R Strategy: Energy Efficiency & Renewables Strategy 2040

EESL: Energy Efficiency Standards and Labels

EPDA: Environment Protection & Development Authority

ESCO: Energy Service Company

Etihad WE: Etihad Water and Electricity Company

EV: Electric Vehicle

EVCS: Electric Vehicle Charging Station

GHG: Greenhouse Gas

GDP: Gross Domestic Product

GIS: Geographic Information System

GPP: Green Public Procurement

GWh: Gigawatt-hours

HE: His/Her Excellency

HH: His/Her Highness

IDO: Investment and Development Office of Ras Al Khaimah

IPPU: Industrial Processes and Product Use

ISO: International Organization for Standardization

IT: Information Technology

km: kilometre

kWh: kilowatt-hours

kWp: kilowatts-peak

LED: Light Emitting Diode

LEED: Leadership in Energy and Environmental Design

LNG: Liquified Natural Gas

m: metres

m^2: square metres

m^3: cubic metres

MOCCAE: UAE Ministry of Climate Change & Environment

MOEI: UAE Ministry of Energy & Infrastructure

MoIAT: UAE Ministry of Industry & Advanced Technology

MOU: Memorandum of Understanding

MW: Megawatts

MWp: Megawatts-peak

PV: Photovoltaic

PSD: Public Services Department

P.O.: Post Office

RAK: Ras Al Khaimah

RAKCOC: Ras Al Khaimah Center for Outdoor Comfort

RAKEZ: Ras Al Khaimah Economic Zone

RAKGAS: Ras Al Khaimah Gas Company

RAKTA: Ras Al Khaimah Transport Authority

Reem: The Energy Efficiency & Renewables Office of Ras Al Khaimah Municipality

RIS Strategy: Ras Al Khaimah Integrated Sustainability Strategy 2050

SCM: Supplementary Cementitious Material

SWRO: Seawater Reverse Osmosis

SME: Small and Medium Enterprise

TSE: Treated Sewage Effluent

UAE: United Arab Emirates

UAQ: Umm Al Quwain

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