

### To establish an effective approval framework

EPDA and RAKEZ sign an MoU to enhance environmental approvals for industry

### Warmth of Giving in the Face of Winter's Chill

EPDA and International Charity Organization Distribute "Winter Gift" to Fishermen as Part of the "Winter Frost" Campaign

Interview

### Mr. Anuj Todi - General Manager of UCC

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### Inspiring Stories

### Dr. Habiba Al Mar'ashi

A Leading Voice in Environmental Sustainability and Climate Action in the UAE

### Environmental Landmarks

### Khor Al Muzahmi Nature Reserve and Mangroves

RAK Model for Coastal Protection and Climate Sustainability

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Environment Protection & Development Authority

## Vision

Leadership in environmental protection and  
the sustainability of its resources

## Mission

To enhance quality of life by protecting the  
environment and sustaining its resources  
through proactive capabilities, effective policies,  
innovative strategies, and leading services  
that ensure environmental compliance.

## Strategic Objectives

- Strengthen environmental compliance
- Protect natural resources
- Improve services for customers, partners,  
and the community
- Enhance institutional & financial efficiency
- Promote environmental awareness

## Values

- Belonging
- Sustainability
- Engagement
- Social responsibility
- Good governance
- Foresight
- Team spirit

## Follow US





## Investing in the environment is an investment in the future of coming generations



**Dr. Abdulrahman  
Alshayeb Al Naqbi**

Acting Director General  
RAK Environment Protection  
Department Authority

We are pleased to present the inaugural issue of Ras Al Khaimah Environment Magazine, released at a time when the world is witnessing growing interest in sustainability and environmental protection as fundamental pillars for a balanced and secure future. Guided by the vision of the UAE's leadership, the country has placed great importance on preserving natural resources and protecting biodiversity through integrated policies and strategies that reinforce the balance between economic development and environmental responsibility.

In the Emirate of Ras Al Khaimah, these efforts are reflected through close coordination with various entities and institutions to embed the principles of sustainability, enhance environmental awareness, and adopt innovative solutions that contribute to protecting natural resources. This includes developing environmental infrastructure, strengthening monitoring and regulatory systems, and encouraging responsible production and consumption practices that support the broader national sustainability agenda.

This magazine serves as a knowledge and media platform that highlights environmental initiatives, projects, and achievements across the Emirate and the country. It aims to spread environmental awareness, encourage community engagement, and present reliable scientific insights and analyses that help deepen understanding of today's environmental challenges while showcasing successful experiences and best practices at both the local and international levels.

We hope that Ras Al Khaimah Environment Magazine will contribute to promoting knowledge exchange, strengthening partnerships, and inspiring individuals and institutions to actively participate in protecting the environment. Through collaboration and shared responsibility, we can support the journey toward a cleaner environment, a more sustainable economy, and a brighter future for generations to come.



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## For Our Emirates, We Plant

### 1,500 Mangrove Trees Planted in Khor Hulaylah to Enhance Biodiversity and Support Environmental Sustainability

In a notable environmental initiative reflecting its continued commitment to protecting natural resources, the Environment Protection and Development Authority organized an event to plant 1,500 mangrove trees in the Khor Hulaylah area in cooperation with the Emirates Environmental Group, under the slogan “For Our Emirates, We Plant.” The initiative aims to enrich vegetation cover and enhance the conservation of biodiversity in the Emirate. The initiative forms part of ongoing efforts to expand coastal green areas and support marine ecosystems, where mangrove trees represent one of the most important ecological components.

#### Mangroves... A Natural Shield for the Coast

Mangrove trees are known for their high capacity to absorb carbon, commonly referred to as “blue carbon,” in addition to their vital role in protecting coastlines from erosion and providing safe natural habitats for fish, birds, and marine organisms. Khor Hulaylah is considered an important environmental site with unique coastal characteristics, making it an ideal habitat for mangrove growth and the sustainability of its ecosystems. Such initiatives contribute to improving the efficiency of natural habitats and supporting climate change adaptation efforts

through nature-based solutions.

#### Institutional Partnership for Sustainability

The Authority affirmed that planting 1,500 mangrove trees represents a valuable addition to coastal vegetation and contributes to promoting a culture of environmental volunteerism and raising community awareness about the importance of active participation in environmental protection. The cooperation with the Emirates Environmental Group also reflects a strong model of institutional partnership that unites efforts toward sustainable environmental goals.

#### The Event Forms Part Of A series of Environmental

initiatives implemented by the Authority to support the national sustainability strategy and maintain a balance between development and the protection of natural resources, ensuring the preservation of the environmental legacy for future generations. Through this initiative, the Authority emphasizes that investing in mangrove planting is not merely an environmental activity, but a long-term investment in ecosystem health, coastal sustainability, and improved quality of life for the community, both now and in the future.

## To establish an effective approval framework for new industrial activities.

### the EPDA and RAKEZ Sign MoU to Enhance Environmental Approvals for Industry



The Memorandum of Understanding was signed by Ramy Jallad, Group CEO of RAKEZ, and H.E. Dr. Abdulrahman Al Shaib Al Naqbi, Acting Director General of the Environment Protection and Development Authority, with the aim of establishing an integrated framework for environmental approvals related to new industrial activities and future expansions. The agreement introduces a streamlined environmental verification and approval mechanism covering sectors such as cement, chemicals, and general industries, ensuring a balanced approach between industrial development requirements and compliance with the environmental standards adopted in the Emirate.



The MoU with RAKEZ aims to integrate best environmental practices with organized industrial development through clear approval frameworks that enhance investor confidence and ensure compliance with environmental standards.

This regulatory framework was developed in close coordination with the Health, Safety and Environment (HSE) Department at RAKEZ, ensuring effective integration between regulatory aspects and operational procedures within the group's industrial zones. The collaboration aims to enhance clarity in regulatory procedures and accelerate licensing and environmental approval processes, while maintaining the highest levels of compliance with environmental regulations and standards, thereby supporting Ras Al Khaimah's vision to advance sustainable industrial growth and strengthen an attractive and environmentally responsible investment environment.

#### Facilitating Procedures and Supporting the Investment Environment

Under the new framework, industrial companies will benefit from faster and clearer environmental assessment procedures, helping reduce the time required to obtain environmental approvals while

enhancing the ease of doing business in the Emirate. The MoU also provides a clear coordination mechanism to address expansion or modification requests submitted by industrial companies, with predefined requirements for environmental studies and regulatory permits. This approach enables investors to plan their industrial projects according to well-defined regulatory pathways. This integrated approach reflects the commitment of the relevant authorities to enhance transparency for investors and provide a stable regulatory environment that supports sustainable economic growth. It also strengthens the environmental monitoring system through ongoing collaboration between the Environment Protection and Development Authority and the RAKEZ HSE Department. Such cooperation contributes to unifying oversight efforts and facilitating the exchange of data and technical expertise, thereby improving the efficiency of environmental assessment and monitoring processes for industrial projects.

### A Strategic Partnership Towards Sustainable Industry

In addition to accelerating environmental approval procedures, this partnership will enhance knowledge exchange and technical cooperation between the two entities, including the implementation of joint training initiatives aimed at strengthening the capabilities of health, safety, and environment teams within industrial institutions. This contributes to reinforcing environmental governance and promoting international best practices in managing

the environmental impacts of industrial activities. The initiative also reflects a strategic direction toward developing a modern industrial model that integrates operational efficiency with environmental responsibility, in line with global transitions toward the green economy and strengthening the competitiveness of the Emirate's industrial sector. Commenting on the partnership, Ramy Jallad, Group CEO of RAKEZ, said:



The partnership reflects the commitment of EPDA and RAKEZ to balance industrial growth with environmental responsibility through clearer procedures and stronger coordination that support investors while maintaining high environmental standards.

H.E. Dr. Abdulrahman Al Shaib Al Naqbi, Acting Director General of EPDA, said the MoU with RAKEZ reflects the Authority's commitment to integrating global environmental best practices with industrial development, through clear approval frameworks that enhance regulatory transparency and ensure compliance with environmental standards.

RAKEZ hosts more than 40,000 companies and continues to strengthen its ecosystem through strategic partnerships that support efficiency, regulatory clarity, and long-term sustainability in Ras Al Khaimah.



## Warmth of Giving in the Face of Winter's Chill

### EPDA and International Charity Organization Distribute “Winter Gift” to Fishermen as Part of the “Winter Frost” Campaign



In a humanitarian initiative reflecting the highest values of solidarity and compassion, the Authority, in cooperation with the International Charity Organization, participated in the “Winter Frost” campaign by distributing “Winter Gift” packages to fishermen in appreciation of their continuous efforts at sea and to support them in facing the cold weather during the winter season. The initiative comes within the framework of the Authority’s social responsibility programs, which focus on supporting field workers, particularly those whose jobs require direct exposure to harsh weather conditions. Fishermen represent a vital group that contributes directly to food security and the sustainability of marine resources, making their support a social responsibility that recognizes the importance of their role.

#### Protection and Warmth at Work

The “Winter Gift” included essential winter supplies that provide protection and warmth, helping improve working conditions and enhance occupational safety and health during periods of low temperatures, especially during the early morning hours when daily fishing trips begin with greater safety, comfort, and operational efficiency.

#### Institutional Cooperation Promoting a Culture of Giving

The Authority emphasized that its participation in the “Winter Frost” campaign reflects a comprehensive humanitarian vision that promotes cooperation and solidarity while translating ethical values into practical initiatives that address the real needs of workers. Such initiatives also reinforce a culture of institutional giving and strengthen effective partnerships between entities with shared objectives. For its part, the International Charity Organization continues to implement seasonal campaigns aimed at easing the burdens on different segments of society during winter through well-planned programs that prioritize humanitarian needs and deliver a direct and sustainable impact. The “Winter Frost” campaign represents a successful model of institutional cooperation, where efforts come together to provide timely support that strengthens community stability and promotes values of compassion and solidarity. Through these initiatives, the Authority affirms that community work is not merely a seasonal activity but an ongoing commitment, grounded in the belief that the warmth of giving can overcome even the coldest days.



## Air Quality in RAK

### Proactive Management for a Healthy Environment and Sustainable Development

At the heart of the economic and urban transformations witnessed by the Emirate of Ras Al Khaimah in recent years, air quality is no longer merely a technical environmental issue managed within government departments. It has become a fundamental pillar of the comprehensive development model the Emirate seeks to establish. With the expansion of urban areas, the growth of industrial and construction sectors, and the increase in transport and logistics activities, clean air has become a direct indicator of the success of the development model in balancing economic ambition with human well-being.

Development Authority has launched an integrated project to develop a comprehensive system for monitoring, analyzing, and managing air quality across the Emirate. The initiative reflects a shift from traditional regulatory monitoring to smart management based on data, scientific modelling, and proactive responses to environmental risks. It also reflects a new philosophy that treats air as a shared public resource and a fundamental component of the Emirate's invisible infrastructure, requiring careful planning and continuous monitoring amid diverse industrial activities and rapid population growth.

#### From Traditional Monitoring to Smart Management

In this context, the Environment Protection and

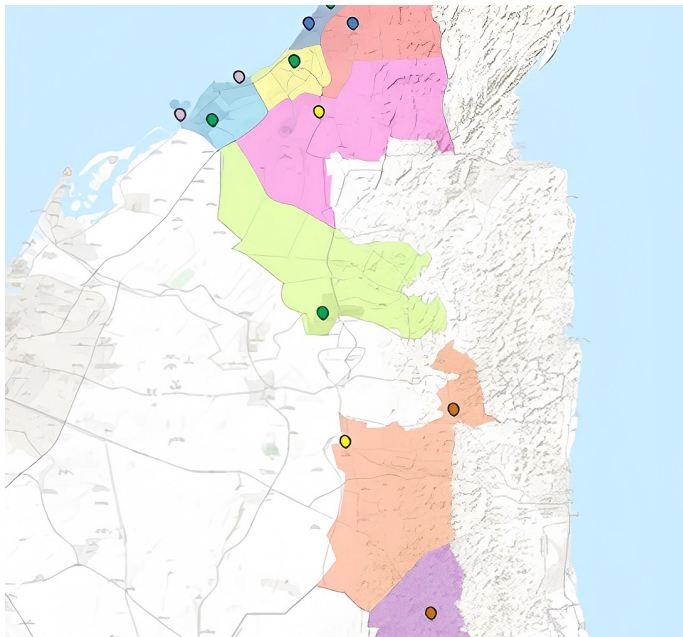
#### Advanced Monitoring Network for Air Pollutants

The project established a scientific database

covering key air pollutants such as fine particulate matter, nitrogen oxides, sulfur dioxide, and ground-level ozone. Particular focus has been placed on measuring fine particulate matter due to its direct impact on respiratory health. To ensure comprehensive coverage, a monitoring network of eight fixed stations has been strategically deployed across residential, industrial, and coastal areas. Scientific modelling is also used to analyze pollutant movement and identify their sources, enabling evidence-based environmental decision-making.

### Industrial Partnership to Enhance Environmental Transparency

The initiative extends beyond government monitoring infrastructure by integrating seventeen additional monitoring stations within various industrial facilities as part of a regulatory partnership that reinforces the principle of shared environmental responsibility.



This integration enhances transparency and enables industrial facilities to monitor their environmental performance while improving emission control systems.

### Data Driving Environmental Policies

The Authority relies on monitoring data and modelling outputs to guide environmental policies more effectively. This includes updating environmental requirements, improving licensing standards, developing traffic management plans, encouraging cleaner pro-



duction technologies in the industrial sector, and integrating air quality considerations into urban planning.

### A Strategic Vision for Air Quality Until 2050

The Authority is currently preparing a comprehensive air quality strategy extending to 2050, aligned with national goals related to climate neutrality, energy efficiency, and sustainable transport. The strategy aims to improve the air quality index and expand monitoring coverage across residential and industrial areas. The project's impact goes beyond environmental dimensions, extending to economic, health, and social benefits. Cleaner air helps reduce healthcare burdens, enhance workforce productivity, and increase the Emirate's attractiveness for investment and tourism. What Ras Al Khaimah is achieving in the field of air quality management represents an advanced model that combines economic development with environmental protection. It confirms that protecting air quality is a strategic choice that places people at the center of development and lays the foundation for a more sustainable future.



## Khor Al Muzahmi Nature Reserve and Mangroves

### RAK Model for Coastal Protection and Climate Sustainability

In the southern part of the Emirate of Ras Al Khaimah, along its tranquil coastline, one of the United Arab Emirates’ most significant environmental experiences takes shape through the Khor Al Mazahmi Nature Reserve, officially declared in 2018 as the first natural reserve in the emirate. The reserve extends over approximately 3.2 square kilometers of sensitive tidal coastal ecosystems, forming an open natural laboratory for understanding the delicate relationship between development and resource protection within an environment considered among the most fragile and vulnerable to climate change and accelerating coastal human activities. Khor Al Mazahmi is not merely a green area on the map. Rather, it represents a comprehensive model for redefining the concept of infrastructure, where natural ecosystems themselves transform

into protective systems performing engineering, climatic, and economic functions simultaneously.

#### Natural Infrastructure in the Face of Climate Change

Instead of relying solely on concrete barriers and rigid seawalls that may isolate the coast from its natural dynamics and require high financial investments, efforts have focused on restoring and strengthening coastal vegetation—most notably mangrove forests—to serve as the first line of defense against waves, storms, and rising sea levels. This approach aligns with the global concept of Nature-Based Solutions, which views ecosystems as strategic assets capable of delivering multiple services, including coastal protection, water quality improvement, sediment stabilization, local tempera-



ture regulation, and carbon sequestration. As climate change accelerates and extreme weather events become more frequent, these services are evolving from environmental benefits into essential components of coastal, economic, and national security.

### The First Line of Coastal Defense

The coastal zones of the Arabian Gulf are highly sensitive to even minor changes in sea levels or storm patterns. Global estimates indicate that sea levels are rising at a rate of approximately 3 to 4 millimeters per year—a figure that may appear small but accumulates over time to pose a serious threat to coastal infrastructure, local communities, and economic activities. Within this context, mangrove forests play a crucial role. Studies indicate that mangroves can reduce wave energy by 50–70 percent before waves reach the shore, while also decreasing coastal erosion rates by up to 60 percent. Their complex root systems stabilize sediments and trap suspended particles, contributing to improved coastal water quality and reduced turbidity.

### A Key Stopover for Birds and Biodiversity

The reserve has become an important winter destination for migratory birds, most notably the Greater Flamingo, along with numerous species of waders and waterfowl. The presence of these birds is considered a vital ecological indicator, as bird populations are closely linked to food availability,



water quality, and the balance of natural habitats. Biodiversity in Khor Al Mazahmi is not limited to birds. The reserve also provides habitat for sensitive marine species such as green sea turtles, as well as many species of fish and crustaceans that rely on mangrove areas as natural nursery grounds during their early life stages.

### Mangroves: The Beating Heart of the Ecosystem

At the center of this ecological system stand the mangrove trees, particularly the Grey Mangrove (*Avicennia marina*), which accounts for more than 95 percent of mangrove forests in the United Arab Emirates. Its uniqueness lies in its remarkable ability to adapt to extreme environmental conditions, including high salinity levels exceeding 40 parts per thousand, oxygen-poor soils, and high temperatures. This adaptability has enabled mangroves to spread widely along



the UAE’s coastline, where mangrove forest coverage has surpassed 130,000 hectares, reflecting a long-term national investment in this vital ecosystem.

### Blue Carbon and the Climate Balance

From a climate perspective, mangroves represent one of the most important reservoirs of blue carbon—carbon stored in coastal ecosystems such as mangroves, seagrass meadows, and tidal flats. A single hectare of mangrove forest can store between 800 and 1,200 tons of carbon dioxide, equivalent to three to five times the storage capacity of traditional terrestrial forests. This immense storage capacity gives mangroves strategic importance within the country’s pathway toward climate neutrality, contributing to emissions reduction and strengthening the role of natural solutions within climate policy frameworks.

### Active Management Supporting the Green Economy

The Khor Al Mazahmi experience goes beyond passive conservation. It is based on active environmental management, including the establishment of a specialized nursery within the reserve dedicated to propagating mangrove trees, producing thousands of seedlings annually to support coastal restoration projects both within Ras Al Khaimah and beyond.

The reserve has also become a platform for environmental education and sustainable tourism, hosting field visits, awareness workshops, bird monitoring activities, and environmental photography initiatives. Such programs promote a new understanding of the environment as an economic enabler capable of diversifying local income sources and creating employment opportunities linked to natural resource management.

### From Local Reserve to National Sustainability Model

The experience of Khor Al Mazahmi demonstrates that investing in nature is not an environmental luxury but a strategic choice that enhances coastal, climate, and economic security simultaneously. Through scientific management, restoration programs, mangrove propagation initiatives, and community participation, mangrove ecosystems are transforming into an integrated defensive system that protects coastlines, stores carbon, and supports biodiversity. Thus, the story begins with a small coastal creek in southern Ras Al Khaimah, yet it extends far beyond its geographical boundaries, reflecting a national vision that recognizes the power of nature-based solutions to protect coastlines, strengthen climate resilience, and shape a balanced and sustainable environmental future for generations to come.



## **Strategic Legislation Strengthening Environmental Governance and Anchoring Sustainable Development**

**Sheikh Saud bin Saqr Al Qasimi Leads the Regulation of Environmental Consultancy in Ras Al Khaimah**



Amid the rapid environmental and developmental transformations in the United Arab Emirates, Law No. (2) of 2026 regulating environmental consultancy in Ras Al Khaimah represents a pivotal step that transcends traditional regulatory approaches. It embodies a strategic shift toward advanced environmental governance capable of keeping pace with the emirate’s accelerating urban expansion, industrial diversification, and growing tourism sector. This legislative framework ensures that development remains aligned with the ecological carrying capacity of natural systems, preserving vital assets such as coastlines, mountain ecosystems, agricultural lands, and marine habitats. The initiative led by His Highness Sheikh Saud bin Saqr Al Qasimi reflects a forward-looking vision in which sustainability is not a symbolic commitment, but a core condition for economic resilience, long-term competitiveness, and societal well-being. In this context, environmental protection is positioned as an integral component of development rather than a constraint upon it.

### **Redefining the Role of Environmental Consultancy**

The law introduces a fundamental redefinition of environmental consultancy, transforming it from a procedural requirement associated with licensing into a strategic partner in shaping development trajectories. Environmental impact assessments are integrated into the earliest conceptual stages of projects, allowing environmental considerations to influence critical decisions related to site selection, land use planning, project density, technological

choices, and operational systems. This early integration strengthens the coherence between environmental policies and urban planning frameworks, reduces the likelihood of unforeseen impacts, and minimizes the need for costly post-approval adjustments. More importantly, it enhances the quality of decision-making by enabling authorities to assess projects through a multidimensional lens that incorporates environmental, social, and economic factors in a balanced and forward-looking manner.

### **A Regulatory Structure Based on Professionalism and Transparency**

To ensure high standards of practice, the law establishes a comprehensive regulatory system grounded in professionalism, transparency, and accountability. It mandates the registration of environmental consultancy offices within an official registry and introduces a tiered classification system based on technical capabilities, professional track records, and the qualifications of human resources. This classification ensures that each project is handled by entities with the appropriate level of expertise, thereby improving the reliability and depth of environmental studies. It also contributes to the development of a structured and competitive professional market that discourages unqualified participation and promotes specialization, ultimately enhancing the credibility of the environmental consultancy sector.

### **Environmental Impact Studies Between Field Reality and Scientific Analysis**

The law addresses one of the most critical challenges in environmental governance—the variability in the quality and rigor of environmental impact assessments—by emphasizing scientific integrity and methodological consistency. Consultancy offices are required to rely on verified data, conduct detailed field investigations, and apply precise measurement techniques to assess key environmental parameters, including air quality, water resources, soil conditions, noise pollution, and biodiversity. Furthermore, the use of advanced environmental modeling tools enables the simulation of various

development scenarios, allowing stakeholders to anticipate potential impacts such as emission levels, pollutant dispersion, and ecosystem responses. As a result, environmental impact assessments evolve into comprehensive analytical frameworks that inform planning, guide mitigation strategies, and support sustainable environmental management.

### Prevention as a Strategic Approach

A cornerstone of the law is the firm adoption of the “prevention first” principle, which reflects a paradigm shift from reactive environmental management to proactive risk mitigation. By identifying potential environmental impacts at an early stage, developers can explore alternative designs, adopt low-emission technologies, and implement resource-efficient solutions that minimize ecological footprints. This proactive approach not only reduces environmental degradation but also lowers the economic costs associated with remediation and restoration. In addition, the law encourages the development of contingency and emergency response plans, enhancing preparedness and ensuring that potential environmental risks are managed effectively and efficiently.

### The Polluter Pays Principle and Environmental Justice

The law explicitly incorporates the “polluter pays” principle as a key mechanism for ensuring environmental accountability and justice. Under this principle, entities are required to bear the financial responsibility for mitigating and remedying the environmental impacts of their activities. This prevents the transfer of environmental costs to society and future generations, while simultaneously creating strong economic incentives for businesses to adopt cleaner technologies and sustainable practices. By internalizing environmental costs within business operations, the law reinforces the integration of environmental considerations into corporate decision-making and promotes a culture of responsible investment.

### Effective Oversight and Institutional Confidence

Recognizing that effective regulation requires robust

enforcement, the law grants the competent authority extensive oversight powers, including the ability to conduct inspections, review the quality of environmental studies, investigate professional misconduct, and impose penalties that may extend to the suspension or permanent revocation of licenses. It also strictly prohibits the submission of inaccurate or misleading data, thereby reinforcing transparency and integrity within the sector. These measures are designed not to restrict economic activity, but



to ensure that it operates within a framework of accountability and credibility. Strong oversight mechanisms enhance institutional trust and provide reassurance to investors that the regulatory environment is fair, predictable, and based on clear standards.

### Long-Term Developmental and Investment Impact

The law is expected to embed sustainability into investment and development decisions, encouraging the adoption of clean energy, resource efficiency, and circular economy practices, while strengthening Ras Al Khaimah’s attractiveness and positioning it as a model for balanced growth.

Ultimately, Law No. (2) of 2026 reflects a new stage of environmental maturity, placing sustainability at the core of development and transforming environmental consultancy into a strategic tool for protecting resources and future generations.

# A Shared Responsibility to Protect the Environmental Landscape

## Warning to Visitors of Natural and Coastal Areas in Ras Al Khaimah



In recent years, the Emirate of Ras Al Khaimah has witnessed a growing influx of visitors to its beaches and natural desert areas, which have become popular destinations for picnickers, camping enthusiasts, and eco-tourism activities. The emirate is distinguished by its rich environmental diversity, combining coastlines, sandy plains, and mountainous landscapes, which strengthens its position as one of the UAE's most prominent natural destinations. With the increasing number of visitors—particularly during the winter season and public holidays—the need to promote a culture of responsible use of open spaces has become more important to preserve their cleanliness, safety, and sustainability.

### Official Warning to Promote Responsible Environmental Behavior

In this context, the Ras Al Khaimah Public Services Department issued a warning addressed to visitors of beaches and desert areas, urging them to adhere to responsible environmental behavior and avoid practices that could negatively impact the environment or public facilities. This initiative forms part of

the authorities' ongoing efforts to protect natural resources and promote environmental sustainability while maintaining a balance between tourism activities and the preservation of sensitive ecosystems.

### 4,326 Environmental Violations Recorded in 2025

Official data revealed that 4,326 environmental violations were recorded during 2025, including both individual violations and those committed by certain establishments. These violations included lighting fires in unauthorized areas, barbecuing on public surfaces without proper equipment, littering or leaving waste in beaches and desert areas, damaging public facilities, and dumping construction waste in non-designated locations.

### Environmental Impacts Beyond Visual Pollution

The impact of such practices extends beyond merely affecting the visual appearance of public spaces. Coastal and desert environments in Ras Al Khaimah host significant biodiversity that may be harmed by

uncontrolled human activities. Waste accumulation can also lead to soil and water contamination, pose risks to wildlife, and increase the likelihood of fires.

### **An Environmental Monitoring System Operating Around the Clock**

To address these challenges, the emirate has implemented an integrated environmental monitoring system operating around the clock. Field inspection teams conduct daily patrols across beaches and tourist sites, while additional patrols are deployed in high-visitor areas such as Al Marjan Island Corniche, Flamingo Beach, and Al Maairid Corniche. Smart reporting systems also enable members of the public to report violations quickly and efficiently.

### **Environmental Awareness as a Key Pillar of Conservation**

Alongside regulatory oversight, authorities continue to implement environmental awareness programs aimed at promoting responsible behavior among individuals. These initiatives include publishing environmental guidelines in public areas, organizing volunteer campaigns to clean beaches and desert locations, and delivering awareness messages through media channels and digital platforms to reinforce environmental responsibility.

### **Community Awareness as the Foundation of Environmental Protection**

Despite the importance of regulatory systems

and legislation, community awareness and individual commitment to responsible environmental practices remain the most critical factors in protecting these sites. The natural and coastal areas of Ras Al Khaimah represent an important environmental and tourism asset and form part of the emirate's identity and cultural image.

### **Simple Practices... Significant Environmental Impact**

Adhering to designated camping areas, following fire safety guidelines, disposing of waste in designated containers, and cleaning the site before leaving are simple practices that can have a significant impact on environmental protection. Similarly, the commitment of businesses to environmental regulations and proper waste management strengthens corporate responsibility.

### **Protecting Nature as an Investment in Ras Al Khaimah's Future**

Ultimately, preserving the natural landscapes that characterize Ras Al Khaimah represents a long-term investment in quality of life and sustainable development. These sites are among the emirate's most important tourism attractions, and protecting them helps ensure the sustainability of natural resources while reinforcing Ras Al Khaimah's position as a leading environmental and tourism destination, while also enhancing its appeal for eco-tourism and responsible investment.





## Mr. Anuj Todi – General Manager of UCC

**“We are on a path aimed at transforming the traditional image of cement from ‘grey and dusty’ to ‘green and clean.’”**

Since its establishment in 1972 as the first cement plant in the United Arab Emirates, Union Cement Company (UCC) has set new benchmarks for the industry—not only in production and efficiency, but also in environmental protection and support for national sustainability goals. This pioneering legacy has inspired the company to adopt a comprehensive approach that integrates industrial innovation with environmental responsibility, positioning UCC as a leading role model in the UAE and the wider region.

This was affirmed by Mr. Anuj Todi, General Manager of UCC, during his interview with Ras Al Khaimah Environment Magazine, in which he spoke about the company’s unwavering commitment to environmental standards and the principles of sustainability, through the following dialogue:

**Union Cement Company was founded in 1972 as the UAE’s first cement producer. How does this pioneer legacy shape the company’s environmental responsibility today?**

UCC is one of the largest cement plant in UAE. It firmly believes that industrial leadership goes hand in hand with advanced environmental responsibility. Over five decades, its environmental initiatives have

contributed significantly to strengthening its sustainability performance. Building on this approach, the current team continues to implement high-impact initiatives, including the use of alternative fuels, reducing water consumption by nearly one third, expanding green spaces, improving energy efficiency, and enhancing standards of cleanliness as well as occupational health and safety.

**What does sustainability mean to UCC in the context of balancing industrial growth with environmental stewardship?**

Industrial growth is essential to support the country’s growing needs; however, it can only be sustainable if its environmental impact is properly



the environment and support the decarbonization pathway while contributing to the development of sustainable communities.

**How does environmental performance feature in executive decision-making and long-term strategic planning?**

At UCC, we believe that sustainability is and will be a key driver of profitable growth.

Our growth targets through 2030 are aligned with our sustainability roadmap, which focuses on expanding low-carbon solutions, strengthening the circular economy through waste heat recovery, renewable energy and recyclable materials, as well as accelerating innovation in decarbonization and the reduction of net emissions. Efficient energy usage is a key criterion while selection of a new equipment.

**What role do international environmental standards and best practices play in UCC's operations?**

UCC sells products in UAE and more than 20 countries. Our customers are global companies who are mindful of the sustainability performance of UCC. In that context international environmental standards play a key role for us. In addition, as part of the Shree Cement Group, we benefit from the group's extensive expertise in reducing energy intensity and emissions, and in expanding the use of alternative fuels—positioning it among the most climate-efficient cement producers.

This leadership has further strengthened the group's participation in global sustainability initiatives and enabled it to achieve advanced ratings in carbon disclosure, reinforcing our commitment to becoming the most environmentally friendly company in the cement industry.

**What steps has UCC taken to reduce carbon emissions and improve energy efficiency?**

UCC has implemented a package of strategic measures to reduce carbon dioxide emissions and enhance energy efficiency. These include increasing the capacity of its Waste Heat Recovery Systems (WHRS) from 12 MW to 31.5 MW and covering approximately 40% of electricity demand, thereby contributing to the reduction of Scope 2 emissions. The company also conducted a comprehensive energy audit in May 2025, accompanied by an ap-



Compliance with sustainability standards will become a fundamental requirement in the sector

addressed. From this perspective, we view growth as an opportunity to strengthen environmental responsibility by installing more energy-efficient equipments while growing our production and digitizing operations to enhance productivity and reduce paperwork.

As our operations grow we are implementing innovative solutions for treatment solid waste to satisfy our growing energy needs, the reduction of internal material handling through automated conveying systems and use of mobile electric equipment to move material .

**Can you share an overview of UCC's environmental management framework and how it aligns with national and emirate level sustainability goals?**

Sustainability is a core pillar of UCC's strategy. As part of the Shree Cement Group, the company is committed to adopting sustainable and inclusive business models. In parallel with the United Arab Emirates' accelerated progress toward achieving its sustainability goals for 2030 and 2050, the company works closely with the Government of Ras Al Khaimah to enhance resource security and efficiency, expand the use of alternative fuels, protect

proved two-year improvement roadmap, and succeeded in reducing energy and fuel consumption by around 3% compared to the average of the previous three years. The measures further encompassed upgrades to processes and equipment, such as optimizing vertical cement mills, installing a high-efficiency kiln burner, and modernizing clinker cooling systems. In addition, the Alternative Fuels and Raw Materials (AFR) system has been in operation since July 2024, achieving a Thermal Substitution Rate (TSR) of 10–15%, with a target of reaching 30% by 2030 to reduce Scope 1 emissions.

Moreover, the company adopted third-generation classifiers for ball mills, utilized Ground Granulated Blast Furnace Slag (GGBFS) and improved clinker quality—collectively supporting emissions reduction and enhancing operational efficiency across the value chain.

### **How does UCC promote efficient use of raw materials and minimize waste across its operations?**

UCC integrates the principles of resource efficiency, waste reduction, and the circular economy into its clinker and cement production processes, with the aim of minimizing environmental impact and enhancing long-term operational sustainability.

This approach includes continuous optimization of raw mix design and kiln operation stability to reduce material losses and improve clinker quality, as well as achieving high material recovery rates through the recycling of kiln dust and fine materials and their reintegration into production whenever technically feasible.

In addition, the company adopts in-house waste management through the AFR system, reducing waste sent to landfill and converting it into added value within the production process.

### **How does UCC leverage technology and innovation to monitor and improve environmental performance?**

UCC adopts a technology- and data-driven approach to continuously monitor environmental performance, ensure regulatory compliance, and deliver measurable improvements in energy efficiency

and emissions. This includes Continuous Emissions Monitoring Systems (CEMS) and integrated digital dashboards that enable real-time monitoring, trend analysis, and rapid response to any deviations.

The company also implements Advanced Process Control (APC) systems and real-time energy monitoring to enhance the operational stability of kilns and grinding units, reducing process variability and emissions.

### **How does the company integrate environmental protection with occupational health & safety?**

UCC integrates environmental protection with occupational health and safety through an integrated management system aligned with international standards. As a company certified to ISO 14001 for Environmental Management and ISO 45001 for Occupational Health and Safety, UCC aligns its operational procedures, risk controls, and continuous improvement methodologies closely with these global standards.

Environmental protection and worker safety are embedded into daily operations through documented procedures, regular audits and continuous compliance monitoring, ensuring a unified and proactive approach to sustainability and workforce well-being.

### **What role do employees play in achieving environmental excellence, and how are they engaged or trained?**

Employees are actively engaged through structured training programs and practical hands-on initiatives. These efforts include capacity-building and training programs based on the Integrated Management System (QHSE), in line with quality, environmental, and occupational health and safety standards. UCC is embedding a culture of workplace cleanliness and responsibility through regular housekeeping and cleaning campaigns.

The company also implements tree-planting initiatives and promotes biodiversity both within and beyond its site. UCC provides specialized safety and environmental training for AFR personnel—enhancing risk management and supporting sustained environmental performance.

### How does Union Cement collaborate with government entities, regulators, and environmental authorities in Ras Al Khaimah?

UCC maintains effective partnerships with governmental and regulatory authorities in support of national sustainability objectives, through active participation in environmental campaigns and awareness programs—such as its involvement in the clean-up campaign organized by the Emirates Environmental Group in Ras Al Khaimah. The company has also been recognized by the RAK Environment Protection and Development Authority with the Sustainability Ecolabel (Ecolabel) certificate, in recognition of its commitment to responsible environmental practices.

### How does UCC collaborate with Ras Al Khaimah's local authorities especially (EPDA) to ensure environmental compliance while encouraging continuous improvement?

UCC works closely with local authorities in the Emirate of Ras Al Khaimah—particularly the Environment Protection and Development Authority (EPDA)—to ensure environmental compliance and drive continuous improvement. This collaboration includes regular coordination on permitting, emissions monitoring, waste management, and reporting requirements, as well as the sharing of monitoring system data and environmental audit results to enhance transparency and effective oversight.

In addition, the technical guidance issued by the Authority supports the adoption of best practices and cleaner technologies. We are happy that the EPDA has recognized our sustainability efforts and awarded us with the 'eco label' certification

### How do you see the future of sustainable cement production in the UAE?

Adherence to sustainability standards will become a fundamental requirement across the industry, driven by both regulations and evolving consumer expectations. The future of the cement industry will move toward an integrated approach that encompasses sustainable sourcing of raw materials in the pre-production phase, targeted thermal substitution and greater use of supplementary cementitious materials during production phase along with the deployment of artificial intelligence to optimize



operations. In post-production phase, the focus will increasingly shift towards improving the quality of building materials to ensure the optimal use of cement and other construction materials as well as improve the sustainability quotient of the buildings.

### What message would you like to share with stakeholders about UCC's role in supporting the UAE's sustainability agenda and net-zero ambitions?

UCC is committed to supporting the UAE's sustainability agenda through a comprehensive approach toward the transition to net zero. This approach encompasses improving energy efficiency, strengthening the circular economy and waste transformation, producing low-carbon products, expanding green cover and enhancing occupational health and safety. The company also places strong emphasis on collaborating with key partners to support this journey and deliver long-term, sustainable impact.

### Looking ahead, what environmental legacy do you hope Union Cement will leave for future generations?

We are on a journey to transform the traditional image of cement from "grey and dusty" to "green and clean." This effort goes beyond the durable buildings we help construct today; it extends to safeguarding climate stability for the people who will live in these buildings tomorrow, ensuring a better environment for future generations.

## INSPIRING STORIES



### **Dr. Habiba Al Mar'ashi: A Leading Voice in Environmental Sustainability and Climate Action in the UAE**

**Dr. Habiba Hassan Sultan Al Marashi Al Hashimi is the founding member and Chairperson of the Emirates Environmental Group, one of the oldest environmental non-governmental organizations in the United Arab Emirates, established in 1991. She has played a prominent role in advancing sustainability at both regional and international levels, including founding the Arab Network for Corporate Social Responsibility and contributing to the establishment of several environmental initiatives, in addition to holding leadership positions in international organizations concerned with environmen-**

**tal protection and sustainable development. At the national level, she is regarded as one of the leading figures in sustainability and climate action. She has received numerous awards and actively contributes to promoting environmental awareness and empowering women in leadership roles. In this context, Ras Al Khaimah Environment Magazine conducts this interview with her to explore her perspectives on environmental challenges, the future of climate action, and the role of partnerships across different sectors in achieving sustainable development.**

#### **What inspired you to choose environmental work as a life mission rather than merely a career path?**

From my early beginnings, I viewed environmental work as a life mission rooted in my personal convictions and values—guided by the belief that protecting the environment is a human and moral duty owed to future generations. As my understanding of the scale of environmental challenges deepened, I realized that temporary solutions are insufficient, and that environmental action requires long-term commitment and institutional work that transforms awareness into daily practice. This realization became the turning point that led me to dedicate my life to this field, by building sustainable platforms that engage society, the private sector, and decision-makers in a shared responsibility. For me, environmental work is a belief that real change begins with people, and that investing in awareness and behavior is the foundation of sustainable development that creates a more balanced and secure future.

#### **In your early years, what were the greatest personal challenges you faced, and how did you overcome them?**

At the beginning of my journey, I faced significant personal and professional challenges, at a time when environmental work was neither a societal priority nor a clearly defined institutional field. The most prominent challenge was engaging in a nascent voluntary movement amid limited awareness

and support, which required proving the seriousness of continuity and the ability of volunteer work to deliver tangible impact when built on a clear vision and long-term patience. On a personal level, this path demanded major sacrifices, additional time, and sustained effort. As a woman in a leadership role at that time, this added another dimension to the challenge, which I addressed through determination, commitment, and gradually building trust with society and both the public and private sectors—while focusing on transforming ideas into practical initiatives with real impact. Today, I see that phase as the foundation for everything that followed, and as proof that sustainable change does not happen quickly, but requires patience and deep belief in the mission.

**What values have guided you since the founding of the Emirates Environmental Group and continue to shape your decisions today?**

Since establishing the Emirates Environmental Group, I have remained committed to deeply rooted values that view environmental protection as an ethical responsibility before being voluntary work, and to the belief that natural resources are a trust for future generations. From the outset, I was keen to ensure that our work was organized and sustainable, based on clear programs and long-term partnerships that deliver tangible impact on the ground. I also firmly believe in the importance of collaboration—particularly with the private sector—as a key partner in achieving sustainability, and that real change can only be realized through shared responsibility. Investment in people and awareness, especially among youth and the wider community, has remained the cornerstone of this journey, as individual behavior is the starting point for any sustainable future. These values continue to be the essence of my path and the reason behind the group’s continuity and growth without losing its identity or mission.

**How do you maintain motivation and continuity in a field that requires long-term perseverance and patience?**

My motivation in environmental work is rooted first



“I realized that these issues cannot be addressed in a fragmented or temporary manner, nor confined to seasonal initiatives or short-term solutions; rather, they require long-term commitment.

in faith, and then in faith in the mission itself. When you realize that what you do has a real impact on society and future generations, commitment becomes a way of life rather than just a job. Seeing initiatives grow and deliver tangible results—whether through environmental campaigns, student awareness programs, institutional support, or contributions to environmental legislation—gives me the energy to continue. Added to this is personal passion and love for my country, driven by a deep inner conviction to contribute to improving our environment, which motivates me to persevere even in the most challenging circumstances.

**What leadership lessons have you learned from volunteer and environmental work?**

Through my experience in volunteer and environmental work, I have learned that true leadership is based on leading by example, commitment, and hands-on engagement—not on titles or authority. A leader succeeds by involving others and empowering them to be part of the solution, believing that

every individual has the capacity to make a difference regardless of their role. I have also learned that patience and active listening are essential elements of leadership, especially in environmental work that requires long-term commitment and belief in the mission. This experience reinforced my conviction that real success is collective success, and that sustainability can only be achieved through partnerships among society, the public and private sectors, and academic institutions, with a strong belief in the role of youth as partners in change. Leadership is an ethical responsibility, measured by the impact we instill in others and the values we pass on to younger generations so they may grow and endure over time.

**How has environmental work influenced your personal life and worldview?**

Environmental work has become an integral part of my life and lifestyle, profoundly shaping my view of the world. Since my early involvement in this field, it has no longer been just a profession or activity, but a system of values reflected in my daily decisions and my belief in humanity’s role in protecting the environment. Throughout my journey—particularly with the establishment of the Emirates Environmental Group—I came to understand that sustainability begins with the individual, through respect for even the simplest resources, and by viewing nature as inseparable from human well-being and future prosperity. On a personal level, this path required significant

sacrifices and long hours, but the sense of responsibility toward the environment and the belief that what we plant today leaves a lasting impact on tomorrow have always been the driving force to continue despite challenges.

**How do you balance leadership responsibilities, community work, and personal life?**

Balancing community work and personal life has been one of the greatest challenges in my journey, as the demanding nature of environmental work has taken a substantial share of my time and family life. Over time, I learned to approach balance realistically by managing priorities according to each stage and level of responsibility, rather than dividing time equally. There are periods when work takes precedence, and others when I prioritize family presence, even within limited but meaningful moments. The support and understanding of my family regarding the nature of my work have played a vital role in sustaining this balance, providing me with a sense of stability and harmony. Ultimately, I believe that true balance is not about equal time, but about harmony between what we believe in, what we work toward, and what we choose to protect in our personal lives.

**What stands out to you today about the environmental awareness of Emirati youth?**

Today, I see a growing environmental awareness among Emirati youth, reflected in their enthusiasm for practical engagement and transforming



knowledge into real initiatives that serve society. Through the activities of the Emirates Environmental Group, youth participation in field campaigns such as tree planting, recycling, and the Clean UAE Campaign highlights their understanding that environmental work is a daily responsibility requiring continuity and initiative. This active youth presence offers genuine hope for a more sustainable environmental future for the UAE.

**How can young people transform their interest in the environment into real and lasting impact?**

Transforming interest in environmental issues into real and sustainable impact begins by moving from theoretical knowledge to practical engagement. Through my experience with youth at the Emirates Environmental Group, environmental workshops and university public speaking competitions have proven effective in empowering young people to propose practical solutions, engage in intellectual discussions on sustainability, and implement initiatives on the ground. This experience instills leadership, responsibility, and collaboration values, reinforcing the idea that sustainability is a daily lifestyle and that small steps can create significant long-term impact. In this way, young people become true leaders of change, carrying the environmental message and creating lasting impact within their communities.

**How can volunteer work serve as a starting point for youth leadership and community impact?**

Volunteer work is a genuine gateway to developing leadership skills among youth, as it enables them to practice responsibility, initiative, and decision-making in real-life situations. Through participation in community and environmental initiatives, young people gradually learn the importance of planning, communication, and teamwork to achieve shared goals. Volunteerism also instills the belief that true success is measured by the impact one leaves on society—not by titles or recognition—and that individual initiative and collective responsibility can drive tangible change. In

this way, volunteer work becomes the first school of leadership, refining values and skills and paving the way for youth to become influential leaders who contribute to building a better future for their communities.

**What skills or qualities are most important for young people aspiring to work in the environmental field?**

Environmental work requires a blend of personal and professional skills to enable youth to achieve sustainable impact, foremost among them passion, commitment, and a strong sense of responsibility as the foundation of any meaningful influence. Creative thinking and problem-solving skills are essential for addressing complex environmental challenges, along with communication, teamwork, and time management skills due to the collaborative nature of working with communities and both public and private sectors. Patience, perseverance, initiative, and ethical leadership remain critical qualities, given the long-term nature of environmental change and the need for conscious, responsible decisions that create lasting impact in society.

**How can youth in the Emirate of Ras Al Khaimah become leaders in local environmental initiatives?**

Based on my experience with youth across the UAE, I believe that the local environment itself is a powerful source of inspiration for leadership. In Ras Al Khaimah, with its unique natural diversity—mountains, coastlines, and oases—youth have a distinctive opportunity to transform this diversity into tangible environmental initiatives that begin with understanding local challenges and move toward practical implementation. Youth who embrace responsibility and mobilize their communities through educational events, volunteer initiatives, and even environmentally driven investment ventures gain practical leadership skills, team management experience, and engagement with local authorities. Through these experiences, youth gradually become influential leaders. Ideas already exist—what they need is opportunity and

support to turn them into real projects that create sustainable impact on the environment and community in Ras Al Khaimah.

### **Why is partnership between government, civil society, and the private sector essential in addressing these challenges?**

Since the founding of the Emirates Environmental Group in 1991, I have believed that partnership is not an option but the very essence of environmental work itself, given the complexity of environmental challenges such as waste management, climate change, resource scarcity, and biodiversity conservation. Real and sustainable impact can only be achieved through the integration of roles: government providing frameworks and policies, civil society leading community action, the private sector contributing resources and innovation, and academic institutions supplying research and skilled talent. The effectiveness of these partnerships has been reflected in initiatives such as the Clean UAE Campaign and recycling programs, where collaboration across sectors transformed ideas into practical, wide-reaching initiatives. Dialogue platforms bringing together government, business, academia, and youth have also demonstrated that diversity of perspectives leads to practical and sustainable solutions. Partnership, therefore, is the key that transforms individual efforts into a collective national movement capable of building a more aware and sustainable environmental future for generations to come.

### **What practical steps can local communities take to support climate change mitigation efforts?**

Environmental responsibility begins with personal awareness and simple daily practices that can collectively create measurable impact in mitigating climate change when adopted by individuals, families, and institutions—such as conserving energy and water, reducing waste, and choosing more sustainable lifestyles. At the Emirates Environmental Group, we focus on practical community initiatives like recycling, tree planting, and creating green spaces to turn environmental concern into tangible daily behavior that allows individuals to see their positive impact. We also place strong

emphasis on instilling sustainable behaviors from an early age, believing that early awareness is the foundation of long-term sustainability. Through school workshops and summer activities, we transform environmental knowledge among children and youth into practical action, reinforcing their sense of responsibility and making environmental protection part of their everyday lives.

### **How can local initiatives in emirates such as Ras Al Khaimah contribute to achieving national objectives?**

Each emirate possesses unique resources and characteristics that can be leveraged to support the UAE's national goals. In Ras Al Khaimah, with its natural diversity, active community, and strong economy, there is a genuine opportunity to serve as a model for local innovation in environmental action—through initiatives such as sustainable waste management, circular economy and recycling, renewable energy adoption, and urban agriculture. These efforts translate national commitments into measurable daily practices that support the UAE Vision 2030 and the Green Agenda 2050. The essence of success lies in empowering local communities and engaging youth, families, and civil society as true partners, transforming environmental action into a lifestyle and community identity, and ensuring that every local initiative contributes to the national path toward a green and sustainable future.

### **How do you envision the future of environmental work in the UAE over the next decade?**

I see the future of environmental work in the UAE as promising and bright, driven by the nation's ambitious commitment to achieving carbon neutrality by 2050 and advancing the Green Agenda 2050. Integrated government efforts have established a pioneering model that balances economic development with environmental protection through investment in clean energy, green infrastructure, resource management, and encouraging the private sector and society to adopt sustainable practices. The UAE's forward-looking vision has positioned it as a global sustainability role model, reflected in major projects and international recognition. Over the next decade, youth will play a

pivotal role through participation in practical and awareness-driven environmental initiatives, transforming individual efforts into a collective societal force that supports national objectives. In my view, the UAE's distinction lies not only in its projects, but in empowering society and youth to translate environmental awareness into daily practice and a lasting legacy for future generations.

**What message would you like Ras Al Khaimah Environment Magazine to convey to society and decision-makers?**

My message to Ras Al Khaimah Environment Magazine is to remind society that environmental protection is not a secondary choice, but an investment in our shared future. Through awareness, knowledge sharing, and highlighting successful initiatives, communities can better understand the impact of their daily practices, while decision-makers can embed sustainability at the heart of policies and development plans. I also emphasize the importance of engaging youth as the driving force of change and the future torchbearers of sustainability, as local initiatives and community campaigns prove that every individual can make a real difference and that environmental commitment is a collective and ethical responsibility translated into sustainable daily behavior.

**How would you summarize the role of the Emirates Environmental Group and your vision for its future—locally in Ras Al Khaimah, nationally, and regionally and globally?**

The past of the Emirates Environmental Group cannot be separated from its impactful present or its ambitious future. It is an extension of a deeply rooted vision that believes environmental protection is a collective responsibility driven by the community. In Ras Al Khaimah, the group works to enhance awareness and community participation through partnerships with academic institutions, government entities, and the private sector, via practical programs that link learning with application and transform environmental concern into tangible initiatives serving the emirate. At the national level, the group has become a key partner in supporting sustainability goals such as carbon neutrality by 2050 and the Green Agenda, by empowering



communities, supporting regulatory frameworks, and translating legislation into practical action across individuals and institutions. Regionally and globally, the group contributes through active global networks, collaborating with international organizations and partners to exchange knowledge, transfer the UAE experience, and apply best practices. My future vision is for the group to continue evolving into a global platform for impact and sustainability—a bridge connecting society, the public and private sectors, and decision-makers—thereby reinforcing the UAE's position as an inspiring global model for sustainable environmental action.

**At the end of this interview, if you were asked to summarize your environmental journey in one sentence directed to a young man or woman, what would you say?**

“Start with a small step, stay true to what you believe in and persevere, and always remember that every positive action toward the environment makes a big difference today and in the future.”

## Renewable Energy

### The Future of Energy and a Driver of Sustainable Development



The global energy system has witnessed profound transformations in recent years, with a growing trend among countries to invest in renewable energy sources such as solar, wind, hydropower, and other natural resources. Global investments in this sector are estimated at hundreds of billions of dollars annually, as part of accelerated efforts to transition toward more sustainable energy systems with lower environmental impacts. Rapid technological progress is expected to significantly reshape the global energy mix over the coming decades. Renewable energy is no longer merely an environmental option; it has become an important driver of economic and industrial development, creating new employment opportunities and opening wide prospects for investment and innovation.



**OSAMA ALABED**  
Consultant

#### The Concept of Renewable Energy

Renewable energy refers to energy derived from natural sources that are continuously replenished in the environment, such as sunlight, wind, water, geothermal heat, and biomass. These sources are characterized by their long-term sustainability, unlike conventional energy sources such as oil, coal, and natural gas, which depend on finite resources that may eventually be depleted. Growing global awareness of environmental challenges, particularly climate change, has further in-

creased interest in renewable energy as one of the most important solutions for achieving a balance between economic development and environmental protection.

#### Advantages of Renewable Energy

Renewable energy offers several advantages that have made it a central focus of modern energy policies. It is a clean source of energy that contributes to reducing greenhouse gas emissions responsible for global warming. In addition, renewable resources are available in most regions

of the world to varying degrees, giving countries an opportunity to strengthen their energy security and reduce dependence on imported fossil fuels. The renewable energy sector is also among the fastest-growing sectors in the global economy, offering significant opportunities for investment and industrial innovation. It also plays a key role in supporting development in rural and remote areas where traditional electricity networks are difficult to establish.

### Challenges of the Transition to Clean Energy

Despite the significant progress achieved in this field, the widespread adoption of renewable energy still faces several challenges. One of the most prominent challenges is the lack of awareness and technical knowledge in some countries regarding renewable energy potential and technologies, in addition to the limited legislative frameworks and regulatory policies that support expansion in their use. Financing and investment also represent major challenges, particularly in developing countries, where renewable energy projects require substantial capital and institutional capacity capable of managing such projects efficiently.

### Sources of Renewable Energy

Renewable energy sources in nature are diverse and include a wide range of resources that can be converted into usable electrical or thermal energy. Solar energy is among the most prominent of these sources, as it relies on harnessing sunlight and solar heat to generate electricity or provide thermal energy for heating and water heating. Solar cell technologies have witnessed remarkable development in recent years, making them one of the most widely used energy sources worldwide. Wind energy, on the other hand, relies on harnessing air movement to drive large turbines that convert the kinetic energy of wind into electrical power. Wind farms, whether onshore or offshore, have become a fundamental component of modern energy systems in many countries. Hydropower is one of the oldest renewable energy sources used on a large scale, where electricity is generated by harnessing flowing or falling water through dams and waterfalls. Other renewable sources include tidal energy,

which results from the gravitational interaction between the Earth and the Moon and can be utilized to generate electricity in coastal regions that experience significant variations in water levels. Geothermal energy also represents an important source of energy in certain parts of the world, where the heat stored beneath the Earth's surface can be used to generate electricity or provide thermal energy for heating. Biomass energy involves the use of organic materials such as agricultural, plant, and animal waste to produce fuel or energy. It is considered an indirect form of solar energy stored in plants through the process of photosynthesis.

### Renewable Energy and Sustainable Development

The future of sustainable development is closely linked to energy issues. Achieving balanced economic growth and improving living standards cannot be realized without providing reliable, clean, and affordable energy sources. Many international conferences, including the Earth Summit in Rio de Janeiro in 1992 and the World Summit on Sustainable Development in Johannesburg in 2002, have emphasized the vital role of energy in achieving economic and social development while protecting the environment. In this context, renewable energy represents a key tool for reducing environmental pollution and lowering greenhouse gas emissions resulting from the use of fossil fuels, which are the primary cause of global warming and rising global temperatures. Renewable energy also contributes to addressing energy poverty. According to World Bank estimates, more than one billion people worldwide still lack access to electricity. Expanding the use of clean energy sources offers an opportunity to provide electricity in remote areas, improve quality of life, and support economic development. In light of these realities, the transition toward renewable energy has become an indispensable strategic option—not only for protecting the environment but also for ensuring a more sustainable and equitable economic future for generations to come, while strengthening energy security and enhancing resilience to global economic and climate challenges.

# Union Cement Company

**We manufacture cement responsibly and sustainably**



## **WOW – Waste Originated Wealth**

Transforming waste into value



## **Clean Energy Leadership**

Waste Heat Recovery - 31.30 MW



## **Expanding Green Spaces**

Systematic program to increase green cover



## **Green Products**

Cementitious products to reduce carbon footprint



If you have industrial or commercial waste that needs to be managed, we would be delighted to partner with you. Reach out to us for a better tomorrow.

**Union Cement Company, Khor Khwair, Ras Al Khaima**

☎ +971 7 266 8166 ✉ [info@uccrak.com](mailto:info@uccrak.com)



disposal,

imah

## From Pollution to Energy Transition

### Chinese Innovation Turns Cigarette Butts into the Energy of the Future



At a time when the world faces two parallel challenges—soaring plastic waste and the growing need for efficient energy storage solutions—a scientific breakthrough from Henan University emerges as a practical model that combines pollution mitigation with enhanced energy system performance.

A research team has successfully transformed cigarette butts—one of the most widespread waste items globally—into an advanced nanostructured carbon material capable of storing energy with high efficiency and long-term stability.

#### A Silent Global Environmental Crisis

Global estimates indicate that billions of cigarette butts are discarded into the environment each year, making them the most common component of urban and coastal litter. Cigarette filters are primarily composed of cellulose acetate, a synthetic plastic polymer that takes years to degrade. During this period, it can release toxic substances and traces of heavy metals into soil and water.

The danger lies not only in their slow decomposition

but also in their fragmentation into micro-particles that may enter the food chain, amplifying long-term environmental and health impacts. This reality underscores the need for solutions that go beyond collection and disposal toward reintegration into productive cycles.

#### Chemical Engineering in the Service of Sustainability

The researchers employed hydrothermal carbonization, a process conducted under controlled temperature and pressure conditions to convert organic materials into nanostructured biochar. Through precise treatment of cigarette butts, they produced porous carbon electrodes doped with nitrogen and oxygen—enhancing their electrochemical properties.

#### The resulting material features a three-dimensional honeycomb

-like structure with a hierarchical porous arrangement that provides an exceptionally large surface

area. The greater the electrode's surface area, the higher its capacity to store electrical charge. Additionally, the presence of pores of varying sizes enables rapid and organized ion movement within the material, improving charging and discharging efficiency.

### Performance Beyond Expectations

Laboratory tests demonstrated that the material—identified as CNPB-700-4—retained more than 95% of its capacity after 10,000 charge-discharge cycles. This reflects a high level of stability compared to conventional batteries used in smartphones and portable devices.

The material also exhibited fast-charging capability without significant performance degradation, making it suitable for use in supercapacitors—critical components in modern energy systems requiring rapid response. Applications include stabilizing electricity grids powered by solar and wind energy and supporting regenerative braking systems in electric vehicles.

### Added Economic Value

Economically, the innovation offers a pathway to reduce the cost of producing advanced carbon materials. Instead of relying on expensive raw inputs, it utilizes waste available in massive quantities worldwide. This opens opportunities to establish new supply chains focused on collecting, sorting, and recycling cigarette butts within specialized facilities. The approach reinforces the principles of the circular economy, where waste is transformed into resources and reintegrated into production cycles rather than discarded. It aligns with global environ-

mental policies aimed at reducing emissions and achieving carbon neutrality.

### Applications Beyond the Laboratory

The potential uses of this material extend across multiple sectors—from household and building-level energy storage to enhancing the stability of smart power grids and improving the efficiency of electronic devices and electric vehicles. It may also support the development of hybrid energy systems combining batteries and supercapacitors for superior performance and longer operational lifespans.

With further research and development, the properties of these materials could be refined to meet broader industrial needs, paving the way for a transformative shift in how small-scale plastic waste is managed.

### A Scientific Message with Global Implications

This innovation does more than provide a technical solution—it conveys a deeper message: environmental challenges can be transformed into opportunities when guided by scientific vision and research commitment. Rethinking waste as latent raw material can lead to breakthroughs that simultaneously address two pressing crises—pollution and energy storage. In this way, cigarette butts are transformed from a symbol of pollution and neglect into an active component of clean energy systems—illustrating how science can redefine the relationship between humanity and its resources and drive the transition toward a more sustainable and efficient future, while encouraging circular economy practices and innovative resource recovery solutions.





## Industry and Environment Series in RAK

### Part One: The Role of Industry in RAK’s Economy

The “Industry and Environment” series aims to highlight the importance of integrating environmental considerations into the development of the manufacturing sector in the Emirate of Ras Al Khaimah. Achieving a balance between industrial growth and environmental protection has become one of the key pillars of modern economic policy. This first part focuses on reviewing the vital role played by industry in the Emirate’s economy, as it represents a primary driver of economic diversification and a major source of added value and employment opportunities.



**Abdulhalim Muhaisen**  
Economic Advisor

#### Industry in RAK An Economy Shaping Its Future

While many regional economies have relied heavily on oil resources as the primary engine of growth, Ras Al Khaimah has adopted a different development path based on building a strong and diversified industrial base. Over the past decades, the Emirate has successfully established itself as a significant industrial center within the United Arab Emirates and the wider region, benefiting from its strategic geographic location, the availability of natural resources, and a flexible investment environment that has encouraged industrial capital inflows

Industry in the Emirate is no longer merely a traditional economic ac-

tivity; rather, it has evolved into an integrated development project that drives economic diversification and strengthens competitiveness in regional and global markets. It has also contributed to building a productive economy based on manufacturing and exports, which has resulted in relatively stable growth levels and improved the resilience of the economy in the face of global challenges.

#### An Industrial Base Driving Economic Growth

Recent economic trends indicate that the industrial sector represents one of the key pillars of Ras Al Khaimah’s GDP. Manufacturing, mining, and construction industries contribute significant-

ly to overall economic activity. According to data from the Ras Al Khaimah Statistics Center, the industrial sector's contribution to GDP has ranged between 22% and 23% in recent years, with an average annual growth rate of approximately 4.3%. This performance reflects the Emirate's success in developing an economic model that maximizes industrial value added by transforming natural resources into exportable finished products. This approach contributes to strengthening the trade balance and increasing economic revenues. It also supports economic stability and reduces vulnerability to external fluctuations, particularly during periods of declining global demand or disruptions in supply chains.

### **A Supportive Investment Environment for Industry**

Economic zones have played a central role in supporting industrial activity. The Ras Al Khaimah Economic Zones Authority (RAKEZ) provides a modern regulatory framework characterized by flexibility and fast procedures, along with advanced infrastructure, competitive operating costs, and the possibility of full foreign ownership. As a result, the number of new industrial companies has grown, and investments across various manufacturing sectors have expanded, ranging from heavy industries to advanced manufacturing. According to statistics from the Ras Al Khaimah Statistics Center, the number of factories operating within RAKEZ has reached approximately 728 factories, reflecting the expansion of the industrial base and the Emirate's increasing attractiveness for productive investments.

### **Mining and Cement... Industries Built on Local Resources**

Mining industries represent the historical foundation of Ras Al Khaimah's industrial development. The Emirate possesses abundant reserves of rocks and minerals, particularly limestone, which is widely used in cement production. Stevin Rock has played a significant role in establishing the Emirate as a major supplier of raw materials in the region by providing large quantities of aggregates and mining materials for construction and infrastructure projects across the Gulf and Asia. The impact of this activity goes beyond exports. It also supports related manufacturing industries

in the construction sector, such as cement production and concrete products, creating an integrated industrial value chain that enhances productivity, generates employment opportunities, and stimulates supporting economic activities.

### **Ceramics Industry... Global Presence Under the Emirate's Name**

The experience of RAK Ceramics represents one of the most prominent industrial success stories in the Emirate. Within a relatively short period, the company has grown into one of the world's leading manufacturers in its field. It operates manufacturing facilities both within the UAE and internationally and exports a large share of its production to more than 150 countries worldwide, effectively serving as an economic and industrial ambassador for the Emirate in global markets. This industry has contributed significantly to boosting non-oil exports and generating important foreign currency revenues, while also creating numerous employment opportunities across production, engineering, marketing, and logistics services.

### **Pharmaceutical Industry... Investment in Knowledge and Technology**

Industrial ambitions in Ras Al Khaimah have not been limited to traditional resource-based industries. They have also extended to advanced knowledge-based industries, particularly pharmaceuticals. Julphar stands out as a leading example in this field and is considered one of the largest pharmaceutical manufacturers in the Middle East and North Africa. This sector has played an important role in transferring modern technology, promoting industrial innovation, developing national human capital, and opening new export markets in Asia, Africa, and Europe, thereby strengthening the Emirate's position on the regional pharmaceutical industry map.

### **Industrial Diversification Enhancing Economic Resilience**

Ras Al Khaimah's industrial base is characterized by a high degree of diversification, encompassing industries such as metals, chemicals, machinery and equipment, plastics, and electronics. This diversification helps reduce risks associated with dependence on a single sector and enhances the local economy's ability to adapt to global changes, including fluctuations

in energy prices or shifts in international demand. It also creates opportunities for integration between different industrial sectors, improving production efficiency, raising levels of innovation, and strengthening local supply chains.

### Industry and the Labor Market... A Driver of Social Development

The industrial sector is one of the most significant sources of employment in the Emirate. According to statistics from the Ras Al Khaimah Statistics Center, approximately 38.3% of the workforce is employed in the industrial sector. This highlights the sector's important social role in supporting employment levels, improving income, and enhancing economic stability for families. Industrial investments have also contributed to the development of technical and vocational education and training programs, helping improve the quality and productivity of human capital. This has been accompanied by significant improvements in infrastructure, including roads, ports, industrial zones, and logistics facilities that support economic activity.

### Transition Toward Smart and Sustainable Industry

In line with global transformations associated with the Fourth Industrial Revolution, industrial companies in Ras Al Khaimah have begun adopting advanced technologies such as automation, artificial intelligence, and the Internet of Things to improve production efficiency, reduce costs, and enhance quality. At the same time, efforts are increasing to adopt environmentally friendly industrial practices, such as reducing industrial emissions, recycling waste, and utilizing renewable energy sources. These efforts align with national ambitions to achieve climate

neutrality and enhance environmental sustainability. This transition also strengthens the competitiveness of industrial products in global markets that increasingly prioritize sustainability standards.

### Industry and the Need for Continued Efforts

Despite the significant achievements of the industrial sector in Ras Al Khaimah, continued efforts are needed to address the challenges facing the sector. These include competition from low-cost markets, fluctuations in raw material prices, and the need for greater investment in research, development, and advanced technologies. At the same time, promising opportunities exist to further strengthen industrial growth, including expansion into advanced technological industries, stronger integration with ports and global supply chains, attracting more foreign direct investment, and developing green industries and clean energy sectors.

### An Inspiring Development Model

The industrial experience of Ras Al Khaimah represents an important development model in the region. The Emirate has successfully transformed the limitation of oil resources into a catalyst for building a productive economy based on manufacturing, exports, and innovation. With continued development of economic zones, infrastructure expansion, and increasing industrial investments, the Emirate is well positioned to maintain its role as one of the leading industrial centers in the United Arab Emirates in the coming years. Industry in Ras Al Khaimah is no longer merely an economic activity; it has become a strategic vision for shaping the future and achieving sustainable development, enhancing competitiveness and long-term economic resilience.





## **UAE Environmental Competitiveness Indicators**

Achievements That Make a Difference



**The** United Arab Emirates achieved remarkable progress in the Global Tourism Index between 2022 and 2025, rising from 25th place globally in 2022 to 15th place in 2025, while maintaining first place regionally during the same period. This advancement reflects the country’s firmly established position as a global tourism destination distinguished by modernity, safety, and advanced infrastructure.

This strong performance is attributed to the National Tourism Strategy 2031, which aims to enhance economic diversification and increase the tourism sector’s contribution to GDP. Flexible visa policies and extensive air connectivity have also

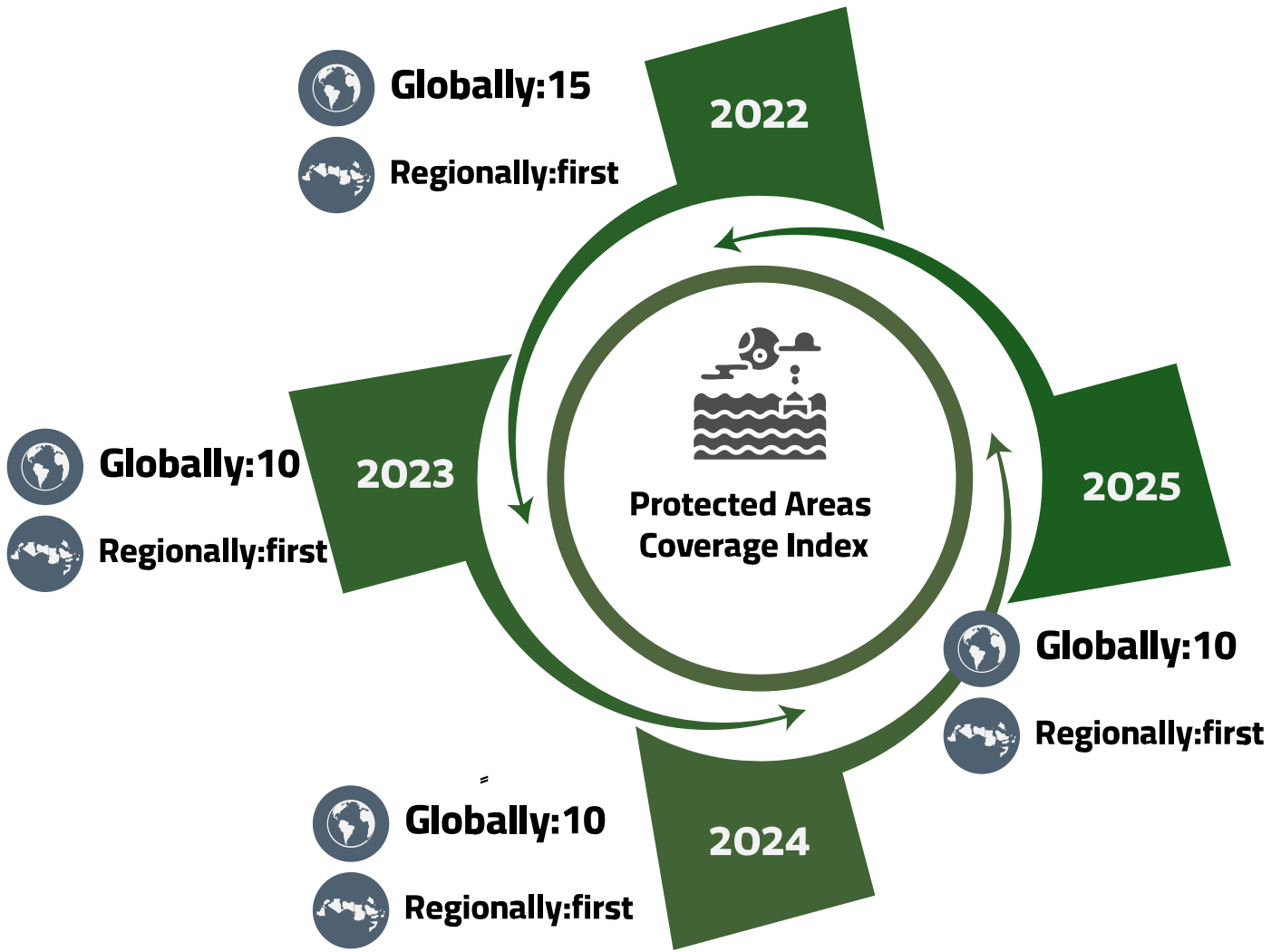
played a significant role in boosting international visitor numbers.

The UAE has expanded and diversified its tourism offerings, ranging from cultural, environmental, and heritage tourism to adventure tourism, business events, and luxury travel. Major global events such as Expo 2020 Dubai and COP28 further strengthened the country’s standing as a sustainable and forward-looking destination.

The UAE’s rise to 15th place globally underscores its ability to compete among the world’s leading tourism destinations and reinforces its position as one of the most attractive and sustainable countries worldwide.

**Environmental Performance Index (EPI)** :It is an international index issued by Yale and Columbia Universities in the United States. It aims to assess countries’ performance in environmental management and protection, based on a set of key environmental indicators.

Source: Yale and Columbia Universities

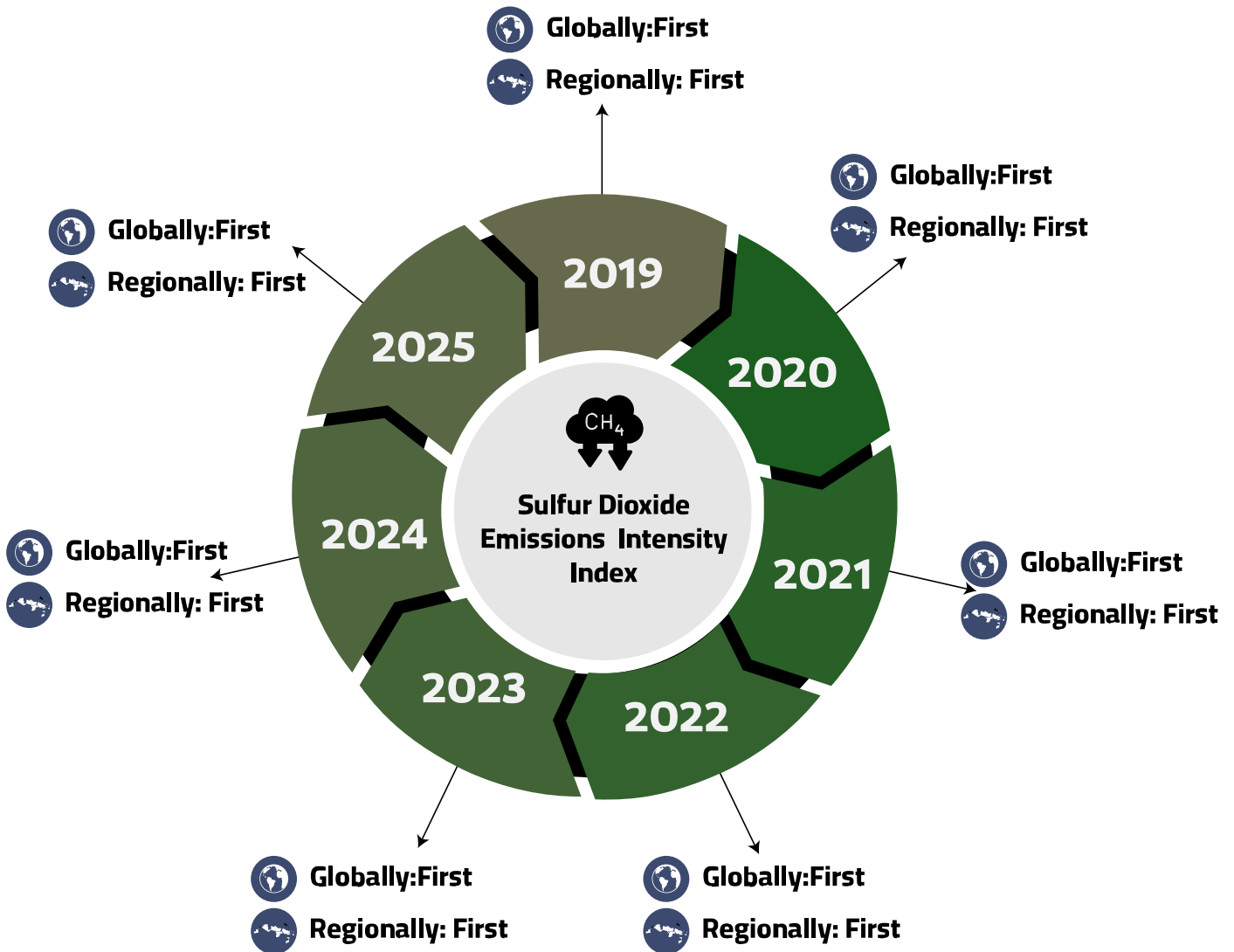


**Data** from the Marine Protected Areas Coverage Index show the United Arab Emirates’ clear regional leadership, as the country maintained first place from 2022 through 2025. This reflects a strong commitment to marine environmental protection and the enhancement of coastal biodiversity. Globally, the UAE demonstrated advanced and consistent performance. It ranked 15th worldwide in 2022, then rose to 10th place globally in 2023, 2024, and 2025—placing it among the leading nations in marine conservation. This progress reflects the country’s sustained ef-

orts to establish and expand marine protected areas, implement integrated coastal zone management programs, and safeguard critical marine habitats such as coral reefs and mangroves. National initiatives have also contributed to reducing overfishing, regulating marine activities, and strengthening ecosystem restoration efforts. These results confirm that the UAE has become both a regional and global model in marine protection, with environmental policies aligned with the highest standards of marine sustainability.

**Protected Areas Coverage Index** : It is a global environmental indicator that measures the percentage of marine areas (within territorial waters or the Exclusive Economic Zone - EEZ) that have been officially designated as protected areas aimed at conserving marine biodiversity and safeguarding ecosystems.

Source: Protected Planet



**UAE** maintained its global and regional leadership in the Carbon Dioxide Emissions Intensity Index between 2019 and 2025, ranking first worldwide for seven consecutive years. This achievement reflects the country’s strong commitment to reducing emissions and transitioning toward a low-carbon economy in support of its Net Zero 2050 target.

The UAE has adopted a proactive approach centered on clean energy, improved resource efficiency, and the development of sustainable transport. The expansion of renewable energy projects—such as the Mohammed bin Rashid Al Maktoum Solar Park and the Barakah Nuclear Energy Plant—has played a key role in lowering emissions and strengthening

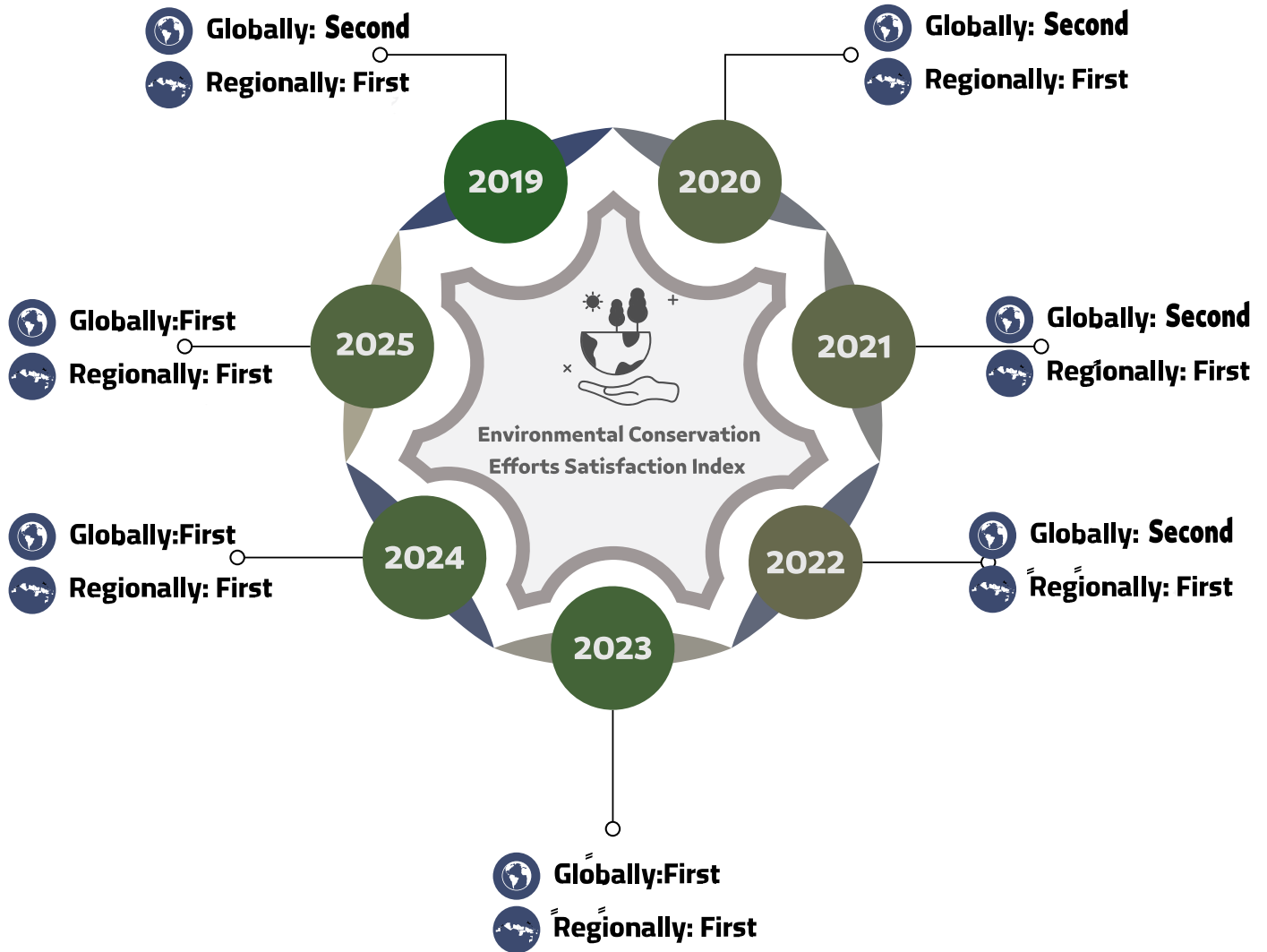
energy security.

The UAE Energy Strategy 2050 and the National Net Zero 2050 Strategy have provided a comprehensive framework for enhancing industrial efficiency and reducing reliance on fossil fuels. In addition, the country has implemented circular economy initiatives and carbon management programs, including carbon capture and storage technologies.

The UAE’s continued global leadership demonstrates its ability to achieve sustainable economic growth without compromising environmental protection, further solidifying its role as a leading nation in climate action.

**Sulfur Dioxide Emissions Intensity Index:** is an environmental indicator that measures the amount of sulfur dioxide emissions generated by human activities relative to production output or energy consumption, in order to assess the efficiency of reducing industrial pollution and improving air quality. Source:

Yale and Columbia Universities



**UAE** has maintained its first-place ranking globally and regionally in the Satisfaction Index for Environmental Conservation Efforts during the period from 2023 to 2025, after previously ranking second globally between 2019 and 2022. This advancement reflects the confidence of both local and international communities in the effectiveness of the country’s environmental policies and its ability to achieve a balance between development and the sustainability of natural resources. The UAE has adopted an integrated approach that combines environmental legislation, targeted national initiatives, and community awareness. The UAE Net Zero 2050 Strategy and the National Biodiversity

Strategy 2031 have played a key role in strengthening the environmental protection framework. Additionally, initiatives such as the Year of Sustainability 2023 and hosting COP28 have reinforced the country’s position as a leading force in global climate action. Satisfaction levels have increased as a result of improvements in air and water quality, the expansion of green spaces, and the implementation of solar and nuclear energy projects. The UAE’s global leadership in this index underscores its capacity to drive environmental efforts and shape a balanced model that harmonizes human development with environmental sustainability.

**Satisfaction Index for Environmental Conservation Efforts:** A public opinion measure of residents’ satisfaction with government environmental policies and their effectiveness in protecting resources, reducing pollution, and promoting sustainability.

Source: Gallup Organization

أحرص على اتباع القوانين والأنظمة البيئية أثناء الصيد وتجنب الصيد الجائر  
Follow environmental laws and regulations while fishing, and avoid overfishing

