



ANNUAL REPORT 2021



WHO WE ARE AND WHAT WE DO

Established in 1996, the Environment Agency – Abu Dhabi (EAD) is committed to protecting and enhancing air quality, groundwater as well as the biodiversity of our land and marine ecosystems.

By partnering with other government entities, the private sector, NGOs and global environmental agencies, we embrace international best practices, innovation and hard work to institute effective policy measures. We seek to raise environmental awareness, facilitate sustainable development and ensure environmental issues remain one of the top priorities of our national agenda.





FOREWORD FROM OUR CHAIRMAN

Fifty years ago, our Founding Father, the late Sheikh Zayed bin Sultan Al Nahyan united this great nation to create the United Arab Emirates, which has since become an illuminating beacon of progress, success, vision and prosperity. Through his astute outlook, he paved the way for the country to grow and develop and transform into a safe and prosperous haven for all citizens and residents. He also paved the way, with compassionate perception, for a positive future for the environment, which is why the late Sheikh Zayed is regarded as the First Environmentalist.

In line with the vision of our wise leadership, we too at the Environment Agency – Abu Dhabi also have a vision for the next 50 years and will continue working, as we develop, at how we can create the perfect balance between the socio-economic growth of Abu Dhabi and conserving the environment for our future generations.

Furthermore, in line with our government's directives, in 2021 we celebrated two major UAE announcements. The first being the Net to Zero by 2050 strategic initiative announced by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister and Ruler of Dubai. In 2023, Abu Dhabi will host the United Nations Framework Convention on Climate Change, also known as COP 28. We are delighted to see the UAE take a leadership role in the dialogue on climate change on Emirati soil, and we at EAD will play a pivotal role in participating in mitigating this global threat and challenge.

H.H. Sheikh Hamdan bin Zayed Al Nahyan
Ruler's Representative in Al Dhafra Region
Chairman



FOREWORD FROM OUR VICE-CHAIRMAN

Fifty years have flown by since the union of the Emirates which has resulted in the unprecedented growth of this prominent country into a leading example that is admired and respected by everyone around the world. The UAE has become synonymous with success and innovation, and due to the unwavering wisdom and support of our great leadership we all aspire to make way for a future as bright as the past five decades – especially in the field of the environment. We at the Environment Agency - Abu Dhabi want to be a part of the United Arab Emirates' bright future, which has chartered a clear path to accomplish quality achievements in a variety of critical sectors that will contribute to the country's long-term success.

At the Environment Agency – Abu Dhabi we aim to be part of the UAE's dynamic future and the year 2021 was an extremely successful one for us at EAD as we are part of the nation's success. We will always align ourselves with the vision of our government, transforming it into a reality on the ground in the emirate of Abu Dhabi to ensure that we leave for posterity a clean and healthy environment to sustainably enjoy.

H.E. Mohamed Ahmed Al Bowardi
Vice Chairman of
Environment Agency - Abu Dhabi



FOREWORD FROM OUR MANAGING DIRECTOR

This year has seen a blend of remote work due to COVID-19, followed by the return to normalcy in our EAD offices, where we immediately picked up where we had left off. It was also a year of elation where we joined hands with everyone in the UAE to celebrate the Golden Jubilee of this rapidly growing nation. And it was also the year in which we began implementation of our new strategy 2021-2025 - a stepping stone upon which to plan for the next 50 years, to ensure that we are always looking into the future with clear vision.

We are well prepared for the decades to come, and we have established a strong base for all our environmental efforts since our inception. We have gained wisdom from all the lessons learnt, and we have ensured that we have long-term conservation initiatives and projects to propel us forward.

We know that sustainability is at the core of what we do and who we are, and we also know that we need to leave a much better world behind for our children and grandchildren. We will achieve this through strategic thinking, research and development, scientific methodologies and creativity, allowing us to realise our goals of raising the bar in everything we do. We will continue striving to consistently be an organisation that is a force to be reckoned with locally, regionally and internationally.

H.E. Razan Khalifa Al Mubarak

Managing Director & Member of the Board of
Environment Agency - Abu Dhabi



MESSAGE FROM OUR SECRETARY GENERAL

The continuous success of the United Arab Emirates leads to the success of the Environment Agency. This year we all enjoyed ruminating over the success of the past 50 years since the union of the UAE and how far as a nation we have come. We also reflected on what we need to do to achieve the same pace of progress and development for the next five decades.

We are well aware that the brilliance of the UAE is due to its wise and visionary leadership. Therefore, I would like to express my gratitude to His Highness Sheikh Khalifa bin Zayed bin Sultan Al Nahyan, President of the United Arab Emirates, as well as High Highness Sheikh Mohamed bin Zayed bin Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the United Arab Emirates, who have served as role models of dedication, commitment, loyalty and patriotism. It is because of these traits that the UAE is a world leader in several fields and sectors – of which the environment is one. It is also because of them that we won the bid to host COP 28 in 2023 and I am truly convinced that we will organise a very memorable event.

I would also like to express my appreciation to His Highness Sheikh Hamdan bin Zayed bin Nahyan, the Ruler's Representative in Al Dhafra Region and Chairman of EAD's Board of Directors, who has supported and empowered us year after year to ensure that we have all the resources we require to succeed.

Life has slowly returned to the new normal, and we at EAD are all back in our physical spaces once again. We are all working laboriously to maintain the momentum of success we achieved despite COVID-19, because the pandemic presented no real obstacle to us, but rather an opportunity to put our resistance, resiliency and adaptability to the test.

In light of this, I am proud to present you with the Annual Report of 2021 that outlines all our achievements during the past year, of which there are several. As always, we are committed to guiding the community towards a strong and fulfilling bond with nature and the preservation of the environment for sustainable development in the years ahead.

H.E. Dr Shaikha Salem Al Dhaheri
Secretary General of
Environment Agency - Abu Dhabi



01

TERRESTRIAL BIODIVERSITY

In 2021, we continued our efforts to protect the emirate's key species and habitats through wide-reaching monitoring and conservation programmes and effective policy-making.

A valley in the city of Al Ain where local Dhofar frogs were recorded



MONITORING THE TERRESTRIAL BIODIVERSITY OF ABU DHABI EMIRATE

Urban Biodiversity Survey and Biodiversity Index

Our Urban Biodiversity Survey aims to document native and exotic species within urban habitats in the Emirate of Abu Dhabi.



18

Monitoring sites
in Abu Dhabi



4

Monitoring sites
in Al Ain city



16,000+

Bird records



1,290

Invertebrate
records



1,093

Plant records



293

Mammal records



79

Amphibian, reptile and
exotic freshwater fish
records



City parks contain a high level of indigenous and exotic biodiversity.



IUCN Red List of Species and Ecosystems

In cooperation with ProVita and the IUCN Commission on Ecosystem Management (CEM), we prepared and developed two red lists, one for species (the first of its kind in the emirate) and the other for ecosystems.

Species Red List:



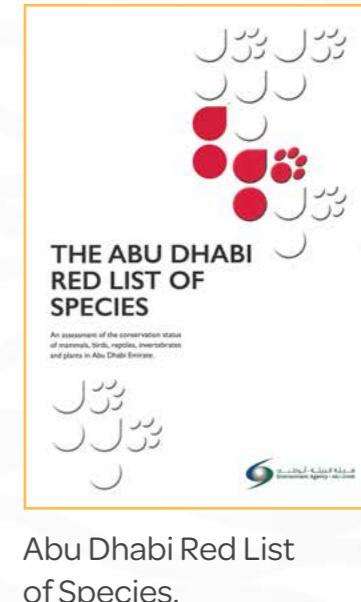
244

Species compiled
(plants, birds, reptiles,
mammals and
invertebrates)



74

Threatened species
(critically endangered,
threatened or
endangered)



Abu Dhabi Red List
of Species.

Ongoing Monitoring of Bird Species and their Migratory Movements



184

Bird species recorded at 63
sites in Abu Dhabi Emirate

Greater Flamingos
(*Phoenicopterus roseus*)

- 12th consecutive year of successful breeding in Al Wathba Wetland Reserve
- 786 chicks started to fly during the year



Adult crab plovers
(*Dromas ardeola*)

- 3 tagged in Abu Al Abyad island



Ongoing movement tracking

- Great flamingos (*Phoenicopterus roseus*)
- Ospreys (*Pandion haliaetus*)
- Egyptian vulture (*Neophron percnopterus*)



Spotted eagle
(*Clanga clanga*)

- Captured in the Al Dhafra Region
- Tracking device installed

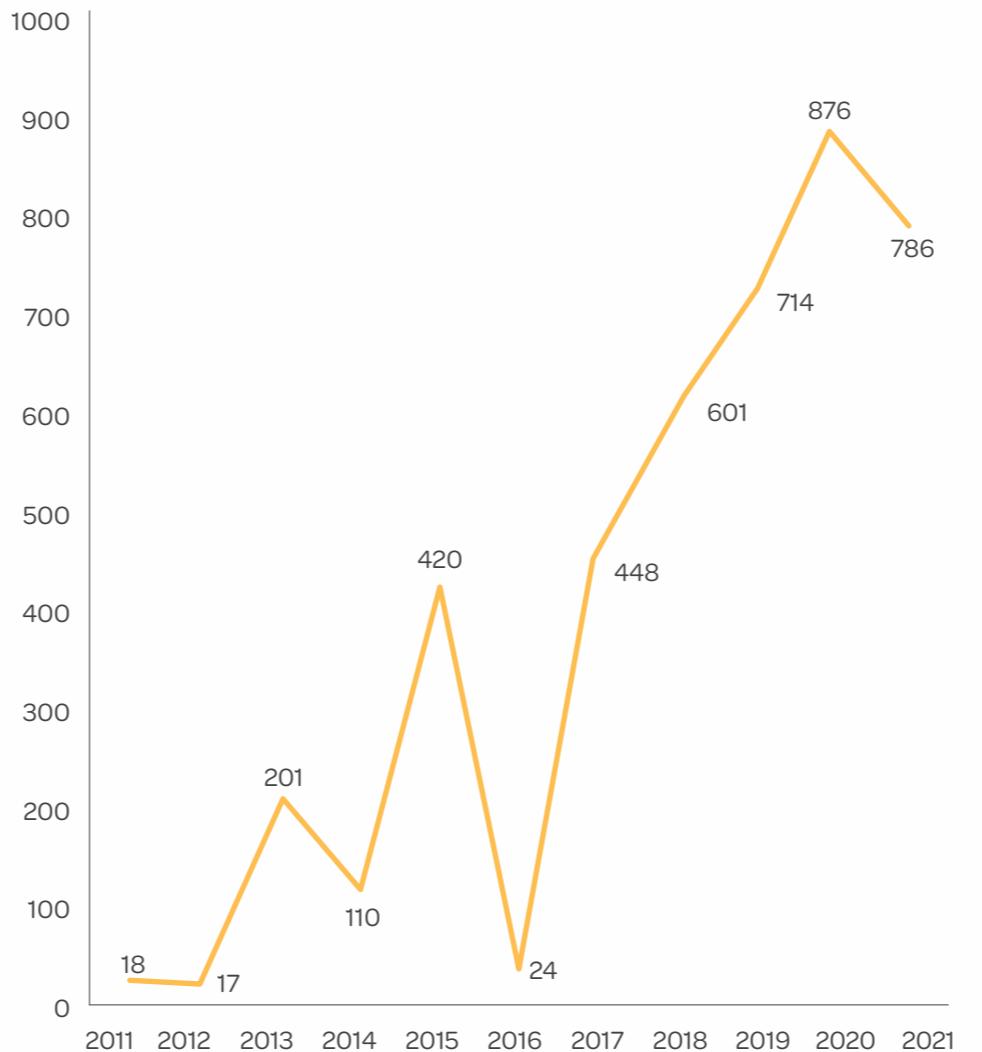


Reproductive success assessment for major breeding bird species:

- 1,327 active crab plover nests
- No breeding records for the sooty falcon (*Falco concolor*)



Annual Report 2021 | Terrestrial Biodiversity



Great flamingo chicks fledged successfully in Al Wathba Wetland Reserve in 2021.



Tracing three crab plovers tagged in 2021.



Launching a tagged spotted eagle at Al Wathba Wetland Reserve.

Monitoring and Recording Animal Species with Hidden Cameras

This ongoing programme has continued to yield important results, recording some animals that are difficult to see during regular field surveys.



1,600+

Views recorded



7

Rüppell's sand fox (*Vulpes rueppellii*) records in the Bid'ah Nature Reserve, the Barqa and the Falcon Reserve



17

Mammal species sighted



3

Blanford's fox records (*Vulpes cana*) in Jabal Hafit National Park Reserve



A Blanford's fox spotted by a hidden camera in Jabal Hafit National Park Reserve.

Perilampus houbarensis was named after the Houbara Reserve, where this new species was discovered. It is the second new species in entomology to be discovered from the Houbara Reserve

New Species and Range of Invertebrate Dispersal

In 2021, we published the results of the invertebrate inventory project in the Emirate of Abu Dhabi.



20

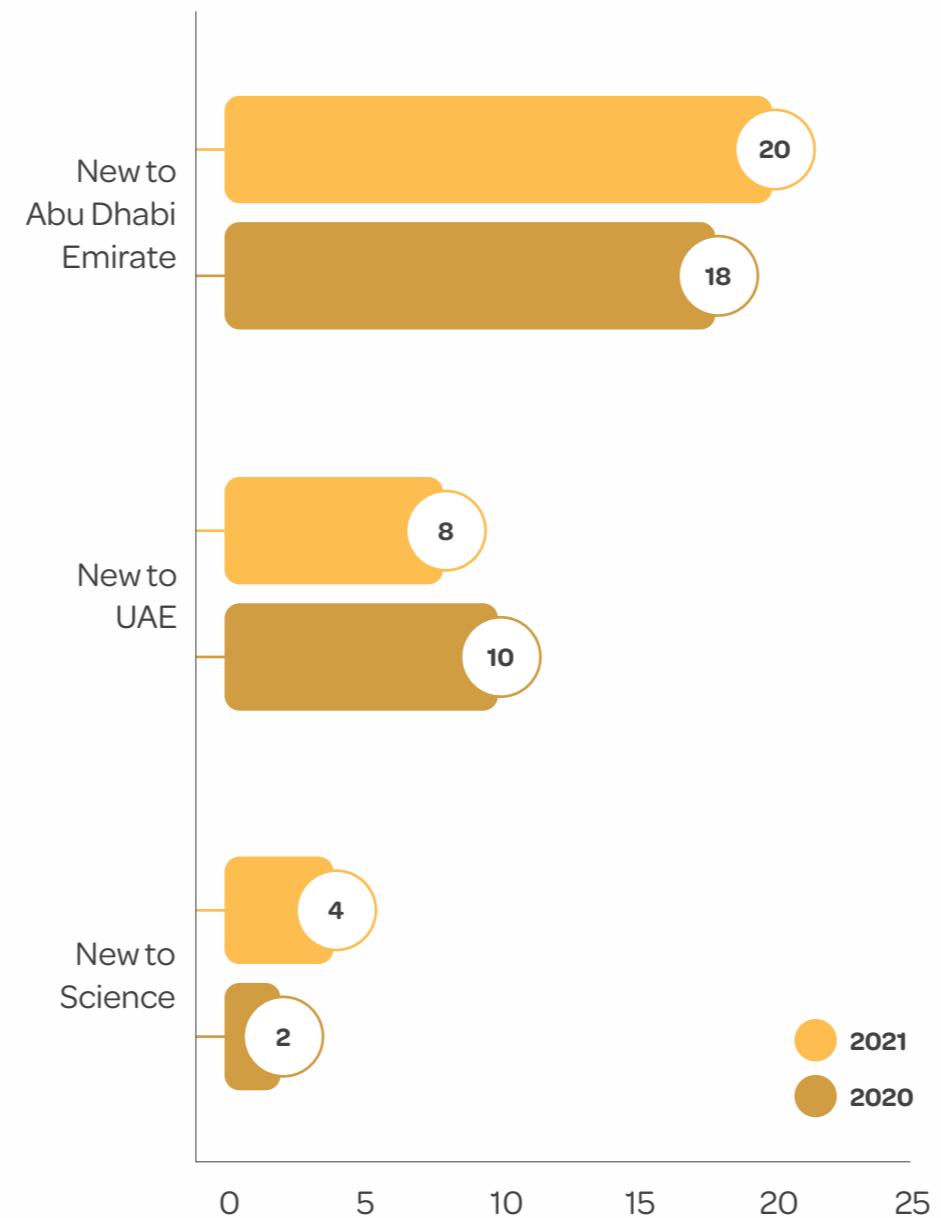
New species registered



- 4 species registered for the first time in the history of science
- 8 registered at a state level
- 8 registered at a local level



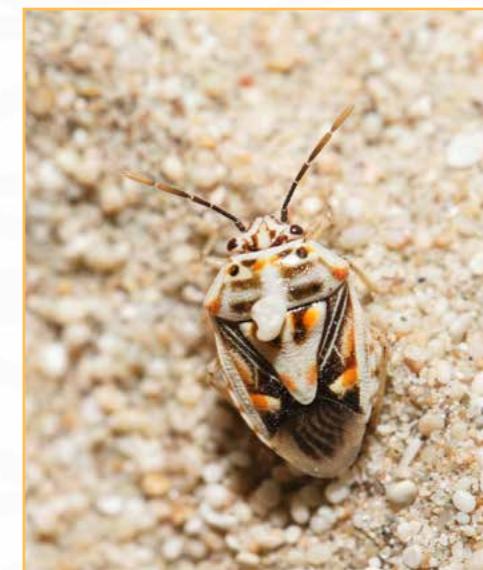
Annual Report 2021 | Terrestrial Biodiversity



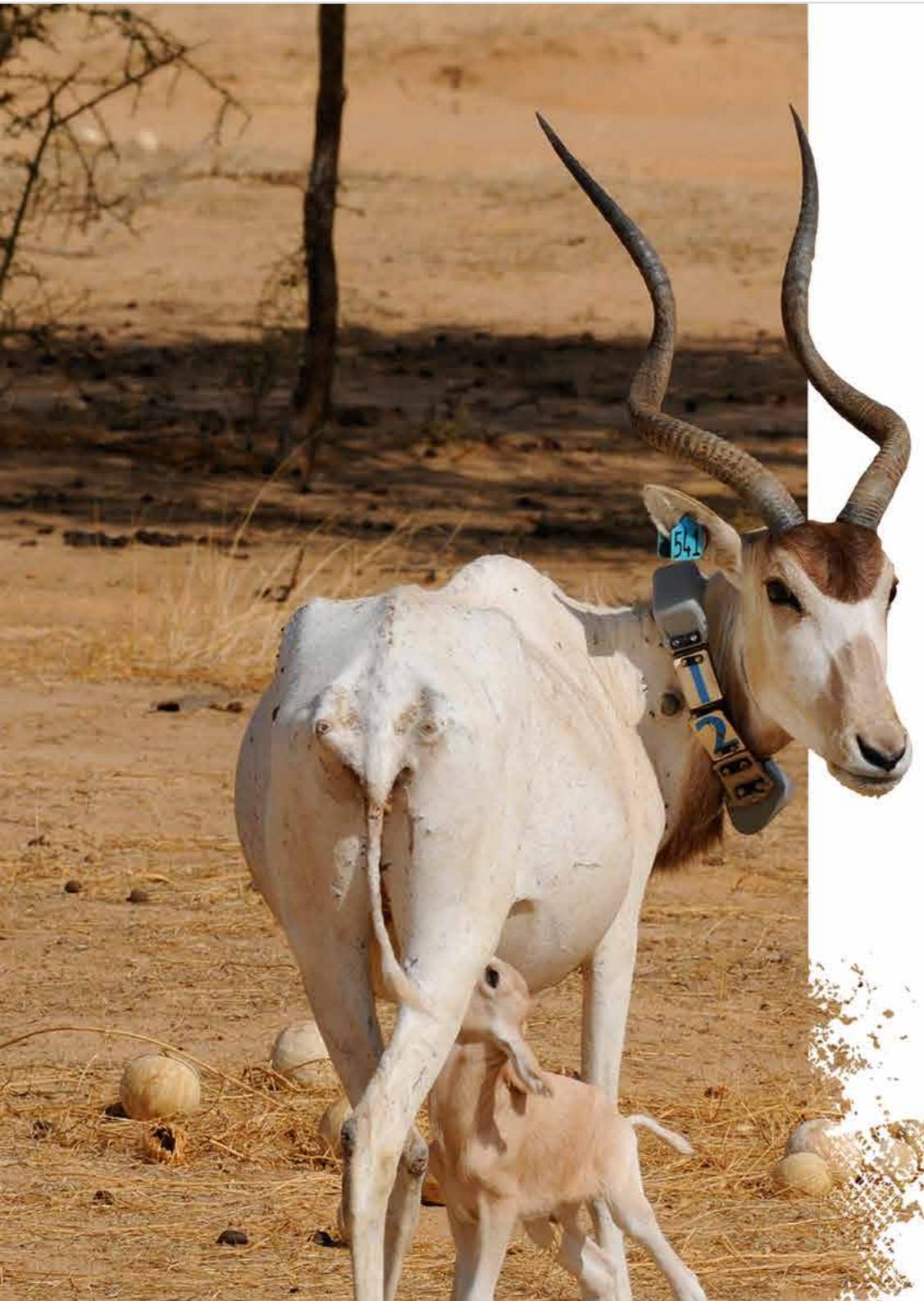
Newly discovered invertebrates species recorded for the first time in science, new in the UAE and in Abu Dhabi Emirate.



A new species in science, *Perilampus houbarensis* named after the Houbara Reserve from where it was collected.



Registration of a new taxon for the Pentatomid bug.



REHABILITATION OF ENDANGERED ANIMAL SPECIES THROUGH LOCAL AND INTERNATIONAL REINTRODUCTION INITIATIVES

Expanding the Reintroduction Programme in the Republic of Chad

Our Scimitar-horned Oryx (*Oryx dammah*) reintroduction programme witnessed a significant expansion in 2021, and now includes conservation and reintroduction programmes for several endangered species, which include Addax (*Addax nasomaculatus*) and Dama gazelles (*Nanger dama*).

Scimitar-horned Oryx Numbers in Chad



400

Total Scimitar-horned Oryx in 2021

- 70 new calves born
- 25 Oryx transported from Abu Dhabi Emirate to Chad

Addax Numbers in Chad



40

Addax released into wild in 2021

- 65 total Addax in 2021
- 15 new calves born
- 25 Addax transported from Abu Dhabi Emirate to Chad



Annual Report 2021 | Terrestrial Biodiversity



Scimitar-horned Oryx and Addax with tracking collars on their way to the reintroduction.



The cargo plane lands in the Republic of Chad.



Scimitar-horned Oryx and their young in the Ouadi-Rimé Ouadi-Hachim reserve.

Establishing a New Habitat for Arabian Oryx in the Houbara Reserve

Our Arabian Oryx (*Oryx leucoryx*) release programme began in the Houbara Reserve in the Al Dhafra region in 2021.



15

Arabian Oryx released at the end of 2020



100

Oryxes – aim for number of species to be released at the reserve



CONSERVATION AND REHABILITATION OF LOCAL PLANTS AND WILD NATURAL HABITATS

Management of the Native Plant Nursery

The Native Plant Nursery aims to propagate targeted local plants to be used across the various projects of EAD and our partners.



500,000

Seedlings produced in 2021



76

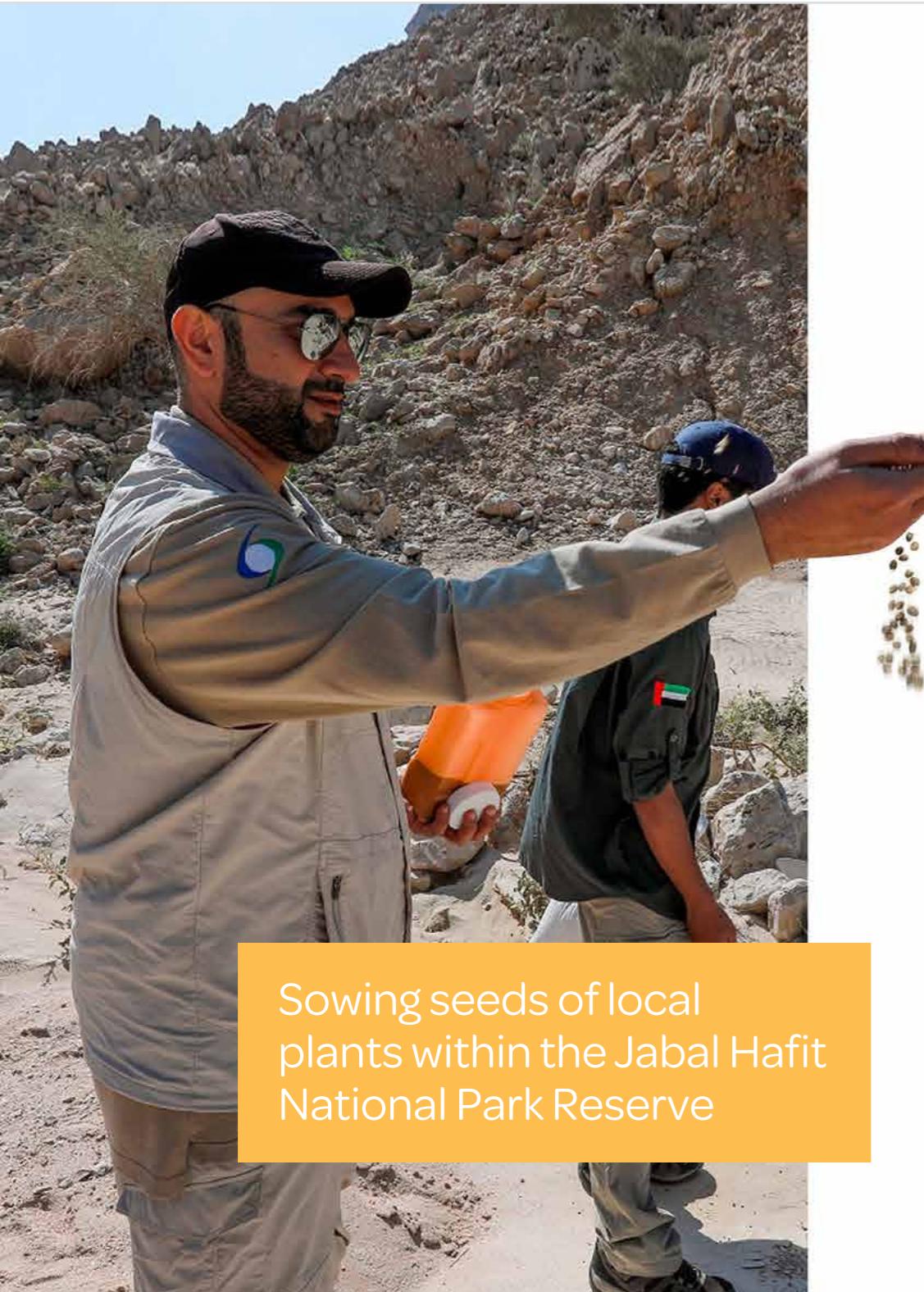
Different wild seed species

Recording Salam Shrubs

Classified as 'endangered', Salam shrubs were previously recorded just twice in Abu Dhabi Emirate. In 2021, around 200 Salam shrubs were sighted in two new sites within the Al Ain region.



The new site for recording the Salam shrubs, north of Sweihan.



Sowing seeds of local plants within the Jabal Hafit National Park Reserve

Rehabilitating Natural Habitats

We undertook a number of rehabilitation initiatives in 2021 for important habitats in different parts of the emirate:



17

Native plant species



3,000+

Plants cultivated
• 16 native plant species



1 million+

Seeds dispersed within 3 reserves:

- Arabian Oryx Reserve
- Jabal Hafit National Park
- Houbara Reserve



Seed dispersal by drone pilot project

- Ghaf trees
- Broom bush (Al Markh)



Rehabilitation of habitats in Bu Hassa by cultivating local plant species.



The dispersal of seed balls of local plants by drones.



Mapping the Distribution and Population of Natural Sage Trees in Abu Dhabi Emirate

Classified as 'endangered', natural sage trees (Samar trees) are considered one of the most important natural tree components in Abu Dhabi Emirate.



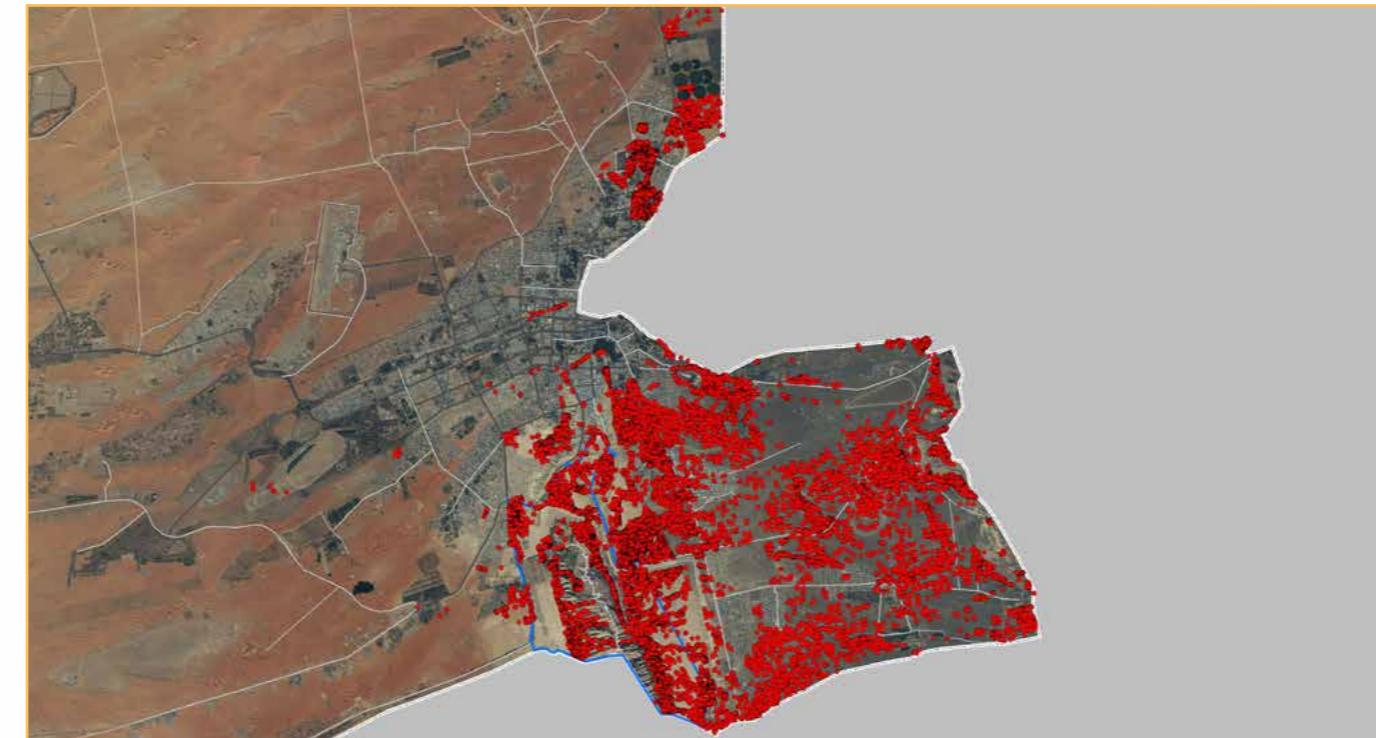
Map

High resolution map prepared



43,000

Samar trees recorded in Abu Dhabi Emirate



The first map of the distribution and number of Samar trees in the Emirate of Abu Dhabi.

MANAGEMENT OF TERRESTRIAL RESERVES, INFRASTRUCTURE AND MAINTENANCE

Counting Arabian Oryx Numbers

In 2020, we implemented the second comprehensive aerial survey programme for the Arabian Oryx Reserve.

~6,000 km²



5

Different study sections



8

Flights of 90 minutes



16

Total flying hours



946

Arabian oryx recorded



83

Calves (8.8 % of total herd size)



76.5 %

Females



A group photo of the aerial survey team.



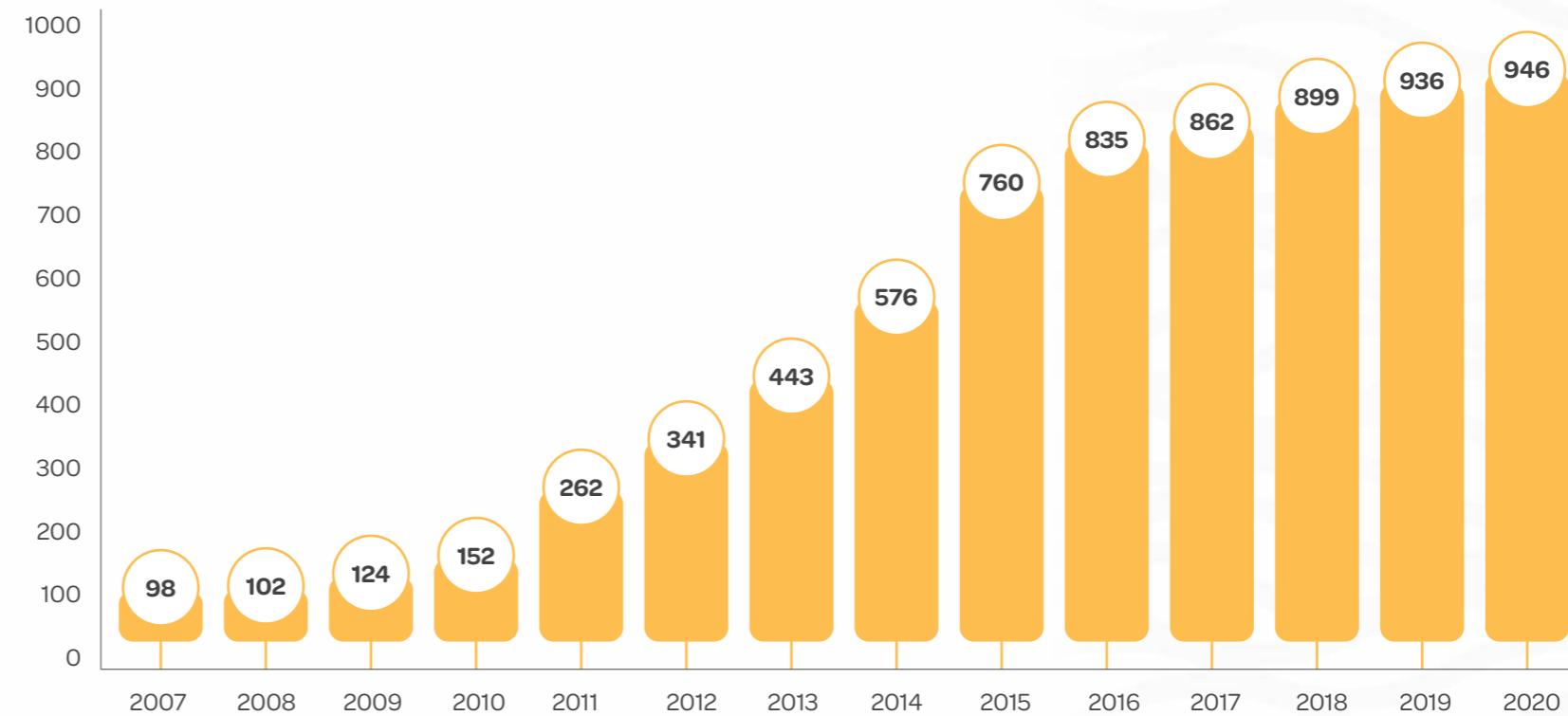


Diagram showing the main survey results.

Preserving Abu Dhabi Emirate's Natural Heritage and Encouraging Eco-Tourism at Al Wathba Fossil Dunes Reserve

In early 2021, we started implementing an integrated plan to develop and protect the fossil sand dunes site in the Al Wathba area. This included:



- Developing the infrastructure of the site
- Building service and tourism facilities
- Declaring the 7 km² site as a natural reserve



4,432

Hours of inspection tours



300 kg

Waste collected during 2 cleanup campaigns



Clean-up campaign in cooperation with the Green Youth Council



Al Wathba Fossil Dunes Development Plan



Perimeter fence building



Guide board for visitor areas



Fully-lit visitor path



Infrastructure construction (internal streets, health facilities, public service facilities, parking and food trucks)



The construction phases of the Al Wathba Fossil Dunes Reserve project.



Annual Report 2021 | Terrestrial Biodiversity

Record Visitor Numbers at Al Wathba Wetland Reserve in 2021



17,000

Visitors



64

Nationalities



300

Visitors
per day



142 %

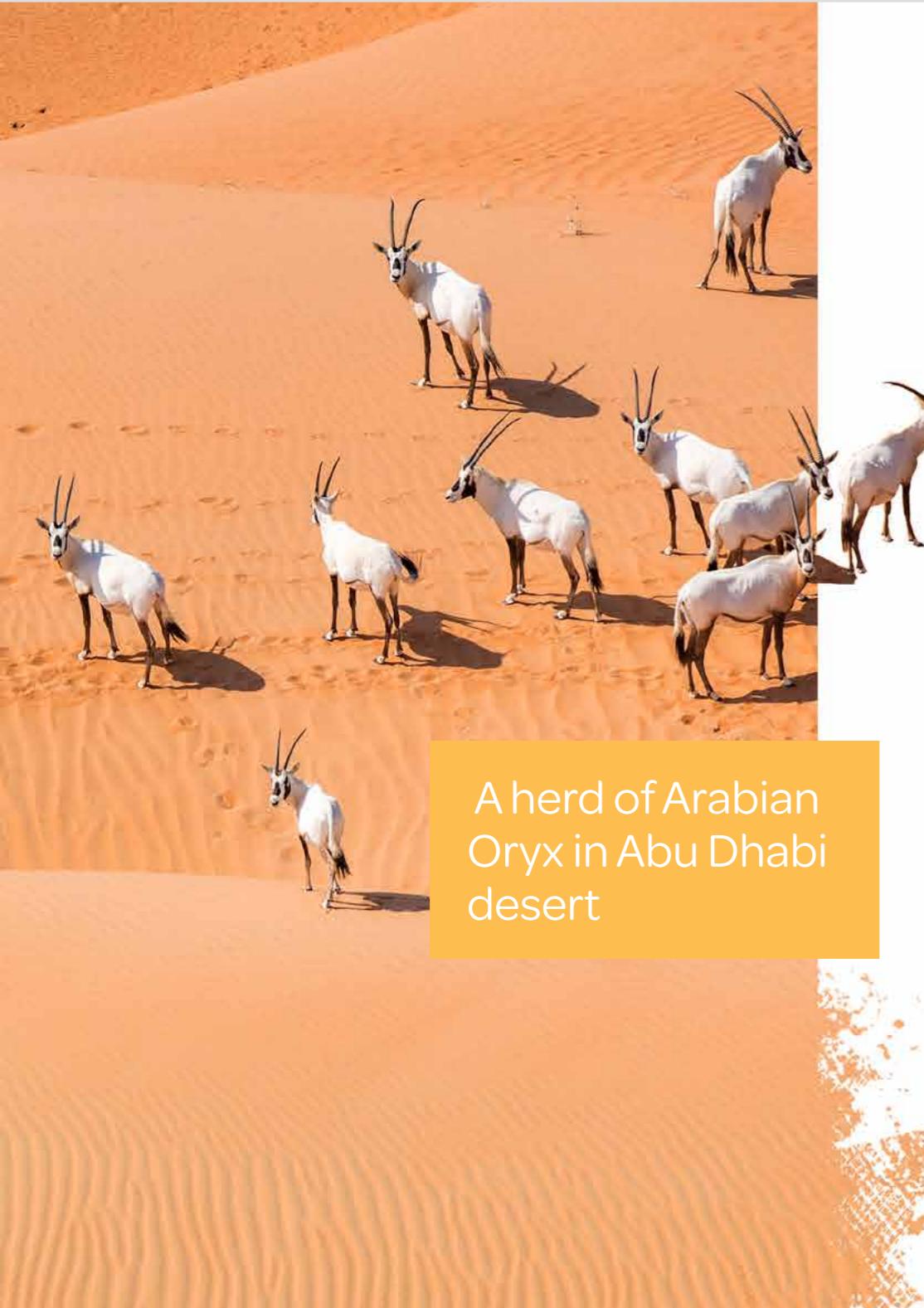
Increase
from 2020



A group of visitors at the site.



Visitor growth curve, 2014–2020.



TERRESTRIAL BIODIVERSITY POLICIES AND REGULATIONS

Achieving Sustainable Grazing in Abu Dhabi Emirate

In 2021, we developed the executive regulations of Law No. (11) of 2020 regarding the regulation of grazing in the Emirate of Abu Dhabi.

Aims



To achieve the sustainability of natural pastures in the emirate through scientific evaluation, field monitoring and community awareness

Conservation of the Arabian Oryx through Cooperation and Awareness

We supported the General Secretariat for the Conservation of the Arabian Oryx (GSCAO) in a virtual symposium, 'Managing the Health of Arabian Oryx Populations in the United Arab Emirates: National Successes and Aspirations'.

We also worked with GSCAO to carry out a regional survey of programmes for the release and reintroduction of Arabian Oryx in the natural reserves of the species' range states. This included:



- The UAE
- Saudi Arabia
- Oman
- Jordan



02 MARINE BIODIVERSITY

In 2021, we continued our crucial work in protecting Abu Dhabi Emirate's marine environment and tackling the challenges presented by climate change with the launch of some critical initiatives that will be at the forefront of our efforts to continue to conserve marine biodiversity in the Arabian Gulf, the hottest sea in the world.



NEW MARINE AND FISHERIES RESEARCH VESSEL

In 2021, we began building the Middle East's most advanced research vessel. This multipurpose marine conservation and fisheries vessel will use environment-friendly technologies to conduct specialist research in the Arabian Gulf.



50

Metre
vessel



30

Space for 30 crew
and scientists



10 m+

Depths of 10 m+
studied by new
vessel

Aims



Continue EAD's
research on
fisheries and
marine biodiversity



Enable EAD to
monitor and
conserve fish
stocks and marine
biodiversity



Inspire young
Emirati marine
scientists



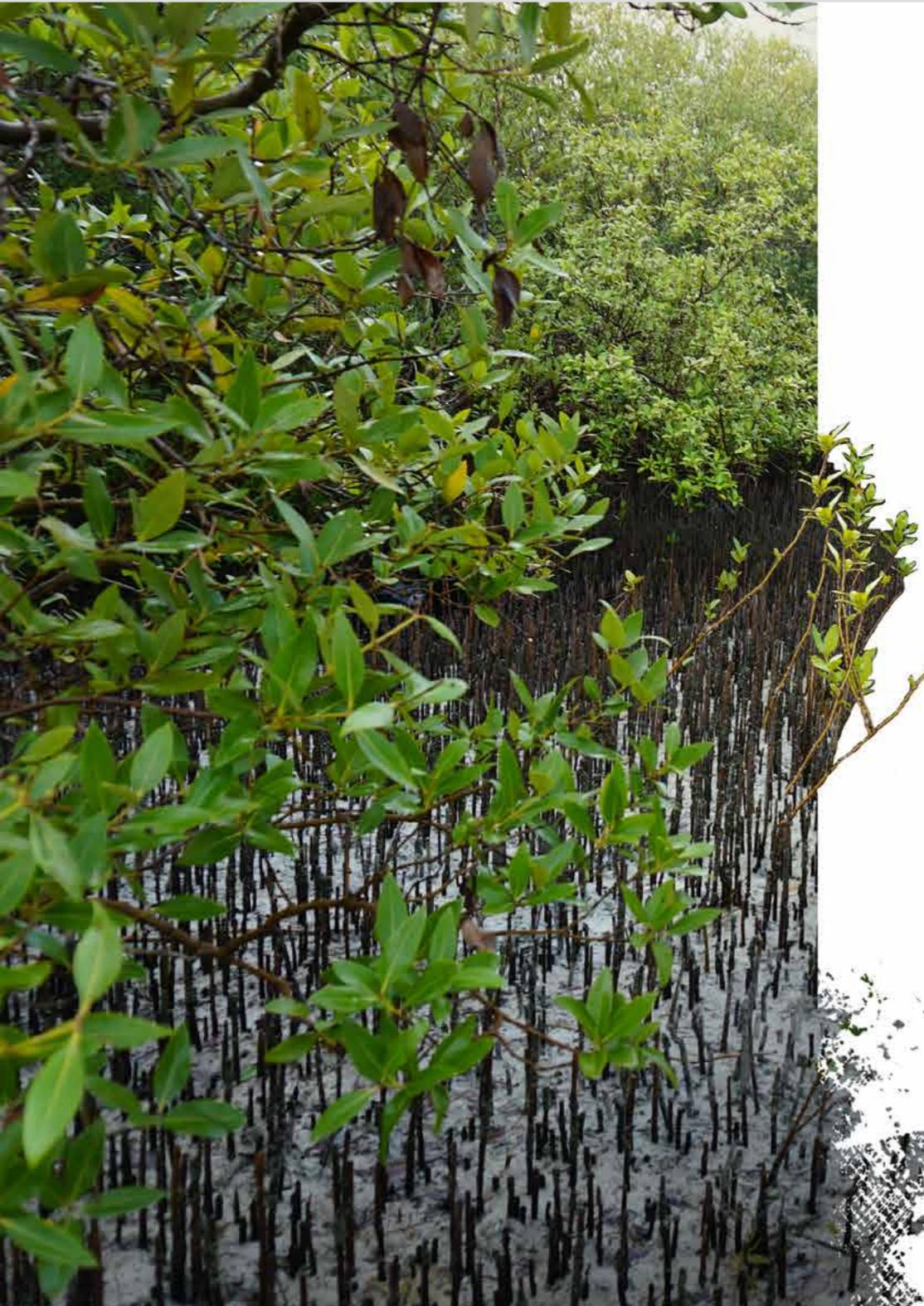
Pioneer
oceanographic and
fisheries research
in the UAE's largely
unstudied deeper
waters



Assess marine sites
and habitats from
an environmental
rehabilitation
perspective



Aid in devising
fisheries
management
strategies



REHABILITATION PROJECTS

Launch of Region's Largest Coral Rehabilitation Project

This project aims to increase the total reef coverage in the emirate's waters and reduce the negative impact of climate change on corals.



1 million

Reef colonies to
be cultured

Phase II of Mangrove Rehabilitation Project

A partnership with energy company Engie, the second phase of this Blue Carbon Environmental and Social Responsibility project uses drone planting technology to sow mangrove seeds.



2,000

Seeds sowed in the
Mirfa region of
Al Dhafra in 2020
• 25 % success
rate in 2020



10,000

Seeds sowed
with drone
technology
in 2021



35 %

Expected
success rate
in 2021



5 %

Typical
mangrove
survival rate
in nature



Largest Turtle Rehabilitation Release Completed

To celebrate World Sea Turtle Day in June 2021, we released rescued, rehabilitated turtles back into Abu Dhabi Emirate's waters at four different locations across the Emirate.



150

Turtles released
Species included:

- Hawksbill turtles
- Green turtles
- Loggerhead turtles



2005

Start of EAD turtle
rescue efforts



700+

Turtles rescued
since 2005

BIODIVERSITY MONITORING FINDINGS

Overall Improvement in Mangrove Condition

This project aims to increase the total reef coverage in the emirate's waters and reduce the negative impact of climate change on corals.



5

Sites
monitored



All sites in better overall health
in 2021, compared to 2019



128

Mature trees
tagged in 15 plots

Abu Al Abyad Island

- High number of active seedlings and crab abundance

Eastern Mangrove Park

- Highest growth rates

Jubail Island (planted area)

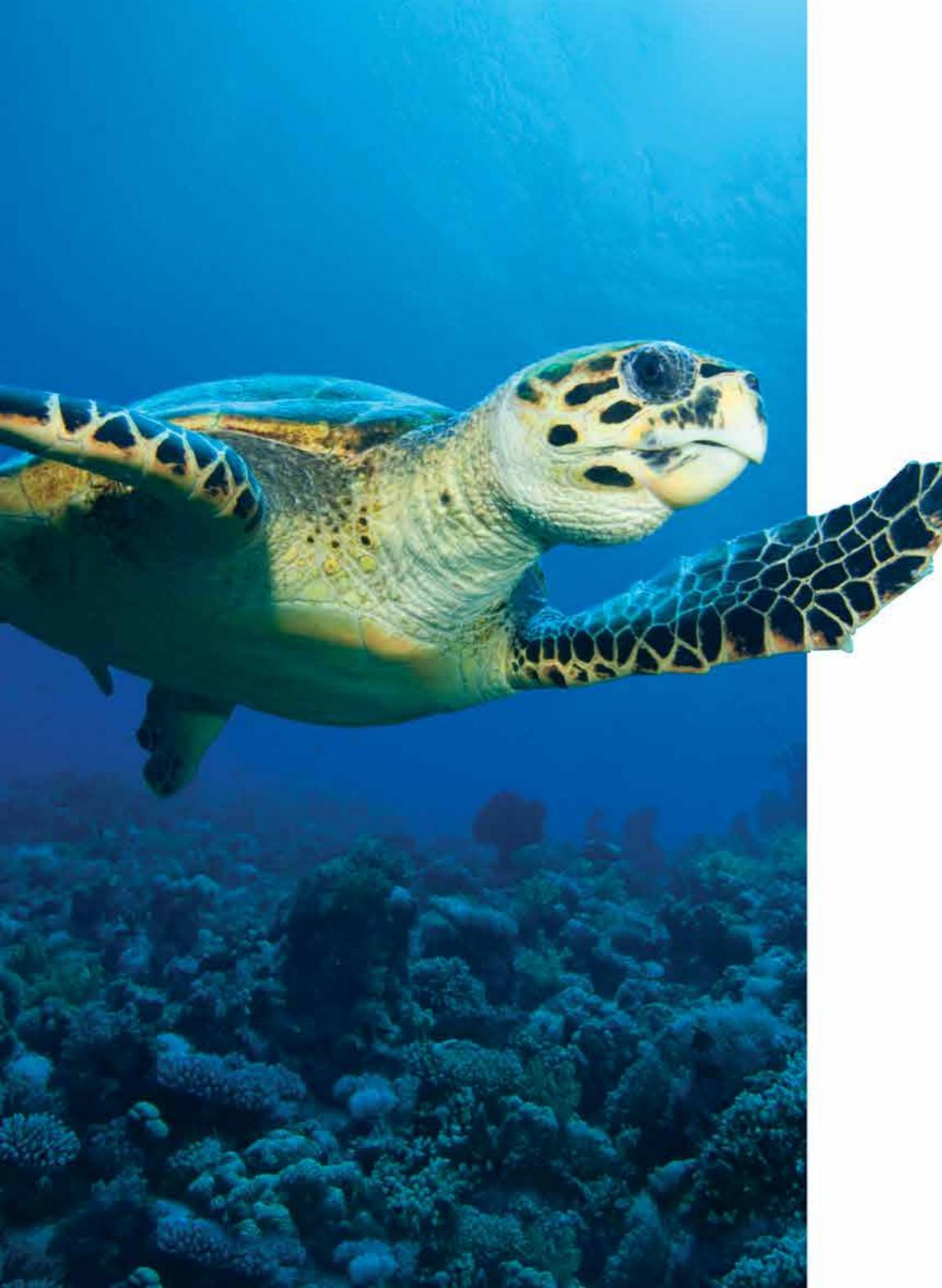
- Highest growth rates, highest increase in tree growth

Jubail Island (natural area)

- Highest growth rates

Ramhan Island

- Healthiest, high number of active seedlings and crab abundance



Nesting Hawksbill Turtles on Offshore Islands

2021 was a successful marine turtle nesting season, with a higher than usual number of nests. We also continued to experiment with the relocation of nests in areas prone to flooding, with the results showing that relocated nests produce healthier, heavier and longer hatchlings compared to the natural nests.

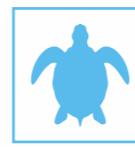


70

Nests recorded at Jarnain,
compared to 40 in 2020

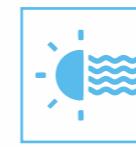
Adult Green Turtle Mass Mortality

A large-scale mortality of Green Turtles was observed in summer 2021 when sea surface temperatures in Abu Dhabi Emirate reached an all-time high of between 37 °C and 38 °C for two weeks.



250

Adult Green Turtles
reported dead



Heat stress

Primary cause
of mortality

Sea Snakes on Abu Dhabi City Beaches

When sea surface temperatures cooled from their summer peak, there was an incidence of sea snake strandings on Abu Dhabi City beaches. We initiated a public awareness campaign to alert residents.



62

Sea snakes
reported



Snakes

Rescued and released
into deeper water



Establishing the Preferred Substrate of Seagrass Species

We revised our seagrass survey and monitoring sites to collect seasonal data on species composition distribution along the depth gradient.



64.4 %

Halodule uninervis – 64.4 % cover (dominant species, observed in all sediments and depth ranges)



13.6 %

Halophila ovalis – 13.6 % cover (sparse, preferring sandy substratum and deep water)



11 %

Halophila stipulacea – 11 % cover (grows at 2 to 8 metres, limited to substratum with organics)



11 %

Marine algae, dominated by *Sargassum* spp. – 11 % cover of the total biomass of seagrass meadows post-winter

The results show a steep increase during the last few years, largely attributed to the improved conditions of exploited stocks, coupled with the changes in fishing patterns

FISH STOCKS IN ABU DHABI EMIRATE

Fish Stock Recovery

(*2021 figures not available at time of publication)

Spawning Biomass per Recruit (SBR)

Definition: Indicates the percentage of fish old enough to spawn, allowing for renewal of stock.



14.1 % to 25.6 %

Overall mean SBR from
2017–2020

- 81% increase



SBR

is expected to continually increase if current commercial fishing policies remain in place

While the SBR score is still below the limit reference point of 30 %, during the last two years the KPI had shown a dramatic increase, forecasting good potential for future improvements in fish stock conditions.

Sustainable Exploitation Index (SEI)

Definition: The trend in the proportion of the catch volume of sustainably exploited species against the total volume of assessed species landed in Abu Dhabi Emirate.



SEI

- 8.4 % – 2017
- 5.7 % – 2018
- 29.3 % – 2019
- 57.1 % – 2020
- 70 % – 2030 target

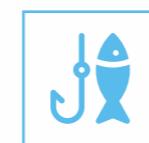


SEI Value

The SEI Value increase is a result of the current managerial restrictions and fisheries policies

Monitoring Fish Stocks at Landing Sites

Our 2020 figures provide a good indication for monitoring the changes in fish stock as a result of the implemented regulations, particularly the gargoor and ghazel net regulations.



Active, Licensed Fishing Vessels in Abu Dhabi Emirate, 2020

- 9 Lansh
- 583 Tarad



Commercial Fish Landing Figures for Abu Dhabi Emirate, 2020

- 1,267 tonnes of fish commercially landed, 2020
- 2,230 tonnes of fish commercially landed, 2019
- 57 % year-on-year decrease



Major landing sites

- Free Port (707 tonnes)
- Al Sader (220 tonnes)
- Al Marfa (192 tonnes)
- Delma Island (121 tonnes)
- Al Silaa (27 tonnes)
- Tarad-Hadaq (672 tonnes)



52 %

Year-on-year decrease



AED 24.4 million

Total commercial value generated in 2020



AED 46.9 million

Total commercial value generated in 2019



Aquaculture in Abu Dhabi: 2020



4

Licensed projects
for aquaculture



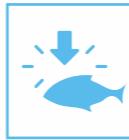
Approx.
AED 19.8 million

Value of aquaculture
production



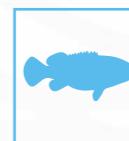
521

Tonnes of aquatic
organisms produced
in 2020



41%

of aquaculture farm
production versus fish
landings



Grouper - one of the
main productive species

- 240 tonnes produced
(double 2017 and
2018 figures)
- 35 % greater than
volume produced by
fisheries in 2020

First Freshwater Oysters Cultivated

In 2021, we launched the region's first freshwater oyster project.



10,000

Oysters –
production
goal by 2024



Increased Compliance with Environmental Laws



17,444

Hours of monitoring



175

Violations issued

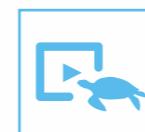


46.2%

Decrease in violations from baseline estimated in 2020

OTHER 2021 ACHIEVEMENTS

Nature documentary *Wild Abu Dhabi: The Turtles of Al Dhafra* premiered in Dubai, showcasing the work of EAD scientists.



Finalist in the New York Festivals TV and Film Awards



Screening in 25 countries (~60 million households)

Fisheries documentary, *Our Sea; Our Future*, released.



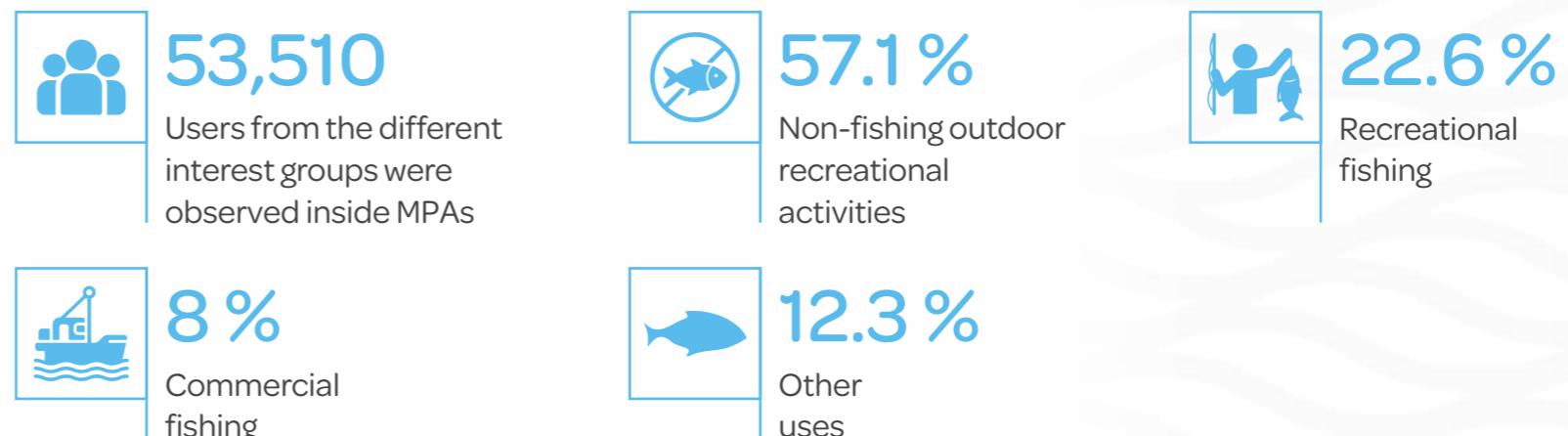
Highlights the role and the status of fisheries in Abu Dhabi Emirate's cultural heritage



Broadcast on Abu Dhabi and Al Emaraat television channels

Increased Direct-Use Benefits from Marine Protected Areas (MPAs)

In 2021, there was a growing demand for ecosystem goods and services from the MPAs, indicating the importance of the ecosystems services they provide in enhancing the well-being and prosperity of residents of Abu Dhabi Emirate.

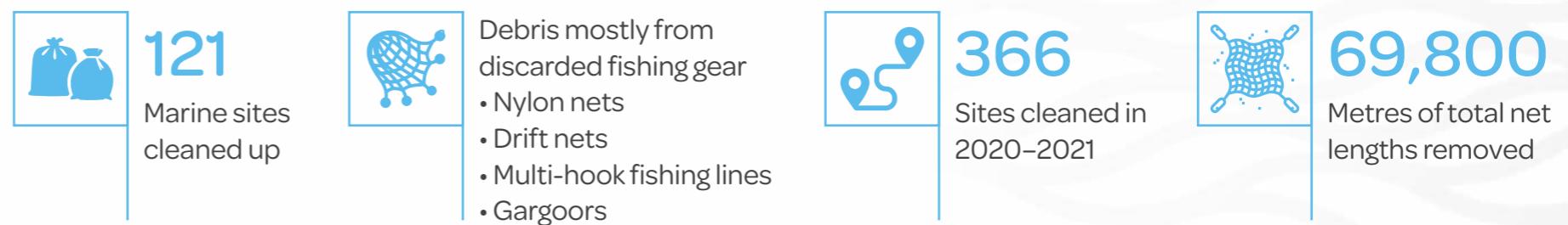


Supporting Bird Reproduction on Offshore Islands

In cooperation with the Abu Dhabi National Oil Company (ADNOC), we installed artificial nests to support Osprey reproduction on the islands in Al Dhafra Region.



Dangerous Marine Debris Removed Within MPAs





03 GROUNDWATER

Groundwater in Abu Dhabi Emirate is non-renewable and it is vital that we protect this natural resource. In 2021, we continued our efforts to monitor groundwater usage in the emirate, as well as launch new initiatives to assess the long-term sustainability of Abu Dhabi Emirate's deep groundwater aquifers.



GROUNDWATER MONITORING PROGRAMME

Groundwater Level Monitoring Network



441

Monitoring wells



1,100+

Visits



Measuring the water level at a monitoring well.

Monitoring Network Maintenance

Ongoing maintenance of the groundwater level network included external well maintenance, and maintenance of automated monitoring devices.



110

Monitoring wells externally maintained

- Protective fences erected with signage
- Reinforced plinths around a new well head
- Surrounding areas stabilised



48

Automated devices monitored
• 94 % efficiency maintained



A newly maintained monitoring well.



Groundwater Quality Monitoring Network

In 2021, we initiated a new Trend Assessment of Groundwater Quality, which will collect 188 groundwater samples from predefined wells.

Aims



Study changes in groundwater quality compared to 2018 baseline data



Assess potential contamination and develop relevant remediation plan



Conduct an intensive case study for an observed contamination



Groundwater sample collection.



Groundwater samples.

GROUNDWATER ASSESSMENT AND DEVELOPMENT PROGRAMME

Hydrogeological Mapping of the United Arab Emirates



45 %

of project completed



80 %

of field investigations completed



1st 1:100,000

Scale map sheets of Northern Emirates completed

Comprehensive Assessment of Deep Groundwater Resources in Abu Dhabi Emirate

This integrated qualitative and quantitative assessment aims to determine the sustainable development and resource utilisation potential of Abu Dhabi Emirate's deep groundwater aquifers.



55 %

of project completed



2

Exploration wells completed in Al Ain Region



2

Key reports submitted

- Inception report
- Selection of deep drilling location report



Deep groundwater well drilling.





Annual Report 2021 | Groundwater

Makhzan Al Khair (Strategic Freshwater Reserve in Liwa)

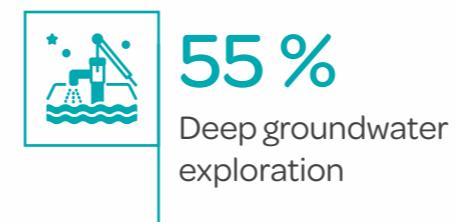
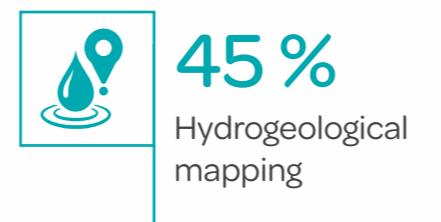
Makhzan Al Khair, a shallow aquifer north of Liwa, is the largest groundwater storage project of its kind, serving as a strategic reserve for Abu Dhabi Emirate.



Harnessing Artificial Intelligence at Makhzan Al Khair

In 2021, we developed a system that uses artificial intelligence to control the automatic selection of pumping wells for each basin, based on salinity limits.

Achievements



The Makhzan Al Khair Artificial Intelligence Project was featured in the 2nd edition of the Government Innovation Report of the Mohammed bin Rashid Center for Government Innovation



GROUNDWATER RESEARCH AND DEVELOPMENT PROGRAMME

Integrated Management Plan in the Emirate of Abu Dhabi

In 2021, EAD and our relevant partners launched the integrated management plan for water resources in the Emirate of Abu Dhabi, which aims to achieve sustainability of the emirate's water resources, including economic feasibility and capital investments.



55

Initiatives,
projects and
programmes



10

Year time
frame for
completion

Numerical Model of the Makhzan Al Khair Aquifer

During 2021, we finalised our project to develop a numerical model to simulate groundwater movement at Makhzan Al Khair, in order to test the project's operational scenarios.

First database of project wells and aquifer layers complete.



315

Production
wells



111

Monitoring
wells



Salt Leachate Project

This four-year PhD study investigates drainage and leachate losses from a modular farm growing a range of food (Salicornia and Quinoa) and fodder (Blue Pannicum) crops irrigated with reject brine.

OBJECTIVE: Investigate the implications of using reject brine for food and forage production and to assess the impacts on the receiving environment.



35 %

of project completed



Salicornia
grown under
3 irrigation
treatments

GROUNDWATER REGULATIONS PROGRAMME

Resolution on the Protection of Groundwater from Contamination

In 2021, we developed a draft resolution to protect groundwater quality and quantities, in line with the requirements of Abu Dhabi Law No. (5) of 2016 for the management of groundwater resources in the emirate. EAD will ensure proper implementation of the resolution through the following activities:



Continuous
monitoring



Permitting



Enforcement



Inspection

The resolution provides EAD with a legal tool that strengthens the regulatory and supervisory role of EAD, and supports the mechanism for addressing activities and actions that negatively impact groundwater resources, taking into consideration the extensive and comprehensive list of violations and fines stated in the mentioned Law that is related to the protection of groundwater from contamination, the values of these vary from AED 5000 to AED 100,000.



04 AIR QUALITY

Throughout 2021, we further expanded our monitoring programme to protect and enhance the air quality in Abu Dhabi Emirate. We also engaged with local institutions and international partners to increase our understanding of air quality pollutants and develop our monitoring and measurement strategies.



The main concerns are high concentrations of particulate matter and ground-level ozone

COMPREHENSIVE AIR QUALITY MONITORING NETWORK

Our air quality monitoring network is centred around an accredited calibration laboratory, which underpins its quality assurance, control measures and procedures, resulting in high data quality.



20

Fixed stations monitor air quality per minute

- High capture rate
- 99 % data accuracy



2

Mobile stations, used to conduct 3 air quality studies at 3 sites



7,075

Visits from UAE and 75 other countries

Data broadcast through www.adairquality.ae



275

Parameters measured

- 244.5 million minute-data points provided annually
- 1.2 billion valid data points in database
- Data provided to 70+ activities
- 30 % year-on-year increase



Air quality monitoring station .

2021 Achievements



Completed the 2020 Annual Ambient Air Quality in Abu Dhabi report

Results: Natural and man-made activities are the main contributors to the air quality in Abu Dhabi. During 2020 and 2021, large improvements on air quality were observed and recorded due to the COVID-19 preventive measures and the subsequent reduction of man-made emissions



Collaborated with local partners, which included:

- Department of Health/Abu Dhabi Public Health Centre universities on a collaborative study to link air quality pollutants to cases of COVID-19 in Abu Dhabi Emirate
- ADNOC to develop the Air Emission Monitoring and Measurement Strategy for Air Pollutants in ADNOC Group Companies, for emissions from the oil and gas sector
- Abu Dhabi Ports and Emirates Global Aluminium to electronically link their ambient air quality monitoring networks with EAD's monitoring system



Undertook the Fine Particle Sampling and Source Identification in Abu Dhabi (PM_{2.5} Study), a major milestone for EAD and the UAE



Approved proposed operational plan for the PM_{2.5} Programme in the Emirate of Abu Dhabi, facilitating the expansion of PM_{2.5} monitoring and management activities



Engaged with international partners, which included:

- Publishing the scientific paper, "The Impact of COVID-19 Pandemic Preventive Measures on Air Quality in Abu Dhabi", in Springer Nature
- Partnering with the World Health Organization (WHO) to join the Global Air Pollution and Health Technical Advisory Group (GAPH-TAG)
- Participating in the 4th International Conference on Atmospheric Dust 2021



Provides reliable scientific basis for the development of air quality management plans



Contributes to the understanding of the regional phenomenon of sand and dust storms, and the ability to forecast air quality

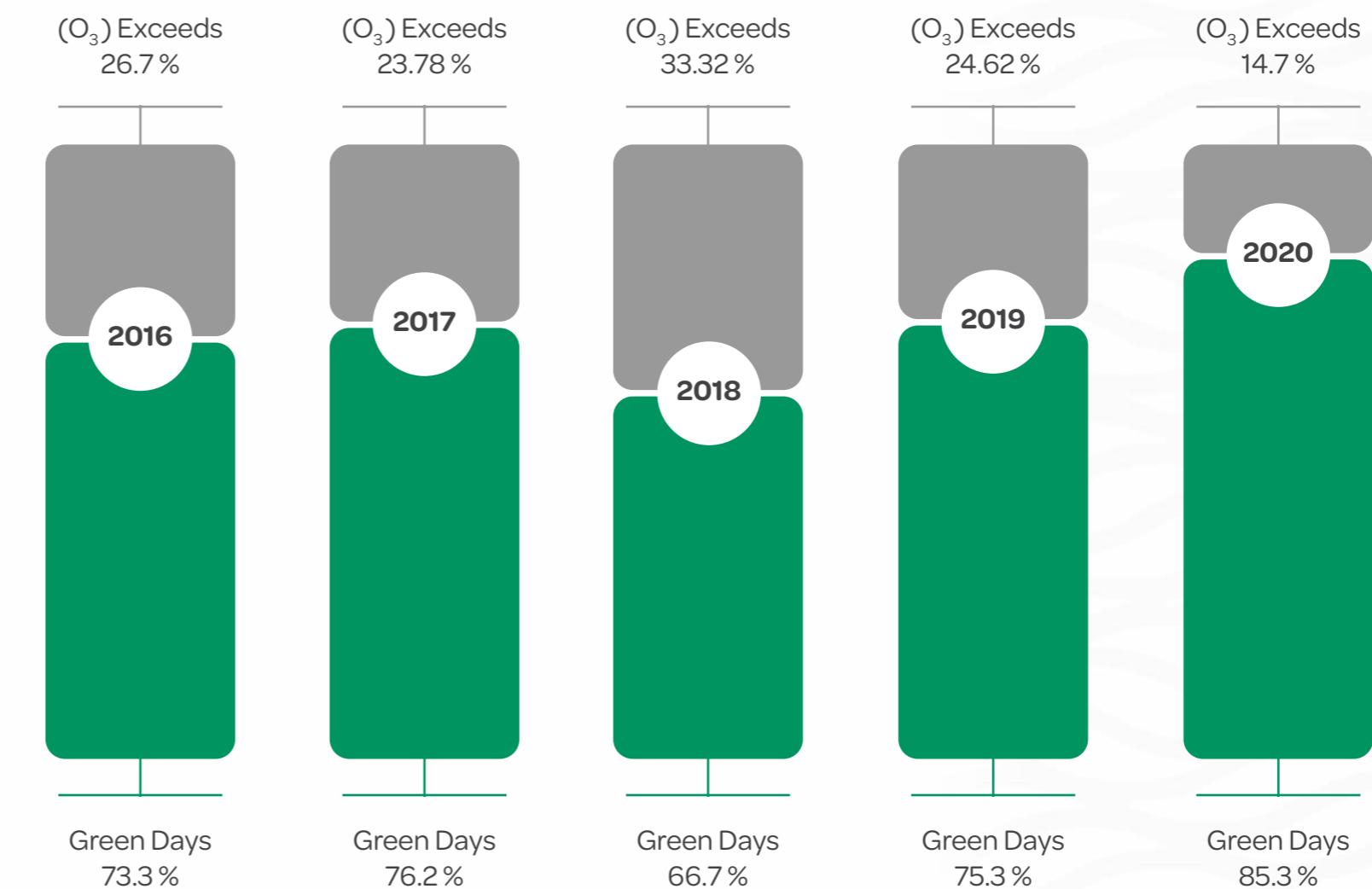




Annual Report 2021 | Air Quality

This indicator measures the days when emissions of sulfur dioxide, ground ozone, nitrogen dioxide and carbon monoxide do not exceed federal limits.

(Note that the 10 % improvement in 2020 is related to COVID-19 precautionary measures).





05 CLIMATE CHANGE

Climate change has been one of our main priorities since the very beginning. Throughout 2021, we have continued our efforts to deepen our knowledge to mitigate and adapt to the impacts of climate change, working across a variety of projects to establish Abu Dhabi Emirate as a leader in this area.



ABU DHABI GREENHOUSE GAS (GHG) INVENTORIES

Our GHG inventories in Abu Dhabi enable the development of emirate-level climate policies and support the UAE federal government in fulfilling its commitments to the United Nations Framework Convention on Climate Change (UNFCCC).

Abu Dhabi Emirate GHG Inventory 4th Cycle, 2021

Aims



Update
2018 GHG
Inventory



Assess future
emissions levels
up to 2030

Emissions Targeted



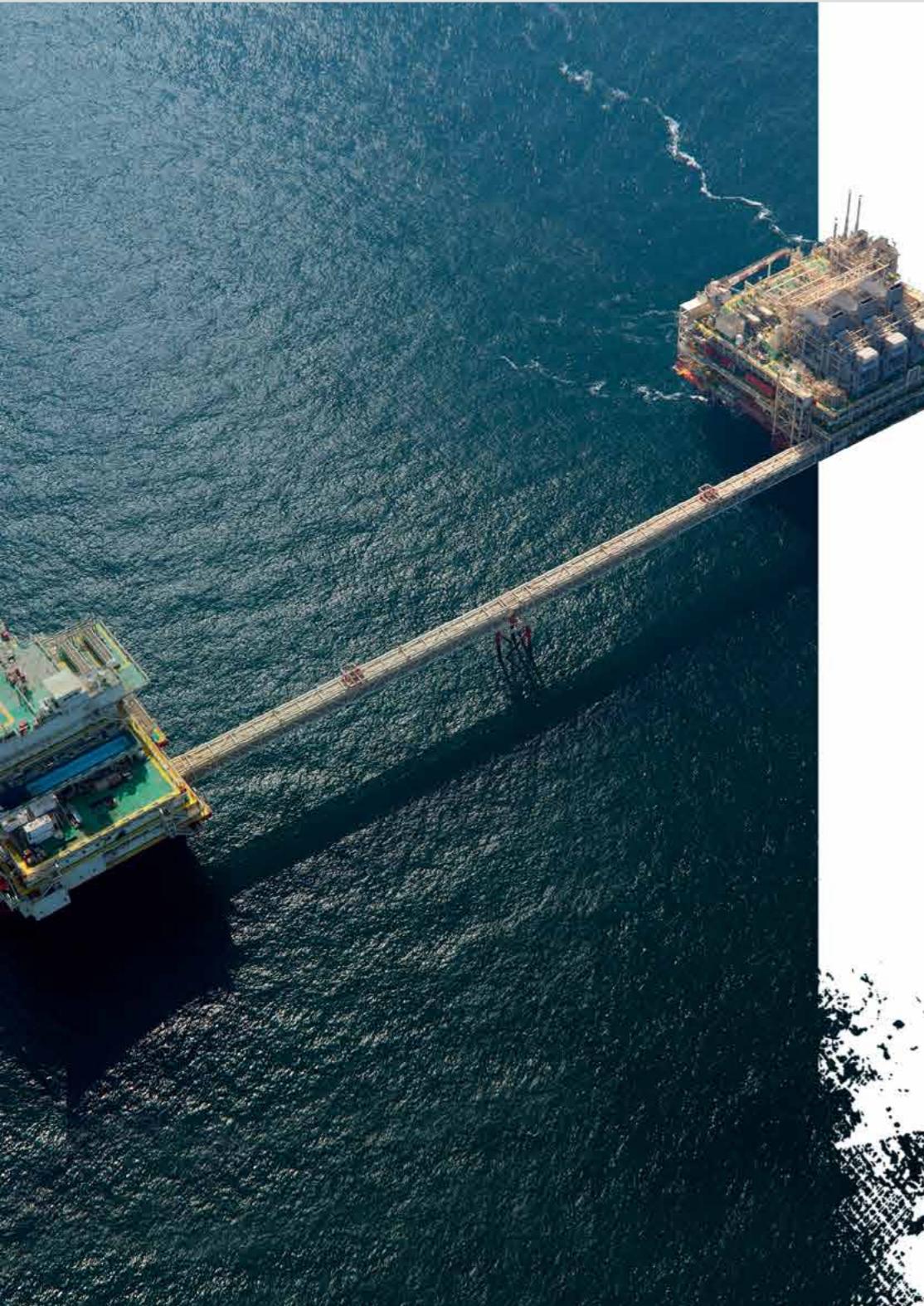
CO₂, CH₄, N₂O,
HFCs, PFCs, SF₆
(primary gases
that directly
contribute to
global warming)



CO, NOx,
NMVOCs, SO₂
(precursors
and indirect
emissions)



Anthropogenic
black carbon
emissions



4th Cycle Data



120,405

Gg CO₂-eq - total anthropogenic GHG emissions in Abu Dhabi Emirate in 2018
• 11% reduction from 2016



6 %

Reduction in CO₂ *per capita* (compared to 2016)



75.9 %

of GHG emissions from energy sector



89.8 %

of total GHG emissions were CO₂



5.5 %

Total CO₂ emissions sequestered by Abu Dhabi Emirate's natural sinks

Emissions projections for 2030



35 %

Reduction in CO₂ *per capita* (compared to 2016)



Significant related public health benefits:

- 839 premature deaths avoided
- 11,700 health facility visits avoided

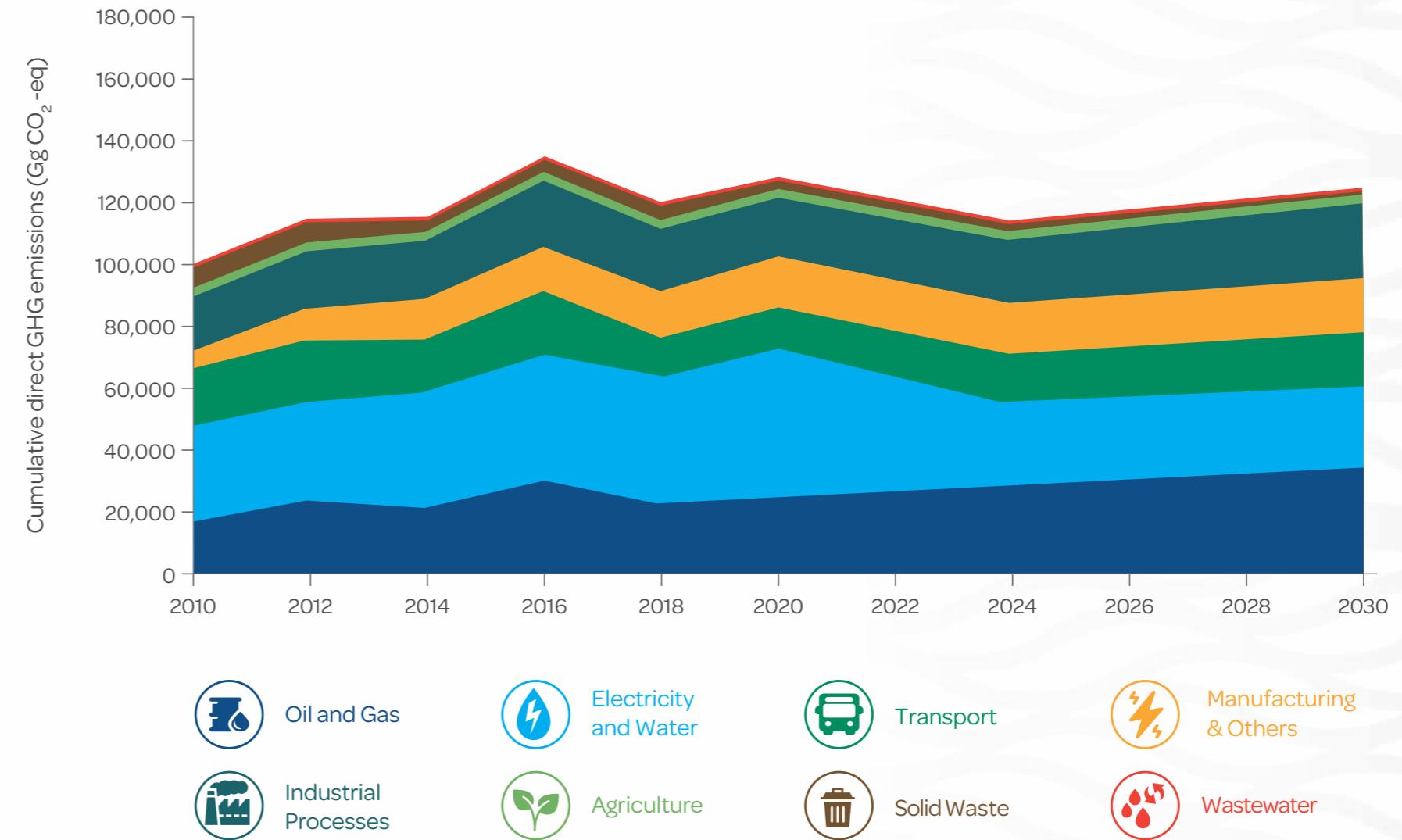


US\$ 12.5–15.8

Billion saved in costs of damage to the environment



Annual Report 2021 | Climate Change

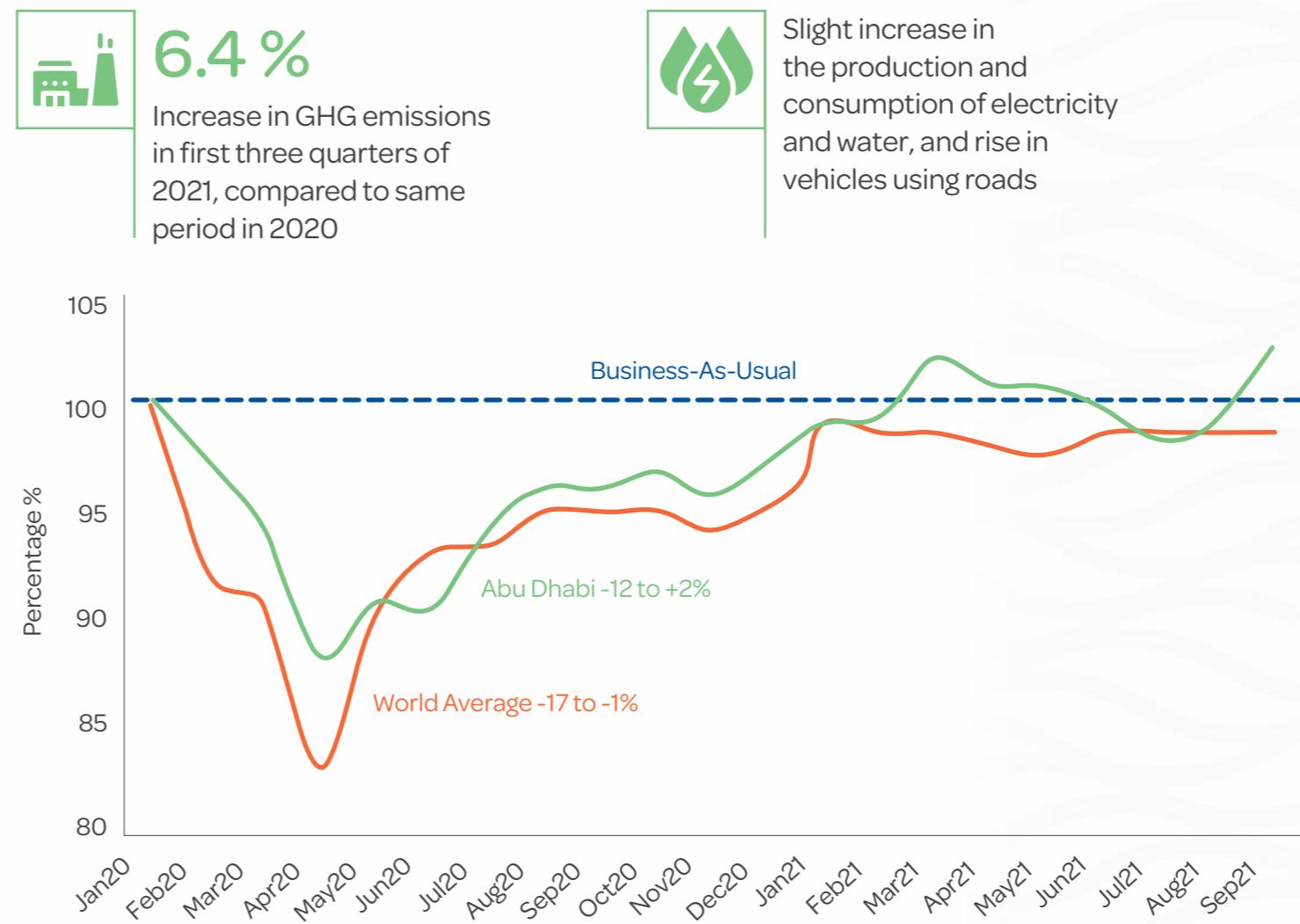


Projected GHG Emissions for Abu Dhabi Emirate According to Mitigation Path (2030).



CLIMATE CHANGE AND COVID-19

Alongside our partners, we studied the impact of governmental precautionary measures to prevent the spread of Covid-19 on climate change in Abu Dhabi Emirate, linking this to the global impacts of the pandemic.



GHG emissions changes due to COVID-19, in Abu Dhabi Emirate and globally.



STRENGTHENING THE EAD TRANSPARENCY FRAMEWORK

In 2021, our climate change priority team participated in four specialised training programmes organised by the United Nations Framework Convention on Climate Change (UNFCCC).

Aim



To strengthen EAD's transparency framework under the Paris Agreement on climate action

ABU DHABI CLIMATE CHANGE TASKFORCE

With members from 26 entities, this taskforce was created to strengthen cooperation and coordinate local efforts to mitigate and adapt to climate change to achieve the UAE's climate change goals.

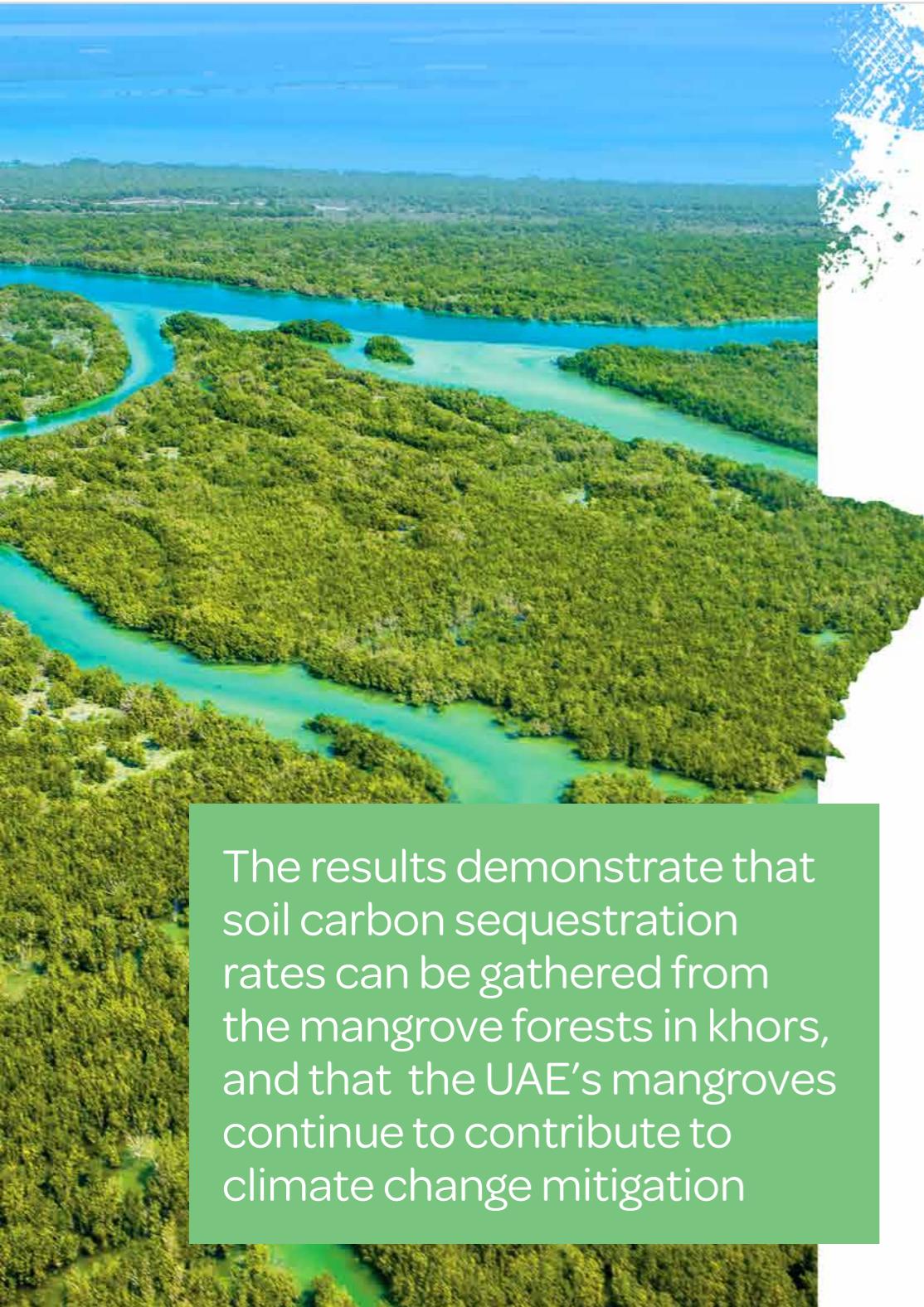
2021 Achievements



Consulted on Abu Dhabi climate change policy



Evaluated an invitation to join the 'Race to Zero' by the Abu Dhabi Executive Office, recognising 53 current initiatives related to climate change mitigation and adaptation



The results demonstrate that soil carbon sequestration rates can be gathered from the mangrove forests in khors, and that the UAE's mangroves continue to contribute to climate change mitigation

AGEDI UAE MANGROVES CARBON SEQUESTRATION PROJECT

A follow-up project to the National Blue Carbon Project, this aims to improve our understanding of carbon storage and the other services that coastal and marine blue carbon ecosystems provide across the UAE.

5 khors (swampy depressions) sampled



- Eastern Mangroves, Abu Dhabi
- Ras Al Khor, Dubai
- Khor Ras Al Khaimah, Ras Al Khaimah
- Khor Hulaylah, Ras Al Khaimah
- Khor Kalba, Sharjah

Carbon sequestration rates from UAE mangroves



8.63 to 111.38 g

Organic carbon m-2 yr-1



57.67 g

Average organic carbon m-2 yr-1

The carbon that is sequestered by mangroves supports many ecosystem services. These include:



Soil carbon, which helps maintain mangroves against sea level rise



Carbon flows from plants and soils supports the food chain of birds, fish and mammals found in mangroves and nearby coastal waters

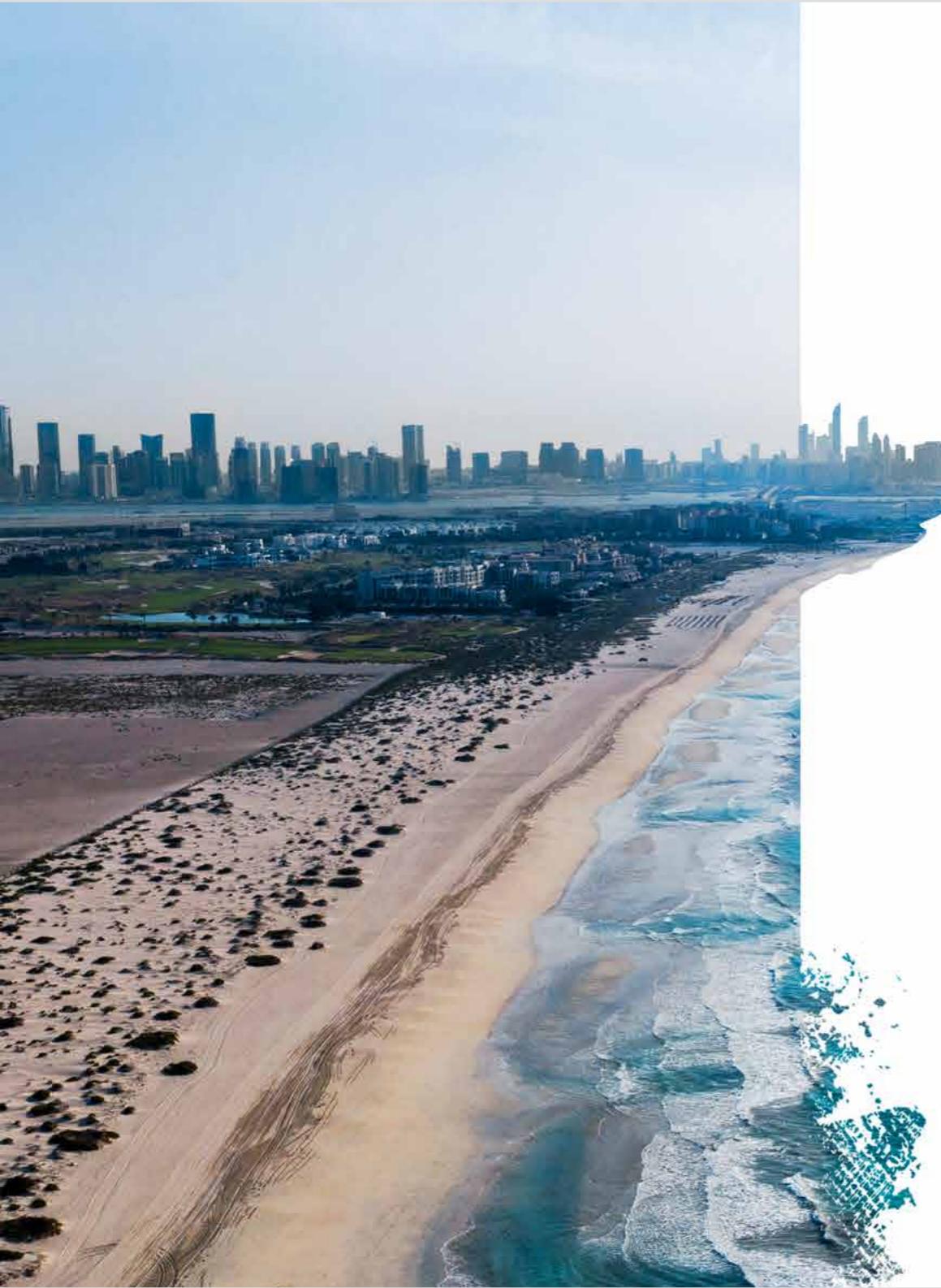


Mangrove forests provide a critical habitat for many marine species



06 MARINE WATER QUALITY

The main goal of our marine water quality (MWQ) monitoring programme is to assess and monitor existing and potential MWQ threats related to biodiversity and public health, in order to develop measures that ensure Abu Dhabi Emirate's coastal waters are safe and healthy for people, plants and animals.



LONG-TERM MARINE WATER QUALITY MONITORING



22

Collection sites for
water and sediment
samples



28

Marine
water quality
parameters



11

Marine
sediment quality
parameters

2021 Results



Marine water quality
in Abu Dhabi Emirate
is generally good



Recreational
waters meet
public health
criteria



Confined areas
around Abu Dhabi
island affected
by anthropogenic
activities



Increase in recorded
harmful algal bloom
(HAB) incidents,
compared to 2020



Increase in
recorded fish kill
cases, compared
to 2020
• 7 fish kill cases
investigated



38.24 °C
Maximum
temperature
recorded during
marine heat wave



7 key MWQ parameters measured every 15 minutes, with data transmitted to EAD every hour



Sediment sample collection.

MARINE WATER QUALITY AUTOMATION PROGRAMME

Our buoy network of 10 stations continuously monitors MWQ at sensitive sites along Abu Dhabi Emirate's coast. These data buoys serve as an early warning system for HAB incidents and provide data for MWQ modelling.



An MWQ buoy.

Monitoring sites



- Confined areas
- Beaches
- Critical marine habitats (coral reef, seagrass, mangroves)
- Newly developed areas
- Nuclear power plant area



MONITORING HAB AND RED TIDE INCIDENTS



14

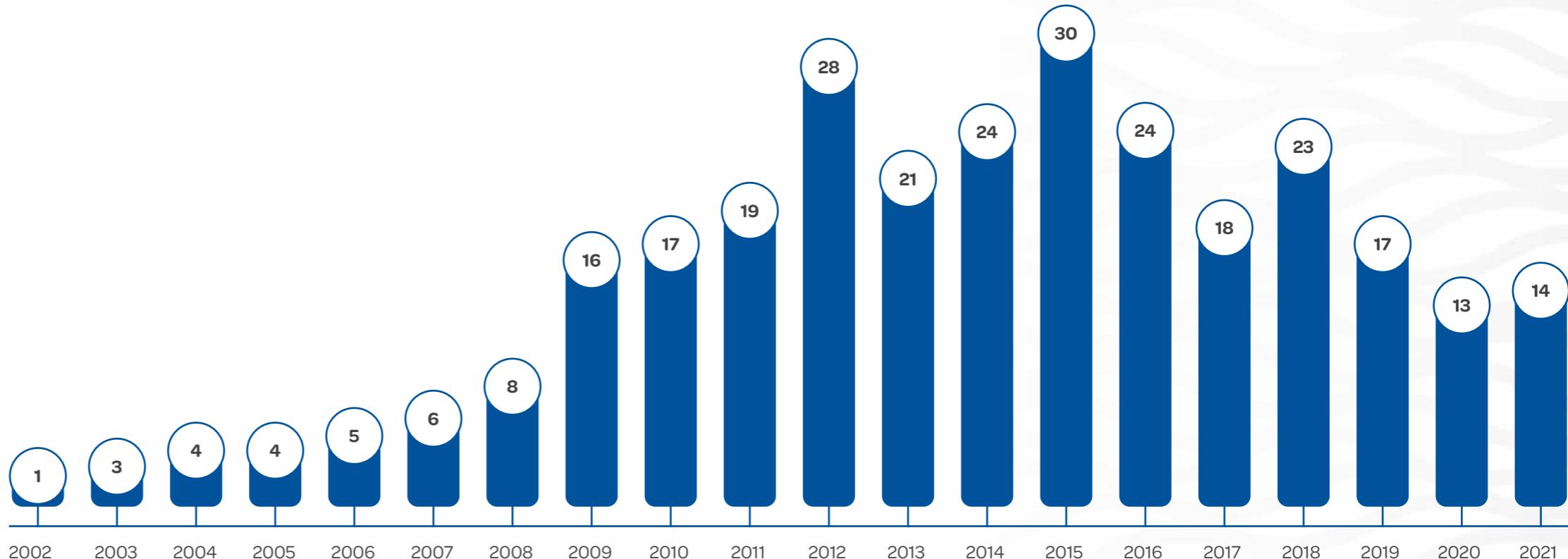
HAB incidents investigated in 2021



Most incidents recorded in confined areas



Most incidents caused by cyanobacteria



HAB incidents in Abu Dhabi Emirate, 2002–2021.



HYDRODYNAMICS AND WATER QUALITY (HWQ) MODELLING

Aims



Establish a fully validated HWQ model of Abu Dhabi Emirate's territorial waters



Develop internal capacity and expertise within EAD

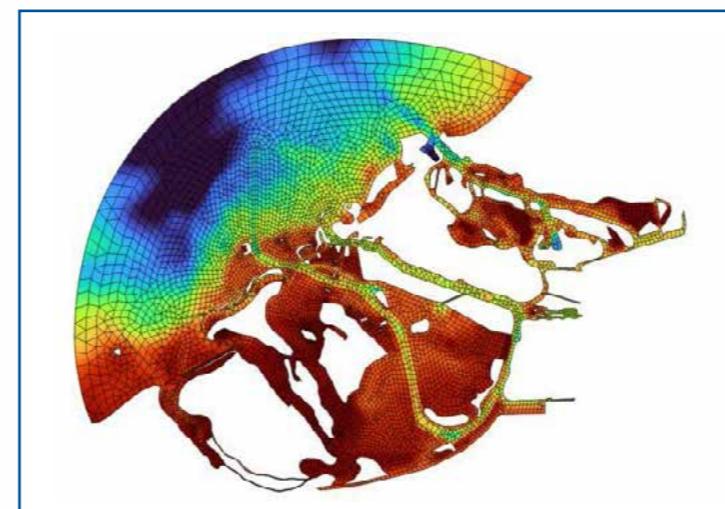


Support understanding of water dynamics and pollutant movements

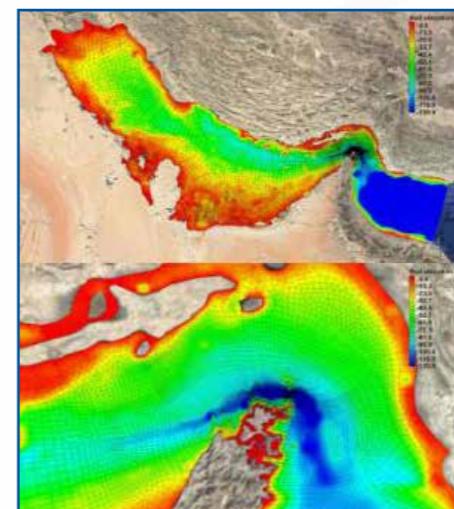


Forecast impact of coastal activities

In 2021, the HWQ modelling team collaborated with international experts and initiated a series of workshops to integrate HWQ modelling into proactive environmental management planning.



Mussafah model mesh.



A hydrodynamic model of Abu Dhabi Emirate.



IMPACT OF DESALINATION PLANTS ON THE MARINE ENVIRONMENT

In 2021, we initiated a project to collect data on and assess the potential environmental impacts of desalination plants, the only solution for reliable drinking water in Arabian Gulf countries. The project initially focused on the Al Mirfa power generation and desalination plant.



Preliminary
survey
completed



Sample sites
selected



Ongoing water,
sediment
and habitat
sampling

Publishing MWQ Achievements

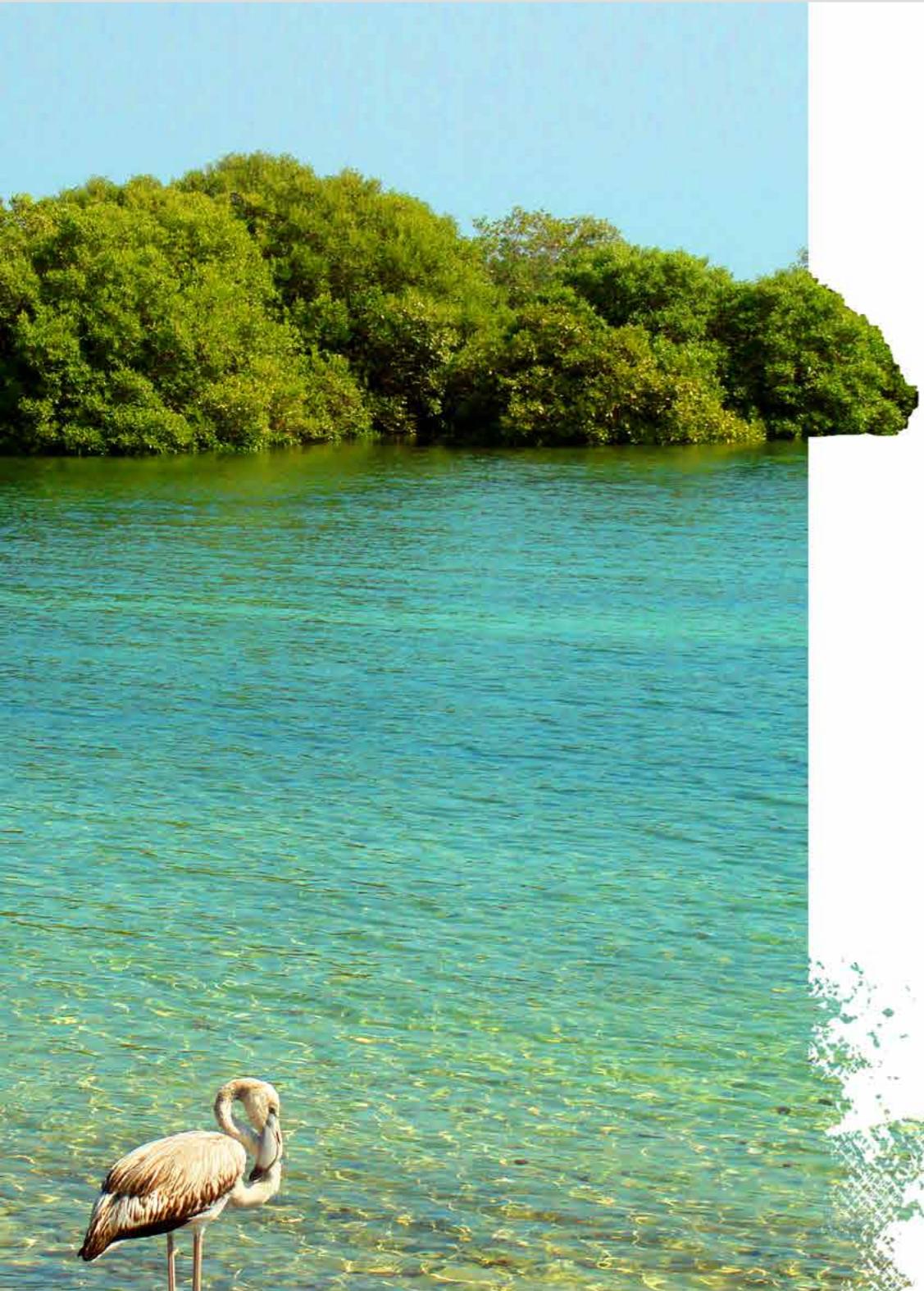
We published two scientific papers in peer-reviewed international journals in 2021:



'Spatial Distribution and Integrated Assessment of Heavy Metal Pollution using Different Indices in Marine Sediments of Abu Dhabi Waters and Management Strategies' in the *European Journal of Applied Sciences*



'Massive Bloom of *Cochlodinium Polykrikoides* and its Impacts in the United Arab Emirates' Waters' in the *International Journal of Ecology and Environmental Sciences*



MARINE WATER QUALITY POLICY AND REGULATIONS

Policy on Sustaining Marine Water Quality in the Emirate

Approved by the EAD Governing Board in 2021, this policy aims to:



Enhance regulatory and operational frameworks



Combat marine contamination by fostering beneficial reuse of discharges and effluents



Ensure comprehensive knowledge of MWQ in Abu Dhabi Emirate



Enable EAD to fulfill our mandate as the emirate's competent authority responsible for protecting the marine environment

Marine Water Quality Regulation

The first regulation of its kind that was developed using a holistic approach that engaged all relevant stakeholders, it officially came into force in 2021, aiming to:



Maintain ambient marine water and sediments quality



Regulate land-based discharges



Implement anti-degradation requirements through environmental impact assessment studies and permitting processes



Foster EAD's role as the emirate's competent authority responsible for protecting the marine environment, including its wildlife and biodiversity



07 LAND AND SOIL

Soil health can have significant influence over many other ecosystems on earth, and falls under seven of the 17 United Nations' Sustainable Development Goals. Our 2021–2025 strategy aims to develop and implement an integrated approach and regulatory framework for soil protection, in coordination with our partners and monitor soil quality to enable data driven policies and regulations.



SOIL QUALITY POLICIES AND REGULATIONS

Policy on Sustaining Soil Quality in Abu Dhabi Emirate

Developed in 2021, this draft policy aims to:



Enhance regulation and enforcement frameworks



Maintain soil quality and rehabilitate degraded areas



Adopt sustainable land and soil management systems



Enhance cooperation among stakeholders



Working together towards a sustainable environment.

Soil Quality Regulation

Developed in 2021, this first of its kind regulation in the UAE aims to:



Ensure the sustainable management of soil in Abu Dhabi Emirate



Maintain soil's basic functions and vital services for its current and future uses



Combat soil quality deterioration



Contribute to the protection of the terrestrial environment including its biodiversity within the emirate's terrestrial protected areas

ABU DHABI SOIL QUALITY MONITORING PROGRAMME

We initiated a soil quality monitoring programme in 2018 to assess the impact of human activities on land and soil resources and provide the basis for future management plans, protection policies and soil related regulations.



First monitoring programme in the NENA region to be accredited with ISO 16133:2018



270+
Monitoring sites



~600
Samples collected



45+
Parameters analysed



246
Facilities visited



92.7 %
Compliance with soil quality regulations



MONITORING THROUGH CUTTING-EDGE TECHNOLOGY

In 2021, we successfully completed the first phase of a project that combines drone-mounted hyperspectral sensors and satellite hyperspectral images with AI to monitor soil quality, with a granularity efficient enough to augment traditional soil quality monitoring.

Achievements



Accurate

The hyperspectral drone sensor can identify concentrations of certain contaminants (e.g., arsenic, lead, nickel, cobalt, copper)



Efficient

Each flight is expected to cover an area of 1.5 ha, surveying 5 sites per day (7.5 ha)



Cost effective

Faster, using less manpower to cover wider areas than traditional surveys



Intelligent AI

with each new flight, the model learns new patterns and becomes smarter



Safe

Monitoring is undertaken without the need for human access to sites



EAD SOIL ARCHIVING FACILITY



6,000

Preserved and
archived samples

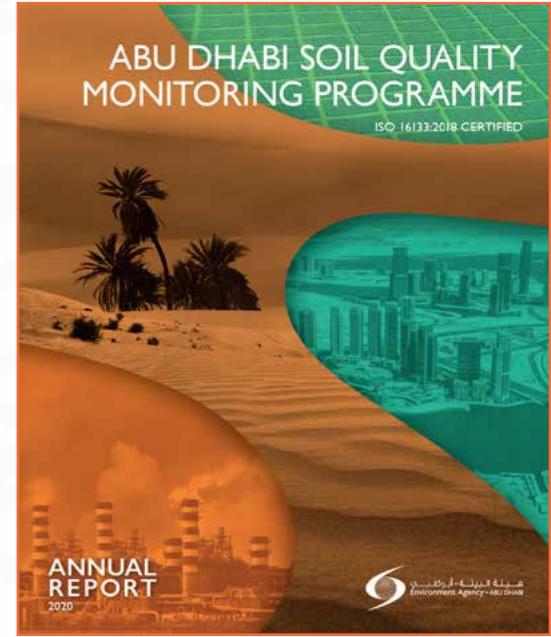


25,000

Storage capacity for
soil samples



Soil archiving
facility policy
developed in 2021



INTERNATIONAL EFFORTS IN SOIL PROTECTION

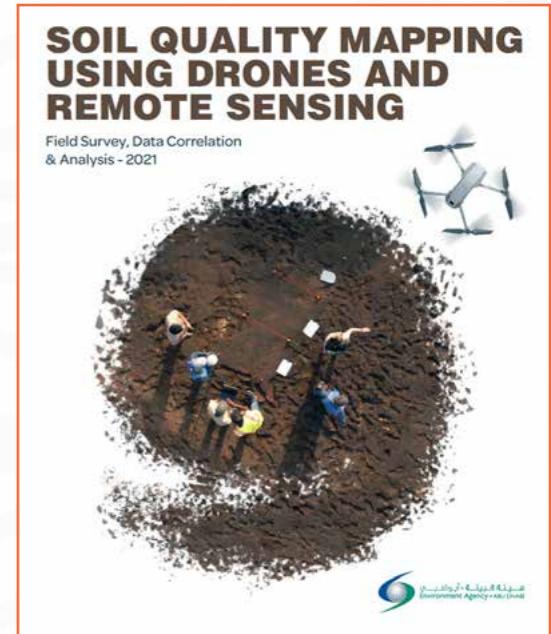
2021 Achievements



Launched the UAE
Soil Organic Carbon
Sequestration Potential
Map, in cooperation with
the Global Soil Partnership
from the Food and
Agriculture Organization
of the United Nations



Signed an agreement
with ISRIC – World
Soil Information,
to provide its
database with soil
environmental data
for the Emirate of
Abu Dhabi



A photograph showing a massive, sprawling pile of trash and debris in a desert environment. Two yellow bulldozers are positioned near the waste site. One is on the left, facing towards the center, and the other is on the right, facing towards the left. The trash consists of various items like plastic bags, bottles, and other unidentifiable waste. In the background, there are rolling sand dunes under a clear sky.

08 WASTE MANAGEMENT

As Abu Dhabi Emirate aims to be recognised as a world leader in waste management, one of our key priorities is to develop a sustainable, efficient and integrated approach to the emirate's waste.

SOLID WASTE IN ABU DHABI EMIRATE, 2020

 **9.86**
Million tonnes
total solid waste
generated

 **13.9 %**
Reduction,
compared to
2019

 **99.0 %**
Non-hazardous
waste (9.77 million
tonnes)

 **1.0 %**
Hazardous waste
(0.095 million
tonnes)

Non-hazardous solid waste by source activity

 **35.3 %**
Industrial and
commercial

 **18.3 %**
Municipal

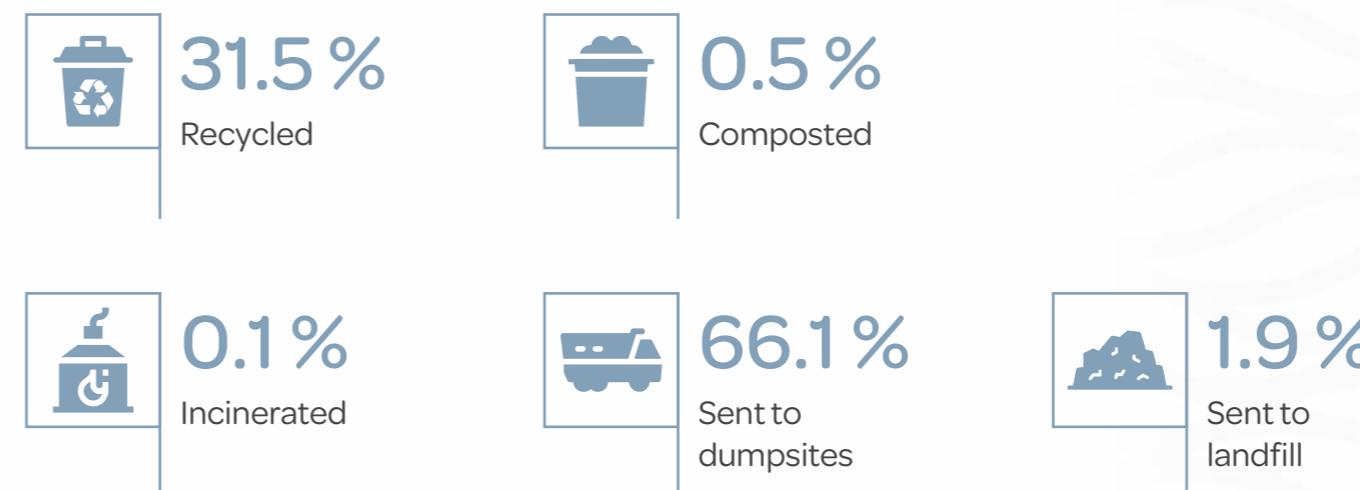
 **32.4 %**
Construction and
demolition

 **12.4 %**
Agricultural

 **1.5 %**
Other activities
(including oil and
gas sector)



Management of non-hazardous waste



WASTE MANAGEMENT TARGETS

We have set three sectoral targets to establish a sustainable waste management system by 2025.



Target 1

Reduce municipal solid waste generation to 1.4 kg/ capita/ day



Target 2

Increase the diversion of total hazardous waste to 70 %



Target 3

Increase the diversion of total non-hazardous solid waste to 39 %



2019 Baseline Figures for Abu Dhabi Emirate



2.06

Kg/capita/day of
municipal solid
waste



53 %

Generated
hazardous waste



35 %

Generated non-hazardous
solid waste diverted from
landfill and recycled,
composted or incinerated

NEW REGULATORY INSTRUMENTS

In 2021, we developed an integrated waste management regulation. Its aims included:



Regulating and
improving waste
management in
Abu Dhabi Emirate



Reducing
and reusing
generated
waste



Applying the best
methods and
technologies available
for waste recycling and
treatment, resource
recovery and safe disposal



Protecting the
environment
and minimising
harm to human
health



Cleanco hazardous and medical waste incinerators in Al Dhafra region

PERMITTING WASTE MANAGEMENT FACILITIES

During 2021, we issued operational environmental permits for three hazardous and medical waste incinerators in Al Dhafra and Al Ain regions, each with the capacity to treat 7,500 tonnes/ year of hazardous and medical waste.

We also permitted the following waste management facilities:



3 mobile incinerators for COVID-19 waste



Base oil and lubricant treatment facility in Al Mafraq area



Green Flame facility for lubricant treatment, able to treat 35 tonnes/ day of oil waste



Fallen stock incinerator, serving Abu Dhabi and Al Dhafra region



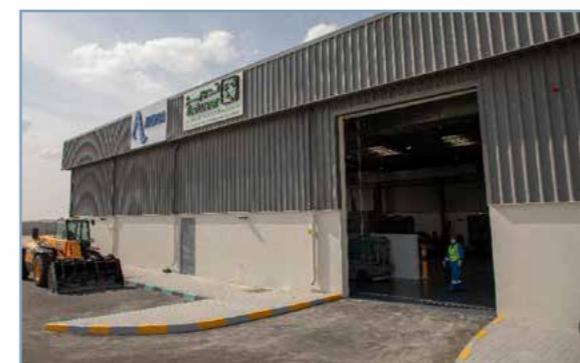
REPEET ME plastic recycling facility, producing 14,500 tonnes/ year of polyethylene



ECOPARK complex for waste management projects



Hazardous and medical waste incinerators in Al Dhafra region.



Fallen stock incinerator.



WASTE SECTOR INSPECTIONS



24

Inspection visits in 2021
• 74 violations
• 22 compliant facilities



10

Complaints about illegal waste disposal to the terrestrial environment

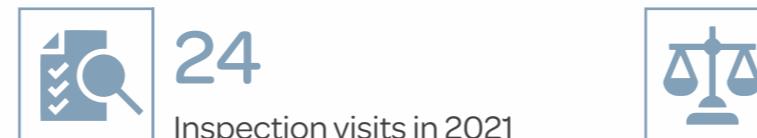


22

In Compliance

2021

Out of Compliance



Enforcement

- 2 facility permits revoked
- 9 legal cases filed against facilities breaching laws and regulations



15

Notifications from the Abu Dhabi Waste Management Center – Tadweer related to improper waste management procedures



26

Complaints about illegal waste discharge to the marine environment



Number of compliant and non-compliant inspected facilities in Abu Dhabi Emirate.

Enforcement actions against non-compliant facilities.



09 ENVIRONMENTAL POLICY AND REGULATION

In 2021, we continued our work in developing policies based on rigorous scientific research, international best practice and the highest quality data.

2020-2025 POLICIES AND REGULATIONS PLAN



19

Total
policies



28

Total
regulations



Policies and Regulations
in 2021

Policies

- 2 approved
- 5 under approval
- 7 in development

Regulations

- 3 approved
- 7 under approval
- 8 in development

2021 Achievements



Policies and Regulations

Continued work on the implementation of the Abu Dhabi Single Use Plastic Policy. This includes:

- Future ban on single-use plastic bags
- Future fees on single-use cups, lids, cutlery, plates and stirrers
- Collaboration with the Department of Economic Development (DED) and the Department of Finance (DOF) to determine on fee value, collection scheme, management and support for retailers
- Development of incentive-based bottle return scheme
- Awareness and outreach measures



Evaluations

- Launched guide for policy and regulations evaluation
- Undertook major transformation in policy evaluation
- Prepared evaluation plan for 4 policies and 5 regulations, and began evaluating 1 policy and 4 regulations



Policy Insight

- Initiated the Disposable Masks Policy Insight, to address the environmental impact of the increased use of disposable face masks



MAINSTREAMING ENVIRONMENTAL POLICY CONSIDERATIONS IN SECTORAL POLICY AND PLANNING

In 2021, we developed a recommendation report to enhance our leadership role in effectively mainstreaming environmental policy considerations across all major sectors in Abu Dhabi Emirate. This included:



- Desk study of global practices
- Federal case study to disseminate environmental policies
- Framework for mainstreaming cross-sector environmental policy considerations
- Recommendations on an enabling environment and suggested initiatives
- Engagement with relevant partners

Guide to Policy Sectoral Environmental KPIs

Initiated in 2021, the aim of this 9-step guide is to equip policy experts with a standard tool to enable quick and systematic response to requests related to recommendations of policy sectoral environmental KPIs. This includes:



- Guiding the activities to recommend environment policy KPIs for non-environmental sectors in the emirate
- Adopting appropriate selection requirements and criteria for Policy Sectoral Environmental KPIs
- Setting a standard assessment method to evaluate KPI alternatives and properly recommend best options

CREATING POLICY DIALOGUE

Developing a Low-Carbon Abu Dhabi Government Fleet

Through a partnership between EAD, Emirates Nature - WWF and government stakeholders (Department of Municipalities and Transport, Abu Dhabi Policy and Department of Energy), we studied the opportunity to decarbonise the Abu Dhabi Government Fleet, in support of the implementation of the Abu Dhabi Low Emission Vehicle (LEV) strategy.

A significant potential reduction in air pollutant emissions across 2 scenarios.

Scenario 1- Low adoption



- 60 % reduction – nitrogen oxides (NOx)
- 45 % reduction – particulate matter (PM)
- >90 % reduction – carbon monoxide (CO), hydrocarbons (HC)
- 42 % reduction – methane (CH₄)
- 59 % reduction in carbon dioxide (CO₂) emissions by 2050

Scenario 2 – High adoption



- 96 % reduction – nitrogen oxides (NOx)
- 83 % reduction – particulate matter (PM)
- >90 % reduction – carbon monoxide (CO), hydrocarbons (HC)
- 95 % reduction – methane (CH₄)
- 88 % reduction in carbon dioxide (CO₂) emissions by 2050

POLICY VISIONING FOR THE FUTURE: ENVIRONMENT CENTENNIAL 2071

In 2021, we developed Abu Dhabi Environmental Centennial 2071, a shared environmental vision that draws the pathways toward the future and lays the foundations for the next 50 years.

Aim



To help Abu Dhabi Emirate become the world leader in environmental conservation, in alignment with the UAE vision to be the best country in the world

3 main pathways



- **Pathway 1:** Vibrant emirate thriving in nature
- **Pathway 2:** Green force resilient to climate change
- **Pathway 3:** Enablers for future environmental leadership



1,000+

Ideas captured through community surveys

- Partnerships with 8 government entities
- Engagement with 19 entities

PARTNERSHIPS: MANAGEMENT OF MoUs AND AGREEMENTS

2021 Achievements:



9

MoUs and agreements signed by Q3 2021



Creation of internal MoU system to manage and track all MoUs/agreements between EAD and external entities



EAD staff awareness sessions for proper implementation of MoU/agreement guidelines and processes

ENVIRONMENTAL ASSESSMENT AND PERMITTING OPERATIONS

Aims: to assess the potential environmental impacts of project and facility activities during the early design stages to ensure implementation of best available practices and compliance with applicable environmental laws and regulations.

Protection of > 60 km² of Marine Critical Habitats		~2800 m³ Reduction in toxic waste produced from drilling operations		Avoidance of approximately 800 CO₂eq/kWh emissions through use of clean energy
	Protection of > 850,000 m² of Terrestrial Critical Habitats		99% Reduction in HCL/FH emissions for fluorine production operations	

Environmental outcomes of some major projects and facilities in 2021.



1,965

Permit applications
processed



372

Environmental studies,
plans and reports
produced



77

Environmental
consultancy offices
processed



98 %

Compliance for processing
environmental permit
applications



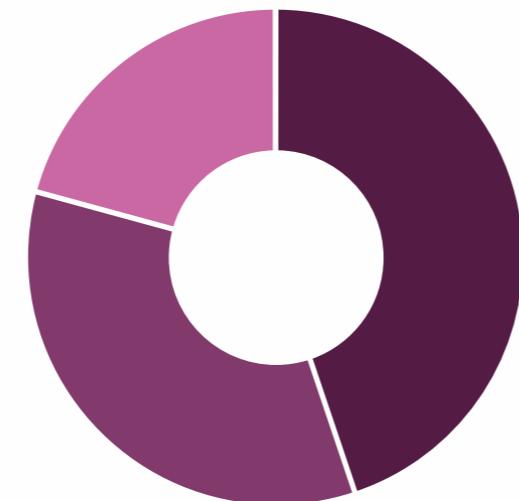
97 %

Compliance for review
of environmental
studies

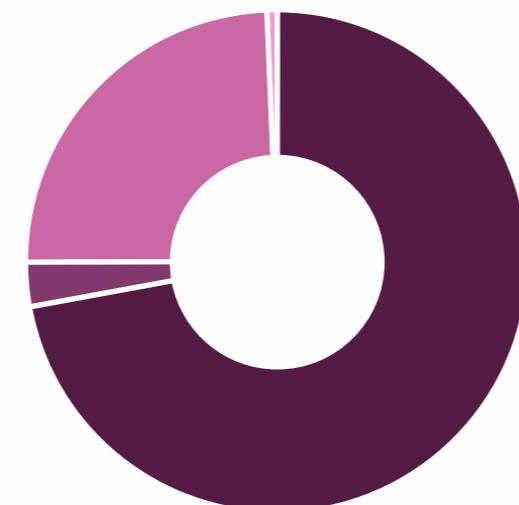




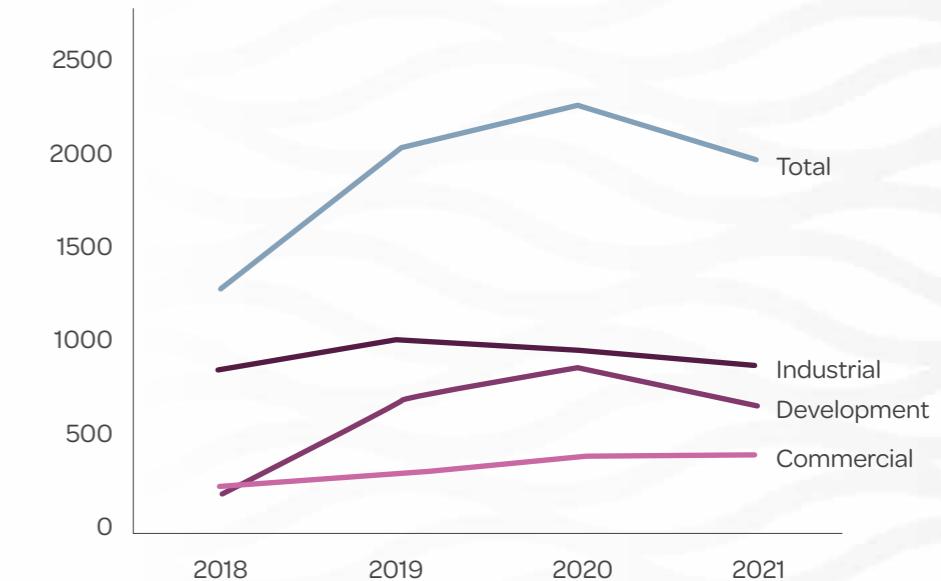
Annual Report 2021 | Environmental Policy and Regulation



- Industrial: 45 %
- Development: 34 %
- Commercial: 21 %



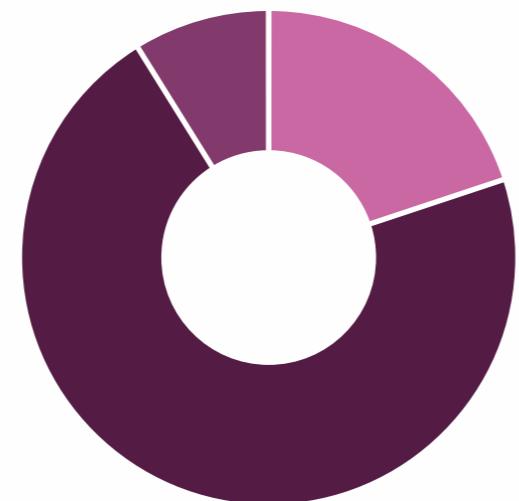
- Issue Permit: 72 %
- Request Study: 3 %
- Request Resubmission: 24 %
- Rejected: 1 %



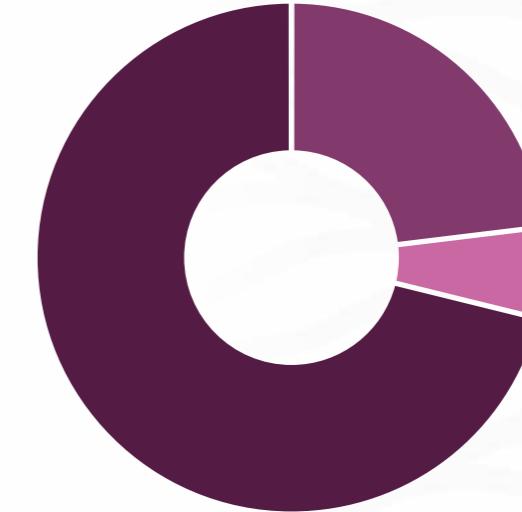
Environmental Permitting Applications Processed in 2021.



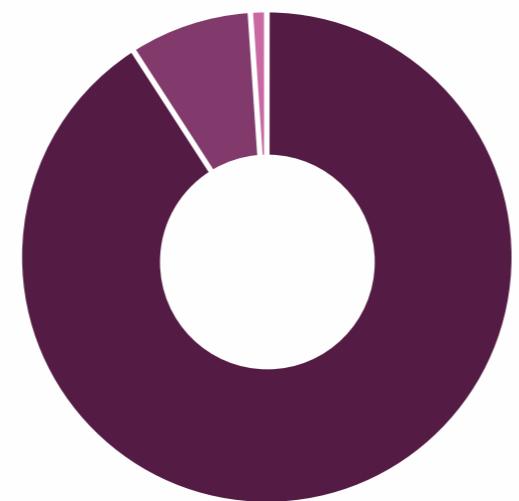
Annual Report 2021 | Environmental Policy and Regulation



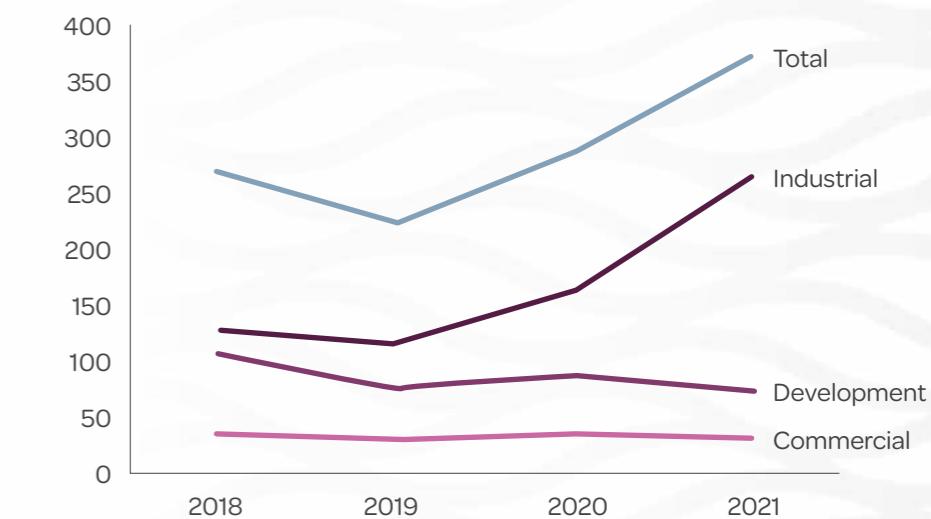
- Development: 71 %
- Commercial: 9 %
- Industrial: 20 %



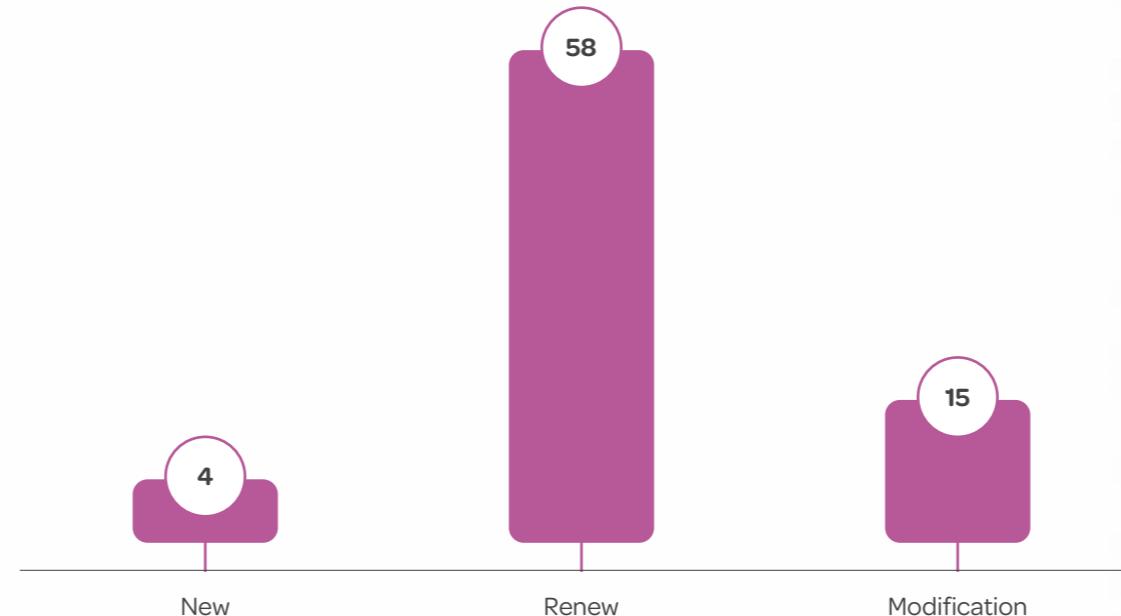
- Env. Report: 71 %
- Impact Assessment: 23 %
- Env. Plan: 6 %



- Approval: 91 %
- Request Resubmission: 8 %
- Rejected: 1 %



Classification of processed environmental studies, plans and reports processed, 2021.



Registration of Environmental Consultancy Offices in 2021.

ENHANCING OUR ASSESSMENT AND PERMITTING PROGRAMME

Key achievements



Completed Strategic Environmental Assessment (SEA) Programme:

We completed the development of a proposed implementation programme, which aimed to embed environmental considerations into the designs for strategic projects, master plans and development of programmes



Developed Permit Conditions for New Sectors:

Studying two sectors, slaughterhouses and medical facilities, we developed environmental permit conditions that were linked to legal citations in the applicable environmental laws and regulations



Updated Standard Operating Procedures and Technical Guidance Documents:

We reviewed and updated nine standard operating procedures for environmental permitting programmes and nine technical guidance documents for implementation of best environmental practices



Developed Iron and Steel Sector Self Reporting Programme:

The programme identified the major pollutants of concern for the iron and steel sector, monitoring and reporting requirements and a preliminary economic impact analysis

UPDATING ELECTRONIC SYSTEMS

De minimis Risk-based Programme

This programme enhances our capacity to standardise permitting requirements and facilitate the permitting process. In 2021, this update included:



Reviewing all industrial, commercial and development activities in Abu Dhabi Emirate



Establishing new criteria based on environmental risk



Incorporating the updated programme in the design of the new digital services

EAD Environmental Permitting Procedures in Line with TAMM Requirements

Our complete restructuring of process flow charts for all permitting operations took a new environmental risk-based approach.



65+ %

Permitting operations automated



Environmental Conditions Data Base

This update facilitated the data migration process to the new digital services system.



2,000+

Permit conditions reviewed, updated and merged

CONTINUOUS COORDINATION WITH STAKEHOLDERS

Federal Authority for Nuclear Regulations



11

Memberships in Protection from Radiation committees



20

Stakeholder meetings attended



132

Hours of training and capacity building taken and/or provided by EAD



ENVIRONMENTAL PERMITTING AND COMPLIANCE AWARENESS

Development of Standard Training Programme

This new programme facilitates the process of environmental permitting awareness outreach and provides information to new recruits. It details:



- Environmental requirements
- Permitting tools
- Applicable laws and regulations
- Process flow charts



- Internship Programme
- 6 national interns hosted
 - 2,300+ hours of training

“

I enjoyed the fact that EAD allowed me to take on significant responsibility in reviewing permits, which provided me with a depth of knowledge.”

Mariam Al Junaibi

“

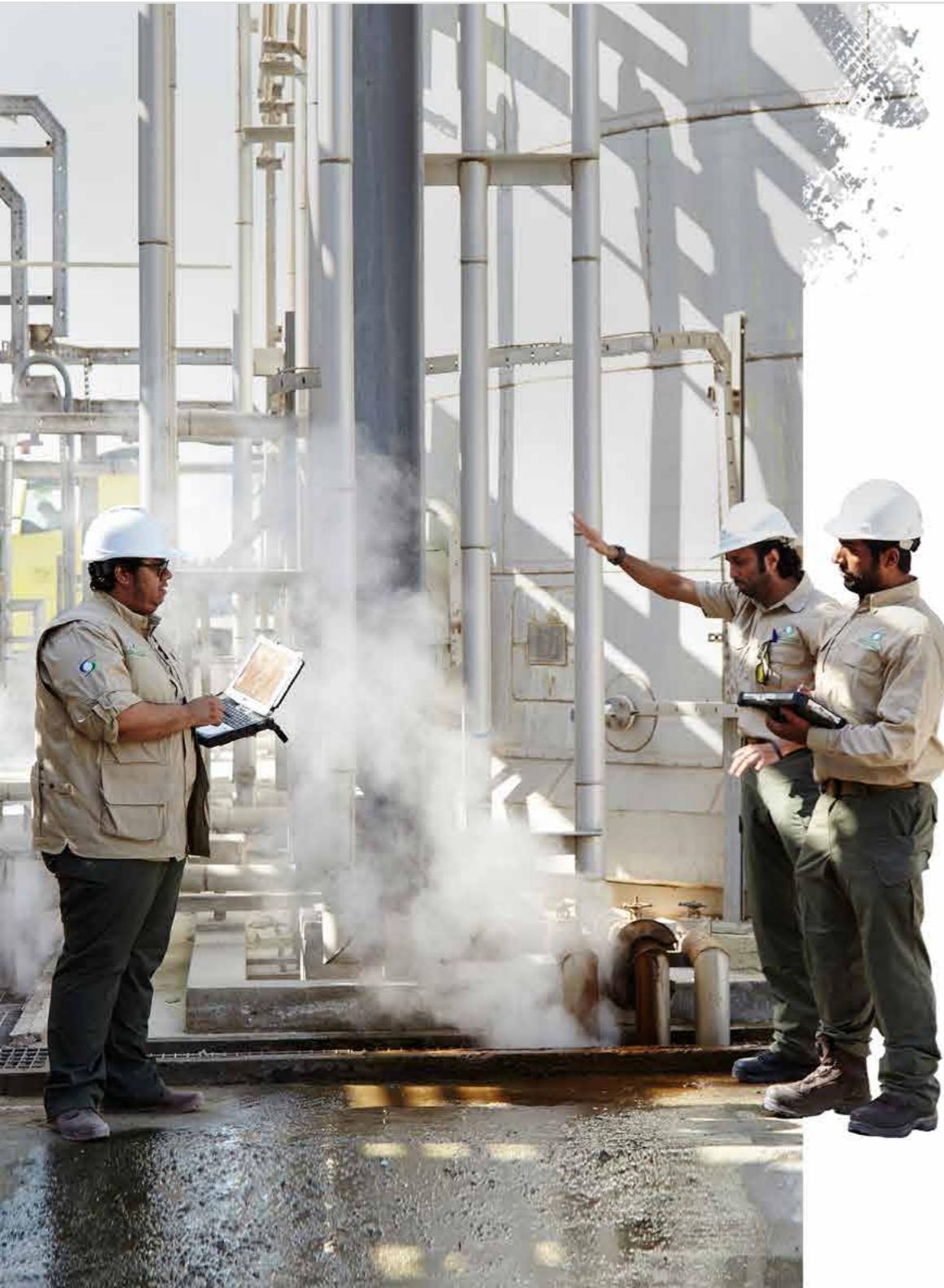
At first, I was surprised by the tasks they do. I wasn't aware before that there was such a thing as an environmental permit, which impressed me. Now I realise the importance of EAD's decisions in all facilities and in development.”

Noof Al Katheeti

“

This experience gave me a lot of knowledge about how developmental and industrial projects can impact the surrounding environment and what is our role as a team to mitigate those impacts.”

Fatima Al Hammadi



INSPECTION, COMPLIANCE AND ENFORCEMENT

This programme aims to improve the environmental regulatory framework and enhance the compliance of all industrial and commercial establishments, hazardous materials (HazMat) stores and development and infrastructure projects.

Environmental Inspection Checklist

This tool assesses various parameters that have a potential for environmental harm. The main environmental aspects are:



- Surrounding area surveillance
- Record keeping and training
- Material transfer, storage and handling
- Combustion units and process operations
- Solid waste and wastewater management
- Safety and emergency response
- Spill prevention and response
- Stormwater pollution
- Specific operations
- Noise
- Permit specific conditions
- Decommissioning



INSPECTED ENVIRONMENTAL SECTORS

Our mandate requires the inspections of facilities and projects to ensure their compliance to environmental laws and regulations and our permit conditions.



755
Field visits

Sectors covered and number of facilities:



- Cement and cement products - 138
- Animal raising and slaughter - 86
- Other industries - 71
- Iron and steel - 69
- HazMat manufacturing and trading - 66
- Plastic products - 66
- Development and infrastructure projects - 52
- Food products manufacturing - 43
- Wood and furniture products manufacturing - 39
- Solid and liquid waste management - 32
- Machinery and vehicle manufacturing - 19
- Coating and surface treatment - 18
- Paper and paper products - 17
- Electrical equipment manufacturing - 15
- Asphalt and paving materials - 12
- Fertiliser manufacturing - 12



HOLISTIC COMPLIANCE AND ENFORCEMENT PROGRAMME

Our field visits identified the prominent environmental aspects that warranted corrective actions.



47 %

Record
keeping and
training



19 %

Material transfer,
storage and
handling



13 %

Combustion
units and process
operations



12 %

Safety and
emergency
response



7 %

Solid and
liquid waste
management



2 %

Other
violations



- 101 follow-up visits
- 26 environmental mitigation plans
- AED 9 million investment in pollution control devices
- 96 % compliance rate due to inspection team's holistic approach



COMPLAINTS AND ENVIRONMENTAL INCIDENTS

88 environmental complaints and incidents responded to



58 %

Improper waste
management



14 %

Industrial
pollution



13 %

Odour



9 %

Other



7 %

Fish kill

Key Achievements



Reactivated field
inspection visits
following easing of
COVID-19 precautionary
measures



Conducted field
visits on 3 medical
waste incinerators



Conducted user
acceptance testing on the
new inspection system
that will launch soon



Finalised a proposal
on administrative
fines to the Abu Dhabi
Executive Office



Participated in a
pilot project for
microbial digestion
of pollutants in
Mussafah South
Channel



Collaborated with local entities, including:

- Abu Dhabi Waste Management Center - Tadweer
- Department of Municipalities and Transport (DMT)
- National Emergency Crisis and Disaster Management Authority (NCEMA)



10 ENVIRONMENTAL INFORMATION AND COMMUNITY ENGAGEMENT

Engaging with the community to promote sustainable practices.



GREEN BUSINESS NETWORK (GBN)

GBN is a community of like-minded businesses committed to environmental causes, sharing their knowledge and experiences, and working together to help each other become better environmental citizens.

Key achievements



2

Baader Days

Paperless Day

12 entities participated, saving:

- 151,766 pieces of paper
- 20 trees
- 18,516 litres of water

Virtual Environmental Cinema Day

- Showcased Wild Abu Dhabi: Turtles of Al Dhafra documentary



82

Members from government and private sectors



2

Virtual sessions organised

- Ceremony to celebrate GBN members' participation
- 2-day case study session showcasing GBN members' environmental efforts



RAISING AWARENESS ON BIODIVERSITY AND PROTECTED AREAS

We undertook a number of outreach efforts during 2021, reaching both stakeholders and the general public.

ADIHEX 2021

Our participation in ADIHEX 2021 celebrated the UAE's 50th anniversary, and focused on our environmental vision for the next 50 years.

Key projects showcased



Air quality innovative sampling technologies and AI



The new EAD research vessel



The Abu Dhabi Gene Bank



Monitoring soil quality using drones, AI and machine learning



ADIHEX 2021



Partnership with Kidzania

Our collaboration with KidZania Abu Dhabi raised awareness among children and their families on environmental preservation.



Stakeholder Collaboration

We collaborated with MODON at the Mirfa Campsite Visitor Centre with an activation focusing on the fauna and flora of Abu Dhabi Emirate.

Virtual Biodiversity Sessions



RAISING AWARENESS ON WASTE

In 2021, our ongoing awareness campaign for key waste topics saw us undertake an array of activities to educate the public.



'Our Environment, Our Responsibility' social media campaign



2,220 kg

Waste collected
• 4 clean-up campaigns
• 141 attendees



611

Participants
• 7 virtual sessions on sustainable waste



VIRTUAL ENGAGEMENT

We harnessed the virtual world to reach a wider audience, through virtual environmental sessions, competitions and online challenges.

4 main virtual talks series



1,341

Attendees

- 18 environmental talks



1,152

Attendees

- 16 Youth talks



398

Attendees

- 8 environmental education talks



70

Attendees

- 3 Storytelling sessions

Social media activities



Photography Challenge

Capture images of local plants to mark the World Day to Combat Desertification and Drought

- 1,080 engagements
- 124 entries
- Winner announced in 2022



Three-day Challenge

A three-day Instagram challenge to adopt a more sustainable lifestyle for World Environment Day

- 3,434 people reached
- 96 people shared this challenge



YOUTH OUTREACH

Sustainable Campus Initiative (SCI)

Key achievements



Conducted the Sustainability Action Project workshop, 'Youth as Advocates for Green Recovery' for 60 SCI members from 13 universities



Virtual Ramadan Campaign 4-day Zoom workshop, organised by Green Youth Majlis (GYM) and Zayed Higher Organisation for People of Determination
• 15 GYM members and people of determination joined



1 Youth Circle
• 'Promoting Circular Economy for sustainable Development'
• 76 participants



Hosted virtual celebrations for SCI members' achievements in 2019–2020 academic year
• 8 universities presented their projects
• 4 announced as winners of Sustainability Action Project and Green Campus Audit



8 Environmental Youth Talks conducted around climate change, waste and environmental sustainability
• 522 attendees



Green Youth Majlis (GYM) Achievements
• Green Youth Majlis members facilitated 2 'Live with SCI' sessions
• Live Instagram tour of Al Wathba Wetland Reserve to introduce and encourage youth to visit the reserve
• 61 people viewed the live tour



2 online debates
• 'Do we require incentives to become sustainable?'
• 46 attendees
• 'Who is responsible for ecosystem restoration?'
• 47 attendees



Interactive virtual session with 286 students from Liwa International School



Sustainable Schools Initiative (SSI)

Key achievements



Pilot phase of Tide Turners Plastic Challenge launched for SSI members, in collaboration with the United Nations Environment Programme (UNEP)



Nature Inspired Tours and Talks developed and published, focusing on Abu Dhabi Emirate's biodiversity



Aim: Inspire young people aged 11–18 to consider the impact of plastic on marine life and land

- 385 submissions received
- 20 winners from 3 schools



16

Virtual environmental education talks, reaching 398 children

Connect with Nature (CWN)

A collaboration with Emirate's Nature-WWF, this innovative programme aims to inspire UAE youth between the ages of 15 and 30, giving them access to different experiences, knowledge and opportunities to enhance their capabilities in becoming future sustainability leaders.



20

Youth selected as ambassadors for nature



6

Field trips to learn more about the EAD's work as follows:

- 2 trips to the pearl farm in Al Mirfa
- 2 trips to the bird monitoring station in Al Wathba Wetland Reserve
- 1 trip to the insect laboratory in Al Wathba
- 1 trip to Al Mina and the Fish Laboratory



ENVIRONMENTAL INFORMATION AND REPORTS

One of our most important priorities is the dissemination of environmental information, which supports decision makers through access to scientifically verified and reliable environmental information.

In 2021, we published the following:



12

Environmental Reports



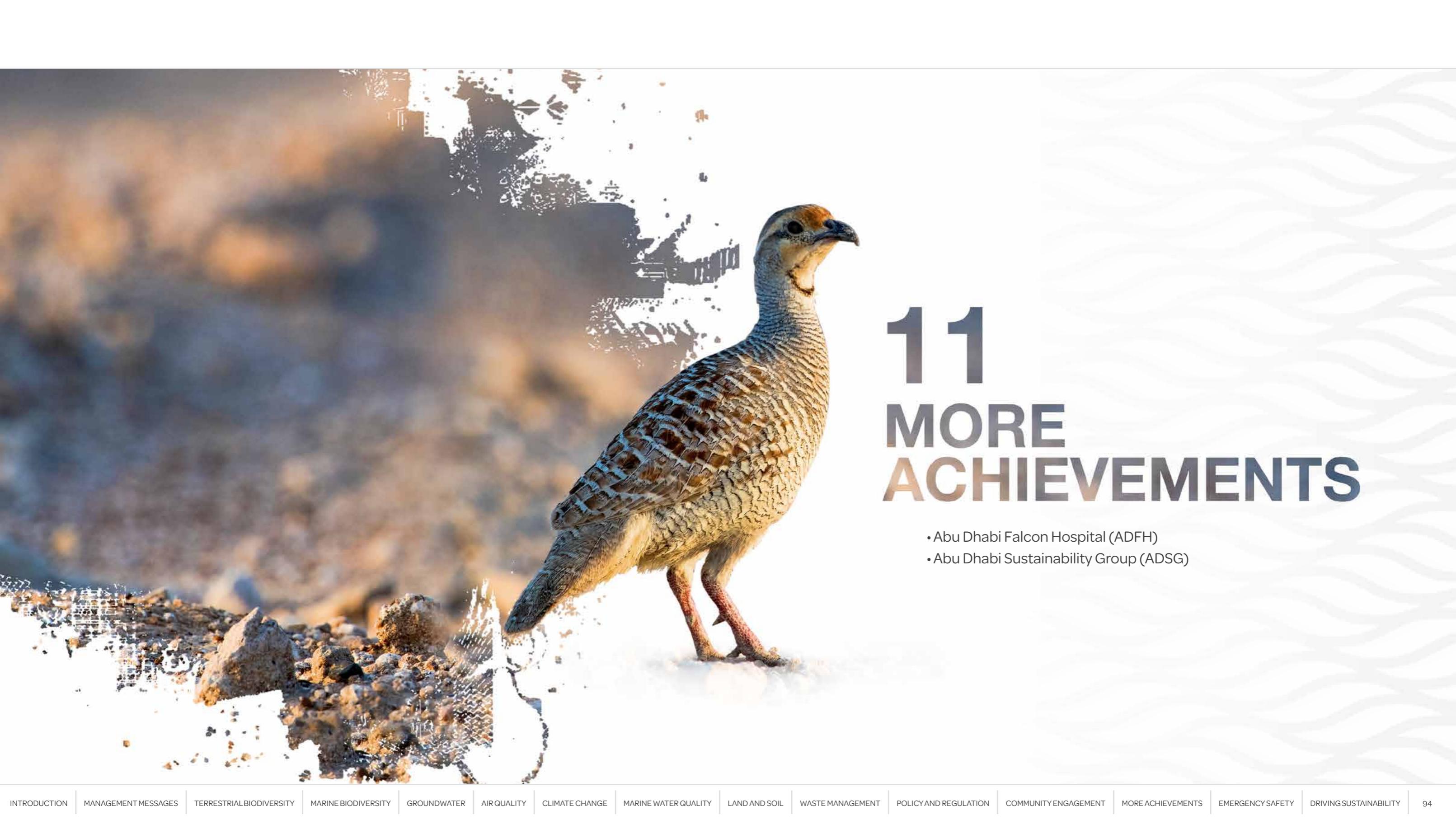
20

Environmental Factsheets



12

Digital Panels



11 MORE ACHIEVEMENTS

- Abu Dhabi Falcon Hospital (ADFH)
- Abu Dhabi Sustainability Group (ADSG)



Annual Report 2021 | More Achievements

ABU DHABI FALCON HOSPITAL (ADFH)

Established in 1999, Abu Dhabi Falcon Hospital has become the world's leading institution for falcon and avian medicine and research. It is also home to small animal hospital ADFH Pet Care Centre, and the Abu Dhabi Animal Shelter.



140,000

Patients



Largest falcon hospital in the world



Winner of Middle East Responsible Tourism Award for 9 consecutive years



Winner of World Responsible Tourism Awards for 2 consecutive years



One of Abu Dhabi Emirate's top tourism attractions



911

Pet adoptions in 2021
• 9.2% increase compared to 2020
• Record number of pet adoptions



Winner of Tripadvisor 'Travellers' Choice Award' for 2 consecutive years



Tripadvisor Travellers' Choice 2021

Abu Dhabi Falcon Hospital



TripAdvisor Travellers' Choice Award 2021.



Annual Report 2021 | More Achievements

ABU DHABI SUSTAINABILITY GROUP (ADSG)

Initiated by EAD in 2008, ADSG promotes sustainability management in the emirate with members from government, private companies and non-profit organisations.

THE ADSG SUSTAINABLE BUSINESS LEADERSHIP AWARDS 2021

Launched in 2015, and now in its seventh annual iteration, the ADSG Sustainable Business Leadership Awards are the region's only independent annual awards for sustainability achievements. In 2021, the awards period was extended to include 2020, enabling companies to showcase their achievements during the pandemic.

2021 Winners



- **Best Sustainability Initiative:** Emirates Nuclear Energy Corporation (ENEC)
- **Best Sustainability Report:** Dolphin Energy
- **Best Sustainability Communication Programme:** Borouge (Sustainable Campus Initiative (SCI))
- **Sustainability Manager of the Year:** Winston Cowie, Section Manager of Marine Policy Regulations and Planning in Terrestrial Marine and Biodiversity, EAD
- **Sustainability Leader of the Year:** Sami Al Angari, Vice Chairman and CEO of AlGhaz Holding
- **Best Energy Management Initiative:** ADNOC Gas Processing



Annual Report 2021 | More Achievements

ADSG Members That Produced Sustainability Reports, 2021

- Emirates Palace Hotel
- Dolphin Energy Ltd
- ADNOC - Distribution
- Aldar Properties
- Abu Dhabi Islamic Bank
- Schneider Electric
- EAD
- First Abu Dhabi Bank
- Masdar
- Emirates Nuclear Energy Corporation



The ADSG Sustainable Business Leadership Awards 2021.

ABU DHABI SUSTAINABLE BUSINESS LEADERSHIP FORUM 2021

The seventh edition of ADSG's annual Sustainable Business Leadership Forum was held under the theme of 'Transitioning to the Future Today'.

Key Focus Areas:



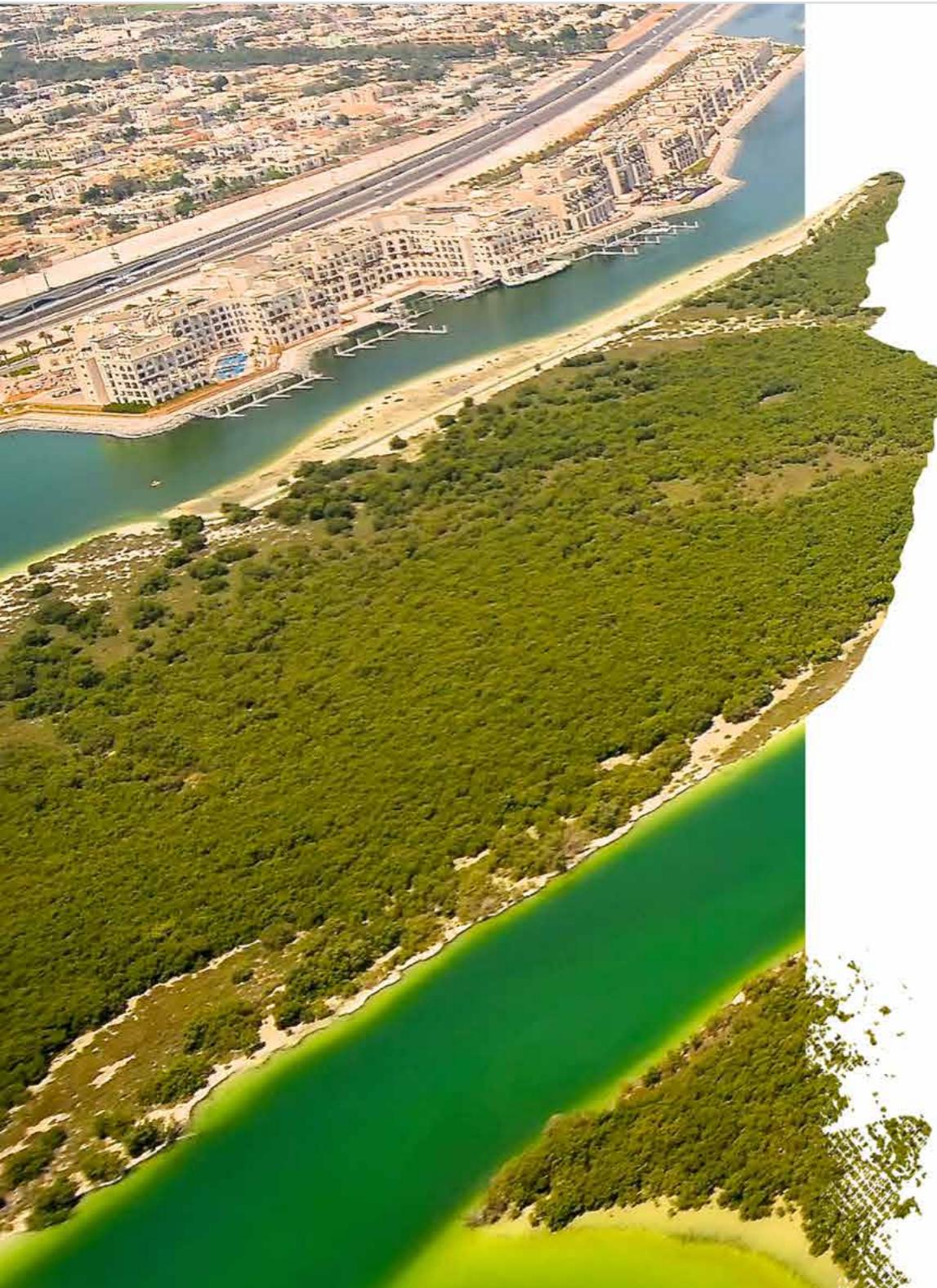
7th consecutive year for Dolphin Energy as lead sponsor and Etihad Airways as official airline carrier



Emphasised the importance of accelerating the adoption of sustainability into organisations' governance and decision-making



Explored key areas including climate change, sustainable economy, finance and the rise of ESG reporting



MEMBERS' QUARTERLY MEETINGS AND KNOWLEDGE - SHARING SESSIONS

ADSG held quarterly members' networking and knowledge-sharing meetings in 2021, which included:



Implementation of Environmental, Social and Governance (ESG) Disclosure in Abu Dhabi –
A collaboration between ADSG, Abu Dhabi Securities Exchange (ADX), Abu Dhabi National Exhibition Centre and Aldar



Key insights on the National Climate Change Plan 2050, the Paris Agreement and climate solutions partnerships –
A partnership between ADSG, supported by EAD, with the Ministry of Climate Change and Environment Abu Dhabi (MOCCAE), DP World and HSBC

2021 Achievements

Published the ADSG Sustainability eJournal special issue, including article by H.E. Dr. Shaikha Salem Al Dhaheri, Secretary General of EAD, and ADSG Forum 2021 Programme and Agenda.

Expanded ADSG's membership to include 53 impactful organisations.



2

New members:

- Bloom L.L.C
- Schneider Electric

Participated in ADNOC's Youth4Sustainability Event



3

Key focus areas:

- Governance
- Climate change
- Sustainable economy

An aerial photograph of the Abu Dhabi skyline, featuring numerous skyscrapers along the coast. In the foreground, there's a beach with people and some greenery. The water is a vibrant blue. The sky is clear with a few birds flying.

12 EMERGENCY, SAFETY AND BUSINESS CONTINUITY

The Emergency, Safety and Business Continuity Division works to enhance the readiness of EAD and ensure the continuity of vital activities during emergencies.

ACTIVE RESPONSE TO ENVIRONMENTAL EMERGENCIES AND CRISES

In 2021, we dealt effectively with all emergencies and environmental crises, successfully closing them all.

44 cases in Abu Dhabi Emirate



We participated in the large-scale international exercise (CONVEX-3) at the Barakah Nuclear Energy Plant. Organised by the International Atomic Energy Agency (IAEA), it was one of the most advanced emergency simulation exercises in the world.



IMPLEMENTING OCCUPATIONAL HEALTH AND SAFETY (OHS) SYSTEM CRITERIA

We intensified our efforts during the COVID-19 pandemic, implementing all preventive and precautionary measures at our sites.



10

Training
courses
held



Periodic
awareness
workshops



'We Commit to Win'
and "Choose to
Vaccinate" campaigns
• 85 publications
and guidelines



767

Employees
attended training
and awareness
workshops



Comprehensive
field visits to agency
sites and facilities
to ensure OSH
requirements met

CORPORATE BUSINESS CONTINUITY SYSTEM

The Business Continuity division works to raise and enhance the awareness of employees and boost their efficiency on topics related to the implementation of the business continuity system in the Agency.



36

Training courses organised



304

Employees attended business continuity workshop



8

Business continuity table exercises
• 78 employees participated



100 %

Implementation of the COVID-19 training and awareness programme



100 %

Implementation of remote work policies

In 2021, the division assessed the level of risk related to the pandemic in the risk register, setting controls, procedures and plans to deal with the risk at the agency's level, as well as reviewing and following up on operational processes.



Achievements



Ensured business continuity for vital activities during the impact of COVID-19



Ensured the implementation of the precautionary measures related to Covid-19 pandemic



Ensured the use of communication channels to contact internal and external bodies



Achieved 2 business continuity awards
• BCI Middle East 2021
• Best Certified Business Continuity Expert 2020 (DRI KL 2021)



Ensured the development of guidelines and precautionary measures for remote work, return to the workplace, field work, suppliers and service providers during the pandemic



13

DRIVING SUSTAINABILITY FROM A LEADERSHIP POSITION

CORPORATE SUSTAINABILITY MANAGEMENT

We have identified corporate sustainability as one of our institutional enabling priorities.

Capture and analyse regular performance results to develop efficient plans to achieve our objectives. Performance indicators include:



Utilities
consumption



6
Categories
of waste
generation



Printing
and paper
consumption



Fuel
consumption

Ensure compliance
to environmental,
occupational health and
safety standards through
inspections



11
Site
inspections

Sustainable
procurement processes
focus on supporting local
small and medium size
enterprises (SMEs)



75 %
of total
contracts with
SMEs

EAD's ENVIRONMENTAL FOOTPRINT



63 %
Reduction in
GHG emissions,
compared to
2020



From 3.99 to
3.66 tonnes
per capita



Integration of sustainable
business practices

- Automation solutions
- Sustainable facility management
- Sustainable procurement

Memberships at ADSG and GBN enable our partners to utilise our knowledge, resources, engagement events and practical recommendations to integrate sustainable business practices within their organisations



100 %

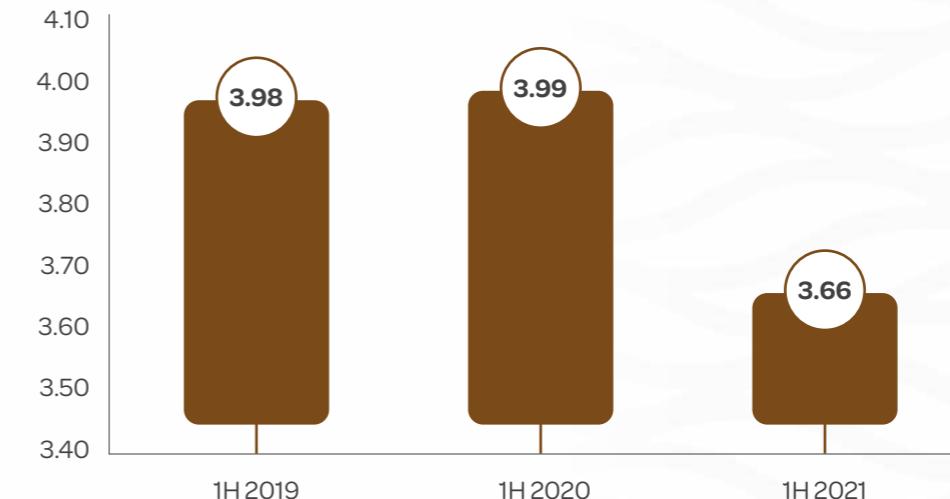
Automation of internal processes related to facility and fleet management



48 %

Reduction in paper printing, compared to 2020

GHG Emissions per Capita (1H 2019 - 1H 2021).



PARTNERSHIPS AND STAKEHOLDER ENGAGEMENT

In 2021, we continued to engage with our partners and stakeholders via various membership groups and networks, including the Abu Dhabi Sustainability Group (ADSG) and the Green Business Network (GBN).



53

Total ADSG members
• 2 new members



82

Total GBN members

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نحافظ على تراثنا الطبيعي . ضماناً لمستقبلنا
preserving our heritage · protecting our future

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