ISSUE 18

The Sustainabilist

Dubai Did It Again

USD1.69 CENTS IS THE NEW BENCHMARK

DEWA Receives Lowest Global Solar Bid Yet Again

BRAINS FOR BRINE CHALLENGE

The Red Sea Company Saving the Sea from Salt

EVERY DROP COUNTS

Managing Expo 2020 Dubai's Water Demand

THE RIPPLE EFFECT

UAE Water Aid Devising Solutions for Water Scarcity

ISBN 978 - 1978357310

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Letter from the Editor in Chief

Eng Waleed Bin Salman
Editor in Chief
The Sustainabilist

The Sustainabilist

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Over the last decades, water demand in the UAE has increased rapidly. The main driving forces have been population growth, economic development and changes in lifestyle that have increased the demand for water in the region.

The increase in water demand is putting a strain on our already scarce natural resources. Ensuring economic diversification whilst reducing the water intensity of commercial and industrial activities, and improving indoor and outdoor water efficiency of the built environment will continue being an overriding consideration for economic and social wellbeing of the country.

> "Upon full implementation, the strategy will achieve savings of AED 74 billion and result in a reduction of 100 million metric tons of CO_2 associated with water desalination."

Given the wide range of human activities that depend – directly or indirectly – on water, future climate-driven changes in water resources will affect many aspects of our lives. Global warming is already having a measurable effect on this cycle, altering the amount, distribution, timing, and quality of available water.

Global dialogue on climate change adaptation must transition into implementation and country-driven action. Keeping this idea in mind, and in line with the UAE's vision to achieve prosperity and sustainability, the Ministry of Energy and Industry, launched the UAE Water Security Strategy 2036 in 2017.

The strategy aims to ensure sustainable access to water during both normal and emergency conditions, as well as reduce overall demand for water resources by 21 per cent.

Upon full implementation, the strategy will achieve savings of AED 74 billion and result in a reduction of 100 million metric tons of CO_2 associated with water desalination.

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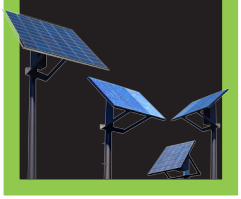
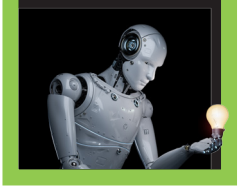
The Sustainabilist
2019 EDITORIAL CALENDAR

JANUARY
ENERGY



FEBRUARY
TECHNOLOGY



MARCH
WASTE

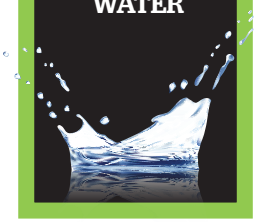
APRIL
GREEN INVESTMENTS

MAY
TOURISM

JUNE
CLIMATE CHANGE

SEPTEMBER
Trending Topic
ELECTRIC VEHICLE

OCTOBER
WATER



NOVEMBER
SAUDI ARABIA

DECEMBER
YOUTH & EDUCATION

PERMANENT DISTRIBUTION POINTS

IRENA
Near Masdar City, Abu Dhabi

Sustainable City
Al Qudrah Street

MASDAR
Masdar City, Abu Dhabi

UBER
Dubai Internet City

ENGIE
Dubai Media City

ENOC
Bur Dubai

EGA
Al Taweelah Area

DEWA HQ
Sheikh Rashid Road

Suqia
Sheikh Rashid Road

MOCCAE
Al Ruwayyah 2

Dubai Municipality
Al Hudaiba, Bur Dubai

EMPOWER
Al Hudaiba, Bur Dubai

Design District

Smart Dubai

DEWA SUST
Al Quoz

DEWA
Warsan

Dubai Science Park
Dubai Studio City

Emirates Transport
Umm Ramool

ABU DHABI AIRPORTS
Etihad Lounges
Etihad Training Center
AL Dhabi Lounge
Golden Class Lounge
Royal Jet
Al Bateen Private Jet
AL Reem Lounges

ZOOM EPPCO
Oud Metha Rd, E 66, Opp Healthcare City

ZOOM ENOC
Oud Al Muteena 2 D54 Dubai

ZOOM ENOC
Shk Rasheed Rd, D 75

ZOOM ENOC
Oud Metha Rd, E 66, JW Mariott Hotel

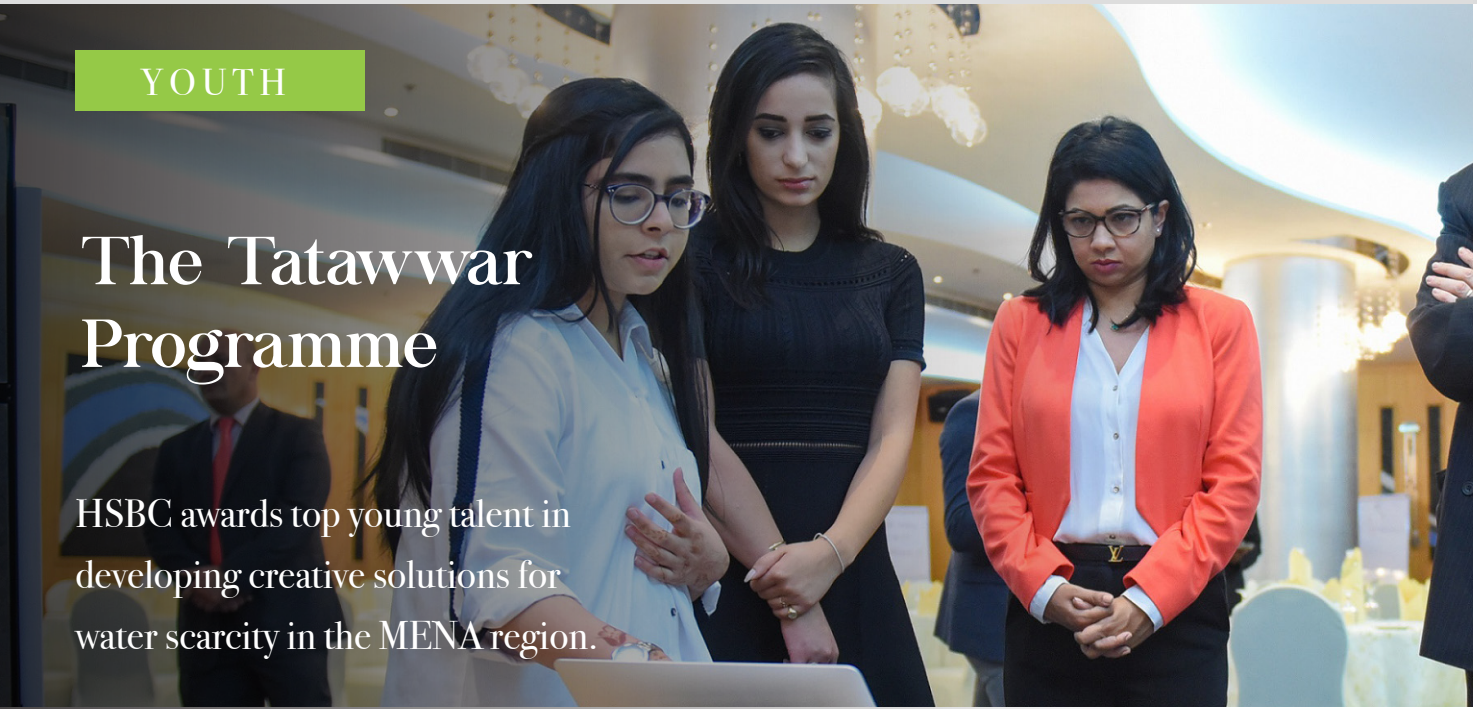
ZOOM ENOC
Oud Metha Rd, E 66, Opp Al Wasl Club

DUBAI AIRPORTS
Marhaba Lounge
DXB Civil Aviation first class lounge
British Airways Lounge
Al Majlis VVIP lounge

Contents

The Sustainabilist looks at the role and importance of water in different industries and efforts on their part to conserve the precious resource.

YOUTH



The Tatawwar Programme

HSBC awards top young talent in developing creative solutions for water scarcity in the MENA region.

The winner of the Tatawwar programme – an initiative launched by HSBC in partnership with the British Council and Potential.com - was announced on Thursday 13 June 2019, at an award ceremony held in Muscat, Oman. The competition, launched earlier this year, aims to respond to one of the major challenges facing the Middle East and North Africa region - water sustainability. In parallel, the goal of the programme was to equip young people with future employability skills.The winner, Zoya Naeem, from United Arab Emirates – whose solution focuses on tracking water consumption at home and linking users to an environmental consultant that can help reduce costs and water waste – will be supported in launching her own campaign on the MENA region's leading crowd-funding platform Zoomaal.com.

Hanin Azzam, Operational Manager for Zoomal says the platform can significantly benefit this great cause. "It's deeply encouraging to see the next generation of regional problem solvers addressing such an urgent issue. Launching their ideas on our crowdfunding platform will give the finalists a chance to not only raise funds, but connect with a wider community and generate awareness about the importance of water sustainability in the region," he said.

HSBC is committed to providing long-term support to help young people access programmes and acquire the skills they need to succeed in the workplace of the future. Tatawwar, underscores this commitment by creating awareness of the social and environmental impacts of water scarcity and helping develop the innovation and entrepreneurial skills of the upcoming generation. In its pilot year, the programme reached over 500 students in the region, who went through an online self-directed learning course to guide them through the process of developing their social enterprise. These students were then invited to attend face-to-face workshops in their respective countries as well as interact on webinars with experts and consultants, who helped them further develop their business models.

The top 10 students from across the five countries were invited to a four-day workshop in Muscat, Oman. While there they were supported in building prototypes of their ideas, which were then showcased at the award ceremony.

NEWS ROOM

DEWA to build 68 new 132/11kV substations worth AED 8 billion

DEWA plans to build 68 new 132/11 kilovolt (kV) substations over the next three years, at a projected value of AED 8 billion. This supports the directives of the wise leadership, and shows DEWA's commitment to expand its infrastructure to meet growing demand for power in Dubai.

In 2018, DEWA's total production capacity reached 11,100 megawatts (MW). DEWA also established a total of 258 main substations of 132/11kV, 18 of which were commissioned in 2018 at a total cost of AED 2.05 billion.

Nat Geo produces show on Abu Dhabi's protected areas

National Geographic Abu Dhabi has partnered with the Environment Agency - Abu Dhabi (EAD) to produce a documentary series that showcases the UAE's diverse flora and fauna and steps that can be taken to preserve the natural heritage in Abu Dhabi.

Called 'Explore Your Environment', the five-part documentary series takes viewers on a journey across various protected areas within Abu Dhabi. Narrated by Emirati explorer and conservationist Fahood Taymour, the series consists of two-minute videos taking the viewer on a journey across the Emirate's protected areas.

Achieving Carbon Neutrality

At Dubai Carbon, we offset our resources used through our UAE-generated credits. A carbon offset is a reduction in emissions of carbon dioxide or greenhouse gases made in order to compensate for or to offset an emission made elsewhere. This approach, despite being more complex, is more beneficial in the long run as it has a 6x multiplier for green economy and green GDP.

We have considered recycled paper, however to do that successfully, we would have to use twice as much recyclable paper, which would actually increase our emissions.

Therefore, we use normal paper, but offset it. Under a circular economy perspective, the latter is more viable from both a resource consumption pattern and the circular life of resources.

Of course, the most sustainable magazine is one that does not use any paper at all! That is why The Sustainabilist will only be printed till the end of Expo 2020.

We are building a community and hope to migrate to 100% digital well before our set target date. After all, The Sustainabilist is a vehicle to raise awareness, and encourage dialogue. If you wish to help us, please contribute and comment on **www.thesustainabilist.ae**

Emissions from Issue 1 – 10

Issue 5		683 KG CO2e
Issue 4		683 KG CO2e
Issue 3		1,964 KG CO2e
Issue 2		683 KG CO2e
Issue 1		1,708 KG CO2e
Issue 10		1708 KG CO2e
Issue 9		598 KG CO2e
Issue 8		632 KG CO2e
Issue 7		598 KG CO2e
Issue 6		854 KG CO2e

United Nations
Framework Convention on
Climate Change

Date: 19 December 2018
Reference: VC/0801/2018

VOLUNTARY CANCELLATION CERTIFICATE

Presented to:

CDM Project 7260: DEWA Chiller Station L

Reason for cancellation:

Voluntary cancellation made by Dubai Carbon to offset emissions generated from printing The Sustainabilist from October 2017 to October 2018

Number and type of units cancelled

10 CERs
Equivalent to 10 tonne(s) of CO2

Start serial number: AE-5-621404-2-2-0-7260
End serial number: AE-5-621413-2-2-0-7260

The certificate is issued in accordance with the procedure for voluntary cancellation in the CDM Registry. The reason for cancellation included in this certificate is provided by the canceller.

FEATURE

Every Drop Counts

Managing water demand is a crucial part of Expo 2020 Dubai's Sustainability strategy. This is how the largest event ever hosted in the Middle East will manage its water consumption.

By Ayesha Al Marzooqi

Assistant Manager, Sustainability and Innovation – Sustainability, Expo 2020 Dubai

Sustainability isn't a new concept in the UAE – Expo 2020 Dubai adopted *Sustainability* as a key subtheme with respect to our ancestors who lived in the harsh desert by taking from the land and sea only what they needed to survive. But as our natural resources become increasingly stretched, we have an unprecedented opportunity to collaborate with and inspire the millions of people who will visit Expo 2020 Dubai to protect the planet's resources and create a more sustainable future.

In a region where water is scarce, managing our water demand is a crucial part of this World Expo's strategy to host a sustainable event and leave a meaningful legacy. Embedded technologies within the buildings and infrastructure will reduce potable water consumption by 40 per cent below the local authority standards.

A significant initiative that will also be implemented across Expo's 4.38 sqkm site is Siemens' MindSphere platform, which uses AI and machine learning to gather and process data from across the site to help manage resources efficiently. Hundreds of soil sensors will feed data into MindSphere, where it will be coordinated with weather data to manage the water supply for site irrigation and adapt according to soil moisture.

By using treated sewage effluent for irrigation – the method dedicated to 100 per cent of non-potable exterior water requirements – water demand is significantly reduced.

More than 100 permanent buildings across the site are on track to achieve LEED Gold certification or higher, and the public realm and infrastructure is on track to receive CEEQUAL Excellent Certification – two of the highest qualifications in sustainable building globally. Part of the remit of these buildings is efficiently managing water, with water meter systems and indoor fixtures to minimise water use.

One of the most significant – and impressive – structures will be the Sustainability Pavilion, which takes a proactive approach to managing water demand. Built to achieve LEED Platinum Certification, the pavilion is designed to reduce water use, recycles water for non-potable uses such as cooling and irrigation, and even captures humidity to provide an alternative water source. Several international participant pavilions will also employ innovative water saving technologies that will demonstrate sustainable solutions from around the world.

> "Embedded technologies within the buildings and infrastructure will reduce potable water consumption by 40% below the local authority standards."

Water conservation is also taken into account when it comes to planning for an expected 50 million meals during Expo 2020 Dubai. Balancing quality and sustainability are crucial, and our goal will be supported with the help of Emirates Flight Catering's vertical farm, planned to be the world's largest and located next to the Expo site. With efficient water use at the heart of the farm's technology, it will produce 2,700 kilos of herbicide- and pesticide-free leafy greens for use at Expo 2020 every day, using 99 per cent less water than outdoor fields.

To further reduce water consumption on the Expo 2020 site and throughout its legacy as District 2020, Expo's on-site nursery is cultivating about 400,000 shrubs and 13,000 mature trees – all either native or adaptable to the Middle East, and thus accustomed to the desert soil and require less water. Additionally, between now and event time, Expo expects to add a further 450,000 shrubs and 4,000 trees that are less water-intensive.

As we aim to extend our impact beyond the Expo 2020 site, schoolchildren who visit will learn the importance of being water-conscious. We are also supporting inventive minds around the globe through our flagship Expo Live innovation and partnership programme, with many grantees focused on water conservation.

An impressive example is the UAE-based Norwegian company Desert Control Middle East, which has pioneered a liquid nanoclay that helps retain water at the root level of plants to reduce desertification and water consumption.

With the urgent need to reduce humanity's footprint on the planet, we have to embrace every opportunity to reduce our individual consumption. At Expo 2020, we are seeking to improve our water efficiency in an arid region to set an example that can lead to a more sustainable future.

COVER STORY

The Weight of Water

The Sustainabilist, in conversation with HE Saeed Mohammed Al Tayer, MD & CEO of Dubai Electricity & Water Authority (DEWA), on trailblazing innovations and technology, world-class infrastructure, investments in the water sector and the future roadmap.

DEWA has identified sustainability as one of its five corporate values. Why do you place such high importance on sustainability?
Dubai Electricity and Water Authority (DEWA) strategy is built on the vision of the wise leadership and the directives of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, and Dubai Government's strategic plans. These include the Dubai Clean

Energy Strategy 2050, Demand Side Management Strategy, Carbon Abatement Strategy, and others that support the transformation towards clean energy; promoting sustainable development, and ensuring the happiness of citizens, residents, and visitors in Dubai and the UAE.

Earlier this year, His Highness Sheikh Mohammed bin Rashid Al Maktoum announced the 8 Principles of Governance in Dubai, and the 50-Year Charter, which outline the future of Dubai to achieve the happiness and prosperity of citizens. As soon as these were announced, we pledged to His Highness to abide by them. We reviewed DEWA's mission and corporate values in light of our vision that was reformulated based on these principles to become 'A globally leading sustainable innovative corporation.'

DEWA has also aligned its strategy to the UAE Centennial 2071, the UAE Vision 2021, the Dubai Plan 2021, the Demand-Side Management Strategy 2030, Dubai Clean Energy Strategy 2050, the UAE Green Growth Strategy, the UN Sustainable Development Goals 2030 and other relevant strategies, all of which support sustainability. DEWA has pioneered the implementation of strategies to instil sustainability as it holistically addresses social progress, environmental stewardship, and economic prosperity. DEWA has made sustainability a priority within its strategy, plans, and initiatives; promoting them in all their environmental, economic, and social aspects, as it continues to raise awareness about sustainability and climate change issues to preserve the planet.

We heavily focus on securing our supply by diversifying the energy mix, including clean energy to provide 75% of Dubai's total power output by 2050. This is why DEWA established the Mohammed bin Rashid Al Maktoum Solar Park. The solar park's capacity will be 5,000MW by 2030, with investments totalling US$13.6 billion. Our R&D Centre at the Solar Park aims to support Dubai's position as a global hub for research and development in the field of solar energy, smart grids, energy and water efficiency, and capacity building in these sectors.

We are increasing our operational efficiency by decoupling electricity generation and water desalination. One example is that DEWA has built a solar-powered desalination plant at the Mohammed Bin Rashid Al Maktoum Solar Park to research and develop these technologies.

To ensure continuous improvement, DEWA is replacing Multi-Stage Flash (MSF) desalination technology with solar-powered Reverse Osmosis (RO) to provide cheap and clean water.

By 2030, DEWA intends to produce 100% of its desalinated water production from a mix of clean energy technologies, that use both renewable energy and waste heat. This means Dubai will exceed global targets for using clean energy to desalinate water.

How important is innovation and investment in technology for the water sector? What new innovations and trends is DEWA incorporating in its future projects?

Innovation is a part of our DNA and throughout the years, DEWA's efforts in creating innovative solutions have culminated in great results, saving both time and efforts.

DEWA provides electricity and water from an integrated value-chain: from Power and Water Cogeneration to delivering services to customers. DEWA plays a vital role, serving over 900,000 customers, with investments of AED 86 billion over the next five years.

Today, DEWA has a world-class infrastructure, with a capacity of 11,400MW of electricity and 470 million imperial gallons of desalinated water per day (MIGD) to meet the ever-increasing demand in Dubai.

We are keeping pace with the 4th Industrial Revolution, and adopting Artificial Intelligence(AI), robotics and the Internet of Things (IoT) technologies to support the Dubai 10X initiative, which is set to propel Dubai towards the future, for a better future for generations to come.

We launched a new initiative that reimagines the concept of service organisations and creates a new digital future for Dubai through DEWA Digital, the digital arm of DEWA. DEWA Digital will implement a pioneering new model for utilities leveraging on innovation in renewable energy, energy storage, autonomous systems, artificial intelligence and digital services. This model will change the entire business of public utilities and help DEWA become the world's first digital utility, utilising autonomous systems for renewable-energy and its storage, expansion in AI adoption, and providing digital services.

We also have a clear and innovative strategy in water network that focuses on Artificial Intelligence and advanced digital solutions. This includes:

1. Develop an AI platform that works

on top of the SCADA system that can learn and monitor the network behaviour, in parallel with the human operators and detect network events such as breakages in near real-time.

2. Use Digital Automation and AI for optimising network and pumping operations to save energy and cost while adequately fulfilling the customer requirements.

3. Use AI in advanced metering infrastructure to effectively detect smart meter tampering and leakages at customer premises through pattern classification and automatic consumption profiling.

4. Use advanced digital solutions and AI in building energy management to reduce wasteful energy and water usage by learning the preferences and occupancy patterns.

5. Use robotic employees (nicknamed RAMMAS) to serve customers, which has contributed to DEWA reaching a world-leading level of customer happiness of 97%.

DEWA has made global achievements in its electricity and water networks. Losses in water transmission and distribution networks decreased from 42% in the past to 6.5% in 2018: one of the lowest recorded rates in the world.

At DEWA, we don't just bring innovative technologies, we also bring the best minds, knowledge and expertise. A great example of this is that Dubai is hosting the International Desalination Association World Congress on water desalination this year. This global event is the world's largest and the most prominent conference on water desalination. Leaders, senior officials, experts, and academics, as well as 2,000 participants from 60 countries around the world will attend it. The conference is held in conjunction with the 21st Water, Energy, Technology and Environment Exhibition (WETEX), which we organise every year in Dubai.

What are the overlaps between water scarcity and the broader issue of climate change and carbon? What is the best level at which this issue should be managed—global, local, public, private?

The UAE has long been at the forefront of the global green debate, focused on becoming the world leader in sustainable development and achieving the Sustainable Development Goals outlined in the United Nations 2030 agenda. The UAE National Climate Change Plan 2050 endorsed by the UAE Cabinet, reflects our nation's goals to become one of the best-prepared countries to combat climate change and achieve sustainable development. This plan aims to unify our concerted efforts and enhance cooperation between the private and public sectors.

Water security is a national security issue for the UAE, and is one of the seven strategic sectors of the National Innovation Strategy, and one of the main pillars of UAE Vision 2021. The UAE Water Security Strategy 2036 aims to ensure sustainable access to water during both normal and emergency conditions.

In Dubai, we have a comprehensive approach to ensure the sustainability of water resources in line with the Dubai Integrated Water Resource Management Strategy, which focuses on enhancing water resources, rationalising water consumption, and using cutting-edge technologies and innovative solutions to reduce water consumption by 30% by 2030. Dubai has the necessary legislation to ensure water security. For example, groundwater consumption has been reduced from 100% in the 1980s to 0.4% currently for drinking water.

This is why currently, DEWA has one of the lowest water loss rates of any water utility in the world of just 6.5%. It is also why Dubai has considerable water reserves to meet demand.

What are the most exciting trends in today's smart water sector? Are there any specific lessons you think can apply from the UAE water market to the rest of the world?

In Dubai, we adopt three pillars to ensure the sustainability of water production. These are based on using clean solar energy to desalinate seawater using the latest Reverse Osmosis (RO) technologies. Excess water is stored in aquifers and pumped back into the water network when needed. This integrated innovative model protects the environment and is a sustainable economic solution. It also emphasises Dubai's ability to anticipate and shape the future.

We are currently desalinating water in Dubai through Combined Cycle Co-Generation, which is efficient and depends on using waste heat created by the production of electricity for water desalination. In order to ensure continuous improvement, DEWA conducted a study to improve water production, and analysed the economic and technical feasibility of replacing Multi-Stage Flash (MSF) desalination technology with solar-powered Reverse Osmosis (RO) to produce water using cheap and clean energy. By 2030, Reverse Osmosis will

help expand our production capacity to 305 million gallons of desalinated water per day, increasing desalinated water production capacity to 750 million gallons of desalinated water per day by 2030. DEWA adopts a clear strategy to ensure that by 2030, 100% of desalinated water will be produced by a mix of clean energy that uses both renewable energy and waste heat. This will allow Dubai to exceed global targets for using clean energy to desalinate water. Increasing the operational efficiency in decoupling desalination from electricity production will save around AED 13 billion and reduce 43 million tonnes of carbon emissions by 2030.

In order to achieve further integration, DEWA launched a geophysical and hydro-geological field study and digging exploration and monitoring wells to study the possibility of injecting and storing desalinated water from solar-powered reverse osmosis plants into aquifers and pumping it back into the water network when needed.

Currently, DEWA is building a subterranean water basin to store 6,000 million gallons of water that can be retrieved when needed. This will provide the Emirate with a strategic reserve of over 50 million gallons of water per day in emergencies, while ensuring the quality of the stored water remains unaffected by external factors. These two integrated initiatives have managed to raise the level of efficiency and effectiveness in the production of water by adopting the latest techniques to achieve sustainable development. They have also achieved substantial savings without affecting the quantity or quality of the water. These initiatives will help to integrate the considerable electricity generated by solar power.

Given the importance of delivery of reliable electricity and desalinated water, does DEWA also prioritise water conservation and waste reduction?

Our vision to become 'a globally leading sustainable innovative corporation' is aligned with the objectives of the UN's 17 Sustainable Development Goals (SDGs) 2030. As members of the United Nations Global Compact (UNGC), we support the substantial role played by the UN in encouraging sustainable progress and the SDGs by aligning our work plans, initiatives, programmes, and projects with them.

To achieve our vision and the SDG goals, we have an integrated strategy to raise awareness about conservation and reducing electricity and water use. This supports our efforts to protect the environment, preserve its natural resources, and reduce our carbon footprint to achieve the goals of the Dubai Clean Energy Strategy 2050 to make Dubai the city with the lowest carbon footprint in the world. It also supports the Carbon Abatement Strategy to reduce carbon emissions by 16% by 2021, and the Demand Side Management Strategy to reduce energy and water use by 30% by 2030.

Our conservation programmes and initiatives over the past 10 years have achieved significant savings in electricity and water use within all stakeholder groups. Cumulative savings between 2009 and 2018 reached two terrawatthours (TWh) of electricity and 7.4 billion gallons of water, equivalent to a total saving of AED 1.2 billion. These savings were achieved in the residential, commercial, and industrial sectors as well as in educational facilities, governmental and semi-governmental organisations and are equivalent to an annual electricity consumption from approximately 305,000 apartments and annual water used by 241,000 apartments. This has contributed to reducing one million tonnes of carbon emissions.

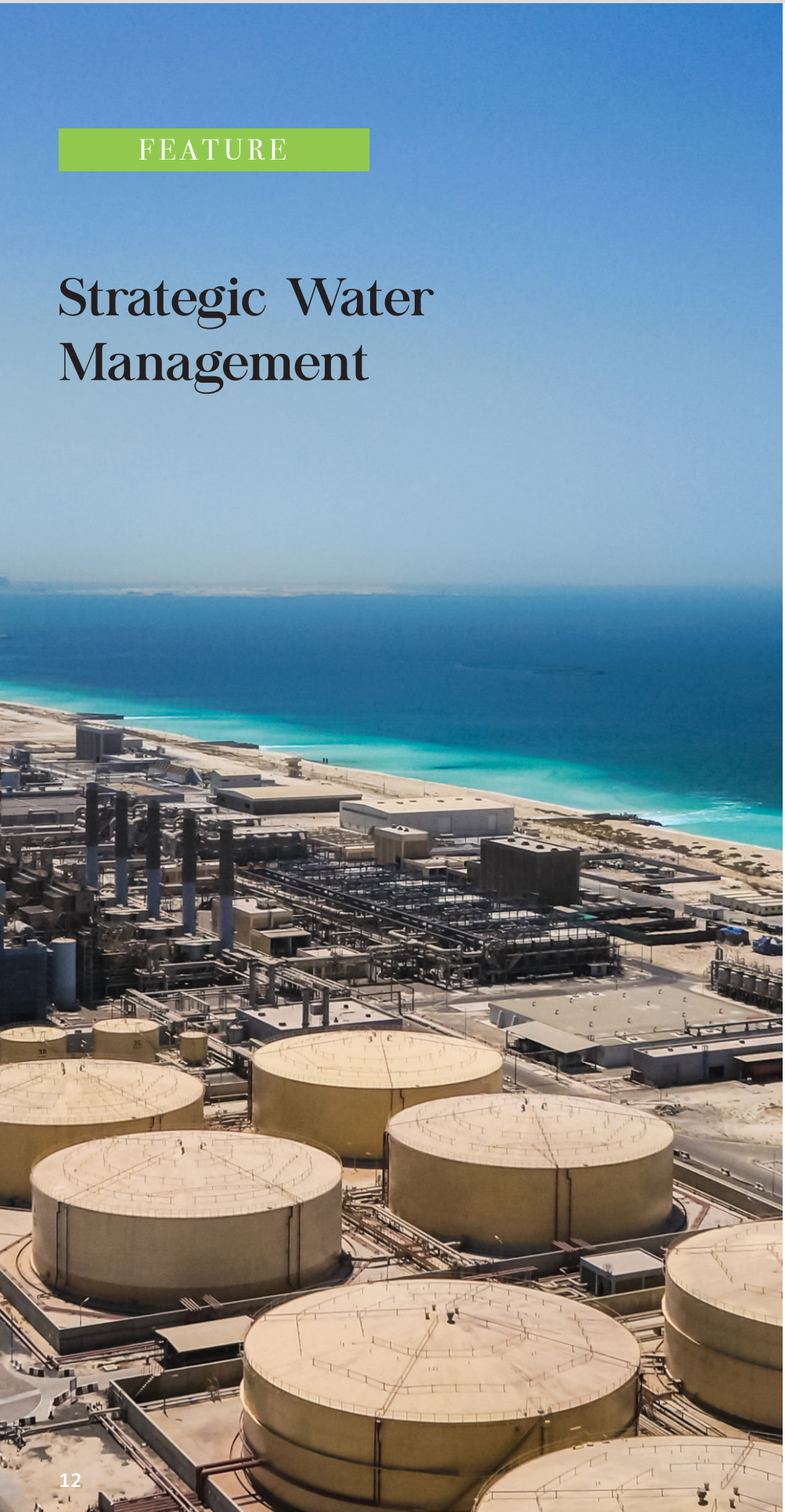
DEWA is planning on investing AED 86 billion over the next five years. What will be the impact of this investment and how will this support in the shift towards renewable energy?

Despite possessing one of the largest oil reserves in the world, the UAE has prepared early to deliver the last barrel of oil, and today our nation leads global efforts in the clean and renewable energy sector through its strategies and investments. At DEWA, we have investments of over AED 86 billion over the next five years to meet the growing demand for electricity and water in the Emirate. This is a path with many challenges, but overcoming them has made it all the more rewarding, especially as we are guided by the foresight and wisdom of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, who launched the Dubai Clean Energy Strategy 2050 to generate 75% of Dubai's total power output from clean energy by 2050. A key pillar of this is the Mohammed bin Rashid Al Maktoum Solar Park, which will generate 5,000MW from a range of photovoltaic and concentrated solar power technologies by 2030.

As well as raising the level of clean energy supplied, Dubai is working to become a model green economy by rationalising its use of energy and water to balance development with environmental concerns.

FEATURE

Strategic Water Management

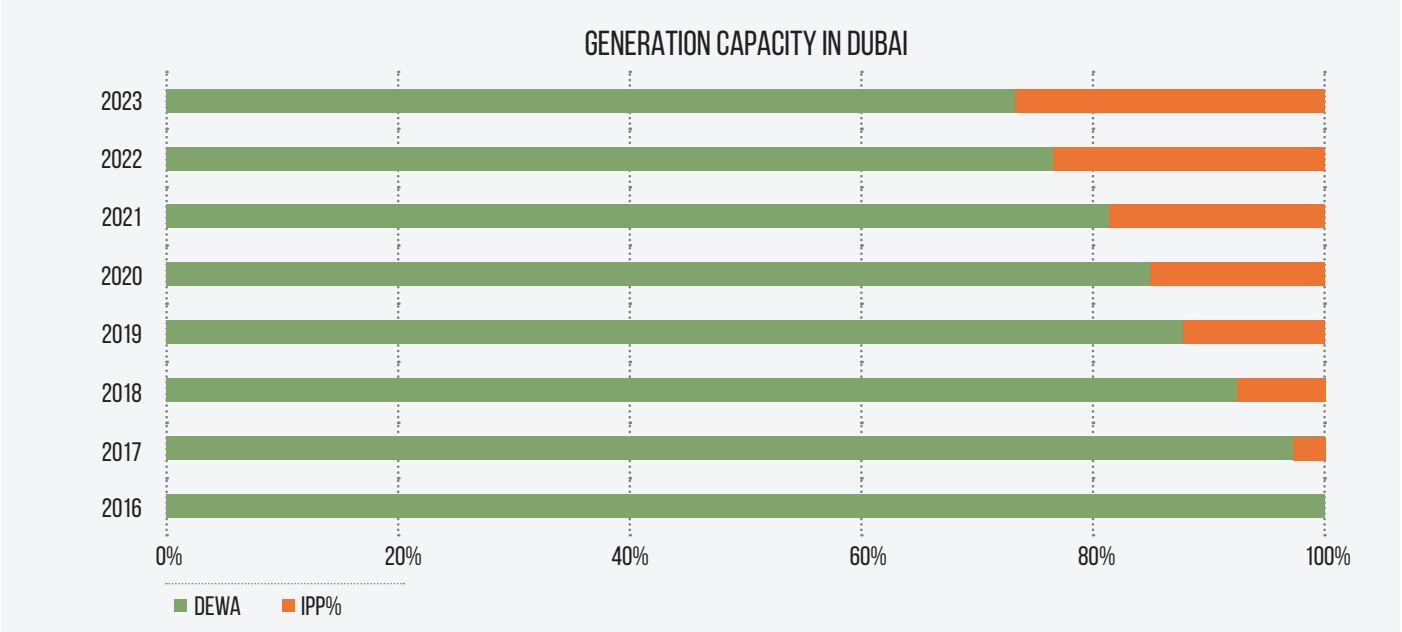


James Grinnell from the RSB discusses the developments driving an impending decoupling of water and power generation.

Head of Water at RSB for Electricity & Water

In 2011 Dubai's government issued a landmark law, creating an opportunity for participation of the private sector in the production of electricity and water. The law allows for the private sector to invest in electricity and water production facilities and sell that product to Dubai Electricity and Water Authority (DEWA), thus alleviating the burden on the government of significant investment in power and water capacity, with private investment comes a wealth of global expertise and capital. Since the law was passed, the emirate has attracted around AED 33bn of investment in power generation, much of it focussed on solar developments.

The success of the IWPP model can be seen from the sheer growth in generation capacity it has delivered since inception. Starting with a pilot 13MW solar PV plant in 2013 led by the Dubai Supreme Council of Energy, independent power generators will provide 4,355MW of electricity generation capacity by 2023, accounting for some 25% of the emirate's total capacity. The increasing share of production capacity met by renewable energy, is in line with Dubai's Clean Energy Strategy and indicative of the Emirate's drive, towards meeting energy



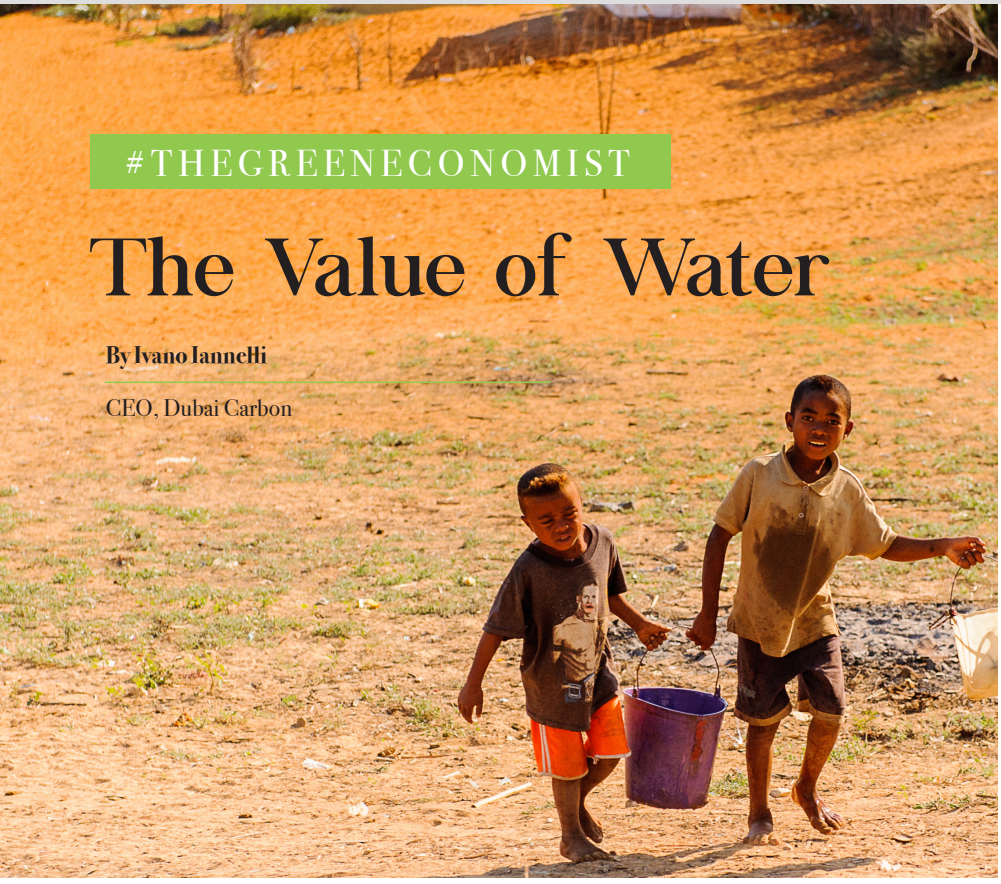
demand with renewable low carbon generation. The Strategy envisages renewables accounting for 75% of Dubai's energy mix by 2050, and assuming the costs of energy storage follow a similar glide path as solar (which most commentators think will be the case), renewables have the potential to play the major role in meeting our energy demands over the foreseeable future, not just as a clean energy source available when the sun shines, but one that can meet our round the clock energy need.With the road map for transition to green renewable energy generation clear, the focus now turns to water production.

Gas fired co-generation plant that employ Multi Stage Flash (MSF) desalination technology have long played a vital role in facilitating the economic development of countries in the Gulf and they have been essential in meeting the electricity and water needs of Dubai throughout its rapid development. But co-generation plant are most efficient when they run at a given ratio of electricity to water production – the mode in which they generate the most electricity and produce the most water per unit of gas supplied. The transition towards clean energy generation will reduce electrical demand placed on co-generation plant making it increasingly difficult to operate in their "sweet spot".

MSF technology typically requires around 15-20kWh per cubic meter of water produced, whilst a modern sea water reverse osmosis (SWRO) plant may require only 2-3kWh/m^3. SWRO is not a new technology but innovation in areas such as membrane material, pressure management and energy recovery, have eked out more and more improvements in efficiency and experts believe that further efficiencies remain to be exploited. With such superior energy performance, SWRO is the preferred solution to evaporative water desalination technologies such as MSF or MED (Multi Effect Distillation).

The economics also back this up. In October 2018, ACWA Power offered a water tariff of US$0.70/$m^3$ as part of a wider bid for a co-generation project in the gulf region and yet, only a few months later, the same company tendered a price of US$0.49/$m^3$ for the Abu Dhabi Taweelah SWRO project. Whilst there are always particular circumstances which may favour one technology over another, the size of this price differential, combined with the economic efficiency offered by solar electricity generation, provides additional motivation to decouple electricity production and water generation, in favour of clean energy generation alongside SWRO water production.

The IWPP model is a proven framework that offers the stability and confidence needed to attract investors and deliver the transition. It is an ideal framework to facilitate a smooth transfer to SWRO solutions, and DEWA is already preparing to invite proposals for the development of a major 120 MIG/d SWRO desalination plant. A plant of that size would add 25% to Dubai's existing water production capacity and would, in one step, dramatically increase the flexibility with which DEWA can operate its water system. What's more, if DEWA were to show a preference for output from the planned 120MIG/d RO plant over the existing MSF technology, gas savings in the region of 270Mm^3 (9.5bcf) per year could be achieved.



#THEGREENECONOMIST

The Value of Water

By Ivano Iannelli

CEO, Dubai Carbon

Water, despite covering 70% of the Earth's surface, is a scarce commodity. This is because only 2.5% of this water is freshwater, and just 0.3% of freshwater is found in lakes and rivers and is available for human consumption.

Water is not only a declared human right, necessary for life and health, but is also a key input into the global economy, powering manufacturing, turning energy turbines, and nourishing crops and livestock. The way in which water is managed in the face of these growing challenges will be key to the economic success of countries where it is scarce, and will almost certainly determine whether the world meets its ambitious Sustainable Development Goals (SDGs).

Water is a scarce resource; therefore, it has an intrinsic economic value. It is increasingly important that we treat water like the valuable, exhaustible, and degradable resource that it is. Projections suggest that by 2050, global demand for water will increase by 30–50 per cent, driven by population growth, rising consumption, urbanisation, and energy needs.

The future will be thirsty and uncertain. Already more than 60 per cent of humanity live in areas of water stress where available supplies cannot sustainably meet demand. If water is not managed more prudently–from source, to tap, and back to source–the crises observed today will become the catastrophes of tomorrow. Competition can be fierce for this precious commodity. Agriculture claims the lion's share of freshwater worldwide, soaking up some 70 per cent, and industrial uses consume another 22 per cent.

As a scarce resource, water ought to be allocated efficiently to maximise its contribution to growth, jobs, and well-being. At the same time, the allocation needs to be equitable to meet the needs of different water users and provide everyone, in both urban and rural areas, with access to clean, safe sources of water for drinking, sanitation, and other essential uses. Finally, sustainability is paramount since freshwater is a renewable natural resource upon which all life outside the oceans depends. Since water is a renewable natural resource, the degradation of aquatic ecosystems has the potential to diminish the current and future productivity of water.

Good water resources management and planning are essential to sustain economic and human development. Especially in developing nations, there is a need to bridge the gap between existing technologies and operational applications in support of the planning, design, operation, and management of water resources.

Water in the developed world has been largely cheap, clean and abundant. However, the notion of universal access to a perpetual and uninterrupted water supply faces a number of contradictions. Over a billion people worldwide are victims of water poverty, defined as having less than 13 gallons of clean water per day per person.

Balancing ecosystem sustainability with immediate economic pressures remains amongst the most challenging tasks for policy makers, particularly when it comes to determining how much water is made available for the environment and determining what water infrastructure will be built and how it will be operated. The appropriate policy mix will need to vary with ecological pressures and country circumstances.

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”

SEBASTIEN CHAUVIN

CEO, VEOLIA MIDDLE EAST

INTERVIEW

As the topic of sustainability will undoubtedly come up during this year's Water, Energy, Technology and Environment Exhibition (WETEX), one of the most prominent challenges that will be discussed is the issue of water security. The combination of the region's hot and dry climate, along with increasing demand from local communities, agriculture, and industries, have taxed an already strained water supply.

According to the latest data from the World Resources Institute's (WRI) Aqueduct tools, 12 of the 17 most water-stressed countries are based in the Middle East and North Africa (MENA) region.

The good news is, there are opportunities to tackle the water scarcity issue and with the right focus and investment, MENA countries will see the development of a circular economy around water with more resilient local agriculture, as well as dynamic and efficient industries.

Untapped potential, for example, lies with the reuse of treated water, which remains largely underutilised in MENA – a total of 82% is not reused according to the WRI. This water would provide a viable source of clean water, the key to establishing food security programs in the region.

By combining Veolia's expertise with more efficient reuse of water, along with organic fertilisation, we enable the creation of a circular model for food security in the Middle East.

Veolia has extensive knowledge and a portfolio of references in desalination, wastewater treatment, and reuse of all types. ` Veolia Middle East supplies potable water for almost 1 million people, as well as sewerage operations to nearly 2 million people.

In the past year, we have also seen an uptick in the industrial process water and, wastewater treatment to support the growth of the Oil & Gas segment, where water is a critical and invaluable resource in the upstream and downstream aspects of the industry's production. Veolia today serves companies such as BP in Oman, KIPIC in Kuwait, and SABIC, SADAF, and Kemya in Saudi Arabia.

One hot topic that I expect will be talked about at WETEX, is around the energy efficiency and biogas recovery from sludge, an area that Veolia is quite invested in. Just last month, we began new projects with Dubai Municipality and Ajman Sewerage, to develop Sludge- to-Energy plants. It is such projects that are aimed at producing renewable energy and reducing the overall carbon footprint, which Veolia is committed to supporting and exemplifies our company's ethos of Resourcing the World.

Another key area of focus for us is the support of local economies, through the creation of local jobs and the nurturing of future talent. With professional development being a cornerstone of our global business, we develop training programs and encourage innovation and education thanks to local partnerships.

Beyond discussing water security, climate change, and regional challenges, I think what needs to be touched upon at WETEX this year, is the need for the Gulf states to take a proactive approach in investing in water infrastructure and digitisation. We also need to open a conversation on the value of public-private partnerships, and contractual schemes in driving the development of sustainable technologies, and accelerating infrastructure development.

ABOUT

FOR THE LAST 35 YEARS, VEOLIA MIDDLE EAST, THE DUBAI-BASED SUBSIDIARY OF VEOLIA GROUP, HAS SUPPORTED THE REGION'S PUBLIC SECTOR AND INDUSTRIES TO MEET THEIR BIGGEST CHALLENGES IN TERMS OF RESOURCES EFFICIENCY, GROWTH, ENVIRONMENTAL COMPLIANCE, WORKFORCE SAFETY, AND DIGITISATION.

OFFERING AN EXTENSIVE PORTFOLIO OF WATER, WASTE, AND ENERGY MANAGEMENT SOLUTIONS, VEOLIA HELPS TO DEVELOP ACCESS TO RESOURCES, PRESERVE AVAILABLE RESOURCES, AND TO REPLENISH THEM.

THROUGH PUBLIC-PRIVATE PARTNERSHIPS AND INNOVATIVE CONTRACTUAL SCHEMES, VEOLIA IS COMMITTED TO ACHIEVING QUANTIFIABLE RESULTS WITH SUSTAINABLE, PRAGMATIC ENVIRONMENTAL SOLUTIONS.

ACTIVE IN A VARIETY OF MARKETS THAT INCLUDE WASTE TREATMENT & RECYCLING, WATER TREATMENT, RENEWABLE ENERGY AND HAZARDOUS WASTE TREATMENT, VEOLIA MIDDLE EAST HAS BUILT A STRONG EXPERTISE IN DEVELOPING COMPLEX PROJECTS, AS BOT, AS WELL AS AN EFFICIENT ORGANISATION TO INCREASE OPERATIONAL PERFORMANCE OF O&M CONTRACTS.

THROUGHOUT 2018, VEOLIA GROUP SUPPLIED 95 MILLION PEOPLE ACROSS THE GLOBE WITH DRINKING WATER AND DELIVERED WASTEWATER SERVICES TO 63 MILLION PEOPLE. WITHIN THE ENERGY SPACE, THE GROUP PRODUCED CLOSE TO 56 MILLION MEGAWATT-HOURS OF ENERGY AND CONVERTED 49 MILLION METRIC TONS OF WASTE INTO NEW MATERIALS AND ENERGY.

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INTERVIEW

Saving Energy

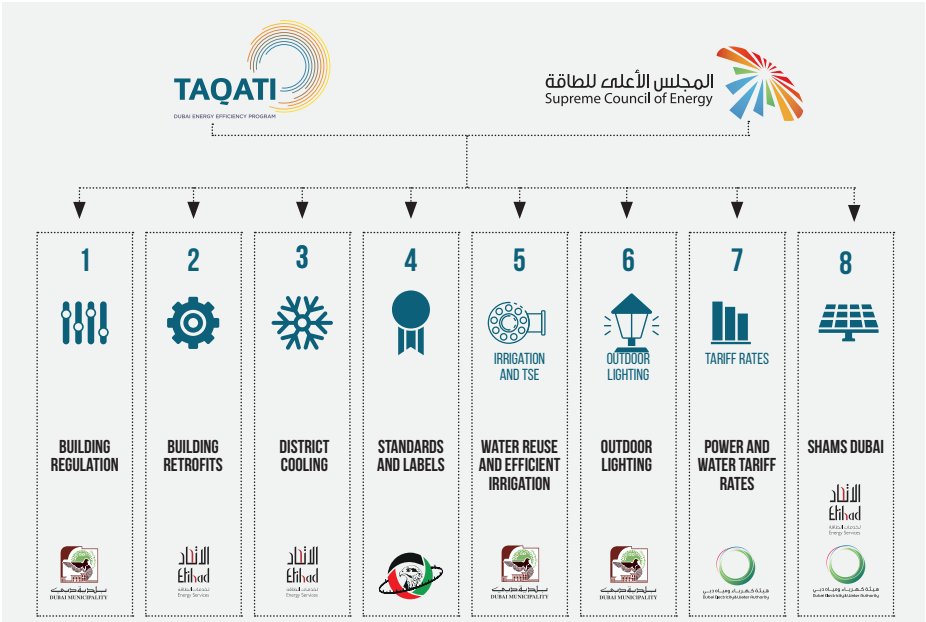
Insights from the CEO of Etihad ESCO Ali Al Jassim, on their role in the built environment, their services and vision for the future.

Have sustainability and environmental issues always been a passion of yours? How did you first get involved, and how did you develop your passion?

Yes, since my early engineering days, my passion and vision have been to develop buildings and systems, which are sustainable and environment friendly. Although, I followed my passion throughout my career, the major breakthrough came when I was appointed, CEO of Etihad ESCO.

Our vision is to transform Dubai's built environment into a leading example of energy efficiency for the region and the world, thereby making the emirate one of the most sustainable cities, globally. Now, my passion and vision were aligned and we had targets set. Dubai is a fast-growing city and, a large number of buildings have a major chunk of energy consumption. Our primary target has been building retrofit, through which we can achieve targets set under DSM strategy 2030.

What exactly does Etihad ESCO do for the built environment and how do



Under the DSM Program No 2 Building Retrofit, Etihad ESCO has set high targets to make UAE sustainable and Green.

Targets to be achieved by 2030

Retrofitting
30,000 Buildings

Annual Electricity Savings of
1.7 TWh

Annual Water Savings of
5.6 Billion IG

Annual CO_2 abatement of
1M Tons

these activities align with the UAE and Dubai's strategies?
Etihad ESCO is a key driver and, Program Manager of Dubai Demand Side Management Strategy. Through Program No 2 Building Retrofit, we retrofit buildings to make built environments more efficient and sustainable. Starting from the envelope of the building to energy guzzling mechanical equipment i.e. air conditioning and lighting, our approach is to go into minute details and make systems energy-efficient.

We understand water is a scarce resource in this region, so we optimise the water usage in built environments and minimise water wastage.

What present and future opportunities does UAE's renewable energy transition open up for Etihad ESCO?
UAE being blessed with solar energy and high solar irradiance all around the year, makes it the perfect place to utilise solar potential as renewables. In line with the UAE Vision 2021 and the Green Growth Strategy, the Dubai Integrated Energy Strategy (DIES) 2030 was developed by Dubai Supreme Council of Energy (DSCE) to support Dubai's vision of leadership in energy security and efficiency. The Dubai Integrated Energy Strategy 2030 sets the strategic direction towards secure and sustainable energy supply and demand. Setting an ambitious target of 25% clean energy by 2030, and further integrating the Dubai Clean Energy Strategy 2050, it targets 75% clean energy by 2050.

Etihad ESCO is Program Manager for DSM Program No 8, and with Shams Dubai is playing a pivotal role with Dubai Electricity and Water Authority (DEWA), to achieve aggressive targets set by Dubai.

Apart from building retrofit what are the other services that Etihad ESCO provides, and how are these integrated in the wider business?
Etihad ESCO has been providing several services which are directly or indirectly integrated with our company's vision and business approach.

- Energy Auditing
- Project Financing
- Measurement & Verification
- Project Management
- Maintenance Services
- Energy Performance Contracting
- Solar PV Projects
- Sustainability
- Advisory & Implementation Support
- Capacity Building

Looking towards the future, what is Etihad ESCO's vision?
Etihad ESCO already has targets set for 2030, to reduce energy demand by 30%. By the year 2025, we plan to retrofit more than 10,000 facilities, which will result in reduction in energy demand by 15-20%. Also, Etihad ESCO is highly focused on the use of renewables to cater to the energy requirements of the commercial as well as residential sector.

FEATURE

Future of Technology in Sustainable Agriculture

There is a big challenge ahead to keep up with feeding a global population predicted to grow to around 9 billion by 2050.

By World Green Economy Summit (WGES)

Sustainable agriculture is becoming an increasingly prominent topic in discussions on how to green the future. The World Green Economic Summit to be held in Dubai on October 21-22, for example, will discuss how the sector can sustainably boost food production and raise yields to meet global demand, as well as the technologies being employed.

The World Economic Fund (WEF) reported in December 2017 that its research showed US$14 billion in investments in 1,000 food systems-focused start-ups since 2010, while healthcare attracted US$145 billion for 18,000 start-ups during the same period. Agricultural technology is a multi-faceted subject, and the WEF has identified 12 major areas that could revolutionise global food production:

Alternative proteins: Partially replacing traditional sources of protein such as livestock, which today account for 15 per cent of greenhouse gas emissions, with novel alternatives derived from insects, aquacultures, plants or cell cultures.

Food sensors: This combines spectroscopy with computer vision to analyse food with respect to quality, safety and authenticity. The data this presents could if it became widely available improve on existing sell-by and use-by dates and so dramatically reduce household waste, as well as preventing food fraud such as the European horsemeat scandal of 2013 and identifying any harmful bacteria and viruses.

Nutrigenetics: This technology analyses a person's DNA in order to work out their optimum nutritional intake. Doctors' and nutritionists' ability to thus provide tailor-made diet recommendations could make a significant contribution to improving health, and could have a particularly beneficial impact in combatting obesity.

Mobile services: Providing a huge range of digital tools and services via mobile phones for the agricultural sector such as ease of access to financial services, agricultural information, supply chain

information, and markets.

Data analytics for insurance: By using big data and analytics, financial institutions can lower transaction costs and mitigate agriculture-related risk, which helps farmers with investments, efficiency, nutrition and income.

The Internet of Things: Allows farmers to track produce through the supply chain and control transport and storage environments in real time. It can also provide consumers with nutritional, environmental and other information about the food they buy.

Blockchain: Promises many advantages, including cutting transaction costs and the time needed to process payments. Blockchain could also be used to prevent food fraud, stop illegal production, and reduce produce recalls and losses.

Precision agriculture: Improving efficiency, profitability and sustainability through technology, automation, robotics and decision-support technologies, which take some of the guess-work out of agriculture.

Gene editing: Genetically modified foods promise to vastly increase crop production yet there are significant hurdles to overcome before this can happen. One is the risk of the technology being concentrated in the hands of large monopolies in developed countries. There are also perceived dangers in terms of public health and biodiversity.

Microbiome technologies: Identifying beneficial microbes that can then be used to coat seeds and plants so that they become more resilient to drought, temperature, nitrogen levels, soil composition and insects could revolutionise modern agriculture. Besides massively boosting crop production and reducing losses, the reduced use of fertilisers the technology entails would lead to a significant reduction in greenhouse gas emissions.

Biological crop protection and micronutrients: Replacing chemical pesticides and fertilisers with biopesticides and micronutrient soil additives would be popular with consumers, and has the potential to increase crop production levels while reducing emissions. However, much needs to be done to ensure biologicals don't come with their own attendant risks such as inadvertent damage to biodiversity.

Off-grid renewable energy generation and storage: If these technologies could be made available to the millions of farmers in developing countries who lack access to electricity, access to cold storage would prevent food losses and improved irrigation systems would reduce water wastage while raising production. The promise of these new technologies is immense, yet before this can be realised there are many challenges to be overcome.

1. Difficulty of achieving scale where production is so widely dispersed, especially in emerging markets.

2. Development and commercialisation are also long and costly processes, with a high degree of risk along every step of the way. Many innovative firms in the agriculture sphere last less than five years.

3. It is also a challenge to tie innovation in with upstream and downstream supply chain partners.

4. Technology in agriculture can sometimes be a hard sell for the public, too. There has been massive resistance to the development of genetically modified foods, for example.

5. There is also the challenge of ensuring that agritech benefits farmers, consumers and the planet rather than presenting new environmental, social and ethical problems if used to maximise profit at any cost.

To help food producers overcome these challenges there will need to be a wider and more sustained governmental effort to provide support in concert with other stakeholders. Innovators will benefit from access to flexible funding, the infrastructure to support development such as technology incubator parks, enabling regulation, and academic collaboration. It will also be necessary for technological advances in developed countries to be made more readily available in developing countries if the gap between the farming haves and have-nots isn't to widen.

If and when all these supportive factors are aligned, then the world will see a real revolution in global food production.

This topic will be discussed further at the World Green Economy Summit (WGES) on October 20-21 at Dubai International Convention and Exhibition Centre. To learn more about the World Green Economy Summit, please visit the following link http://www.wges.ae/

“Promoting sustainability in built environments and preparing our cities for the future, is a goal that I will always work toward achieving through my roles at AESG, the EmiratesGBC and the WorldGBC.”

EmiratesGBC
مجلس الإمارات للأبنية الخضراء
Emirates Green Building Council

I AM THE SUSTAINABILIST

Saeed Al Abbar

Chairman of the Emirates Green Building Council

Have sustainability and environmental issues always been a passion of yours? How did you first get involved, and how did you develop your passion?
The environment has always been something I have been passionate about, which I suppose stemmed from an upbringing and love for the outdoors. I would say it is something I first became professionally involved in during my engineering degree, whereby it became clear to me that the skills and knowledge I have gained through my education and training in engineering can be best applied to solve pressing global environmental or resource scarcity challenges.

What was your first job that actually involved sustainability and environmental issues?
My first professional position, perhaps ironically, was in oil and gas, 15 years ago. The first project I was involved with, in fact related to improving efficiency of enhanced offshore oil recovery techniques. The experience was fantastic as it applied the technical concepts, I had learned in engineering to devise and develop solutions to improve the energy efficiency of gas turbine systems offshore. Seeing that this not only had an energy saving benefit but also translated into cost savings for the business I suppose provided me with the conviction that to drive sustainable change it really needs to be underpinned by a strong economic and business case.

Have you actively tried to align your career with your passion for sustainability? And does this commitment to sustainability extend to your home/personal life?
Eight years ago, I founded AESG, a firm specialising in the provision of specialist engineering, consultancy and advisory services throughout the Middle East, Europe and Africa, where our mission is to contribute to creating a better world. This led to me serving as Chairman of Emirates Green Building Council, for the past five years, which has been and still is a journey which has translated my passion toward sustainable development in a way I could have not imagined when I embarked on my career. I am currently serving on the Board of Directors of the WorldGBC, to which I was recently elected to the Executive Committee as Treasurer. I feel honoured to serve as a champion for the green building movement on the international stage; to further our reach means we are furthering our message toward combating climate change. It is a true pleasure to be able to demonstrate the positive work the UAE is creating towards driving change in order to achieve sustainable targets, both on a national and global level.

Do you have a particular favourite area of sustainability or environmental issues?
My area of focus is within the urban development and built environment space. With a global trend of exponential population growth and mass migration to cities, it is essential that we redefine cities from a sustainability perspective. The myriad of challenges this presents throughout the world is daunting, yet exciting. Ranging from climate change and resource scarcity to citizen health and well-being, cities really are the front line for achieving global sustainable development goals.

Where do you see your career and commitment to sustainability progressing in the future, both professionally and personally?
Promoting sustainability in built environments and preparing our cities for the future is a goal that I will always work towards achieving through my roles at AESG, the EmiratesGBC and the WorldGBC. I see now that the call to action in our sector is more pressing than ever. We are facing a global climate and resource scarcity crisis, which is well documented, while at the same time a global health crisis, where in many parts of the world, the urban environment has overtaken smoking and road accidents as the number one cause of death. Sustainable urban development provides a new paradigm to tackle these challenges.

Why do you think sustainability is important to Dubai and the UAE? Is it something in which we should all be invested?
The Founding Father of the nation, His Highness Sheikh Zayed Bin Sultan Al Nahyan famously stated; "On land and in the sea, our forefathers lived and survived in this environment. They were able to do so only because they recognised the need to conserve it, to take from it only what they needed to live, and to preserve it for succeeding future generations." We are blessed that the current leadership has placed sustainability and environmental issues at the heart of the nation's development. The UAE Vision 2021 has clear targets for preserving natural resources, increasing the contribution of clean energy, and building an energy-efficient, smart city infrastructure that is environmentally friendly.

INTERVIEW

Becoming Net Positive

Ibrahim Al-Zu'bi, Chief Sustainability Officer, Majid Al Futtaim – Holding tells *The Sustainabilist*, about their key initiatives, visionary strategy and listing the world's first benchmark corporate Green Sukuk.

What does sustainability at Majid Al Futtaim mean?
At Majid Al Futtaim, we believe that sustainability is an integral part of our core business model, it is no longer a nice to have or an add on. Sustainability at Majid Al Futtaim has always driven and informed the decisions we take as a business.

Sustainability for us means delivering on our vision while keeping our negative environmental footprint to a minimum as well as driving positive socioeconomic wherever we operate.

There are many reasons why being sustainable is so important to us, one of the main reasons is that it supports our long-term growth, our goal is to provide our customers with sustainable positive experiences, contribute to saving our planet's natural resources and combating climate change. Hence, our focus long-term remains not only on profitability, but also on making a positive impact on the planet and the lives of those whom we serve.

Can you describe a few initiatives that you are most proud of?
Sustainability is at the top of our agenda and to support this we have institutionalised many strategies and programmes to ensure we are making a significant impact in moving the needle. I wouldn't particularly pick an initiative as I believe each and every programme we've put in place is a giant leap towards a better and safer tomorrow. Having said that, one of the umbrella strategies I would particularly like to highlight is setting ambitious goals for 2019, which I'm happy to report we are on track with. The strategy is to deliver results across three key areas, which are: developing and managing high performance assets

that support prosperous communities and delivering pioneering standards across our business.

As part of our ongoing commitment to sustainability, we have also developed and implemented an over-arching Sustainable Development Strategy, 'Dare Today, Change Tomorrow', which outlines a series of policies in line with our commitment to building a sustainable future by addressing three fundamental aspects: social, environmental and economic. Policies include, our Net Positive 2040 strategy, which aims to significantly reduce the company's water consumption and carbon emissions to the extent that it puts more back into the environment than it takes out, resulting in a positive corporate footprint by 2040, a Green Building Policy, a Pre-Acquisition Checklist, and minimum requirements for health and safety, and labour conditions.

What is Majid Al Futtaim doing to manage climate change risks and mitigate effects in the industry?

It is alarming and obvious that the world today is facing several challenges when it comes to the environment. Natural resources are depleting at an undeniable rate; thus, climate and clean energy policies have come to play more than ever before. Individuals, corporates and governments are starting to become extremely cautious about their actions and how that will impact the environment. This has also been the case with us, where we have made major advancements implementing initiatives to accelerate clean energy and climate protection.

For example, we've put in place initiatives that produce zero carbon power, invest in clean energy projects locally and regionally, pioneer in new technologies to cut emissions and improving energy and water efficiency. Furthermore, we've undergone transformations internally and have joined forces with government entities to tackle climate change and safeguard the environment for future generations, as highlighted by the recent signing of a Memorandum of Understanding (MOU) with the United Nations Environment Programme.

We are an organisation that has a proven track record of spelling out our commitment towards sustainability, but we believe that we still have a long way to go.

When you address climate-related challenges, do you feel the effort should be focused on the company level, or on collaborations?

Climate change is increasingly growing to become a serious challenge. There is an immediate need for the communities to collaborate and commit to working together to address climate change – this is central to accelerating sustainable development. No one organisation can do this alone, thus, we need regulatory bodies to ensure initiatives are being actioned and not just put in place. We all need to be more aligned, moving towards one direction, of a sustainable future.

Environmental challenges are talked about at almost every conference and is part of many global platform agendas. It has come to a point where business models are being restructured and accountability is demanded. Hence, corporates and governments need to begin addressing issues and not think of businesses or communities in isolation.

The onus remains on corporates to align themselves with government bodies in their efforts of addressing social and environmental problems. Thus, collaboration between public and private sector is key to realising sustainability goals and promoting a shared responsibility for the environment.

Majid Al Futtaim recently listed the world's first benchmark corporate Green Sukuk. How is Majid Al Futtaim planning on using this investment?

We have witnessed an incredible increase in the interest towards solving sustainability issues, especially in the region, but also globally. To support that, we announced the listing of the region's first corporate Green Sukuk, valued at USD 600 million. This marked a key milestone within our sustainability strategy, highlighting our commitment to transitioning to a low carbon economy.

The Green Sukuk demonstrates how serious we are to uphold sustainable practices across our businesses and the communities we operate in. Its investments will support funding of green buildings, renewable energy, sustainable water management, and energy efficiency, and will help move forward the company's 2040 Net Positive goal. Furthermore, we intend to allocate an amount equal to the net proceeds of any Green Sukuk to a portfolio of eligible green projects in the following categories:

- Green Buildings: Construction or refurbishment of buildings which meet recognised standards, such as BREEAM and LEED

- Renewable Energy: Generation or procurement of energy from renewable energy sources such as the solar or wind to power the company's operations

- Sustainable Water Management: Water recycling projects and investment in technology, product or systems which will lead to a reduction in water usage and demand by a minimum of 30%

- Energy Efficiency: Investment in technology, product or systems which will result in at least a 20% improvement in energy efficiency

Where do you think Dubai stands, in the international arena, in terms of sustainability?

Dubai is leading in terms of its sustainability efforts to adopt international best practices, thus underlining the concept of a sustainable lifestyle towards preserving our local environment for the current and future generations. We are very lucky to be operating and calling Dubai our home base as it poses a massive opportunity, given the fact that the UAE government is a stronger supporter of sustainable initiatives.

The government is a great example and has put in place several initiatives to bolster sustainable living, such as the UAE Energy Strategy 2050, and the UAE's National Climate Change Plan 2050, which aim to support the country's efforts in the areas of climate change within a broad framework and timeframe for the management of greenhouse gas emissions.

These strategies lead the transition into a climate-resilient green economy, while increasing climate change adaptation capabilities via getting strong engagements from corporates and other players. As always, we are grateful for the continued support of the UAE government in helping us achieve our sustainability goals.

INTERVIEW

Aluminium Ambitions

The MD & CEO of Emirates Global Aluminium (EGA) Abdulla Jassem bin Kalban, talks to *The Sustainabilist* on managing the leading aluminium giant and implementing their ambitious sustainable water management practices.

How is EGA contributing to the UAE water industry?
EGA has been a significant player in the UAE's water sector since the 1970s. To use just one example, we use advanced techniques for seawater desalination to produce fresh water at both our company sites. The heat generated at our power plant in Jebel Ali is used to run a desalination plant which is capable of producing up to 30 million gallons (136,000 cubic metres) of water per day. Our desalination plant at Al Taweelah uses reverse osmosis and has the capacity to produce 3.75 million gallons (approximately 17,000 cubic metres) of water per day, all of which we use on our own site. Through these efforts, we produce both potable and distilled water.

What activities does EGA conduct as part of sustainable water management?
EGA's approach to sustainable water management is multi-faceted; this includes reducing consumption, desalination and production, maintaining water discharge quality, and safeguarding the water eco-system at Al Taweelah.

EGA has also gone beyond relevant local regulations by investing in cooling towers at Al Taweelah to reduce the temperature of water used during energy production before discharge to the sea.But beyond these large-scale measures, we are also initiating measures to reduce our consumption of water in general – or to replace the use of freshwater where we can.

We keep meticulous track of water flow throughout our smelter operation to record and monitor actual rather than estimated consumption. Flow restriction devices – such as low flow taps and reduced flush toilets – have been installed in common areas.We also make extensive use of recycled grey water, which is sewage treated on-site at our sewage treatment plants. Similarly, the water

filling station at our Jebel Ali site has been re-engineered to capture spilled water.

What have been the results of your practices?
All our water needs in the UAE are met from the sea. EGA does not use groundwater or any other water source – greatly contributing to efforts to conserve this critical resource. Over 95 per cent of all the water we withdraw is returned to the sea.

Results from 2014 to 2017 confirm that EGA is predominantly compliant with standards set by the local authorities in terms of our discharged water. Our monitoring activities have identified no significant environmental impacts associated with the water discharges from our UAE sites.

On top of that, EGA supplies about 1.5 per cent of Dubai's water demand, as well as supplying other customers and meeting our own water needs. All the water produced by our Al Taweelah desalination plant is repurposed for our industrial processes.

Heavy industry has typically been associated with problematic water discharge. How does EGA solve this problem?
We closely monitor both the temperature and salinity of water discharged back to the sea, as this is important to preserve the marine environment. Through daily online results and regular laboratory of water sample analysis at Al Taweelah and Jebel Ali, we ensure protection against adverse environmental impacts and confirm our discharge meets compliance obligation limits.

Our cooling towers and disinfection systems also eliminate any damage to the delicate eco-system at Al Taweelah beach and minimize the risk of producing potentially harmful byproducts.

What happens to the excess water products generated by EGA?
The water that we do not use ourselves is put back into the economy through sales to several industries. Uses of this product by our customers include food processing, perfumeries, and feed water for boilers. Customers for potable water are supplied either through pipelines or via a dedicated tanker filling station located outside our Jebel Ali site. Distilled water is supplied to customers through pipelines and to tankers directly at our desalination plant.

What are the type of issues that your solutions are addressing?
Water scarcity is a pressing concern for the UAE as population growth, urbanization and economic development have all led to increased demand for the country's vital freshwater resources. Through our production of desalinated water and our preventive maintenance of water usage, we are contributing to the UAE Water Security Strategy 2036. This is a national agenda that calls for the reduction in demand of water and scarcity, and increase in water productivity and the reuse of treated water. We are also contributing to the UAE's circular economy through generating value from waste like our unused water supply by allowing it to be used by other industries.

How do these activities tie in with the rest of your sustainability initiatives?
Our water management and treatment practices are part of our broader commitment to environmental and social responsibility.

In addition to reusing wastewater and selling it to companies as wastewater, we similarly dispose of other byproducts of the aluminium smelting process, by providing it to cement companies and other industries that use it as raw material. Our efforts to protect the Al Taweelah eco-system also extend to cleaning up beaches and protecting the endangered Hawksbill turtles that nest and hatch in the area.

Besides monitoring and disinfecting our water discharge, EGA invests close to AED 1 billion annually in environmental technologies to control our emissions and meet industry standards of sustainable performance. We are the first company in the Middle East to achieve a certification to Aluminium Stewardship Initiative standards for our Al Taweelah site, the internationally-recognised benchmark for responsible behavior by aluminium companies.

INTERVIEW

Saving the Sea from Salt

The Sustainabilist in conversation with John Pagano CEO of Saudi Arabia's The Red Sea Company, about one of most urgent challenges of the region, brine management.

What do you consider, broadly, to be the most urgent current challenges for marine conservation?

Human activity is one of the most pressing threats to the health of the world's oceans. From coral bleaching to sea level rise as a result of climate change, to plastic pollution and over-tourism, the entire marine ecosystem is rapidly changing because of the human footprint.

Recent research published by the University of Exeter scoured existing published studies and Twitter for shark and ray entanglements. The study cited reports of more than 1,000 entangled individuals. Plastic waste has reached epidemic proportions with an estimated 100 million tons of the material now found in the world's oceans, according to the United Nations.

Global warming is causing alterations in ocean chemistry and processes, threatening many species of marine animals that cannot cope with higher temperatures. Ocean warming, a phenomenon attributed to climate change, has already led to an increase in coral bleaching events, which are predicted to increase in frequency and severity in the coming decades. In 2015/2016, the Great Barrier Reef suffered its worst bleaching event on record, damaging more than 90 per cent of the reef's 1,400 miles (2,250 kilometers).

Overfishing is another challenge in many parts of the world. The Reef Resilience Network reports that over 55 per cent of the world's reefs are threatened by overfishing or destructive fishing. There is an urgent need to understand how we can better manage this food resource to ensure

we don't exhaust it. Another key issue underpinning human activity is that farming and agriculture, along with manufacturing and construction processes are designed and implemented with little consideration of the consequences for the health of water ecosystems. Many pesticides and nutrients utilised in agriculture end up in coastal waters for example, which distresses marine plants and shellfish, threatening the entire food chain.

One of the most urgent challenges for our region is brine management. Due to the limited availability of drinking water, the Middle East and North Africa account for two-thirds of the world's brine produced by desalination plants. Some plants use chemicals to treat the water, others use a chemical-free reverse-osmosis process to extract drinking water from the sea. Both processes produce brine which, when returned to the sea, can put some types of coral species under enormous stress. However, awareness is increasing. The environmental movement, supported by a strong body of academic research, is encouraging governments, businesses and individuals to take steps to support marine preservation. I believe that transformation is on the horizon, and in some cases already here, bringing change that will not only protect and preserve our oceans but hopefully reverse the damage that they have endured in recent decades.

Do you remember a certain revelation that took you from merely appreciating marine life to feeling compelled to protect it?

I spent several years in the Bahamas, where I saw first-hand the impact of human encroachment on reef ecosystems. Coral bleaching and coral death stemming from over-tourism and direct human intervention on the reef was a significant issue for the Bahamas. Thankfully, there are areas where the coral is more resilient and awareness is growing that, by protecting the reefs, the country is actually protecting its desirability as a tourism destination.

When I first visited the Red Sea Project area I was struck by the extraordinary natural beauty of the site. It's certainly not what I expected. Indeed, I believe that first-time visitors to the destination in years to come will be staggered to learn that this natural jewel has been so close and yet so little known. I also became aware of the many species, including endangered species, that call this area home.When we first started planning the development, we identified an island, Al Waqqadi, that was a perfect place for a resort. It had amazing sunsets, perfect sand, clear waters, beautiful corals – everything. However, when we started planning, we learned that this island is also a preferred nesting spot for the endangered hawksbill sea turtle. By some estimates, perhaps one hawksbill turtle in every hundred is born in our lagoon. By pursuing our plan, we would disrupt the turtles' nesting ground and that could put even more pressure on the species. I think that's when it became personal.

We have a responsibility as we develop the destination to protect, preserve and enhance it for generations to come. Not just because it's good business to protect the natural assets that will attract visitors in the future. But rather because what we're doing will have an impact on individuals and species that have been using the destination for far longer than we have and which, with proper protection, will continue to use it long after we are gone.

What happens to the excess salt produced by water desalination? Is it useful or just a waste product? If it is a waste product is it dumped out to sea where it can potentially harm marine life?

After ocean water is stripped of salt and minerals to produce freshwater, the resulting by-product contains very high salinity levels. This leftover brine is typically poured into surface waters, pumped back out to sea, or occasionally stored in wells and holding tanks. When brine is poured back into a source without proper mixing or careful planning of the location, the concentrate could potentially contaminate the surrounding habitat and poison aquatic organisms. Brine discharged into wells poses a potential risk to the surrounding water table.

Research into the environmental impact of desalination or brine is still limited, but because this waste product is heavier than seawater, it will sink to the bottom if incorrectly discharged to the ocean. The brine is devoid of dissolved oxygen, meaning the plume of salty water can quite literally suffocate organisms on the sea-bed.

Certain countries and jurisdictions, such as the State of California in the U.S., are implementing standardised brine disposal regulations which include proper mixing techniques and pipe requirements to minimise marine life disturbance.

We are taking careful steps at the Red Sea Project to ensure that we manage brine in an environmentally sensitive manner. Our desalination plants will not use chemical treatments and we are taking care to ensure that brine is properly diluted and released into areas where we can avoid creating hot spots. There are areas of high saline concentration that occur naturally within the Red Sea and we are investigating biomimicry techniques to take advantage of this natural phenomenon. And we are actively looking for new technologies and ideas in brine

management to ensure that we are using the best techniques available.

Brine is a useful feedstock for a number of chemical processes, but its ubiquity means that it is not commercially viable to ship it long distances. Brine has also been used successfully to cultivate forage shrubs and dietary supplements, though at the cost of land salinisation. Scientists are now working on ways to transform brine salt into marketable baking soda and calcium chloride products, which have numerous industry applications.

The main challenge is the volume of brine produced. Brine is typically twice as salty as seawater, and advanced desalination plants still produce an average of 1.5 litres of brine for every litre of clean water so even a small reverse osmosis plant can produce thousands of tonnes of brine in a single day.

Tell us about The Brains for Brine Challenge.

The Brains for Brine Challenge is an initiative launched by the Red Sea Development Company and King Abdullah University of Science and Technology (KAUST) earlier this year. The aim is to challenge academics, scientists, engineers and the wider water industry to develop new solutions to manage the disposal of brine in a sustainable and commercially viable manner.The competition was open to individuals or organisations from anywhere around the world, with 1st August, 2019 as the deadline for submissions. We exceeded the target number of entries within weeks, suggesting that people from all across the spectrum are willing and eager to contribute towards finding solutions to this and other environmental challenges.

Five winners of the competition will present their solutions at Amsterdam International Water Week in November, and up to three prize winners will receive a first prize of US$10,000 each. As a longer-term plan, we are exploring the potential for winners to be commercially trialled and supported through investment and other mentoring opportunities, to ensure that the best solutions have the best chance of success.

Why is the challenge important and what do you hope to achieve?

TRSDC has pledged to help create technological solutions to environmental problems. The Brains for Brine challenge is an example of our determination to set new standards in sustainable development and tourism.

Brine disposal is recognised as a growing problem for the Middle East. The seas surrounding the Arabian Peninsula are largely enclosed, with low levels of water circulation and decreased freshwater input due to dams and diversions upstream in many of the region's rivers. In some spots in the Gulf, salinity doubled between 1996 and 2008, and is expected to more than double again by 2050, if left unchecked.

We hope, through the Brains for Brine Challenge, to raise general awareness of the problem across the region and to encourage research and technical innovation to tackle this problem before the impact on our ocean's habitats is irreversible.

We also want to demonstrate our commitment to the sustainable and clean development of our destination, and ultimately hope to contribute to a waste-free and environmentally friendly desalination process that would benefit the region as a whole, and potentially the international community.

HIGHLIGHT

Dubai Did It Again

In conversation with HE Saeed Mohammed Al Tayer, MD&CEO of DEWA, on receiving the world's lowest bid of USD1.69 cents per kW/h for 900 MW 5th phase of the Mohammed bin Rashid Al Maktoum Solar Park.

Dubai Electricity and Water Authority (DEWA) has achieved a world record by receiving the lowest bid of USD 1.6953 cents per kilowatt hour (kW/h) for the 900MW 5th phase of the Mohammed bin Rashid Al Maktoum Solar Park for using photovoltaic (PV) solar panels, based on the Independent Power Producer (IPP) model. This phase will become operational in stages starting in Q2 of 2021.

Please provide us some insight into this latest development.

For the fifth time, DEWA has achieved a world record in getting the lowest price for PV solar power projects based on the IPP model. This shows the priority our wise leadership gives to clean and renewable energy projects, which has contributed to its global cost reduction.The projects at the Mohammed bin Rashid Al Maktoum Solar Park, the largest single-site solar

HE Saeed Mohammed Al Tayer

MD & CEO of DEWA

park in the world, are of great interest to international developers and reaffirms investor confidence in the major projects that are supported by the Government of Dubai. DEWA has attracted huge investments to the UAE from the private sector and foreign banks, leading to increased cash flow to the economy of Dubai and the UAE.

How does the Mohammed bin Rashid Al Maktoum Solar Park align with the visionary objectives of the Dubai Clean Energy Strategy 2050?

Achieving the Dubai Clean Energy Strategy 2050 to provide 75% of Dubai's total power output from clean energy by 2050, requires a capacity of 42,000MW of clean and renewable energy by 2050. DEWA is building three other projects with a total capacity of 1,250MW. The 900MW 5th phase of the solar park will increase the production capacity to 2,863MW.

DEWA is committed to completing the phases of the Mohammed bin Rashid Al Maktoum Solar Park according to the highest international standards using the latest solar power technologies to enhance the shift towards a green economy by increasing its share of clean and renewable energy. Additionally, the solar park would reduce over 6.5 tonnes of carbon emissions annually.

"Achieving the Dubai Clean Energy Strategy 2050 to provide 75% of Dubai's total power output from clean energy by 2050, requires a capacity of 42,000MW of clean and renewable energy by 2050."

GOVERNMENT OF DUBAI

عام التسامح
YEAR OF TOLERANCE

THE FUTURE OF CLEAN ENERGY
POWERED BY AN EXTRAORDINARY VISION
THE MOHAMMED BIN RASHID AL MAKTOUM SOLAR PARK

MOHAMMED BIN RASHID AL MAKTOUM
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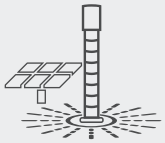
The Mohammed bin Rashid Al Maktoum Solar Park was announced in January 2012 in line with the directives of HH Sheikh Mohammed bin Rashid Al Maktoum, to enhance the sustainable development of the Emirate. It also supports the Dubai Clean Energy Strategy 2050 to make Dubai a global center of clean energy and green economy. The strategy also aims to provide 75% of Dubai's energy from clean energy by 2050.
DEWA is managing the Solar Park, which is the largest single-site Solar Park in the world, based on the Independent Power Producer (IPP) model with a planned production capacity of 5,000 MW by 2030, with total investments of up to AED 50 billion.



Power generation 5,000MW by 2030

Innovation Centre

R&D Centre

Mohammed bin Rashid Al Maktoum Solar Park projects:

First Phase	13MW using photovoltaic solar panels, became operational on October 2013.
Second Phase	200MW using photovoltaic solar panels, became operational on March 2017.
Third Phase	800MW using photovoltaic solar panels, the first 200 MW project became operational on April 2018, with the second and third projects being implemented in stages until 2020.
Fourth Phase	700MW of Concentrated Solar Power and 250MW of photovoltaic solar panels, will be implemented in stages starting from the last quarter of 2020.

For more details, please visit www.dewa.gov.ae

Our Vision
A globally leading sustainable innovative corporation
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"HALF OF THE WORLD'S POPULATION LIVE IN CITIES, WHICH MEANS OUR CITIES ARE GOING TO HAVE TO GROW AND CHANGE. WHILE WE DON'T YET KNOW WHAT THIS MIGHT MEAN FOR THE FUTURE, WE CAN START TO PREPARE. THE UAE IN PARTICULAR IS TAKING PROGRESSIVE STEPS IN THIS AREA – FROM AUTONOMOUS CARS TO CLEANER FORMS OF ENERGY TO GREEN COMMUNITIES. IT GIVES ME A SENSE OF PRIDE TO BE A PART OF IT."

LOUISA LYNCH

HEAD OF MIDDLE EAST REAL ESTATE AND HOSPITALITY
NORTON ROSE FULBRIGHT

INTERVIEW

I first became interested in green buildings as a junior property lawyer after attending a lecture introducing Abu Dhabi's green building code, Estidama. I remember walking away wondering why we weren't all living and working in energy efficient buildings that optimize not only the performance of the building, but also the satisfaction of the people living and working in them.

There has been a lot of discussion around green buildings in the Gulf for a number of years now but behavior has not always kept up with sentiment. I think that there are huge opportunities as the regional real estate sector matures and as we see more sophisticated asset managers and investors. These stakeholders often take a longer term view of their property assets and will want to ensure their assets are "future proofed" – so we urge our clients to be future ready by focusing on resilience, sustainability and connectivity.

The financial sector is leading the way in recognizing that climate change presents risks to the way we do business. Accordingly not only is there moral responsibility to change our behavior to ensure a sustainable future, but also a persuasive commercial reason to do so. GRESB has estimated that the construction and operation of buildings contributes to 40% of worldwide greenhouse gas emissions. While there are challenges for the sector in addressing this, there are also huge opportunities for real estate investors and developers to tap into the increasing amounts of green and sustainable financing initiatives that national and international financial institutions are making available.

Government strategy and regulation has a huge role to play in contributing to the growth of a more sustainable built environment in the Gulf. Based on trends we have seen in developed real estate markets, it is only a matter of time before more regulation is introduced in the Gulf and it is likely that this will look at sustainable communities as a whole, taking a more holistic approach to development. This means going beyond simply requiring the construction of green buildings, but also looking at the communities we live and work in and having local integrated infrastructure serving them.

As a lawyer, I would welcome the introduction of updated and flexible regulations that promote sustainable development in the region while also allowing room for the continued introduction of innovative technologies. In the meantime, we are working closely with clients on how they can develop and invest in smart and sustainable real estate assets using new legal structures to mobilise capital and finance assets. The future is coming and all of us must invest now to ensure it is a sustainable one.

ABOUT

LOUISA LYNCH IS A PARTNER WITH NORTON ROSE FULBRIGHT AND LEADS THE FIRM'S REAL ESTATE AND HOSPITALITY PRACTICE IN THE MIDDLE EAST. LOUISA HAS BEEN IN THE REGION FOR OVER TEN YEARS AND ADVISES PUBLIC AND PRIVATE ENTITIES ON THE EFFICIENT AND SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF ALL CLASSES OF REAL ESTATE ASSETS.

LOUISA WANTED TO BECOME A PROPERTY LAWYER SO SHE COULD SEE THE TANGIBLE RESULTS OF HER WORK. HER APPRECIATION FOR CITIES AND COMMUNITIES IS WHAT SPURS HER INTEREST IN SUSTAINABILITY ISSUES, WHICH IS REFLECTED IN HER CLIENTS AND THE PROJECTS SHE ADVISES ON. AN ADVOCATE FOR 'DOING BETTER', SHE BELIEVES THAT REGULATION IS KEY TO PROMOTING THE SUSTAINABILITY AGENDA ON A GLOBAL SCALE.

LOUISA IS A KEY MEMBER OF NORTON ROSE FULBRIGHT'S SUSTAINABLE PRACTICE. WE AIM TO MINIMIZE OUR IMPACT ON THE ENVIRONMENT – TO PROTECT THE PLANET, ENSURE THAT RESOURCES ARE AVAILABLE FOR FUTURE GENERATIONS AND CREATE A BETTER QUALITY OF LIFE FOR ALL LIVING BEINGS. WE INTEGRATE SUSTAINABILITY BEST PRACTICE INTO ALL OUR DECISION-MAKING AND BUSINESS ACTIVITIES.

NORTON ROSE FULBRIGHT

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FEATURE

Mohammed bin Rashid Al Maktoum Global Water Award

The award is overseen by the UAE Water Aid Foundation (Suqia), which operates under the umbrella of the Mohammed Bin Rashid Al Maktoum Global Initiatives.

By Dubai Electricity and Water Authority (DEWA)

Water is at the centre of economic and social development, and its security is a global challenge because of the increasing population and economic growth. Water scarcity affects over 40% of the world's population. Drinking water is one of the main foundations for achieving the UN Sustainable Development Goals 2030, with the sixth goal being to 'ensure access to water and sanitation for all.' According to the United Nations World Water Development Report 2019 titled 'Leaving no one behind,' 3 out of 10 people do not have access to safe drinking water, and over 2 billion people live in countries experiencing high water stress, and about 4 billion people experience severe water scarcity during at least one month of the year. Stress levels will continue to increase as demand for water grows and the effects of climate change intensify. Water-related diseases remain among the major causes of death in children under five; more than 800 children die every day from diseases linked to poor hygiene.

This is why His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, launched the Mohammed bin Rashid Al Maktoum Global Water Award. The award was launched to encourage research centres, individuals, and innovators around the world to find sustainable and innovative solutions, using solar energy to address the scarcity of potable water. Overseen by the UAE Water Aid Foundation (Suqia), which operates under the umbrella of the Mohammed Bin Rashid Al Maktoum Global Initiatives, the second award will take place shortly with three main categories: Innovative Projects Award, Innovative Research & Development Award, and Innovative Individual Award, with prizes totalling US$ 1 million that

will help improve the lives of millions of people around the world and result in positive global changes, that comes from the UAE, the land of peace, happiness, and positivity and the country of tolerance, benevolence, and generosity.

The Innovative Projects Award targets government, semi-government, and non-government organisations. It has two categories: the Large Projects Award with total prizes worth US$ 300,000, and the Small Projects Award with total prizes worth US$ 240,000. The Innovative Research & Development Award targets individuals and teams from academic institutions and research centres that are independent or annexed to governmental or semi-government organisations. It has two categories: the National Institutions Award and the International Institutions Award with total prizes worth US$ 200,000 each. The Innovative Individual Award has two categories: the Youth Award, which targets youth between the ages of 15 and 35 with a prize value of US$ 20,000; and the Distinguished Researcher Award with a prize value of US$ 40,000. Terms & conditions for applying are available on Suqia's website (www.suqia.ae).

The award jury will evaluate applications according to the highest international standards. The evaluation criteria of the Innovative Projects Award and Innovative Research & Development Award include creativity and innovation (30%), technology & process design (20%), adaptability to local environments (20%), adherence to health and safety and other environment standards (20%), and cost-effectiveness and scalability (10%). The Innovative Individual Award - Youth Award will be evaluated on creativity and innovation (50%), active engagement, teamwork, education and awareness on water scarcity related issues (25%), adherence to health and safety and other environment standards (15%), and technology & process design (10%). The Distinguished Researcher Award will be evaluated on proven leadership in the advancement of water scarcity issues and the production of safe drinking water using solar technology (35%), creativity and innovation (35%), technology & process design (15%), and adherence to health and safety and other environment standards (15%).

By the end of 2018, over 9 million people in 34 countries had benefited from Suqia's projects. Suqia will continue its efforts in providing safe drinking water to communities suffering from water scarcity and pollution, in cooperation with local and international organisations as well as continue our research and development efforts to create sustainable solutions for the desalination and purification of water using solar power.

FEATURE

Providing Potable Water, Reducing Carbon Footprint

ENGIE is one of the leading Independent Water and Power Project (IWPP) developer and producer in the world, with a strong regional footprint in the UAE and the GCC.

By Martine Mamlouk

High Level Advisor – Prospective and Stakeholders' Management
Engie Middle East, South & Central Asia and Turkey

ENGIE is one of the leading Independent Water and Power Project (IWPP) developer and producer in the world, with a strong regional footprint in the UAE and the GCC, dating back 30 years and a total gross portfolio of generating more than 31 GW of power, and over 5.7 million cubic meters of desalinated water production in operation per day.

Technology changes, enabling higher efficient use or reverse osmosis, and concern to reduce carbon footprint and fossil fuel consumption are today leading trends in the production of desalinated water in the region; the UAE has set the course from many perspectives. Decisive targets have been fixed in the UAE for clean desalination, in Dubai as well as in Abu Dhabi, contributing to the ambitious target of carbon reduction emissions of the country by 70% in 2050, changing the landscape for desalination.

ENGIE, aiming as a Group to achieve upmost decarbonisation, is committed to supporting the efforts for energy transition in the region and to enhance its investments in desalination along these lines, with a strong focus on more energy efficient process of Seawater Reverse Osmosis (SWRO), high efficiency of plant operations and increase in the use of clean sources of electricity while continuing, as it did in the past, to guarantee and secure reliable provision of water.

Historically, thermal desalination has been a fundamental part of most of the power and water projects in the region, and has alleviated the consequences of increasing shortage of potable water from other

sources. In this context, ENGIE has always been keen to use gas sources of electricity with lower carbon footprint for the thermal desalination plants it has developed.

More recently, SWRO has been added, initially, to enhance thermal desalination and, increasingly, to replace it entirely, providing the ability to "decouple" the production of water from power generation assets and, thereby allowing better synchronisation with each and every specific demand cycle. Indeed, decoupling has the benefit of avoiding excess, and loss of electricity generated related to 'must run' co-generation to produce still sufficient water during the lowest periods of electricity demand. In addition, the use of reverse osmosis (RO) has been proven to be more energy efficient, resulting in substantially reduced costs, and the impact on the environment. Masdar's pilots, in Ghantoot, have demonstrated that in particular (in partnership with GDF-Suez/ENGIE for some projects).

Consequently, the region is witnessing a great deal of interest in medium sized and large SWRO desalination projects, for which our Group intends to offer its world standard expertise, and experience in developing and operating large scale RO projects, and efficient desalinated water production.

Provision of clean sources of electricity for desalination is increasingly on the agenda. As the prices of renewable energy are becoming more and more competitive, storage more affordable and efficient, and regulations adapting, a variety of flexible solutions via the grid or on site will be more and more at hand. As a member, ENGIE has followed with great interest, the work engaged by the Global Clean Water Desalination Alliance, the H_2O minus CO_2 climate initiative, led by the UAE and under Masdar's presidency. The Alliance has worked at a "Blueprint for Clean Desalination Tenders", that reviews and underlines the wide range of options that can in the present state of art, be pursued; being off-grid, on site, or grid connected hybrid solutions.

> "ENGIE, aiming as a Group to achieve upmost decarbonisation, is committed to supporting the efforts, for energy transition in the region, and to enhance its investments in desalination."

In line with off takers' specific requirements, Engie is ready to include, adapted renewable energy components in its offering.

Leading in-house operations, engineering excellence and maintenance expertise is absolutely vital to operate reverse osmosis (and still in some cases, thermal desalination plants in parallel), which must be backed up with very high efficiency in order to lower the carbon footprint. Above all, key providers in the water generation and power industry, must be fundamentally committed to delivering best-in-class solutions that minimise the impact on the environment, by implementing action plans to avoid, reduce and if necessary, compensate them while optimally managing the resources at its disposal.

ENGIE, for example, is most focused on providing technical solutions to mitigate the environmental impact in the following areas:

- Climate change, leading to global warming of the atmosphere and oceans, but also the increasing frequency and intensity of extreme climatic events, caused by the increase in emissions of greenhouse gases due to the consumption of fossil fuels.
- The management of water resources whether it is fresh, drinkable or wastewater treatment.
- Biodiversity management in different environments or territories potentially impacted by human activities. ENGIE will pursue in the coming year development of mangroves, possibly around of some of its assets for example.
- The management of air quality and the issue of green mobility.
- The more general challenge of intelligent management of all resources consumed and the waste produced to propagate a circular and sustainable economy.

FEATURE

Water Wise Tourism

Inspiring a shift in the city's water conservation and sustainability efforts.

By Yousuf Lootah

Executive Director, Tourism Development & Investments, Dubai Tourism

Water scarcity continues to be a globally recognised issue, with growing economies placing increasing demands on often-depleted water supplies. According to the World Tourism Organization (UNWTO) and the United Nations Environment Programme (UNEP), global water demand is projected to outstrip supply by 40 per cent by 2030. Coupled with agricultural runoff and various forms of pollution, this is exacerbating the scarcity of water that is fit for human and industrial consumption around the world.

The tourism industry has a strong commercial and moral responsibility to address this issue. To continue operating

successfully, establishments must learn to do more with less; they must implement better water management practices that improve efficiency, reduce water waste, and lower their water footprint for a more sustainable future.

Achieving this goal represents both an opportunity as well as a necessity; a goal that Dubai has long recognised and strived to improve on. Working to inspire change across the city, towards a more sustainable tourism industry and bridging the gap between water supply and demand, Dubai Tourism has actively embraced a model with the ongoing Dubai Sustainable Tourism (DST) initiative. This is guided by the vision of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to bolster Dubai's position as the world's leading sustainable destination. The DST initiative is therefore, committed to collaborating with a robust network of public and private sector stakeholders to bring to the forefront a set of diverse programmes and tools that can measure, and subsequently help improve, the impact of sustainability. By doing so, DST aims to inspire a paradigm shift towards a greener economy by reducing the negative impact of carbon emissions on health, the environment and tourism development.

Driving environmental awareness amongst industry stakeholders through the DST initiative, Dubai Tourism launched 19 Sustainability Requirements on 1 January 2019 for hotel establishments across all classifications to advance their efficiencies and further strengthen resource management practices. The regulated guidelines are designed to help support positive change across a variety of areas, including sustainable management approaches, performance metrics, energy, food and water management plans, guest education, employee training initiatives, the presence of sustainability committees within hotel establishments and corporate social responsibility programmes for local communities. The Requirements' Water Management Plan, in particular, aims to assess how well the establishment is equipped to conserve water without reducing guest comfort, by addressing plumbing fixtures, equipment, landscape and irrigation, wastewater, laundry or other significant water issues, as well as offering guests the option to reuse linens and towels with clearly visible signs in rooms and bathrooms.

> "According to the World Tourism Organization (UNWTO) and the United Nations Environment Programme (UNEP), global water demand is projected to outstrip supply by 40 per cent by 2030."

Building on this commitment to sustainability throughout its operations and maintenance, the Savoy Suites Hotel Apartments are amongst the city's leading examples of hotel properties embracing green innovation.

By investing time and resources in careful planning, organisation, training and follow-ups, the hotel has been able to adopt a series of practices that ensure water conservation without compromising on guest experiences. These include the use of water aerators across guest and staff rooms, and public areas to reduce excessive water flow; setting up sun protection covers for swimming pools when not in use, to reduce water evaporation and chlorine loss; and deploying pressure jet cleaning pumps to avoid wastage of water compared to using a hose reel – all without impacting the comfort or expectations of guests. The hotel also places strong emphasis on environmental education, recognising that all team members in the operations chain have a responsibility to drive sustainability – including the guests – hosting active awareness and training sessions to help them make more eco-friendly choices, through the education on the environmental impacts of laundering linen and bathroom towels on a daily basis.

As Dubai continues to focus on strengthening the sustainability of the tourism sector with the goal of cementing the city's position as a leading sustainable destination globally, it remains imperative that industry players continue to harness their collective potential to ensure the preservation of valuable environmental resources for future generations.

INTERVIEW

Peak Performance

In conversation with Ahmad Bin Shafar, CEO of Empower, on the growth and importance of district cooling in the region.

What have been the highlights and challenges of your time as CEO of Empower?

In the early 2000, district cooling was an evolving and an embryonic industry in the Middle East. Today, it is the most preferred, energy efficient and environmentally friendly alternative to all forms of conventional air conditioning systems in the region.

Having said that, the industry had its own challenges and some of these challenges were: convincing real estate developers, government officials and other stakeholders regarding importance of adopting district cooling systems, lack of demand or timeline guarantee by real estate developers, significant upfront capital investment in the district cooling infrastructure, retrofitting within existing buildings, establishment of district cooling networks in busiest parts of the city, etc.

During this journey, some of the key highlights and strategies that Empower had adopted are:

- Relentlessly promoted the concept of District Cooling to large Master developers, building owners, key government department and officials
- Conceptualised and adopted innovative business model of utilising temporary/semi-permanent district cooling plants
- Actively promoted concepts such as standardisation of plant room designs, modular approach to asset creation, life cycle cost analysis for key equipments, strategic procurement approach, etc in order to create assets in a most cost effective manner
- Pioneered and actively promoted the concept of sub-metering including persuading building owners to retrofit
- Continuously focused on innovations and increasing operational efficiencies
- Innovated the use of TSE in combination with RO to make-up water requirements which was awarded IDEA's first Innovation Award introduced in 2013
- Commissioned the world's first LEED certified District Cooling plant in Business Bay, Dubai
- Brought in financial discipline with an efficiency focused approach
- Established robust internal systems and processes and became one of the most efficient and cost effective operator in the DCS industry
- Enhanced credibility of the industry among banks, financial and other institutions
- Made one of the largest acquisition in the district cooling industry by acquiring Palm District Cooling

- Partnered with United Nations Environment Programme (UNEP) in its global initiatives – "District Energy in Cities" and "Cool Coalition"

As a result, Empower has become the World's Largest District Cooling Service Provider serving more than 1.43 million Refrigeration Tons (RT) of cooling load to 100,000 customers through its 75 plant rooms in Dubai.

Tell us about Empower's current projects and future plans.
Empower has connected its services to 43 new buildings during the first half of the current year which includes developments in Jumeirah Village, Business Bay, Dubai Land Residential Complex, Dubai International Financial Centre, Dubai Healthcare City, Jumeirah Lake Towers and others.

Empower's new/future projects include Al Barari, Deira Waterfront Development (DWD), City Land Mall, Metro 2020, Museum of the Future, Al Jaddaf, One Za'abeel, The Address Hotel – JBR, Yotel Hotel, Wasl Tower, Aykon City, etc.

How do you heat or cool a neighborhood or an entire city at the same time as reducing its carbon emissions?
District cooling utilses 50% lesser energy compared to traditional air-conditioning systems, and hence, significantly contributes in reducing carbon emissions of the city. Being energy efficient, District Cooling has been identified as one of the key initiatives for cities to move towards climate resilient, resource efficient and low carbon pathways. Dubai has identified District Cooling as one of the key pillars of its energy strategy – Dubai Integrated Energy Strategy (DIES) 2030 and Dubai Clean Energy Strategy 2050, in effectively managing the demand of energy resources.

What are some of Empower's milestones in district cooling?
As highlighted earlier, Empower has achieved significant milestones in the District Cooling industry. Besides these, Empower has implemented the following innovative technologies and solutions, and taken initiatives which have been recognised by various professional bodies and international institutions such as International District Energy Association (IDEA) and The American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE).

- Intelligent Delta – T Analyzer & Detector technology
- 360° Solution for Metering Artificial Intelligence, AIMS 360
- Energy Transfer Solution Flow Control Optimisation Using Statistical Process Control
- Delta T Pro solution
- Centralised Metering Data Management System
- Utilisation of TSE in combination with Reverse Osmosis (RO)
- Development of the First Global District Cooling and Heating Design Manual by ASHRAE

What are some of the technological advances we can expect to see?
Empower has introduced a new system called Parallel Working environment (PWE), which ensures business continuity from operations perspective. The key to ensure business continuity is to have continuous and close visibility of plant operations, so we can provide precise and quick responses. Our operations team keeps a close watch on plant rooms through the state of the art – Command Control Centre (CCC). PWE is an alternate monitoring arrangement, and is a completely independent setup providing all of the facilities of the Command Control Centre. These two setups enable seamless monitoring of our operations, thus ensures business continuity.
Also, we are keen on utilising Artificial Intelligence (AI) technology and aim to have the world's first unmanned and fully automated District Cooling plant in our Jumeirah Village project.

Is the district cooling market growing or has it reached the peak?
As concerns on environmental issues are increasing worldwide, acceptance and adoption of energy efficient environmentally friendly district cooling services is increasing day by day. District Cooling utilises 50% lesser energy compared to traditional air-conditioning systems and it is being developed in several countries due to its ability to dramatically reduce carbon intensity of cooling; improve air quality; increase the share of renewables in the energy mix; reduce reliance on fossil fuels and energy imports; and increase resilience. District Cooling also serves as an alternative over environmentally hazardous hydro fluorocarbons (HFCs) and hydro chlorofluorocarbons (HCFCs) refrigerants. The district cooling sector has a high potential to grow worldwide and especially in the Middle East, as the unstable market condition of the oil sector and environmental impact of fossil oil has increased the importance of energy saving and energy efficient solutions.

FEATURE

The Sustainable Blue Economy

Unlocking an ocean of opportunities in the UAE.

By Laila Mostafa Abdullatif

Director General of Emirates Nature-WWF

The World Wildlife Fund (WWF) has defined the Sustainable Blue Economy as a regulated and regenerative marine-based economy that provides social and economic benefits for current and future generations, while restoring, protecting and maintaining the diversity, productivity and resilience of marine ecosystems.

It is also based on clean technologies, renewable energy, and circular material flows to secure economic and social stability over time, while keeping within the limits of our planet. To put it simply, the Sustainable Blue Economy is an economic concept that aims to reduce environmental risks, while seeking sustainable economic development.

Future Economic Stability

As the local WWF office in the UAE, Emirates Nature-WWF believes that our economy, society and environment can thrive in unison – and together we can build a prosperous future in harmony with nature. In recent years we have observed a rising interest from government and businesses alike in the UAE, seeking a sustainable economic model for the future. The UAE has a deep connection with nature. In fact, this nation has a deep marine connection that began with pearl diving and seaborne trade spanning many centuries – while today we see a large part of the economy benefiting from marine based activities across several industries, including food, water, transport and energy, as well as tourism and recreation. By implementing Sustainable Blue Economy principles, we ensure responsible marine practices, planning and management that directly benefits the economy, business and society. As a result of this commitment to our seas, we are collectively facilitating the UAE's future economic sustainability in a rapidly evolving and diversified economy. With the overall global value of key ocean assets totalling US$24 trillion, it's in the best interest of the UAE business community to actively pursue the Sustainable Blue Economy to ensure long-term prosperity.

Take Only What You Need

As the Late Sheikh Zayed bin Sultan Al Nahyan, Founding Father of the United Arab Emirates, famously said: "On land and in the sea, our forefathers lived and survived in this environment. They were able to do so because they recognised the need to conserve it, to take from it only

what they needed to live, and to preserve it for succeeding generations." This idea is more important now than ever before, as residents in the UAE use about 550 litres of water, which is about two times the amount consumed by people around the world, according to official government data. And our demand for water is only projected to grow, both locally and globally. Aadopting the Sustainable Blue Economy offers a diverse array of solutions to many of our biggest challenges and holds new opportunities for the wider economy.

Exploring New Opportunities

With the ocean economy now recognised as the world's seventh largest economy, the time is right to discuss the perilous state of our oceans and the need to dramatically change our approach to avoid negative consequences. In March 2019 political leaders and policymakers, heads of global businesses, scientists, NGOs and multilaterals from across the globe came together in Abu Dhabi for the World Ocean Summit to participate in discussions on the future of our oceans. The UAE government has also shown its keen vision and willingness to take a leadership role in the discussion, and through its global scientific and technical network, Emirates Nature-WWF is exploring the local business context of the Sustainable Blue Economy, the associated opportunities, risks and rewards, aiming to lead the country towards a sustainable economic model for the future.

A Thriving Economy

As the marine environment is of benefit to everyone, the topic of a Sustainable Blue Economy is not only environmental, it is equally economic and societal too, the cost of which is too great to ignore. For this reason, Emirates Nature-WWF developed the Sustainability Partnership Programme, allowing companies that are passionate about the environment to complement the efforts of the government in sustaining the marine economy of the UAE. We recognise that a healthy environment is the backbone of a sustainable economy and thriving society, however we also acknowledge that one organisation alone can't effect the change needed to protect the nature that sustains us. That is why our work is built on the foundations of collaboration and partnerships, united around a shared vision of the UAE's sustainable development and the preservation of the environment.

INTERVIEW

No Oxygen, No Marine Life

The findings of NYUAD Researcher Zohair Lachkar, who discovered the reason behind the expansion of the Arabian Sea dead zone.

What do you believe to be the consequences of temperature changes in the Arabian Gulf at a local and global level?

Rising water temperatures in the Arabian Gulf can lead to local changes such as the bleaching of corals and the destruction of reefs in the Gulf. Several episodes of coral bleaching events in the region have been recorded in the last couple of years.

At a larger scale, our study shows that the increase in the Gulf water temperature leads to a reduction of the ventilation of the Arabian Sea, thus resulting in an expansion of the dead zone there. This causes a compression of fish habitat thousands of kilometers away from the Gulf and leads to a reduction in available nutrients in the sea and eventually a release of nitrous oxide, a very potent

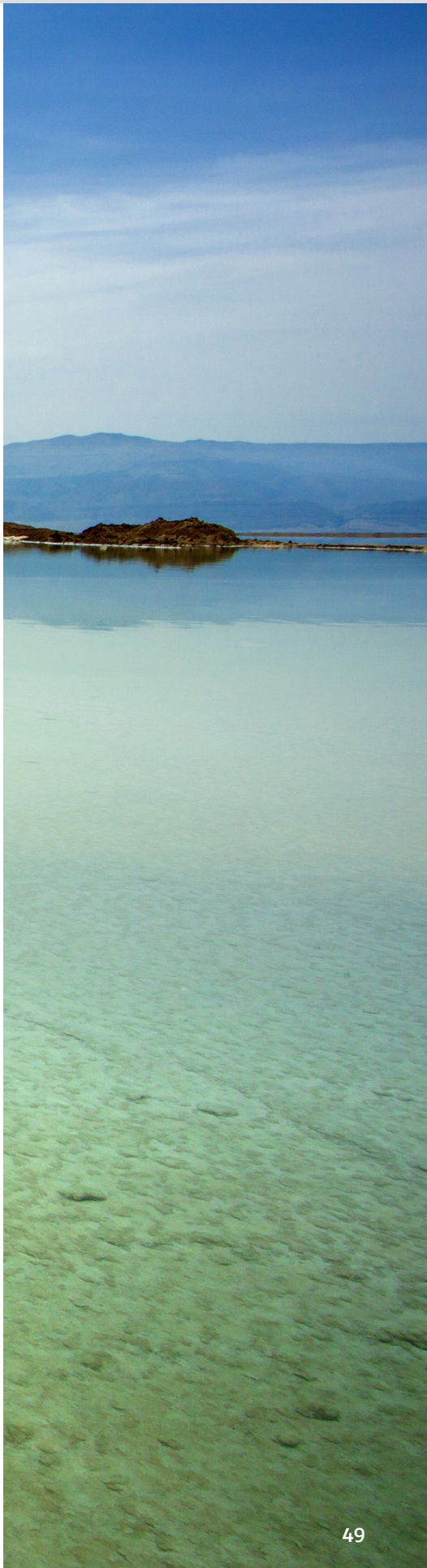
greenhouse gas. These changes can affect the ocean and climate at a global level.

What are the types of biases you've uncovered in regards to the application of global climate models?
Because the global climate models come with a coarse resolution, they typically misrepresent marginal and small semi-enclosed seas like the Arabian Gulf. This implies that they generally fail to accurately reproduce the ventilation of the dead zone by the Gulf water and hence, the link between the temperature of the Gulf and the intensity of the dead zone in the open Indian Ocean.

How has your previous research in this area supplemented the current study of the Arabian Sea Dead Zone?
My previous research has focused on the impact of changes in the Indian monsoon winds on the intensity of the Arabian Sea dead zone. Recent observations and model-based evidence suggests summer monsoon winds may intensify under a warmer climate. My previous work has shown this can cause the dead zone to intensify and deepen. In this context, the present study is an extension of the previous work aiming to further explore the consequences of climate change on the Arabian Sea dead zone.

What questions does this study raise for future research?
This study raises a couple of new questions for future research such as: how can the combination of Gulf warming and other climate-change driven perturbations like changes in winds impact the dead zone? Another related key question is how might the combination of decreasing dissolved oxygen, rising temperatures and increasing ocean acidification impact the marine ecosystems of the region?

What advice do you have for young researchers interested in this field?
Oceanography is a relatively "young" science. There is still a lot to be discovered in the next few years and decades, which opens up great opportunities for young researchers. It is also an interdisciplinary science in the sense that it builds on concepts from different areas of science: physics, biology, ecology, chemistry, and more. Therefore, a young researcher interested in dead zones, for instance, needs to adopt a multidisciplinary approach and borrow concepts from many scientific fields. Finally, as with any other field of science, research requires a great deal of creativity, enthusiasm, hard work and mostly perseverance.



INTERVIEW

Our National Treasure

Dr Tiffany Claire Delport, Director of Marine Environmental Operations at Emirates Marine Environmental Group (EMEG), talks to *The Sustainabilist* about EMEG's plans for sustainable development of Jebel Ali Marine Sanctuary (JAMS) wetlands.

What are some of the advantages of having wetlands?

There are few sites in the United Arab Emirates which support such a diverse set of habitats with such rich biodiversity as Jebel Ali Marine Sanctuary. The area consists of both coastal and marine wetlands acting as a sanctuary for over 539 diverse species of marine fauna and flora, and a protected environment for ~34 species of corals, of which 40% are threatened. Wetland mangroves play a crucial role in protecting the coastal sanctuary and low-lying local coastal communities against the impacts of rising sea levels and coastal erosion.

What are some of the most memorable encounters you've had?

The waters of Jebel Ali Marine Sanctuary are crystal clear with a rich diversity of fish species using the area as a nursery and sanctuary from predation. While leading young learners through the sanctuary, we share knowledge of the different types of ecosystem services provided by our wetlands. Children are often amazed by the diversity of some ~147 fish species that call the wetlands home. It is a truly rewarding experience to nurture curiosity, and foster appreciation of wetland ecosystem importance, for our future decision and policy makers.

What does EMEG's role involve?

Jebel Ali Marine Sanctuary is a base for the monitoring and maintenance of coastal wetland ecosystem health. EMEG faculty on site are responsible for observation of local and migratory marine species, analysis of wetland water quality and observation of anthropogenic impacts to

the site. Through collaboration with Dubai Electricity and Water Authority (DEWA), management of DEWA's Environmental Centre at JAMS is utilised for provision of educational camps for schools, community members and corporate groups in an effort to increase awareness and understanding of regional environmental threats and issues.

What are you currently working on?

Emirates Marine Environmental Group is driven by its mission to preserve wetland biodiversity. This mission is achieved through localised conservation initiatives and the provision of educational programs to facilitate community awareness. In alignment with World Wetlands Day 2020, we are currently focused on creating a sustainable development strategy for wetland mangroves, incorporating mangrove plantation initiatives and a supplementary education programme, to disseminate tools for ecosystem-based adaptation to climate change to future generations.

How would you describe the changes in the wetlands since you first began your career?

Wetlands of the United Arab Emirates exhibit species richness and diversity unseen in regional neighbours. Over the last 5 years we have seen a remarkable increase in the diversity of migratory marine bird species and nesting frequency of endangered Hawksbill turtles (*Eretmochelys imbricata*) in wetland coastal vegetation zones. Wetland protection has become a key priority for the Ministry of Climate Change and Environment, addressing the need to create environmental conservation initiatives in response to global warming.

> "A recent report by UN Environment suggests that if all of today's mangroves were lost, the global damage from flooding would exceed AED 301 billion per year."

What are some of the solutions that need to be implemented quickly to stop some of the devastation?

Habitat conservation is a key focus area for our organisation this year. Mangroves protect coastal vegetation nesting zones against the impacts of rising ocean water levels and coastal erosion by providing a barrier against flooding. A recent report by UN Environment suggests that if all of today's mangroves were lost, the global damage from flooding would exceed AED 301 billion per year. Development of sustainable mangrove planting initiatives, supported by the establishment of a local community network to oversee ecosystem-based adaptation, will assist in the mitigation of climate change effects. Adaptation programs are more cost effective than engineered solutions while simultaneously creating space for nature.

Should we try to influence public opinion so that they can influence policy makers on the state of the wetlands?

As a marine conservation organisation, it is our responsibility to promote shared understanding of the diverse range of ecosystem system services, provided by wetlands. Collaboration between community members and policy makers is important for the realisation of UAE Vision 2021, for the creation and maintenance of sustainable ecosystems.

What are your plans for the future – 5 to 10 years down the line?

The profound ability of wetland mangroves to both protect coastal shorelines, and shelter threatened coral reefs provides a natural solution to climate change. Our ultimate goal is expansion of the wetland area at Jebel Ali Marine Sanctuary and facilitation of ecosystem tourism, whereby our team can disseminate knowledge and the tools required to use nature to defend against climate change. It is of national importance to give local communities the power to tackle change.

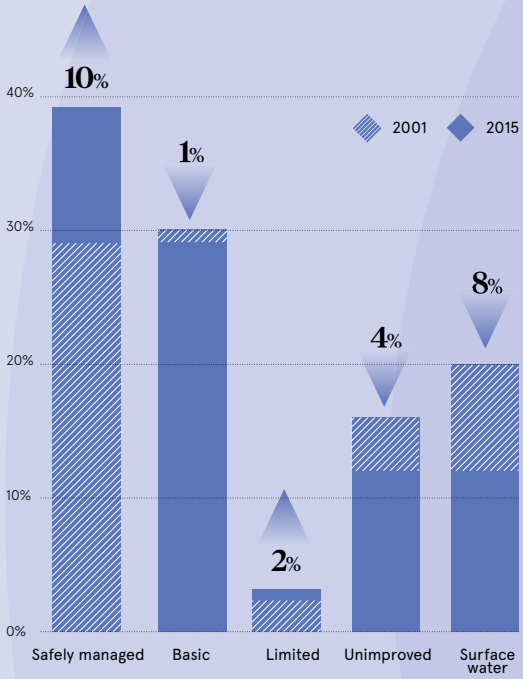
RESEARCH

Water Access

Finding a safely managed source of water is a daily challenge for more than two billion people worldwide, and water, sanitation and hygiene-related diseases such as cholera, dysentery and typhoid are still to blame for the deaths of one million people each year.

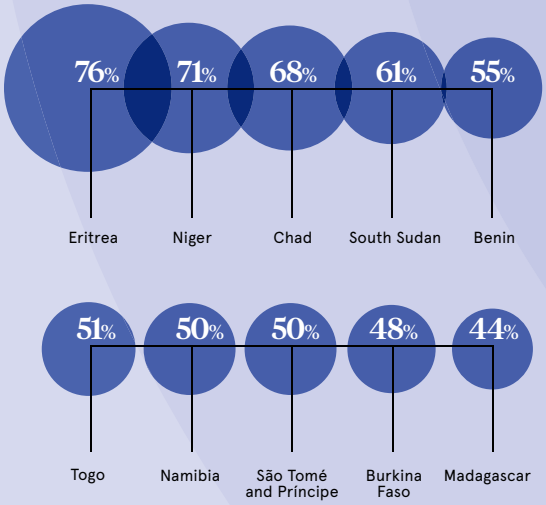
Global access to managed sanitation

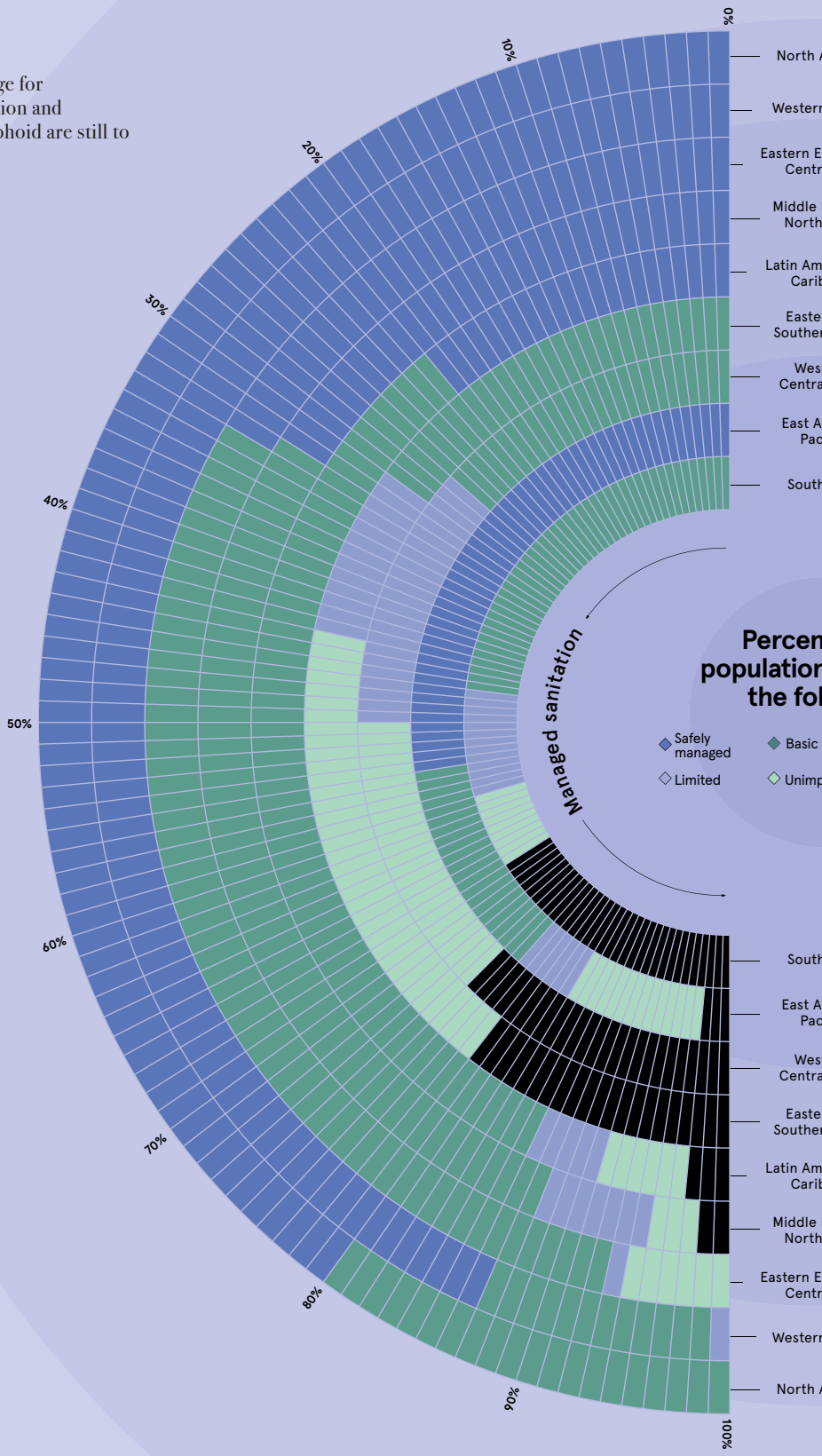
Percentage of global population in 2015 accessing the following



Worst countries for sanitation

Percentage of population who still defecate in the open



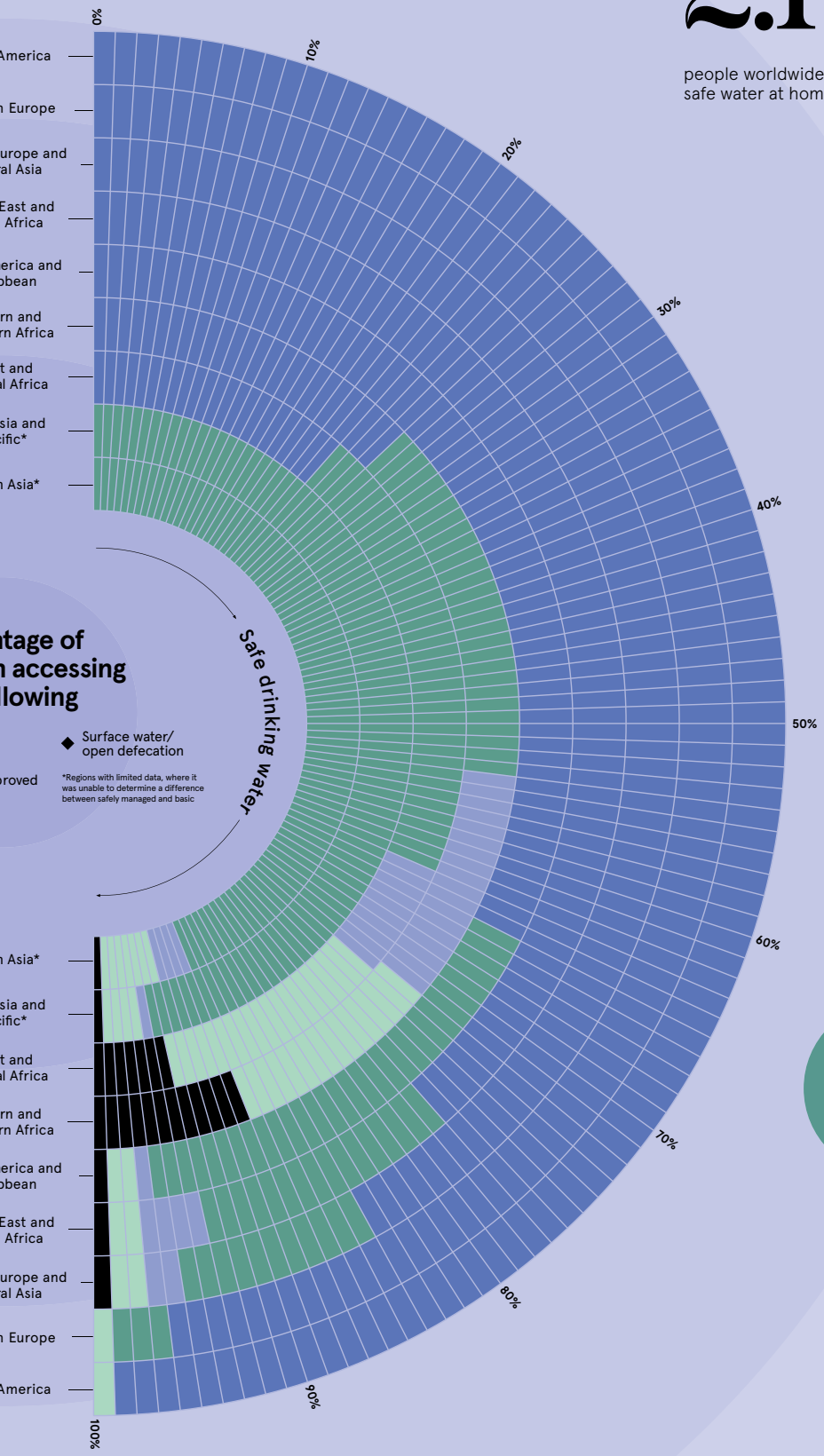


2.1bn

people worldwide lack safe water at home

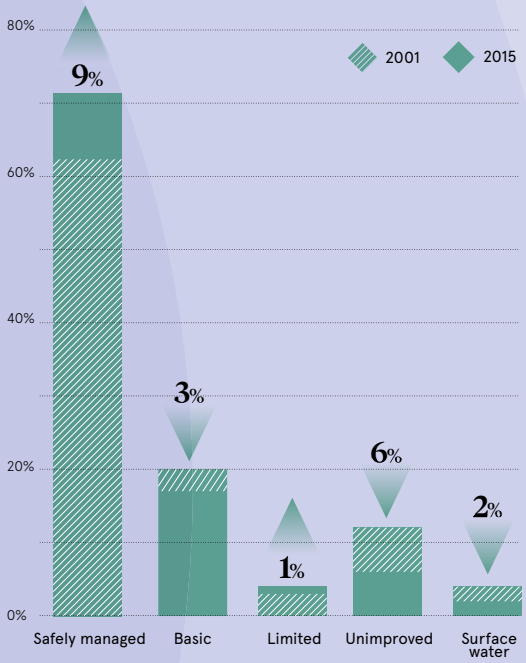
4.5bn

worldwide have no toilet at home to safely manage excreta



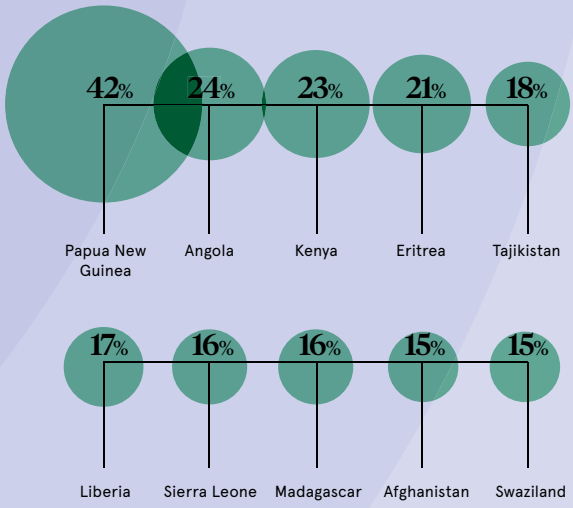
Global access to safe drinking water

Percentage of global population in 2015 accessing the following



Worst countries for drinking water

Percentage of population who still drink surface water



Raconteur, **World Health Organization/Unicef 2018**

FEATURE

Water the Path to Sustainability and Abundance - Turning the Desert Green

By Corrado Sommariva

CEO and Founder
Sustainable Water and Power Consultants (SWPC)

Water is a key element in the overall sustainability process, as water is the only element which is indispensable to support life and to allow the growth of vegetation, forestry which are elements so crucial not only in terms of greenhouse emission, but also in terms of exergy enrichment of the planet.

Water is and will remain for long time, a major challenge in GCC and many other scarce water countries in arid regions. However, through utilisation of advanced technologies and water resources management, these challenges can be resolved in a cost effective and efficient schemes to achieve a sustainable development.

As population and as water demand per capita increases, the amount of renewable water per capita is constantly decreasing. Along with a decrease in renewable water however, there is a constant increase of waste water; this is now seen as a liability to get rid at the lowest possible cost.

In reality, in the same way as waste needs to become the technological and biological nutrient store for the future, waste water also needs to become the new water source for the future.

Technology can now offer the possibility, to upcycle water through advance water treatment systems.

These processes are industrially well proven, can be energy negative (therefore can produce rather than require energy from waste water), and can further sequestrate carbon by enhancing the photosynthetic process.

In arid countries water is generated by seawater desalination. Desalination has been traditionally an energy intensive technology, however thanks to recent development the energy intensity has drastically decreased. Furthermore, in arid countries several solar projects have been installed with extremely competitive energy tariffs, and therefore energy for desalination projects can be provided by renewable sources at the same time.

The schematics in Figure 1 displays, how the combination of renewable desalination and water upcycling systems that are energy neutral or energy negative, can not only satisfy water requirements but also contribute to extend or magnify the biosphere. The abundance in this case would means increasing the energy of the biosphere: in other words turning the desert green.

One of the biggest paradoxes in today's wastewater treatment plant approach is the incredibly high amount that is dissipated in the process of "killing" the residual

energy of the waste water treatment streams.

However, can we for a moment, think of wastewater treatment plants as something different than an asset designed uniquely to get rid of industrial or municipal waste water?

Can the next generation of wastewater treatment plants, be imagined as a "cradle to cradle" water processing and energy generation plant, where waste water is upcycled to fresh water and energy from the waste water stream is recovered rather than dissipated?

Today, wastewater treatment processes in the GCC are mainly based on oxidation: the more the wastewater is oxidised ,the more carbon dioxide is emitted and the potential for energy recovery from the wastewater stream is lost.

Moving to anaerobic and membrane processes, would leave the carbon in the sludge, making it ideal as fuel for waste to energy thermal plants or biogas generation. Along with the inherent energy, nutrients and resources in wastewater stream can be upcycled, recovering nitrogen, organic carbon, phosphorus and other elements precious to the biosphere, for beneficial use.

The industry is also gradullay discovering the value of struvite as a biological phosphorus rich fertiliser, and it is gaining commercial momentum versus the chemical fertilisers. The possibilities offered by nutrients recovered are endless and fully in reach due to technology today.

The scheme below shows how a cradle to cradle approach could be applied to new water schemes, to preserve and augment our biosphere, minimising water abstraction from the biosphere by reusing and upcycling water.

Natural meteorological replenishment phenomena, can then reinstate the water abundance that naturally exists in the biosphere. Disposing waste water without reinserting it into the circle of life, results in the five associated waste processes:

- *The life driving and the energy storage possibility that water has for the biosphere*
- *The energy associated with the waste water content*
- *The nutrients in the waste water*
- *The possibility of preserving a natural ecosystem*
- *The beauty and wellness that abundant water offers to humanity*

Whenever water is reclaimed, recycled, treated and reused for any application that is not only related to domestic or industrial use but also for agriculture, landscaping or forestation the planet will receive one of the most significant contributions to its abundance.

For this reason water resources are essential; they need to be preserved maintained and augmented for the health of the planet. In other words, water needs to be used for what has been created by nature: sustaining life.

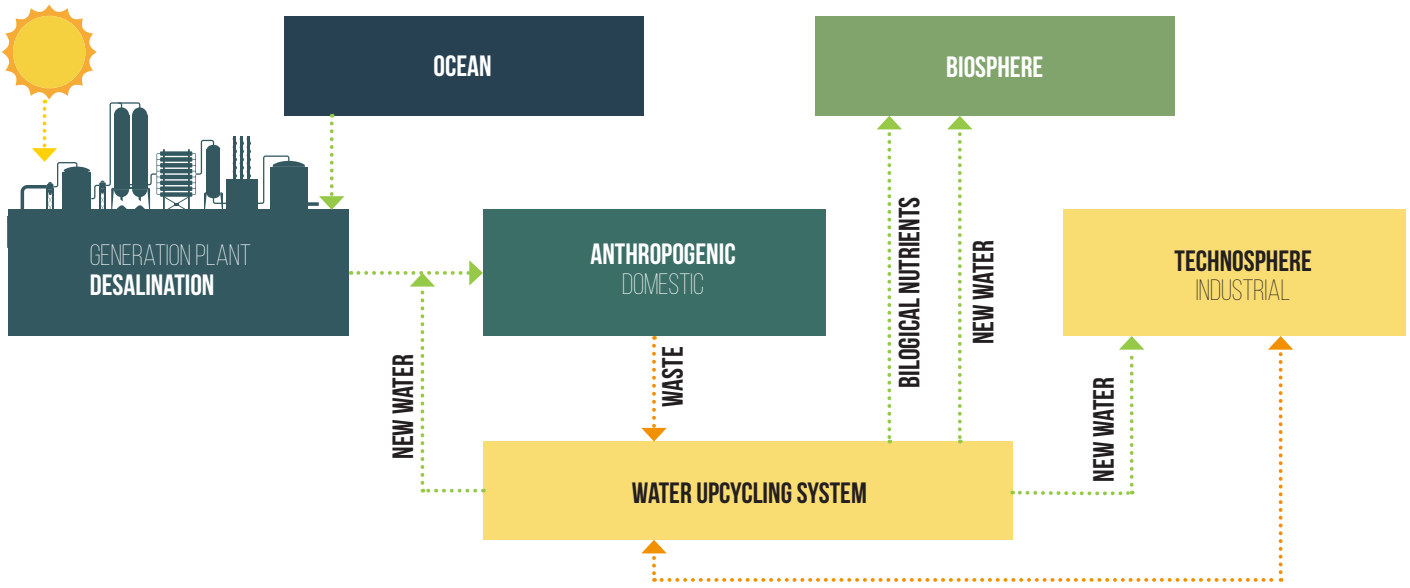


Figure 1: **An abundant flow of water arid countries**

سيرف تيك
SERVETECH
Service meets Technology

Servetech is a premier complete solution provider for plastic and metal systems for piping and lifting services. Servetech Middle East General Trading is proud to be accredited by the BSI group (ISO 9001, 14001, OSHAS 18001), and our other division conform to accreditation standards prescribed by Lloyds, BV, EIAC, DNV GL. We have diversified our operation divisions to include design, distribution and implementation in the field of Automation, Extra Low Voltage (ELV), and information technology (IT).

Servetech Automation Engineering Group (AEG) is an approved sub-contractor and one of the reputed service provider for potable water RTU-SCADA systems for Dubai Electricity and Water Authority (DEWA) that includes all field instruments, actuators, flow sensors and pressure transmitters. Servetech AEG is having panel manufacturing facilities and system integrator of IDS/Schneider/Siemens/Rockwell control system and providing complete solution to DEWA for supply installation, testing and commissioning of RTU/PLC Automation panel and integrating with DEWA master station.

SCADA RTU Control System for DEWA

Control Panel Manufacturing Facilities

Integration of VFD & Redundant Control System for Pumping Station.

Field Instrumentation Services

PERSON

"Not Science Fiction": Abdulla Alshehi Wants to Bring an Iceberg to UAE

Making headlines all over the world, Abdulla Alshehi's plan to spend hundreds of millions of dollars to bring a giant iceberg from Antarctica to the coast of Fujairah in order to harvest fresh water is set in motion to be tested in 2019.

"The main purpose is to help in resolving one of the world's most important issues, the water crisis," Abdulla Alshehi declared in an interview for The National. "Currently 1.2 billion people around the world do not have access to clean water. So we are pleased this has attracted positive coverage around the world."

Alshehi, an electronics engineer who authored a book about solving the UAE's water shortage problems, insists he can succeed in solving several of the issues the country is facing, with his innovative idea.

Due to its arid environment, the UAE doesn't have a large variety of water sources. The country, therefore, currently consumes around 15 per cent of the world's desalinated water.

Alshehi argues that his audacious idea will provide solutions to the country's water shortage problems, providing fresh, drinkable water to around one million people for up to 5 years. Alshehi also believes that having an alternative to desalination would be positive for the environment as well. "We believe it will be a more economical and environmentally friendly project to utilise the icebergs' water not only for the UAE, but throughout the world."

How will this work? The iceberg will be selected by satellite and could measure 2 kilometres by 500 metres. A patent-pending metal 'belt' will be used to prevent the iceberg from breaking up during its long journey. However, it is still expected to lose up to 30% of its mass before reaching warm Arabian waters. Before bringing the iceberg to the UAE in the next few years, the project's viability will be tested.

A trial run is scheduled to be conducted later in 2019, with a smaller iceberg being moved by tug boat to Cape Town in South Africa or Perth in Australia for water harvesting. The preliminary test, says Alshehi, is expected to cost between US$60-80 million. The fully-fledged mission to the UAE, is forecast to cost around US$100-150 million.

PROJECT

Launching QATRA

The effluent treatment project will be completed in January 2020 with a daily production capacity of 5,000 cubic meters.

Sharjah Investment and Development Authority (Shurooq) has officially started the construction of QATRA, a joint venture with BESIX Group to develop new water reuse plant in Sharjah's Al-Sajaa industrial area. Set for a January 2020 completion, the plant will produce 5,000 cubic metres per day of high-quality water for non-drinking purposes out of Treated Effluent from the Al Saja'a Sewerage Treatment Plant. This water will be ideal for industrial and domestic uses such as landscaping, and will be a sustainable alternative to desalinated water with four times less energy consumed in its production process.

HE Marwan Al Sarkal, Executive Chairman of Shurooq, said: "Since its establishment, Shurooq has been committed to transforming its visions and strategic plans into tangible projects and initiatives. This includes strengthening existing partnerships and entering into fruitful new ventures that help in achieving our goal to better serve the diverse communities and companies in Sharjah. Such partnerships enable us to find advanced solutions that align with current consumer trends in Sharjah, the UAE, and the region at large."

"This initiative underlines our priority to build a sustainable future, while focusing on economic and human development and taking into account our eco-footprint through our partnership with BESIX Group, which is among the leading companies specialised in providing sustainable energy solutions."

Established in 2019, the Sharjah Investment and Development Authority (Shurooq) is the driving force of Sharjah's transformation into an investment, tourism and business destination. Shurooq seeks to evaluate and follow-up on tourism, investment, and heritage-related infrastructure projects, and participating in the comprehensive construction and development process. It also works closely with other entities and organisations to drive investment through its comprehensive information centre, which highlights the investment opportunities in Sharjah.

PRODUCT

100% Recycled Plastic...and Still 100% Recyclable

The new bottle, a first for Nestlé, is made of 100% recycled PET or rPET.

Nestlé's Belgian mineral water brand, Valvert, has launched a bottle made entirely from recycled PET (rPET). The game changing new bottle marks an important milestone in Nestlé journey to make 100% of its packaging recyclable or re-usable by 2025.

The new bottle, a first for Nestlé, is made of 100% recycled PET or rPET. This means Valvert only uses old bottles to produce the new bottle, and no new virgin PET needs to be created. Valvert has been able to secure a reliable supply of the high-quality, food grade rPET that is required for bottled water. Nestlé has made some remarkable achievements in its efforts towards safeguarding the environment and acting on climate change. On world Environment Day this year, the company released figures listing their progress. Since 2010, Nestlé Middle East has achieved a 42% reduction in water withdrawal per ton of product, a 34% decrease in energy consumption, and 28% reduction in greenhouse gas emissions, while its production went up by 68%. The company has also achieved zero waste for disposal at its food manufacturing sites in the Middle East.

On a global scale, Nestlé's packaging ambition, announced in April this year, is to make 100% of its packaging recyclable or re-usable by 2025. As well as delivering on its 2025 commitment, Nestlé has a longer-term ambition to stop plastic leakage into the environment across its global operations. This will help avoid further accumulation of plastics in nature and achieve plastic neutrality.

Research and multi-sectoral partnerships are also being developed, with recent examples including the creation of the Nestlé Institute of Packaging Science to evaluate and develop new sustainable packaging material and solutions in collaboration with academia, supplier, startups, and others. This will ensure all of the company's packaging across the world is recyclable or reusable by 2025. Valvert, a still natural mineral water which gushes from a source in Belgium's lush green Gaume region in the Ardennes deep in the forest of Etalle, is wholly committed to shaping a more sustainable future for the next generations. In 2018, Etalle's farmers, Nestlé Waters, and the Etalle local administration, signed an agreement to protect the Valvert source and the surrounding environment through sustainable farming. As a result, the 10 farmers use zero pesticides, no chemicals, and Nestlé Waters supports the farmers by providing training and advice from experienced agronomists and bio-engineers.

TOP 10

Water Crisis Facts

The global water and sanitation crisis impacts the lives of more than 2 billion people worldwide.

EVERY **60** SECONDS

A CHILD UNDER THE AGE OF FIVE DIES FROM ILLNESSES RELATED TO DIRTY WATER

EVERY **DOLLAR**

INVESTED IN SAFE WATER AND IMPROVED HYGIENE AND SANITATION RESULTS IN EIGHT DOLLARS OF INCREASED ECONOMIC ACTIVITY

443 MILLION SCHOOL DAYS

ARE LOST EACH YEAR DUE TO WATER-RELATED DISEASES.

THE AVERAGE DISTANCE THAT WOMEN IN AFRICA AND ASIA WALK TO COLLECT WATER IS **3.7 MILES**

THAT IS 19,500 STEPS, EVERY DAY, JUST TO GET WATER THAT IS MAKING THEM SICK

A FULL 5 GALLON JERRY-CAN WEIGHS ABOUT

40 POUNDS

MANY WOMEN CARRY TWO AS THEY RETRIEVE WATER FOR THEIR FAMILY

40 BILLION HOURS

WERE SPENT BY SUB-SAHARAN AFRICAN WOMEN AND GIRLS A YEAR COLLECTING WATER

EQUIVALENT TO A YEAR'S WORTH OF LABOR BY THE ENTIRE WORKFORCE IN FRANCE

2.4 BILLION PEOPLE,

1 IN 3, LACK ACCESS TO A TOILET

844 MILLION PEOPLE

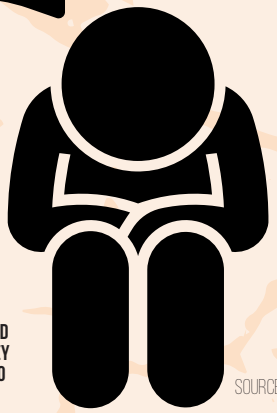
ON EARTH LIVE WITHOUT CLEAN WATER. THAT'S ROUGHLY 1 IN 10 PEOPLE ON EARTH OR ABOUT TWICE THE POPULATION OF THE UNITED STATES

WOMEN AND GIRLS SPEND UP TO **6 HOURS** EVERYDAY

TO GET WATER FOR THE FAMILIES

100 MILLION FAMILIES

ARE STUCK IN THE CYCLE OF POVERTY AND DISEASE BECAUSE THEY DON'T HAVE ACCESS TO SAFE WATER



SOURCE: WWW.LIFEWATER.ORG

CORPORATE CARBON FOOTPRINT
WHAT IS YOUR IMPACT?

CARBON FOOTPRINTS TYPICALLY INCLUDE **CARBON DIOXIDE (CO_2), METHANE (CH_4) NITROUS OXIDE (N_2O)** EMISSIONS AND ARE EXPRESSED IN **TONNES OF CO_2 EQUIVALENT (TCO_2e)**.

CO_2 CH_4 N_2O

TYPICAL EMISSION SOURCES AT THE CORPORATE LEVEL:

- REFRIGERATION
- COMPANY FLEET
- COOKING GAS
- ELECTRICITY AND WATER CONSUMPTION
- GENERATORS
- BUSINESS TRAVEL
- OFFICE COMMUTE
- PAPER
- LANDFILLED WASTE

WHY CORPORATE CARBON FOOTPRINT WILL HELP YOU:

- IDENTIFY EMISSIONS HOTSPOTS AND PRIORITIZE REDUCTION OPPORTUNITIES
- SET EFFICIENCY OR EMISSION REDUCTION TARGETS
- MEASURE, MONITOR AND REPORT EMISSIONS PERFORMANCE OVER TIME
- GUIDE INVESTMENT AND PROCUREMENT DECISIONS BASED ON OPERATIONAL RISKS AND OPPORTUNITIES
- PARTICIPATE IN VOLUNTARY REPORTING PROGRAMS
- IMPROVE CORPORATE REPUTATION AND ACCOUNTABILITY (CSR)
- MEET INFORMATION NEEDS OF STAKEHOLDERS

WRITE/CALL ME AT
FAREEDAHA@DCCE.AE
04-322-9854 FOR MORE DETAILS.

WHAT CAN **DUBAI CARBON** DO FOR YOU?

- CALCULATE YOUR CARBON FOOTPRINT IN COMPLIANCE WITH INTERNATIONAL STANDARDS
- SELECT A CALCULATION APPROACH USING REALTIME EMISSION FACTORS AND PARAMETERS
- DISCLOSE THE CARBON FOOTPRINT IN ANY PREFERRED FORMAT, ENSURING TRANSPARENCY IN THE DATA REPORTED
- PROVIDE AN ACTION PLAN LISTING OPPORTUNITIES TO REDUCE EMISSIONS AND SAVE ENERGY AND MONEY
- A FULL-DAY TRAINING ON CORPORATE CARBON FOOTPRINTS AND YOUR IMPACT
- ARRANGE VERIFICATION OF THE CORPORATE CARBON FOOTPRINT WITH LEADING THIRD-PARTY EXTERNAL AUDITORS

TOGETHER FOR SUSTAINABILITY

LIVE GREEN

DEWA IS PROUD TO BE THE OFFICIAL SUSTAINABLE ENERGY PARTNER OF **EXPO 2020 DUBAI**

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

EXPO 2020 DUBAI UAE

OFFICIAL SUSTAINABLE ENERGY PARTNER