

The Sustainabilist

ISSUE 02

Climate Change. A Private Sector Affair.

THE UAE'S CLIMATE ACTION

Interview with His Excellency
Dr. Thani Al Zeyoudi

AED 100 MILLION RETROFITTING DUBAI

Dubai Airport Partners with Etihad Escco

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NEWSROOM

Building a Mega City That Will Cost \$500 Billion

Saudi Crown Prince Mohammed bin Salman announced plans to build a new city on the Red Sea coast, promising a lifestyle not available in today's Saudi Arabia as he seeks to remake the kingdom in a time of dwindling resources.

The prince said the city project, to be called "NEOM," will operate independently from the "existing governmental framework" with investors consulted at every step during development. The project will be backed by more than \$500 billion from the Saudi government, its sovereign wealth fund and local and international investors, according to a statement released on Tuesday at an international business conference in Riyadh. ^[1]

**Privatisation of Oman Municipal Waste Management**

The Oman Environmental Services Holding Company – also known as Be'ah – is close to completing the transfer of waste management operations in each of its 11 governorates to international operators. The move is part of a waste management plan that aims to modernise and restructure the handling, treatment and disposal of municipal solid waste (MSW) and expand the country's capacity for recycling and waste-based energy generation.

Companies having been awarded contracts include Spain's Urbasar, which is currently working for the Al Batinah South governorate; Dubai-headquartered Averda, which won the contract to manage Ad Dakhiliyah and Dhofar; and a joint venture between Oman's Al Ramoos and France's Veolia for operations at Al Dhahirah and Buraimi. ^[2]

DEWA hires firm to expand smart metering project

Dubai Electricity and Water Authority (DEWA) has appointed Honeywell to help expand its smart energy project in the emirate.

The deal will see Honeywell provide a further 150,000 smart meters in addition to the 250,000 it has already deployed across Dubai.

The multi-million-dollar initiative will enable Dubai to manage electricity use more effectively within the residential sector across the city.

Honeywell said that unlike traditional meters, smart meters give customers access to detailed and automatic readings of both their current and historical energy usage, allowing them to better understand and control their consumption. ^[3]

Blockchain initiative drives Dubai's fintech development

The Dubai Land Department (DLD) has become the world's first government agency to adopt blockchain technology for all of its transactions, with the development part of the Emirate's plans to strengthen its position as an international leader in financial technology (fintech) and information.

This initiative comes amid an increase in fintech development in Dubai, with the Emirate launching its own blockchain strategy at the end of last year that aims to move all government transactions to the online database by 2020. ^[4]

Expo 2020 Dubai: an economic catalyst

Officials discuss impact of the World Expo on Emirate's infrastructure and logistics: RTA's contribution to the world expo, sees fifteen kilometres of new rail lines, road improvements around Dubai International Airport, a Dh3.5 billion project to improve road access around the Expo 2020 Dubai site, 625 new buses, 900 new taxis and 14 bus stations. ^[5]

Dubai growth: from 2.9 per cent to 3.5 per cent

Dubai growth expected to accelerate from 2.9 per cent in 2016 to 3.2 per cent in 2017 and 3.5 per cent in 2018.

Diversification has put the Dubai economy on road to progress and the Emirate will outperform the rest of the Gulf countries by sustaining strong growth in gross domestic product (GDP) in 2017 and 2018, according to a latest report. Institute of International Finance (IIF) said Dubai has performed relatively well due to its diversified economy. Tourism, retail trade and transport will continue to be the key driver of its economic growth. ^[6]

Year of Zayed

New official logo for the 'Year of Zayed', 2018 has been unveiled. The powerful logo will serve as the official emblem for all communications pertaining to the nationwide initiative. Honouring Sheikh Zayed's legacy as the founder of the UAE and celebrating his vision, which continues to guide and inspire a path of progress and prosperity for the modern nation, the emblem will be used for all official communications pertaining to the initiative.

Knowledge Summit 2017

The summit has been inaugurated. The summit was inaugurated by His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, who was accompanied by Shaikh Hamdan Bin Mohammad Bin Rashid Al Maktoum, Crown Prince of Dubai, and Shaikh Ahmad Bin Mohammad Bin Rashid Al Maktoum.

Speaking to guests on the first day of the summit, Hani Al Mulki, Prime Minister of Hashemite kingdom of Jordan, the guest of honour, told the audience that the Arab world must continue to embrace technological advancements brought about by the fourth Industrial Revolution.

Letter from the Editor in Chief



Eng. Waleed Salman

Chairman, DCCE

Dubai Carbon Centre of Excellence

The Sustainabilist

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In the inaugural edition of The Sustainabilist, we set the stage for the private and public sector to narrate their success stories via a dedicated platform, sharing exposure and information through business focussed features, commentaries and news.

In this second edition, we build on this foundation, extending our reach by delving into the pressing issue of climate change. Global emissions urgently need to decrease to avert the severe, widespread, and irreversible impacts predicted.

The landmark Paris Agreement within the United Nations Framework Convention on Climate Change (UNFCCC) set out the principles of a global response to climate change, but not the details.

The COP 23 Climate Change summit in Bonn, Germany, this November, provided the opportunity to accelerate action, progressing its implementation guidelines.

While the Conference of Parties is a meeting of minds at the policy-maker level, the resulting targets and agreed actions necessitate commitment from both the public and private-sector.

This feeds into the Sustainable Innovation Forum, COP 23's largest side event, which operates under a mandate to help build the cross-sector partnerships required to realise the Paris Agreement's goals, catalyse the exchange of global knowledge, and provide a springboard for action for global leaders.

Addressing climate change and other global environmental challenges is now key to managing business risks and ensuring long-term returns on investment.

Innovative solutions are essential, and private-public partnership is critical in driving action.



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The COP 23 Climate Change summit in Bonn, Germany, this November, provided the opportunity to accelerate action, progressing its implementation guidelines

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ON THE COVER

His Excellency Dr. Thani Al Zeyoudi, UAE Minister of Climate Change and Environment



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Global climate change is not for the faint of heart. Its effects are increasingly widespread and disruptive. Rising sea levels, increased temperatures, large-scale human migration, invasive pathogens and diseases, more frequent intense weather events – it's not a pretty picture.

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COMMENTARY

Over the past few decades, climate change has shifted from being considered as a side-line issue to being recognised as a serious development challenge. There have been significant accomplishments during this timeframe – global carbon dioxide emissions have stayed broadly flat for the past three years, for example – but there is still some way to go before we achieve the level of international commitment needed to avoid the forecasted catastrophic climate events.



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INTERVIEW

Thought Leader of the Month

His Excellency Dr Thani Al Zeyoudi
UAE Minister of Climate Change and Environment

Q. Your Excellency, can you tell us more about the UAE National Climate Change Plan 2050, approved by the Cabinet in 2017, which reflects the mandates of the UAE Vision 2021 and the UAE Green Agenda 2015-2030?

The National Climate Change Plan 2050 builds on the existing policy and institutional framework for green growth and sustainable development in the UAE. It reflects the mandates of the UAE Vision 2021 and the UAE Green Agenda 2015-2030, and factors in the nation's unique circumstances, development priorities, resource endowments, and capacity.

With an ambition to achieve a diversified, innovative, climate-resilient economy and a high quality of life, the National Climate Change Plan seeks to achieve the following threefold objectives: (1) manage greenhouse emissions while sustaining economic growth; (2) build climate resilience through minimizing risks and increasing capacity for climate adaptation; and (3) advance the UAE's economic diversification agenda through innovative solutions.

Through pursuing these interlinked goals, the Plan seeks to enable the nation to achieve continuous growth even while addressing the complexity of climate change, thereby facilitating the transition towards a climate-resilient green economy.

Q. How does the UAE demonstrate its leadership in addressing climate change abroad?

The UAE shares common aspirations with the global community in relation to achieving the United Nations' sustainable development goals (SDGs) and the objectives of the Paris Agreement.

The UAE has been proactively engaging in the climate change negotiations under the UN Framework Convention on Climate Change (UNFCCC) and was one of the first countries to ratify the Paris Agreement.

In addition to actively engaging in international climate change negotiations to protect the UAE's interests, the Ministry of Climate Change and Environment (MOCCAE) is also enhancing domestic climate action efforts, guided by a clean energy target of 27% by 2021 and 50% by 2050. These efforts include the deployment of renewable energy projects at scale, promotion of energy and water efficiency in all relevant sectors, introduction of efficient public transportation systems and protection of our blue carbon ecosystems. The UAE contributes to the advancement of global climate action by sharing our experiences and best practices and transferring our knowledge.

We also support other developing countries with dedicated funds for renewable energy deployment, which have multiple effects, from reduction of greenhouse gas emissions, increased energy security, better access to education and basic services, as well as job creation.

During the 72nd Session of the United Nations General Assembly (UNGA) in New York in September 2017, the UAE hosted a roundtable against the backdrop of Hurricanes Harvey and Irma, which devastated many parts of the Caribbean. We announced the first five projects under a new US\$50 million grant fund for the Caribbean Islands. The projects include cutting-edge solar, geothermal, and energy storage solutions in the Bahamas, Barbados, Dominican Republic, Saint Vincent and the Grenadines and Barbuda. We believe that renewable energy is the solution for minimizing the impact of climate change and reversing the current trend of increasingly severe natural disasters.

In addition, the UAE pledged US\$10 million to the United Nations in humanitarian relief to the Caribbean in the wake of the recent hurricanes. The priority is to get children back to school, restore business operations and public services, and implement utility systems that are resilient to extreme weather.

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Furthermore, we have been hosting several international platforms to advance dialogue, forge partnerships and take collective climate action, such as the Abu Dhabi Ascent, the annual Abu Dhabi Sustainability Week and the World Government Summit.

Q. The Ministry of Climate Change and Environment has established the Emirates Committee for Sustainable Environment Research, to further innovation through research and development in the UAE. Can you elaborate on the direction of the Committee and what the Ministry hopes to achieve by establishing this Committee?

The Emirates Committee for Sustainable Environment Research comprises representatives from a range of different organizations, entities and universities across the public and private sectors and will oversee the development of a research strategy and integrated work streams on environmental sustainability and climate change - key national priorities of the UAE Government.

The Committee will mandate collaborative efforts, information exchange and data sharing (including enabling freer access to the Ministry's technical data) across government entities and universities as well as through setting strategic objectives for different organizations.

The formation of the Emirates Committee for Sustainable Environment Research is part of the Ministry's commitment to supporting sustainable practices, efficient use of resources and driving scientific research across the country in a bid to ensure behavioral change in accordance with the objectives of the UAE National Agenda. The Committee will play an important role in sustained efforts to find research-driven creative, innovative and environmentally friendly clean energy solutions in the UAE.

Through this Committee, we hope to fill the gaps that exist with regard to ensuring a relevant knowledge base and scientific evidence to support efforts in pertinent fields including climate change.

Q. The Ministry of Climate Change & Environment is actively involved in engaging with the private sector. What are some key initiatives of the Ministry's efforts to collaborate with the private sector and do you expect investments from the private sector to mitigate climate change?

The UAE Council for Climate Change and Environment has been established to reinforce the UAE's policies and strategies on climate change, environmental and sustainable

development. The Council will develop plans towards achieving environmental objectives and represent the UAE in regional and international negotiations related to the scope of work of the Ministry. The Council will also create partnerships with the private sector and conduct studies and lead scientific research in fields related to the Ministry's work.

We strongly believe that the work of the private sector is crucial in mitigating climate change, and are encouraged to note that the UAE based private sector companies are already taking proactive climate action measures. The MOCCAIE has established the Environment and Business Majlis to further boost the contribution of the private sector and guide them in ensuring that their activities are aligned with the government's strategic directions.

The Majlis seeks to identify the appropriate regulatory and legal frameworks in addressing climate action, and encourage the private sector to come up with best practices and solutions that may be rolled out across all environmental and economic sectors.

It also aims to propose innovative and technological initiatives in the environment and climate change sector that are in line with the global direction. These include encouraging private sector companies to adopt corporate social responsibility programs that will reduce carbon emissions, as well as improve and extend the Ministry's services to the private sector.

The job prospects in the green economy are promising, but require the filling of significant capacity gaps in order to realize them. To prepare the workforce for the transition to green sectors such as clean energy, green manufacturing, and environment-friendly goods and services, the UAE will carry out a comprehensive capacity needs assessment, leverage young local talent by equipping them with technical, managerial, and vocational skills, and forge closer collaboration between academia and industry.

Key MOCCAIE - UAE private sector initiatives

EGA

Emirates Global Aluminium (EGA) has already made a great leap in this direction by ensuring resource and energy efficiency through cleaner production methods that are promoted under the

UAE Green Agenda 2015-2030. By February 2017, EGA completed a Government Accelerators project to reduce nitrogen oxide emissions from its power plants in 100 days in close coordination with the Ministry of Climate Change and Environment and the Prime Minister's Office. Within this short period, EGA managed to reduce its NOx emissions by 16%, beyond the 10% target of the Accelerators. This is equivalent to removing 450,000 cars from the UAE's roads.

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We believe
that renewable
energy is the
solution for
minimizing
the impact
of climate
change and
reversing the
current trend
of increasingly
severe natural
disasters
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Waste - to - energy

The Ministry is conducting a study with Abu Dhabi Future Energy Company-Masdar and Bee'ah aimed at implementing a waste-to-energy conversion facility to serve the emirates of Ras Al Khaimah and Fujairah. Waste-to-energy projects offer benefits including reduction of methane (a potent greenhouse gas) emissions, waste to landfill and fossil fuel combustion for electricity generation.

Artificial Caves

Launched in 2016, MOCCAIE is working with Delma Industrial Supply & Marine Services (Delma Marine) on an Artificial Caves Program to support the fishing industry by deploying artificial caves to increase breeding grounds for marine species, thereby stepping up fishing productivity and protecting our marine resources from the onset of climate change. The Ministry's ongoing efforts in this regard aim to safeguard the sustainability of living aquatic resources and enhance food security in the country – a key element of the UAE Vision 2021.

Collaboration with Lush

Lush, a leading international ethical cosmetics brand, well-known for its environmentally conscious products, in partnership with the Ministry of Climate Change and Environment, recently launched a campaign to raise awareness on the impact of climate change on oceans and marine life.

Other interesting work here in the UAE includes:

The world's first research facility aimed at finding a way to cultivate food, as well as generate biofuels using desert land irrigated with seawater, is under operation at Masdar City. The program - 'Sustainable Bioenergy Research Consortium' - is led by the Masdar Institute with members from leading private sector companies including Etihad Airways, Boeing, Takreer, GE and Safran.

Majid Al Futtaim's Net Positive sustainability strategy – the major shopping mall, retail and leisure developer across the Middle East, Africa and Asia has adopted a strategy 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.

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Q. Please highlight some of the measures the Ministry of Climate Change and Environment is implementing to gain public support and engagement towards the climate change policy actions in the UAE?

Gaining support from all spheres of our society is critical, as policies alone cannot deliver climate action.

For this reason, the Climate Plan was developed in extensive consultation with our stakeholders, and our delegation to annual COPs include a wide range of sector representatives including youth.

We conduct various awareness and communication campaigns, in partnership with concerned stakeholders, following a

thorough assessment of the targeted audience’s understanding, motivations, and willingness to engage in climate actions. Furthermore, MOCCA hosts events in partnership with relevant stakeholders to facilitate the participation of government entities, businesses, youth, households, academia, and media, in addressing climate change.

The National Environmental Education and Awareness Strategy aims to strengthen the community’s commitment to sustainability and environmental protection as well as to educate the youth in leading the UAE towards a sustainable future.

Q. Your Excellency, can you comment on the progress of the implementation of the various initiatives in the UAE to meet the objectives and targets of the strategies set in place by our wise leadership?

The UAE is committed to addressing climate change as part of the global efforts, and it is leading by action.

Climate Action: UAE Accomplishments:

National clean energy target of 27 percent by 2021 and 50 percent by 2050.

The Sheikh Mohammed bin Rashid Al Maktoum Solar Park is the largest single-site solar project in the world with a planned capacity of 5,000 MW by 2030.

Masdar has been advancing the UAE’s ambitions for renewables and sustainable technology development through addressing the whole value chain, from education and research and development, to investment and commercialization.

Masdar invests in renewable energy projects around the globe, including the solar home systems being installed across 940 villages in Morocco, the London Array offshore wind farm in the UK, and other international projects that advance renewable energy solutions.

The UAE capital is home to the International Renewable Energy Agency (IRENA). The UAE has mobilized close to USD 1 billion to

support developing countries with renewable energy deployment, including the USD 350 million IRENA-ADFD Project Facility, USD 50 million Pacific Fund and the USD 50 million Caribbean Fund.

New electric car owners in Dubai will be able to charge their vehicles free of charge until 2019, use free designated green parking spaces in Dubai, obtain free electric vehicle registration and complimentary renewal fees as well as Salik tag and license plate sticker identifying the vehicle as an electric car. This initiative supports the Dubai Clean Energy Strategy 2050 that aims to ensure Dubai has the lowest carbon footprint in the world by 2050 and the Dubai Carbon Abatement Strategy (CAS) 2021 that seeks to slash carbon emissions by 16 percent by 2021.

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COMMENTARY

Expo 2020: Cultivating a positive approach to climate change

Expo 2020 Dubai has set ambitious targets to minimise its impact on the planet, while also nurturing innovations around the world that help address this urgent challenge.

By **Najeeb Mohammed Al-Ali**

Executive Director
Dubai Expo 2020 Bureau

An increase in the average global temperature of 2 degrees Celsius is a small yet significant shift, which most of the global community acknowledges could dramatically impact our future. This figure is among several critical qualitative and quantitative signals that define a safe operating space that will allow humanity to thrive. Together, they reflect a new understanding of our influence on the planet.

Humanity no longer impacts only local environments in limited ways, but the collective effect of our actions and lifestyles have a knock-on affect on our planet in ways that can rival the powers of nature. Many experts are calling this era the Anthropocene, a time when humans have become the predominant cause of change at the planetary level. From the depths of the oceans to the outer edges of the atmosphere and beyond, the human footprint is increasingly visible. Our extraordinary success as a species is tipping

the balance between what humanity requires to shape its future, and what the Earth can naturally supply and absorb. With changes in global population and urbanisation, we are increasingly borrowing from our own future and that of the next generation.

While this could lead to a pessimistic view of tomorrow, Expo 2020 Dubai recognises the opportunity to understand and use the power of our imagination, technology and innovation to mitigate or even rebalance our negative influences.

Expo 2020 Dubai aims to encourage an innovation and inspiration-driven approach to climate change by demonstrating and applying the latest in sustainable standards and practices. But, just as importantly, we also aim to bring to the surface and help scale solutions and grassroots innovation from around the world that

demonstrate tangible and positive impacts for our future.

World Expos were founded 166 years ago and have always been less about exhibiting products and more about exposing millions of people to innovations that can help them understand the difference between various options for our future. Expo 2020, with Sustainability as one of its three subthemes, aims to connect and expose visitors and innovation – we're aiming for 25 million visits with 180-plus participating countries – to the positive and transformative actions that so many communities around the world are already implementing.

Several nations feeling the early effects of climate change have already signed up to participate in Expo 2020, recognising the potential to help address this pressing challenge. They include the Pacific island nations of Solomon Islands, Marshall Islands and Tuvalu.

Many of the Marshall Islands' atolls are barely a metre above sea level and could be engulfed if waters rise further. Doreen DeBrum, Assistant Secretary for the country's Bureau of Multilateral Affairs, Ministry of Foreign Affairs and Trade, said last month (October): "Expo 2020 Dubai will be a chance for us to address urgent climate change issues, which are not only pressing for us but for the world. Hopefully, together, we can find long-term solutions that will help save our islands and preserve the planet for future generations."

Tuvalu and the UAE, through the Abu Dhabi-backed renewable energy company Masdar, are already working together to showcase the viability of clean energy – one of the goals of Expo 2020 – with a UAE-funded 500 kilowatt solar photovoltaic power plant on the Tuvaluan atoll of Funafuti.

Expo 2020 is also helping to develop grassroots ideas to improve the planet through its flagship social impact programme Expo Live, which is already supporting – financially and otherwise – more than a dozen projects that have proven to have significant positive impacts on the environment.

They include kites that harness wind in the higher atmosphere to generate electricity in remote areas, a system that is currently being tested in Cape Verde, and a solar-powered water purifier that is helping to provide clean water in regions where natural groundwater reserves have been polluted or poisoned or where seawater is the only available water source.

Another of Expo Live's initiatives, the Innovation Impact Programme, aims to inspire everyone – from students to scientists, parents to pioneers – to tap into their creativity to solve problems that affect society and the environment.

Through the procurement process, we are also challenging our supply chain to move beyond 'business as usual' to higher levels of environmental awareness and stewardship. This will not only inspire businesses to redevelop their products and services to be more in harmony with our natural resources but also demonstrate that doing so can be profitable.

Of course, we are also leading by example with the Expo site itself. It will not only be the Sustainability Pavilion that pushes the limits of sustainable practice and technology; all Expo structures and spaces are being designed and constructed with the most sustainable technology, materials and operational practices possible.

All Expo buildings will meet at least the rigorous LEED Gold standards for water and energy use, as well as carbon emissions. The Sustainability Pavilion supercedes that and is aimed at reaching LEED Platinum standard, a very rare distinction.

Eighty percent of Expo's built structures and spaces will remain in legacy, forming the backbone of District 2020, a new city for the future.

Half of the site's energy requirements will be supplied through renewable energy such as solar power. We will segregate at least 85 percent of waste at source to enable more efficient recycling and to reduce waste to landfill.

Expo will also adhere to stringent air quality standards, aided by our transport strategy that facilitates low-emission modes of transport, including a direct Dubai Metro line (Route 2020), which is currently under construction, and the ExpoRider public bus service.

Expo 2020's Mobility Pavilion was designed by Norman Foster, whose mentor Buckminster Fuller spent most of his life pushing the limits of architecture to create habitats for humanity that could thrive within the boundaries of our finite resources.

He coined the expression "spaceship Earth" to remind us all that we need to take good care of the ship that is giving us a home in the universe. When people look back at Expo 2020, they will remember it as taking place at a time when humanity was understanding how to master the boundaries for a growing number of people to lead a healthy existence. Technology, knowledge, business acumen and connectivity will not be sufficient to save us if the values that shape the choices we make are not in line with our goal to mitigate climate change.



We hope that Expo 2020's contribution to the Anthropocene will help nurture new opportunities by thinking outside the box and truly acting as a 'big humanity' in our small spaceship Earth.

INTERVIEW

Dubai Airport terminals can save 20% in energy consumption annually

Etihad ESCO has signed an agreement with Dubai Airports for the retrofitting of Terminals 1, 2 and 3 of Dubai International Airport and the Dubai International Airport Hotel at Concourse B

Interview with

Michael Ibbitson
Executive Vice President – Technology and Infrastructure, Dubai Airports

Ali Al Jassim
CEO, Etihad ESCO

Q. A major performance implementation contract has just been signed between Etihad ESCO and Dubai Airports. Does the deal apply to the whole airport or to specific terminals/areas?

It applies to the entire airport, where we plan to retrofit Terminals 1, 2, and 3 of Dubai International Airport and the Dubai International Airport Hotel at Concourse B. The retrofitting work will be done in four phases. We have started the first phase of the project, which covers major passenger buildings.

Q. Can you share more details about the scope of work?

The project duration is estimated to be four years, and it will be implemented in four phases. In the first phase, which will be 18 months long, all building systems such as the handling units and cool water distribution systems will be upgraded to make them energy-efficient. The new contract is expected to boost energy efficiency and help save around 15-20% in energy consumption annually.

In the second phase, the lighting system will be upgraded to a more energy-efficient system in all the major buildings.

Etihad ESCO's scope of services during the construction period includes water conservation. Existing faucets will be replaced with low-flow faucet aerators, which break flowing water into

fine droplets and entrain air while maintaining wetting effectiveness. This will reduce water use at faucets while maintaining a strong flow.

The scope of work also includes installation, operation and maintenance of a solar PV system. Monitoring systems will be installed for all solar PV projects. In addition, Etihad ESCO will provide training to the customer and third parties.

Q. What kind of lighting systems will be installed?

The airport currently has 175,000 light fittings. The area and the type of light will dictate which type of lighting system will be installed. We are conducting a study to finalize the lighting system, but it will predominantly be an LED system.

Q. With regard to the solar PV installation, is there a specific energy saving target that you hope to achieve?

The Terminal 2 building can accommodate solar panels, which will help generate 10–15% of the total electricity consumption of the facility. We also plan to have larger installations in other airports where there is more space.

Q. Who are the parties involved and what are their responsibilities?

Etihad ESCO, which is the prime contractor, has subcontracted various components of the work to other companies like DEWA and National Bonds. National Bonds is providing all the financing. Dubai Airports pays its utility bills through DEWA, which pays off the investment for Etihad ESCO. This is very beneficial for Dubai Airports because it does not have to provide advance payments for financing the project. This will enable them to balance between energy investment and passenger experience because the financing structure is built into the system, among Dubai Airports, Etihad ESCO, DEWA, and National Bonds.

Q. How did this partnership between Dubai Airports and Etihad ESCO happen?

Etihad ESCO approached Dubai Airports with a proposal. Dubai Airports were on top of Etihad ESCO's list given their size, scale of operations, and intensive consumption of energy.

Dubai Airports has known for a long time that one of the biggest saving opportunities for their business, and also an environmental benefit for their community, was to engage in this program. Dubai International Airport is the biggest international airport in terms of passenger traffic so this will make a huge impact on lowering the environmental footprint on every journey that takes place through the terminals. This will also affect Dubai's overall energy consumption, producing a sizeable and meaningful impact.

DUBAI AIRPORT BUILDING RETROFIT PROJECT – SUMMARY

Scope of Work: Retrofit 4 facilities
(Terminal 1, 2, 3 and Concourse B)

PROJECT SUMMARY

Annual Energy Bill
AED 130,464,720

Proposed Solar PV Plant Capacity
4.89 MWp

Annual Guaranteed Saving
65.49 GWh

Annual Guaranteed Saving
21 MIG

Annual Guaranteed Saving
AED 29,968,797

Total Guaranteed Saving (7 Years)
AED 209,781,579

Total Project Cost
AED 141,204,914

Total No. of Facilities for Retrofit
4 Facilities

Project Construction Period
18 Months

Guaranteed Energy Saving Period
7 Years



FEATURE

Building a sustainable and future-ready city in Dubai

The Sustainable City project helped Diamond Developers create a blueprint for what future cities could look like. Its knowledge and consultancy arm SEE NEXUS is working to duplicate the model and export it from Dubai to the world

By Karim El-Jisr

Executive Director
SEE NEXUS Institute

A closer look at global greenhouse gas emissions shows that the construction and manufacturing industries account for 35–40% of total emissions. As industries around the world mobilize towards reducing their carbon output, the construction sector inevitably must own up to its share of the responsibility. Fortunately, this is already being implemented by a growing number of industry players, either through more efficient manufacturing and construction methods, improved building design strategies, or the adoption of renewable energy technologies.

The Sustainable City, a unique and award winning development, is a joint venture between Diamond Developers and its knowledge and consultancy arm SEE Nexus. Carefully designed according to the three pillars of sustainability, the city delivers social, economic and environmental outcomes.

The 46-hectare development is an international case study for sustainable living, work, education, and recreation. The Sustainable City has incorporated many features to reduce its carbon footprint, such as villa orientation and demand side management, PV solar rooftop installations, water recycling, and clean mobility and electric vehicle infrastructure. A 25-meter wide buffer zone comprising 10,000 hedge trees and date palms enable carbon sequestration while also serving as scenic wind blockers. To avoid heat islands, The Sustainable City offers shaded narrow alleys (sikkas) and wind towers (barajeel) as well as light-colored pervious road surfaces.

The project is slated to become the first operational net zero energy community development in Dubai.

The first phase of the project concluded in December 2015 and the second phase will be completed in 2018, including a hotel, a school, a medical facility for sustainable health and wellness, and the SEE Nexus headquarters.

Climate action requires performance accountability. Working with WWF-Emirates Wildlife Society and Dubai Carbon, The Sustainable City is monitoring its greenhouse gas emissions according to the Global Protocol for Community-Scale GHG Emissions Inventories (GPC). The inventory will establish a new benchmark for carbon foot-printing in the real estate sector.

To verify GHG emission reduction, Diamond Developers is developing and registering The Sustainable City under the 'UAE Small Scale Programme of Activities' as a 10MW clean development mechanism (CDM) project with the UN Framework Convention on Climate Change. The project will help accelerate solar rooftop uptake, and result in Certified Emission Reduction (CER) credits. Dubai Carbon is



“
Water recycling, electric mobility, and solar energy production have avoided 1,402 tonnes of carbon dioxide emissions. The median Energy Use Intensity of occupied villas in The Sustainable City was 94 kWh/m²/year
 ”

assisting Diamond Developers with CPA registration and CER issuance.

The combination of climate smart design (with more than a dozen industry awards to date), adoption of renewable energy (verified through the CDM registration), and preparation of a GHG emissions inventory (according to GPC), provides a solid platform for low carbon living in line with the goals of the Paris Agreement.

The Sustainable City is also home to the SEE Nexus Institute, which promotes climate action by building, spreading, and applying sustainability knowledge in the built environment. Sustained education programs for The Sustainable City residents help reinforce energy and water conservation behaviors. The Institute is also playing a leadership role in testing innovative solutions for low carbon living, and is providing education and support for sustainable initiatives across the region in partnership with a host of local and international universities and research institutions.

Since October 2016, the Institute has been conducting post-occupancy monitoring and reporting at The Sustainable City. The results so far reveal that water recycling, electric mobility, and solar energy production have avoided 1,402 tonnes of carbon dioxide emissions. This is equivalent to 157,769 gallons of gasoline consumption avoided. Specifically, The Sustainable City recycled 63,444 m³ of greywater - equivalent to 25 Olympic size swimming pools, driven 179,500 km in electric buggies - equivalent to 5 times around the equator, and diverted 87 percent of its waste from landfills - equivalent to 18 tennis courts. The median Energy Use Intensity of occupied villas in The Sustainable City was 94 kWh/m²/year. The Institute will continue to monitor the performance of The Sustainable City, as well as future cities by Diamond Developers and SEE Nexus, and publish key findings.

SEE Nexus encapsulates the knowledge acquired during the planning, construction, and operation of The Sustainable City in Dubai. Its mission is to emulate the city both locally

- in alignment with the Dubai Clean Energy Strategy and the UAE National Green Growth Strategy, as well as globally in alignment with the Sustainable Development Goals. With a focus on strengthening the social, environmental and economic pillars of sustainability, the company is uniquely positioned to provide 360-degree solutions that are borne from practical experience and applicable sustainability concepts.

COMMENTARY

GE Sustainability: Energy and Climate



Energy and climate represent two of the most important business challenges of this century. Energy—its generation, use and transmission—is critical to both the global economy and individual advancement. Finding ways to help emerging economies meet rising demand for energy is essential for economic and human development.

As a key stakeholder in the energy sector, GE focuses on providing its customers with cleaner and more productive solutions to meet rising energy demand. At the same time, we are working in our own operations and value chains to increase resource efficiency in production.

Ecomagination is GE's growth strategy to enhance resource productivity and reduce environmental impact on a global scale through commercial solutions for our customers, in our own operations and by developing strategic partnerships to solve some of the toughest environmental challenges to create a cleaner, faster, smarter tomorrow.

Since 2005, Ecomagination has become one of GE's most successful initiatives: We have invested \$20 billion in R&D and generated \$270 billion in revenues from Ecomagination-qualified products.

For example, in 2016, GE, in partnership with EDF Energy, made history and won a Guinness World Records™ title for powering the world's most efficient combined-cycle power plant in Bouchain, France, with the Ecomagination-qualified gHA.01 turbine—with a measured efficiency of 62%. The enhanced efficiency is achieved by running at higher temperatures made possible by using advanced materials, better thermal barrier coatings and more sophisticated

cooling technology, boosted by the superior aerodynamics of the turbine's curved blades. As a result, customers can respond quickly to grid demand fluctuations, integrating renewables as necessary.

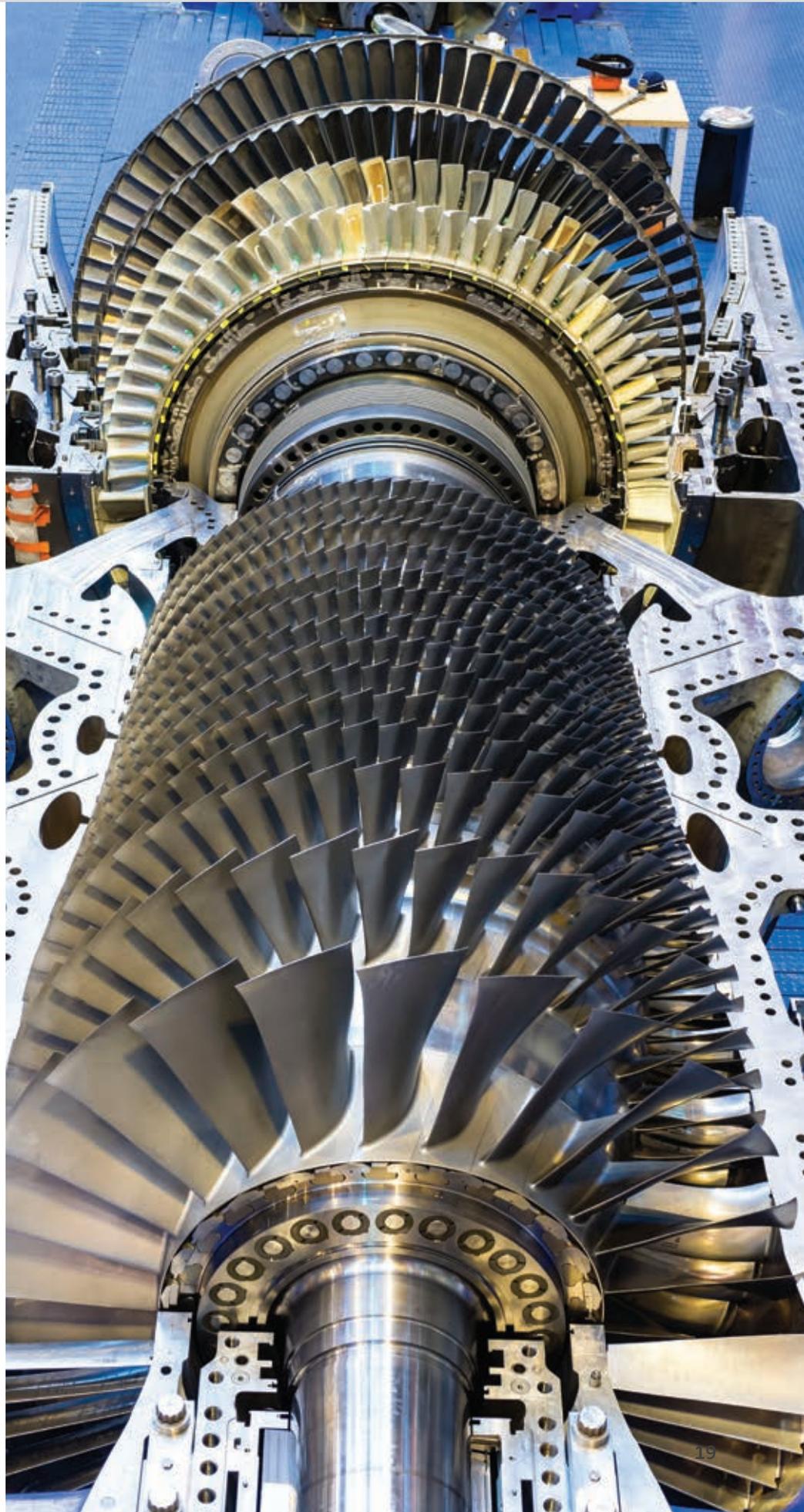
Today we continue to measure our progress on resource efficiency through our 2020 commitments: to invest an additional \$10 billion in Ecomagination R&D and reduce our greenhouse gas emissions and freshwater use by 20%, from the 2011 baselines. Within our own operations, we have reduced our GHG emissions by 18% and freshwater use by 29% through 2016, from the 2011 baseline.

Since we launched our first operational goals, we have sharpened our strategy and efforts. Over the past decade, we have realized our best results through projects that deliver improved environmental performance and significant economic benefits, shown through cost reductions and productivity improvements. We're finding that creating an Ecomagination culture has embedded a relentless drive to "lean" both our operations and their environmental impact. For example:

In 2016, our GE Energy Connections facility in Peterborough, Canada, won top honors in GE's annual EcoAwards competition by turning rooftop area into green space, reducing site VOC emissions by 60% and reducing noise emissions from the facility—achieved with inspiring engagement by employees and the local community.

Our Rutland, Vermont, site has delivered approximately 46,000 tons of carbon emission reductions and saved the plant more than \$5.2 million per year since 2006 through facility upgrades such as lighting, motors and control systems.

Our GE Oil & Gas site in Massa, Italy, completed a substantial upgrade of equipment to reduce losses of the refrigerant R134a by improving handling, storage and gas recovery equipment. The site expects to observe emissions reductions of up to 44,000 tons of CO₂ annually.





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We’ve impacted the lives
of 500,000+ Captains and
12 million users
”

INTERVIEW

Interview with Careem

Nadia Rouchdy, Haed of Sustainability & Social Impact

Q. What is Careem?

The idea behind Careem was not just to build a business but to start one that would have a big impact. The founders, Mudassir Sheikha and Magnus Olsson, wanted to improve the lives of thousands of people and change society for the better. They realised that addressing the region’s mobility challenges through technology to enable transportation was the means in which they would deliver this impact. On-demand services were unheard of in the region at that time and they seized the opportunity.

Careem was thus created on the eve of Ramadan in 2012 and is now the region’s leading ride-hailing app. Since then, we’ve expanded to 12+ countries, from Morocco in the West to Pakistan in the East. We’ve impacted the lives

of 500,000+ Captains and 12 million users. We’re the fastest growing tech company in the region and the only unicorn, or as we like to call ourselves, a “unicamel”. We’re excited to keep growing while building an inspiring institution and making a positive impact on the lives of our Captains, Customers, Colleagues and our Community.

Q. COP 23 is happening while we talk. The main focus of this conference is on Climate Change. What is Climate Change for Careem and how can Careem mitigate it?

As a technology company, we take the challenge of innovation and growth very seriously. We look at mobility challenges and try to solve them for

Customers, Captains and Colleagues through the lens of how our product can be at the core of the solution. Whilst climate change will undoubtedly be one the biggest challenges of our time, we don’t shy away from acknowledging our contributions and are in the process of developing initiatives to do our part.

We believe that as more people move away from heavily relying on individually-operated cars and move towards shared vehicles, the process becomes much more efficient and reduces the amounts of cars on the road. A recent study by the American Public Transportation Association revealed that the more people use shared transportation modes, the more likely they are to use public transit, own fewer cars and spend less on transportation overall. A win for everyone!

Fighting climate change can pave the way for new opportunities for us to be innovative and continue to help solve some of the region's biggest problems. Our aim is to move the region towards better living, so we're constantly looking for ways to have a positive impact.

Q. Do you have any environmental-friendly cars in your fleet? Such as hybrid cars or electric cars, or even low fuel consumption cars?

When retrofitting a building, hard and soft measures for ensuring energy efficiency are always considered right? Either we change technology or reduce demand. The latter is precisely the approach we are taking at Careem as there is so much that can be done with the existing fleet our Captains have! We've implemented a variety of initiatives to work with Captains to encourage fuel-efficient behaviour by helping them understand best practices and reduce costs. We are also testing a variety of different initiatives to get better fuel-saving outcomes, and continuing to reduce emissions.

We've also launched pooling, or Sawa, in Jordan, which allows customers to enjoy the same ride, but share their trip with others, effectively reducing their emissions and fare costs.

Additionally, we work closely with the Dubai Roads and Transport Authority (RTA) on enabling partnerships for driverless electric transportation methods to revolutionise the way people commute. These driverless pods will be more efficient and environmentally friendly.

We're committed to partnering with innovative entities across the region to accelerate this take up and have more up our sleeves!

Q. The fact that you have been appointed as Head of Sustainability and Social Impact, is a step forward: what are your plans?

The fact that a 5-year old start-up is already looking to scale its ambitions in sustainability and social impact is a bold move and very inspiring. Careem, meaning generous in Arabic, brings together a group of people who are mission-driven. This means our teams are here because they believe in simplifying and improving

lives and building an awesome institution that inspires. And sustainability and social impact is an important part of the business that directly contributes to this mission.

Before I joined, without there being an explicit role or mandate, there was already an incredible amount of initiatives to drive social and environmental change, all being implemented by

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Fighting climate change can pave the way for new opportunities for us to be innovative and continue to help solve some of the region's biggest problems
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passionate and driven people. Our teams have already begun working on issues important to our business and sector, such as tackling gender equality in the workplace, growing the economic opportunities for Captains, offering innovative solutions such as pooling and elevating the opportunities to empower MENA refugees. As we have grown into being one of the rare “unicorns” of the region, the opportunities for impact is increasing and the scale of our responsibility is only growing. That is why the role in sustainability and social impact was created, to ensure we match that growing responsibility with action and truly contribute to improving our region to leap-frog to better living.

Q. I understand you are more involved with the social aspect of sustainability: what about the other two aspects, the environmental and the economic ones?

Economic impact is one of the most important things at Careem. Ensuring that we continue to provide employment opportunities across the region, is the reason many of us are so passionate about our working at Careem. We employ over 500,000 captains, who can plug into our technology and are true micropreneurs with full flexibility of how and when they wish to work. Ensuring we continue to deliver the best support and opportunities for captains comes first at Careem, there is a reason why we use the term “Captains”, they don't just drive, they steer us all towards future possibilities.

Additionally, environmental considerations like green mobility and energy efficiency will definitely be anchored in our sustainability mission as it underpins many important issues in our region such as climate change and air pollution.

But of course social impact is a key pillar of truly being Careem. Whether that means being Captain Obsessed and finding creative ways to provide educational opportunities to captains or that we support the plight of refugees by raising awareness and funds for MENA refugees, our social impact will continue to grow in a very important way.

We have a responsibility to ensure that we prioritize the important areas of focus for our Captains, customers, colleagues and community. Those objectives will naturally include all considerations of economic, environmental and social positive impact. We can't leave any unturned opportunity, because every day is another chance to truly simplify and improve the lives of those in our region.



INTERVIEW

Smart lighting saves resources and changes the way of doing business

Philips Lighting is driving the transition to a circular economy by providing ‘Light as a Service’:

Interview with

Ebru Bilge,
Integrated Communications Director, Philips Lighting ME & Turkey

Olav Scholte,
Segment Marketing manager, RoME

Q. What does climate change mean to Philips Lighting?

Our ambition is to lead the industry in helping to combat climate change. We invest heavily in the development of green technologies and we’re leading a global switch to LED lighting. By changing the way we create and use light, we can improve lives and have a positive impact on the planet.

To mitigate climate change, the transition from a linear to a circular economy is essential. We are driving the transition to a circular economy by providing ‘Light as a Service’ and closing the materials loop through Circular Lighting. Through circular design, upgradability, reuse and recycling, and operational energy management, we ensure the lowest environmental footprint for our customers, while minimising capital expenditure.

Q. How can smart lighting shape sustainable living across the world?

Cities are epicentres of sustainable change. Currently, more than half of the world’s population lives in cities, and it is estimated that more than 60% will be living in cities by 2030. It is estimated that there are 300 million streetlights globally and only 12% of them are LED lights. Out of the 12%, only 2% constitutes connected lighting, which give up to 80% of energy efficiency. So you can imagine how much more room is available to improve energy efficiency.

Therefore, the need for smart cities and energy-efficient light is crucial. One of our priorities is the development of streetlights for smart cities, which are fundamentally designed to be energy efficient.

Dubai Lamp is a very good example. The world’s most energy-efficient commercially available LED lamp, which Philips Lighting developed together with the Dubai Municipality, cuts power consumption by up to 95% as opposed to commercial lights. By improving energy efficiency of LEDs, we help meet the needs of a growing, urbanizing population while decreasing lighting’s share of global electricity consumption.

Q. How is Philips setting an example for the private sector to play a leading role in a sustainable future?

As a global leader in the lighting industry, we introduce the technologies and share the knowhow with governments through collaborations also with private sector.

Sustainability is central to our company vision, strategy and purpose, that is why we have our sustainability program 'For Brighter Lives, Better World'. It is built on two pillars; sustainable revenues and sustainable operations.

Under sustainable revenues, we aim to increase revenue from sustainable products, including packaging, systems and services to 80% of total sales by 2020. As of Q1 2017, we were at 78%. In addition, we have committed to deliver more than 2 billion LED lamps by 2020.

Under sustainable operations, we aim to become 100% carbon neutral in our operations, logistics and business travel, use 100% renewable energy, and send zero waste to landfills. In addition, we want to achieve a 50% reduction in recordable injuries and illnesses to create a safe and healthy workplace for our employees. With regard to our suppliers, we will engage with them through multiple strategic programmes to improve the sustainability performance throughout our supply chain and 100% of risk suppliers will be audited, with minimum performance of 90%. All these targets are to be met by 2020.

Among these targets, we are very proud to say that our operations in the Middle East region have become 100% carbon neutral by the end of 2016. The Middle East region is for Philips Lighting one of the first markets that has achieved this target.

Our corporate social responsibility programme has four pillars: (1) lighting lives - bringing light to communities not connected to or underserved by the grid; (2) lighting entrepreneurs - helping communities take ownership of lighting solutions, by offering technical training and support for the development of business skills; (3) energy awareness - educating the next generation on the value of energy efficiency; and (4) humanitarian lighting - offering material and logistical assistance to communities affected by humanitarian crises.

We have also been looking at our waste management. Philips Lighting has decreased the amount of waste materials delivered to landfills by 41% compared to 2015 and continued a sustainability drive across its portfolio, for example, by investing 80% of its R&D spend in sustainable innovation.

Recently, we achieved the status of Industry leader in the Electrical Components and Equipment category of the 2017 Dow Jones Sustainability Index. The company's overall score was 91 out of 100 points. Top scores (100/100) were obtained by Philips Lighting in the categories climate strategy, environmental reporting, operational eco-efficiency and innovation management. This is the first year that Philips Lighting has been included in the category as an independent company since its initial public offering in March 2016.

Q. What are the applications of lighting that can drive sustainable business models?

Circular lighting helps break away from the traditional way of doing business. Businesses no longer need to purchase products that provide light, but rather only buy the light itself. There's no need to invest in equipment and we take care of the management, maintenance and innovation.

Businesses are also using their lighting systems as an indoor GPS to drive customer engagement. We have partnered with du to provide visible light communication technology, which enables the transmission of digital information from a Philips LED luminaire to a smartphone or tablet. The luminaire sends a direct code that can be detected by the smart devices' camera. For example, each LED light feature transmits a one-way location signal to a shopper's smartphone to trigger them to open the app so it can provide them with location-based services like localising promotions in the store. This technology not only provides positioning but also orientation. If you are in a du store, say, beside an iPhone, then all the information about the iPhone and the packages will pop up on the app as the lights sends information to your device through the camera.

Supermarket chain Aswaaq guides shoppers in their stores by using visible lights communication technology and their mobile app. Customers at home can scan or add items to their shopping

list, and when they reach the store, the app uses Philips indoor positioning to work as a personal shopping assistant to direct the shopper to the exact locations of all items on their list.

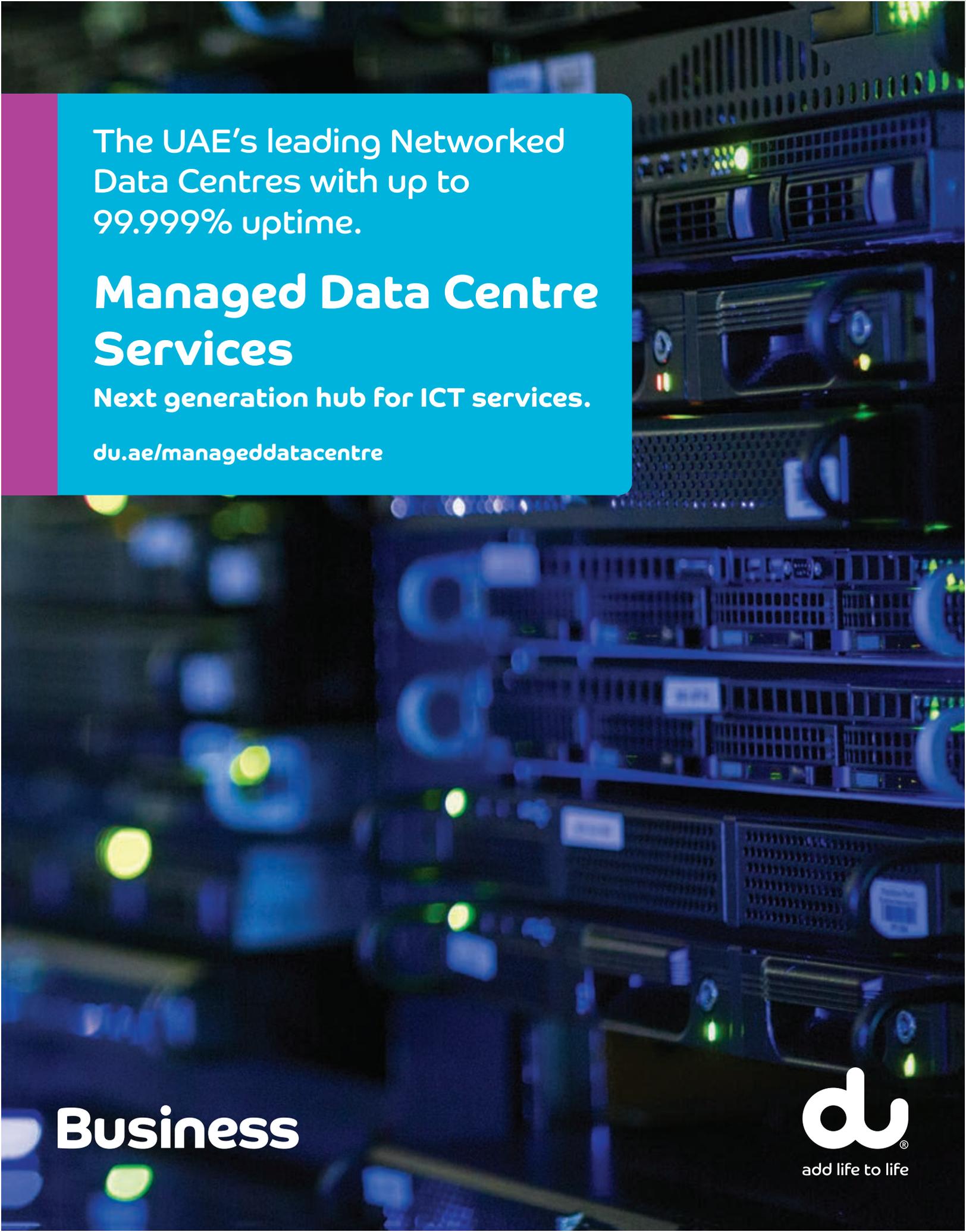
Another example would be for instance getting coffee from Starbucks; the luminaire detects your location and then Starbucks can bring the coffee to you, if they are using the same light technology.

Data collection is very simple because the lights only emit codes, it does not receive any information back from your phone. The codes go straight through to your camera and to our database. Then, from the database all relevant information gets sent from du back to the customer. We do not save any personal information. A common app is used for several stores because it would be inconvenient to have a separate app for every store.

Customers like du and Starbucks do not have to invest in the software or the application. They only have to install Philip lights in their stores. We charge a monthly fee to use the storage space and the software platform, which are not big investments. Our goal is to roll this technology across the UAE. Ultimately, light is not just for illumination, but it now provides other services as well.

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We aim to increase revenue from sustainable products, including packaging, systems and services to 80% of total sales by 2020

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COMMENTARY

Mind the global emissions gap: Raising ambition for a low-carbon future

According to a senior Emirates Wildlife Society - WWF official, countries must set more ambitious goals, with clear strategies in place for how to execute them

The world is falling short of its commitment to ensure that global temperatures do not increase by more than 1.5 degrees Celsius, according to a senior official at Emirates Wildlife Society in association with WWF.

Both the public and private sector must come together to close the gap between countries' current efforts, and the efforts required to "avoid the most catastrophic impacts of climate change," argues Dr Deepti Mahajan Mittal, Programme Leader, Climate and Energy, Emirates Wildlife Society - WWF.

As this gap persists, she continues, it can only be addressed by a cross-country recognition of climate mitigation and adaptation as a policy priority.

"The good news here is that advances in energy efficiency and renewable energy technology, buoyed by regulatory support and market dynamics, present an unprecedented opportunity for change," Mittal said.

Ahead of the UN Climate Change Conference in Bonn in November 2017, Mittal says there is a palpable sense of hope among countries, private businesses and civil society actors, offered by the positive power of human agency.

This hope, however, is clouded by "the realisation that the world is falling short of the actions required to keep temperature increase to less than 2 degrees Celsius, let alone the aspirational target of 1.5 degrees Celsius," she added.

A failure to achieve this goal, set out at the 2015 United Nations Climate Change Conference as part of the Paris Agreement, could have profound implications for human life and livelihood, and the health of our ecosystems, Mittal argued.

“Given the imminence of climate risks globally, and the limited time available to contain carbon emissions to keep to the scientifically determined temperature increase threshold, it is important that both state and non-state actors understand the need to accelerate and upscale climate action,” she said.

The bottom-up approach of countries submitting Nationally Determined Contributions (NDCs) to the United Nations Framework Convention on Climate Change (UNFCCC), as envisaged under the Paris Agreement, builds in the requirement of “progression over time.” This requires a country’s successive NDCs to be more ambitious than the last one.

The 23rd Conference of Parties, or COP 23, will further consultations on the organisation of the Talanoa Dialogue or Facilitative Dialogue 2018 that will take stock of committed government efforts vis-à-vis the goals of the Paris Agreement.

This, according to Mittal, is a critical process as the outputs of this dialogue will be key for determining the level of ambition required as countries develop future contributions.

There are agreed timelines for the submission of NDCs: All countries are required to communicate NDCs – new or updated – by 2020, and every five years thereafter. Countries that have set targets up to 2025 in their submitted NDCs are required to submit their second round of commitments by 2020, while countries with targets up to 2030 are required to communicate/update their NDCs.

“The level of commitments agreed by parties since 2015 point to the existence of a significant emissions gap,” Mittal said.

According to the UN Environment’s The Emissions Gap Report 2016, the world’s 2030 emissions will be 12 to 14 gigatonnes higher than levels needed to limit global warming to 2 degrees Celsius, even if global NDC commitments are implemented.

The estimated emissions in 2030, the report says, will set the globe on a path for a temperature rise

of 2.9 degrees Celsius, to 3.4 degrees Celsius, this century.

The scale and time-sensitive nature of the task at hand is highlighted also by a 2017 report from the International Renewable Energy Agency (IRENA) and International Energy Agency (IEA), titled Perspectives for the Energy Transition: Investment Needs for a Low-Carbon Energy System.

This report highlights that to have a 66 per cent chance of keeping temperature increases to below 2 degrees Celsius, about 70 per cent of energy-related CO₂ emissions need to be reduced by 2050. The report also notes that many of the scenarios assessed by the Intergovernmental Panel on Climate Change (IPCC) in its Fifth Assessment Report that limit the temperature increase by 2100 to 2 degrees Celsius rely heavily on negative emissions technologies, implying that there is “active and permanent removal of carbon dioxide from the atmosphere,” and that the global energy sector absorbs CO₂ emissions instead of emitting.

The UAE can have a pioneering role amongst fossil fuel exporting countries in the Gulf, Mittal argues.

“The UAE was the first Gulf country to ratify the Paris Agreement. Its NDC articulated the country’s target of increasing their share of clean energy to 24 per cent of the country’s total energy mix by 2021, amongst other policies targeted at increasing energy efficiency and uptake of clean technologies in various sectors,” she said.

As the country looks to revise its commitments in line with the requirements of the Paris Agreement, there is the potential to raise ambition, Mittal added.

The UAE has already made advances in policies that provide a sound basis for revised ambition and engagement.

In June 2017, the UAE cabinet adopted the National Climate Change Plan 2050, in order to implement a coordinated effort to mitigate

greenhouse gas emissions and adapt to imminent climate impacts.

Earlier during 2017, the UAE Energy Plan 2050 was announced, designed to increase the contribution of renewable energy in the total energy mix to 44 per cent, increase consumption efficiency by 40 per cent, and cut carbon emissions resulting from power generation by 70 per cent.

“The country can further look to set economy-wide emission reduction targets, and take on an even stronger leadership role amongst fossil fuel producing nations,” Mittal said.

She continued: “The climate conundrum presents a test for collective human ingenuity – it is a test that we do not want to fail.”

There needs to be a more widespread and enhanced understanding of the idea that there can be no development without climate action, said Mittal, adding: “Climate is not just a ‘budget head’ within development plans and agendas, and climate mitigation and adaptation is a foundation block of development.”

“Any sectoral or national development plans need to ensure that the envisaged development targets and activities are climate-safe and geared towards mitigating climate change to ensure human wellbeing as well as conserve biodiversity,” she concluded.



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EDITORIAL

Amazing the Middle East

As countries in the Middle East look to transform their economies for generations to come, technology will play a major role, and the cloud will be in the middle of that transformation.

When it comes to business, sustainability makes sense. More and more organisations are realising that embracing sustainability within business practices can have a number of significant benefits, both in building brands in the eye of the consumer and in making savings that contribute directly to the bottom line. Businesses focusing on sustainability are the most likely to find themselves succeeding in the long term.

One such player in the business world that is transitioning to a culture of sustainability is Amazon.

The tech giant is the largest internet-based retailer in the world by total sales and market capitalisation and the fourth most valuable public company in the world, and it continues to grow its cloud-computing services, with plans to expand its Amazon Web Services (AWS) operations in the Middle East via new data centers headquartered in Bahrain.

In September, Amazon announced plans to open an infrastructure region in the Middle East by early 2019, its first major foray into the region after opening offices in January 2017 in Dubai and Manama. Headquartered in Bahrain, the new AWS Middle East (Bahrain) Region will consist of three “availability zones” at launch, each supported by redundant power and networking services. In addition, AWS will launch an AWS Edge Network Location in the United Arab Emirates (UAE) in the first quarter of 2018. This will bring Amazon CloudFront, Amazon Route 53, AWS Shield, and AWS WAF to the region and expands the 78 points of presence AWS has around the world.

«As countries in the Middle East look to transform their economies for generations to come, technology will play a major role, and the cloud will be in the middle of that transformation.» Andy Jassy, Chief Executive of Amazon Web Services, said in a statement. In

recent years, the Middle East has shown a strong focus on innovation, economic stimulation, and sustainability, with established vision plans, such as UAE Vision 2021 and Bahrain Vision 2030 guiding growth. It’s clear that cloud technology could play a key role in these areas, which enhances market opportunities.

Of note, however, is that Amazon cited the opportunity to power the availability zones with renewable energy as an important criterion in launching the new cloud operations. Bahrain is proposing to construct a new solar power facility to meet AWS’s power needs, with the Bahrain Electricity and Water Authority expecting to bring the 100 MW solar farm online in 2019, making it the country’s first utility-scale renewable energy project.

Along with AWS’s long-term commitment to achieving 100% renewable energy usage for their global infrastructure footprint – exceeding their

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Amazon cited the opportunity to power the availability zones with renewable energy as an important criterion in launching the new cloud operations

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goal of 40 percent in 2016 and working on a new goal of 50 percent for 2017 – there is also an argument that running applications in the cloud bring environmental benefits through fewer on-site servers, and the cloud servers being more power efficient. This improvement in energy efficiency drives a reduction in carbon emissions – large-scale cloud providers like AWS use a power mix that is 28 percent less carbon intense than the global average.

Overall, Amazon runs an impressive number of sustainability initiatives, including to wind farms for power generation, multi-year waste reduction initiatives, such as reduced and recyclable packaging, electronic waste programmes and by hosting large-scale rooftop solar systems on fulfillment centres.

Solar energy also features in Amazon’s headquarters in Milan, Italy and Dublin, Ireland and Amazon’s newest buildings in Seattle are

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Businesses focusing on sustainability are the most likely to find themselves succeeding in the long term

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heated by recycling energy from a nearby data centre. Additionally, many of Amazon’s fulfilment centres feature sustainable design initiatives, such as green roofs that capture and filter rainwater, recycled building materials, natural lighting, and resource-efficient plumbing fixtures and lighting controls.

Cynics may suggest Amazon only focuses on sustainability to boost its image in the eyes of consumers; however, there are also clear impacts on the bottom line and a host of environmental benefits. Ultimately, what’s more important is that behemoths like Amazon are embedding sustainability into their operations, leading by example and setting benchmarks for others to follow.

FEATURE

Storage technology will drive economies of scale in renewable energy

Global storage capacity could triple if countries double the share of renewables in the energy system, says IRENA report

The energy sector is going through a revolution in power generation. Just as electricity competed with gas more than a century ago, renewable energy is competing with fossil fuel energy. Renewable energy and associated technologies can replace fossil fuel energy entirely only if a there's a transformation in the storage of renewable energy.

The issue of storage is incredibly important for the future of the energy transition and sustainability. We need a secure, reliable electricity supply that is constantly available. For the sake of the planet, we also need to utilise renewable energy resources such as solar and wind to reduce our reliance on non-renewable fossil fuels such as oil and gas. Solar and wind power depend on natural conditions, and they may be available consistently. The ability to store large volumes of electricity at viable costs is crucial to progress in the pursuit of sustainable energy.

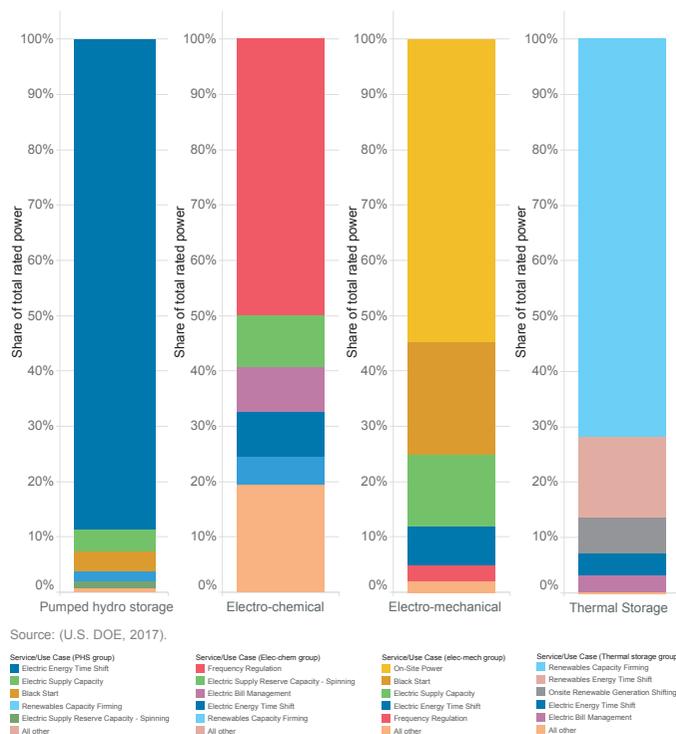
Energy storage has the potential to solve the problem of fluctuating supply. By storing the energy generated from solar and wind power in reliable, powerful batteries, we can maintain a power supply that won't affect the earth adversely. Over the past 25 years, battery performance has improved toward higher efficiency and slower degradation. The problematic factor is cost. Lithium ion (Li-ion) batteries are still too expensive to fully displace conventional technologies such as gasoline engines for cars and gas turbines for electricity. According to a report in Forbes, prices of batteries need to fall by an additional 50% to 80% to be economically compelling for cars and the grid, despite the prices falling by a factor of 10 since lithium-ion batteries were introduced.

There may be hope after all. A recent report published by the International Renewable Energy Agency (IRENA) titled 'Electricity Storage and Renewables: Costs and Markets to 2030' and launched during the 'Innovation for Cool Earth Forum' (ICEF) held in Tokyo, Japan, in early October 2017, indicates that the cost of battery storage for stationary applications could fall by up to 66% by 2030. This price decrease would have the potential to stimulate a 17-fold growth of installed battery storage, opening up a plethora of new commercial and economic opportunities. The report also found that global storage capacity could triple if countries double the share of renewables in the energy system.

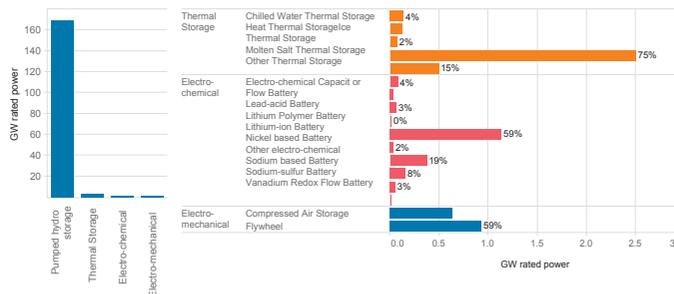
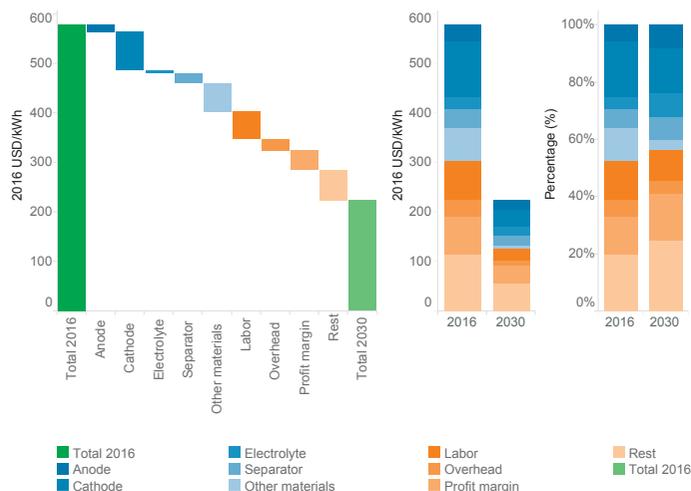
"As storage technology improves and prices decline, both utility-scale and small-scale, distributed applications could grow dramatically, accelerating

renewable energy deployment," said IRENA Director-General Adnan Z. Amin at the launch, also pointing out that the research demonstrates the growing strength of the business case for renewable energy, positioning it firmly as a low-cost and secure source of energy supply.

The report, which is focused on stationary applications, highlights that while pumped-hydro systems currently dominate total installed power storage capacity with 96% of the installed electricity storage power globally, economies of scale and technology breakthroughs will support accelerated development and adoption of alternative storage technologies, such as Li-ion and flow batteries.



Global energy storage power capacity shares by main-use case and technology group, mid-2017



Cost reduction potential by source of lithium iron phosphate battery energy storage systems, 2016 and 2030

Global operational electricity storage power capacity by technology, mid-2017

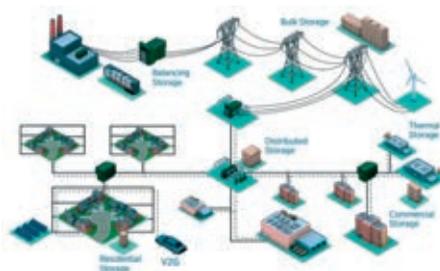
Advancements in battery technologies have been made largely due to the expanding electric vehicle (EV) industry, where the viability of battery storage is rapidly improving. IRENA believes the growth of Li-ion battery use across the transportation sector over the next decade will help drive down battery costs for stationary storage applications. Electrified mobility could also have an impact on energy storage through vehicle-to-grid technologies, in which vehicle batteries can be connected to the grid and discharge power for others to use, helping feed a virtuous circle of renewable energy and storage integration.

IRENA predicts that by 2030, the calendar life of Li-ion batteries could increase by approximately 50%, and the number of full cycles possible could potentially increase by as much as 90%. Li-ion is not the only solution. Other battery storage technologies offer large cost-reduction potential: high-temperature ‘sodium sulphur’ batteries could see costs declining by up to 60%, and flow batteries have the potential for up to two-thirds of cost reduction on the total installed cost by 2030. While flow batteries have higher up-front costs compared to other technologies, they often exceed 10,000 full cycles, balancing initial cost with high lifetime energy throughputs.

Whatever the format, electricity storage will play a crucial role in enabling the next phase of the energy transition. Along with boosting solar and wind power generation, it allows sharp decarbonisation in key segments of the energy market, feeding into the rapid global shift to

sustainable energy, which is required to avoid the risk of catastrophic climate change.

With the rapid decline in the cost of renewable-power generation technologies in recent years, the power sector has made significant progress with decarbonisation, but renewable power deployment needs to accelerate. Electricity storage is thus crucial in facilitating deep decarbonisation. Storage based on rapid improvement in batteries and other technologies permits greater system flexibility, which will be necessary as the share of variable renewable electricity increases. In a study for the G20 that analysed the effects of the energy transition until 2050, IRENA found that over 80% of the world’s electricity could derive from renewable sources. At that point, solar photovoltaic (PV) and wind power will account for 52% of total electricity generation, but electricity storage is at the heart of this transition. Long-term energy storage is vital to smooth supply fluctuations and provide the energy security needed to power our world.



Potential locations and applications of electricity storage in the power system

Electricity storage makes possible a transportation sector dominated by electric vehicles, enables effective, 24-hour off-grid solar home systems and supports 100% renewable mini-grids. By providing these essential services, electricity storage can drive serious electricity decarbonisation and help shape the energy sector of the future.

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Renewable energy and associated technologies can replace fossil fuel energy entirely only if there’s a transformation in the storage of renewable energy
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EDITORIAL

du lays out roadmap to mitigate environmental impact

Telecoms provider du has drawn up a strategy that includes energy and waste management to help address climate change in the UAE

In order to curb environmental damage in the Middle East and North Africa (MENA) region, companies must consider the power they have to address the climate crisis. Whilst firms need to understand their negative impact, they must also understand their potential for positive change.

It is particularly the case in business - where climate change negatively influences capital expenditures, resource availability, and operations efficiency - that the importance of protecting the environment and mitigating negative impacts is greater than ever.

In the Information and Communication Technology (ICT) industry, companies must address their shortcomings, and capabilities, when drawing up effective environmental strategies to contribute to protecting the environment.

For telecommunications providers like du, this means formulating a multi-layered approach to climate change that integrates environmental responsibility into every function of business.

It means reducing energy consumption and greenhouse gas emissions of direct operations and throughout the supply chain, and continuously collecting data on resource consumption and waste output so as to sustainably manage operations.

du's environmental strategy addresses waste management, the conservation of natural resources, the responsible procurement of materials, and the environmental impact of communication technology as its key pillars.



“ Our flagship initiative to conserve natural resources has been to convert our base transceiver stations to hybrid energy systems ”

Based on environmental targets and standards that enable sustainable operations, du aims to minimise its environmental footprint and enhance its positive impact through the smart use of ICT in the UAE.

The company's flagship initiative to conserve natural resources has been to convert its base transceiver stations to hybrid energy systems. This system automates and consolidates du's energy management initiative into a single platform, and also provides the necessary inputs and indicators to drive sustainability initiatives throughout the organisation.

Today, du has 220 sites running on this hybrid energy system, a further 150 sites on an innovative free cooling system, and 11 sites operating on solar panels, all of which has helped reduced diesel consumption at each of these locations by up to 50 per cent.

du has also partnered with the government in developing and delivering their vision to make Dubai the smartest city in the world. As the strategic partner for the Smart Dubai Platform, du brings comprehensive expertise of Dubai's landmark technique to smart cities. The company has already started to build the Smart City foundation through initiatives such as Wi-Fi UAE, the Middle East's first Internet of Things (IoT) network, and pioneering the use of blockchain technology for electronic health records all of which will result in efficiency and cost savings.

The company has also invested in ensuring its retail stores are LEED certified, meaning they are recognised as being sustainable by the U.S. Green Building Council. Three of its largest flagship stores - located in Mirdif City Centre, Fujairah City Centre and Me'aisem City Centre - are LEED Platinum certified, and continue to be the UAE's greenest telecom retail outlets.

The LEED certification allows du to make significant savings in water and energy consumption, and also reduce waste. The stores are also furnished with 100% Energy Star equipment, motion sensor lights, re-used furniture and furnishings, all of which help reduce the environmental impact of operations at these stores.

Climate change has become a growing priority for businesses, industries, and governments. Entities around the world are working hard to design solutions for environmental issues as the severity of the global climate crisis escalates.

In the MENA region, where temperatures are staggeringly high during the hottest times of the year, climate change has resulted in more frequent heat waves, water shortages and sandstorms.

Recent research shows that summer temperatures in the region are increasing more than two times faster than the global average, and as a result, some areas with already-scorching summer weather could become near uninhabitable if the climate continues to deteriorate at its current pace.

For du, waste management strategies are a priority, in order to fulfil its commitment to environmental sustainability and to halting climate change. The company's efforts on this front have resulted in a reduction of waste in multiple aspects of its business.

With the introduction of its newly redesigned SIM card packs, for example, du has eliminated 99 per cent of plastic usage, and with its e-billing initiative, the company has reduced its paper usage by 61 per cent since 2016.

Furthermore, du has implemented programs to recycle paper, plastics, printer cartridges, cardboard, and hazardous waste from all its offices and technical sites.

The sustainable procurement of materials is another key area of focus for du. In order to ensure responsible procurement of materials wherever possible, du makes it a priority to source materials that are recycled or certified from sustainable sources such as FSC and PEFC.

Furthermore, most products purchased by du contain recycled or recyclable materials and can be shipped with minimal packaging.

For telecoms providers in particular, whose presence and influence on day-to-day life and operations is extremely significant, environmental preservation extends beyond financial and operational benefits.

To combat climate change and incite largescale improvements across the region, telecommunications providers must re-evaluate their operations on every level to enable a strategy that addresses environmental protection and climate change.

“ Climate change has become a growing priority for businesses, industries, and governments. Entities around the world are working hard to design solutions for environmental issues as the severity of the global climate crisis escalates ”

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“When food waste is disposed into landfills, it produces green house gases during the decay process and amplifies the impact on climate change”

COMMENTARY

Managing the business and climate costs of food wastage

Auditing food wastage from farm to fork can be a twofer approach to reducing carbon footprints and increasing net profits in the food value chain

The climate burden associated with food wastage is 4.4 gigatonnes of greenhouse gas emissions per year, according to the Food and Agriculture Organization of the United Nations (FAO). To put this into perspective, if food wastage was a country, it would be the third largest greenhouse gas emitter in the world after China and the US. Loss and wastage occurs at every stage of the food supply chain, from agricultural production to consumption.

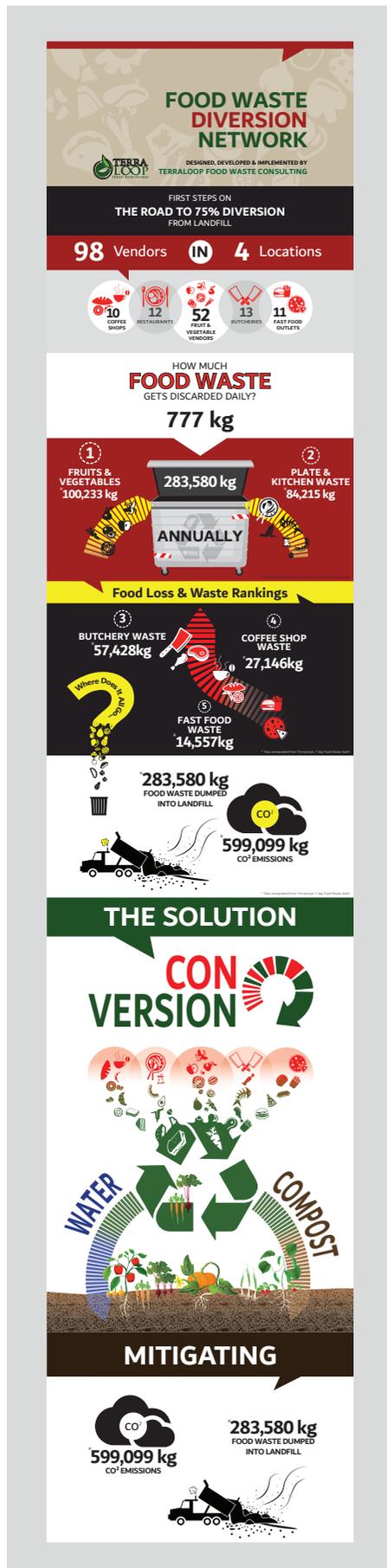
The FAO estimates that one third of the food produced in the world for human consumption every year, approximately 1.3 billion tons, gets lost or wasted. A recent YouGov study focused

on issues related to food wastage has found that the top source of food wastage in the UAE, Egypt and Saudi Arabia is left over or discarded food in a restaurant (32%), followed by extra food cooked for celebrations that gets thrown away (30%).

The food value chain is a complex network of activities involving farmers, manufacturers, retailers, and consumers, along with contributions from almost every commercial sector. Every stage in this chain has its own level of dependence on our planetary resources. Food wastage puts strain on resources such as energy, land, water, labour and capital while increasing costs due to poor supply chain management. As

a result, wastage of food is wastage of resources that support the value chain. For example, every kilogram of beef wasted is also 15,415 litres of water wasted, and every egg wasted is also 197 litres of water wasted.

Along with the resources consumed throughout the food value chain, there are all the associated carbon emissions for each of the various stages, one third of which is unnecessary if the food is never to be consumed. In addition, when food waste is disposed into landfills, it produces green house gases during the decay process and amplifies the impact on climate change. So it goes with out saying that reducing this loss and



wastage of food has a profoundly positive effect on climate change mitigation and the availability of resources.

Because the loss and wastage of food has both upstream and downstream impacts, reducing it is in the interest of any business in the food value chain. According to the FAO, food wastage and losses in developing countries occur mainly at early stages of the food value chain and can be traced back to financial, managerial and technical constraints in harvesting techniques as well as storage and cooling facilities. The direct impact of such wastage can be seen at every stage of the food value chain, particularly food service businesses, which struggle to increase their net profits.

Measure to manage

There are numerous solutions to this widespread challenge, such as new policy implementations and technology that supports monitoring or waste conversion.

According to Ryan Ingram, founder of Terraloop, a UAE-based food waste auditing consultancy, companies that produce, process, prepare, sell, and serve food should take more responsibility for their food waste by measuring it.

Ingram recommends a four-step process for food waste auditing: measure, reduce, divert, and close the loop. In addition to measurement of food waste and solutions for its reduction, audit reports also provide solutions to donate edible, safe food, and convert unavoidable food waste into a valuable resource such as compost, thereby preventing it from ending up in landfills:

“Food businesses should understand their food waste stream firstly in order to find ways to reduce their carbon footprint. I’d warn every company to never underestimate their food wastage. Audit reports provide an insight on the volumes and value of the food being wasted at the various nodes in the food waste stream,” he said.

There are positive trends emerging across the world to tackle food wastage.

Over the last 3–4 years, restaurants and supermarkets selling waste food have popped-up in Europe, UK, US & Australia. Simultaneously, over 20 smart phone apps have been developed to tackle food waste.

In 2016, France banned the dumping of unsold food and facilitated the donation process to charities. In the same year, the World Resources Institute published the first Food Loss and Waste Accounting and Reporting Standard (Food Loss & Waste Protocol).

In the UK, a ‘Love Food, Hate Waste’ campaign was launched in 2007 to help households recognize and tackle food waste. In more recent years, people have become increasingly aware of the scale of the problem and in response, thought leaders and innovators have begun a food waste revolution that is still very much in its infancy, but its reach and impact is growing steadily.

The UAE government is addressing food wastage through partnerships with food and hospitality sectors such as restaurants, supermarkets and hotels. The UAE Food Bank, a non-profit charitable organisation launched January 4th 2017 under the umbrella of the Mohammed bin Rashid Al Maktoum Global Initiatives (MBRCI), is working to make Dubai the first city in the region to achieve zero food waste. To achieve its goal, the UAE Food Bank is collaborating with local authorities as well as local and international charities to create a comprehensive ecosystem to efficiently store, package and distribute excess fresh food from hotels, restaurants and supermarkets to those in need.

The Ras Al Khaimah Government’s Waste Management Agency is distributing free brown bags in the Emirate to collect food waste, which will then be processed into compost and water to be utilised for gardening and landscaping, in their Food Waste Diversion Network program.

Ultimately, consumers need to demonstrate large-scale behavioural changes to create a significant impact. These include lowering demand and expectations of volume, aesthetics and variety, which are responsible for good food not making it to the supermarket shelves and thus being left on the farm or discarded along the way.

Appreciation for the effort, resources and thus value of food needs to be cultivated (no pun intended). Daily the human population, excluding the food-insecure, has 20 Billion opportunities to make a change, if calculated as 3 choices a day per person. These choices, when amplified, can influence policy development and implementation as well as the demand for increasing tech innovations to support food loss and waste reduction.

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INTERVIEW

Helping businesses boost performance through digitalisation and integration of energy and facilities management

Enova, the joint venture between Majid Al Futtaim and French company Veolia, has introduced a suite of digital tools to help customers achieve their financial, operational, and environmental targets

Q. How is Enova supporting Climate Change mitigation?

Enova is a multifaceted company that provides much more than energy services. By implementing tailored, effective energy-saving plans into the buildings of the region, it plays a vital role in reducing the Middle East's carbon footprint.

Following the vision that the scarcity of natural resources must be transformed from a constraint into an opportunity, Enova leads the transformation towards greener and more economical energy solutions among the facilities management and building management industry.

Enova's mission is to preserve environmental resources for the generations to come. Combining access to global expertise and deep knowledge of the local market, it delivers innovative sustainable energy solutions, guaranteeing and enhancing the clients' performance while sustaining their growth and resourcing the world at the same time.

Q. How is digitalisation revolutionising integrated energy and facilities management?

Digitalisation will dramatically change the way we work, bringing more transparency with real-time data and analysis. When we started, Enova was the only company to be certified as an ESCO company, and our business was about retrofitting buildings and improving air conditioning and lighting. Digitalisation will dramatically change the way we work, bringing more transparency with real-time data and analysis. When we started, Enova was focusing on maintenance and asset management. As first company to be certified as an ESCO company, our business was extended to retrofitting buildings and improving air conditioning and lighting. We have now reached a point where we need to go a step further and venture into smart monitoring and leveraging data.

Therefore, we have started our digital transformation by working on our internal efficiency by following best maintenance practices and recording all the tasks that are done by our staff on the site. We are optimizing our interactions with clients and end users by analyzing data and conducting customer satisfaction surveys in real time because we want all stakeholders to contribute to reducing energy consumption. We can achieve these new customer engagement goals only through digitalisation of our services.

Interview with

Anne Le Guennec
Chief Executive Officer, Enova

Q. Energy efficiency is an opportunity to mitigate Climate Change: what is Enova's approach to improving processes and skills to enhance efficiency?

It is in our DNA, not only because of our shareholder who is very engaged in efficiency but also because of our own identity and our market experience. Competition is tough and we want to provide our clients with the best solutions developed through efficient processes.

We need to adapt ourselves to the pace of technology evolution. In this regard, digitalisation can help us enhance efficiency, transparency and engagement. Operational and internal efficiency are the first steps toward digitalisation. The second step is communication. Data should not only be gathered but also shared with clients.

Q. How will your digital transformation contribute to a circular economy?

A circular economy involves saving energy and water, using renewable sources, and also, recycling and waste management. To drive a circular economy, we must integrate energy and facilities management.

We are launching new services for waste recycling at the facilities that we manage. We'll be able to provide better waste recycling solutions by

recording and measuring the quantity of waste produced, proportion of waste recycled and type of waste recycled.

As facility management providers, we have direct access to information about the waste produced inside a facility and the ability to sort the waste by type, such as cardboard, food, and plastic, by weight and by tenant. All this data can be recorded on our mobile app Eswap (Enova Smart Waste App). We will be able to inform our clients in real-time about the quantity of waste produced, their improvement in terms of recycling rates, and what would be the most efficient way of managing their waste.

Measuring waste is part of our digital roadmap, and we are including it in all our digital tools.

Q. What are the digital tools available from Enova for energy, water, waste, and facilities management? How are the tools being applied?

The Enova by Veolia smartphone app gives clients 24-hour access to real-time data on energy and Facilities Management services through user-friendly features such as automatic status updates and instant task reporting.

A second app, Enova Smart Waste App, or Eswap, enables clients to quickly and efficiently check, track, and manage their waste management procedures. This allows users to log refuse streams received from tenants and sent back out for recycling through barcode scanning. Data from Eswap is captured and plotted into the interactive ‘Waste Dashboard’, which presents it in a graphical, user-friendly format. The combination of both tools allows the optimization of recycling rates produced by a facility, thus improving the client’s environmental footprint and overall performance.

Enova’s digital suite includes a series of customizable dashboards, software that displays real-time information on energy, water, and waste on computer monitors or television screens and thus enables flexible analysis. The presentation of the data in a graphical, user-friendly form helps one visualize key performance indicators and trends at a glance.

Enova has custom-built such a system for Sheraton Dubai Mall of the Emirates Hotel. Tailored to the hospitality sector, yet potentially applicable

within many other industries, the program allows transparent real-time monitoring. Both technical staff and facility managers can use it to track operational KPIs to take immediate decisions to optimize performance and increase the well-being of guests. Potentially, it could also be used to encourage guests to take active steps towards leading ‘greener’ lifestyles.

We can go one step further thanks to other tools developed by Veolia, our shareholders, that really give the ability to end users to communicate and inform us about something that is happening in their facility. It also goes beyond the management of energy and water consumption, because we also provide information about the availability of bicycles in a community or new events at the mall of that community, which ultimately creates a feeling of belonging and willingness to contribute in making the community more sustainable.

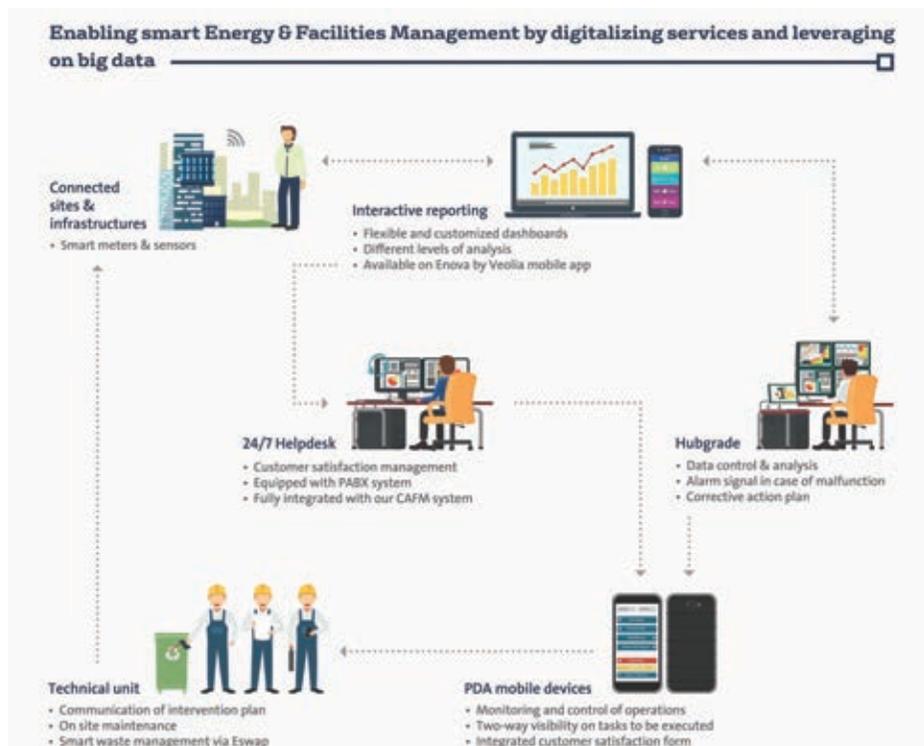
Q. How is Enova helping Majid Al Futtaim reduce carbon emissions and what’re the projected energy savings?

Majid Al Futtaim’s sustainability mission is to become net positive in carbon emissions by 2040. One of its immediate goals is to achieve at least 5% energy use from renewable sources by 2018.

Enova provides Majid Al Futtaim with energy management, energy savings and facility management services. It has signed a deal with Majid Al Futtaim to supply solar power to three of its malls to help cut their carbon dioxide emissions by 3,200 tonnes per year, the equivalent of taking 700 cars off the roads and cooling 400 apartments. The scheme will enable Majid Al Futtaim Properties to generate 6,000 MWh of electrical energy annually and save AED 80 million.

Starting in 2017, 12,500 panels will be installed in Mall of the Emirates, City Centre Fujairah, and City Centre Mirdif covering an area of 25,000 square metres, including mall rooftop space and 1,020 car parks.

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To drive a circular economy, we must integrate energy and facilities management
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EDITORIAL

PLASTIC. NOT FANTASTIC.

Recycling and awareness efforts must be intensified significantly to counter the damaging environmental effects of single-use and on-the-go packaging

Brand owners see packaging as a means to an end, to sell more products by increasing their shelf life and shelf appeal, as summed up in an old industry saying, 'packaging protects what it sells and sells what it protects.' Data from market research company Smithers Pira forecasts steady growth across the packaging industry: a market valued at \$839 billion in 2015 will increase at 3.5% year-on-year and reach a total value of \$997 billion in 2020. As this happens, sustainability will become an increasingly important factor for decision makers at all stages of packaging value chains.

Packaging contributes toward the sustainability of a packaged product and should be designed holistically together with that product to optimise overall environmental performance and minimize product spoilage, wastage or damage. The underlying problem is that packaging is mostly designed for single use and on-the-go applications to cater to consumer convenience, which results in the disposal of tonnes of packaging waste, particularly from food and FMCG products, into landfills everyday.

Research conducted by Seas At Risk, an umbrella organisation of environmental NGOs from Europe that promotes marine protection policies, reveals the quantities of single-use, on-the-go plastic items consumed in the European Union

annually: 46 billion beverage bottles, 16 billion coffee cups, 2.5 billion takeaway packages, 580 billion cigarette butts, and 36.4 billion drinking straws. The findings indicate that many of these items do not need to be made from plastic because glass and paper alternatives exist, and that reducing consumption of single-use plastic items would eliminate a major source of marine pollution in all of Europe's seas.

The outlook of the study is positive because measures to reduce plastic consumption enjoy a high level of public support and enthusiasm in Europe. However, consumers can be unaware of the consequences of their purchases and misled into believing that they are using recyclable packaging. Consider disposable coffee cups, which appear to be made only from paper, but are lined with polyethylene plastic to make them waterproof. Contrary to popular belief, they are not easy to recycle because the plastic clogs the machines in recycling facilities.

Stand.earth, an environmental organisation, estimates that coffee brand Starbucks alone will serve four billion paper cups in 2017, most of which will end up in landfills. Customers assume that a cup tossed in a recycling bin will get recycled and turned into a new paper product. In fact, the Starbucks paper coffee cup cannot

be recycled in standard paper recycling facilities because it is lined with plastic. Stand.earth criticises Starbucks by pointing out that although the company committed to stop destroying forests in 2008 by making a 100% recyclable cup and encouraging the use of reusable cups, almost nothing has been done to meet these commitments nine years later.

There are two schools of thought to tackle environmentally harmful packaging materials: (1) impose a blanket ban on toxic materials such as plastics or (2) recover and recycle 100% of packaging materials.

A total ban on plastics is easier said than done. Plastics, the most widely used packaging materials, are indispensable because of their advantages such as flexibility, durability, low weight, and low cost. Global plastics production has surged over the past 50 years, from 15 million tonnes in 1964 to 311 million tonnes in 2014, and is expected to double again over the next 20 years. Currently, packaging represents 26% of the total volume of plastics used. In Europe, nearly 60 million tonnes of plastic are produced each year, around 40% of which is used for packaging.

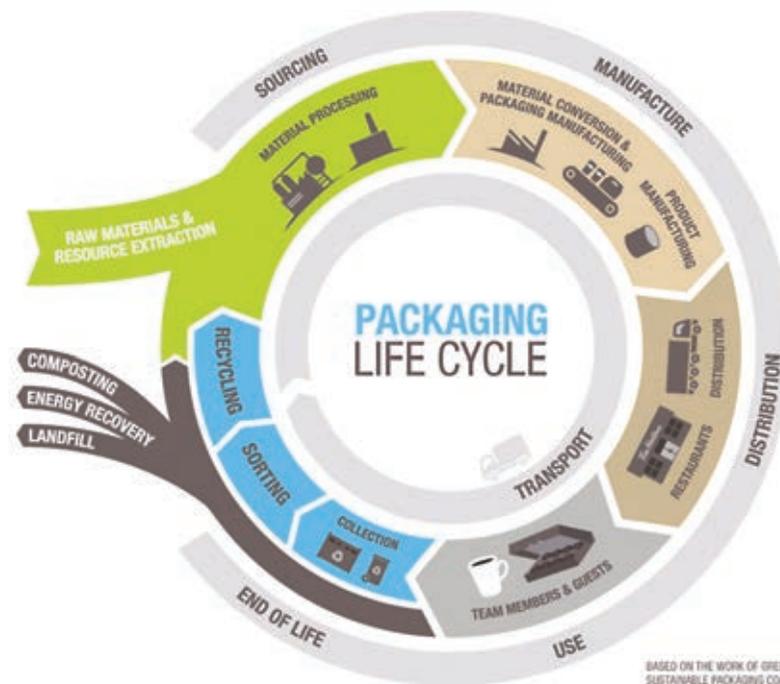
Furthermore, according to Smithers Pira, there is presently no packaging that is completely sustainable and the various packaging materials including plastics, paper, paperboard, metals and glass cannot be unequivocally classified as good or bad.

The second approach, reduce, reuse, recycle and recover packaging waste, is more practical and in line with a circular economy. However, there's a long way to go because current recycling figures for plastic packaging are disappointing. A report published by the World Economic Forum, Ellen MacArthur Foundation and McKinsey & Co. titled 'The New Plastics Economy: Rethinking the future of plastics' in 2016 indicated that globally only 14% of plastic packaging is collected for recycling, and that by 2050 oceans could contain more plastics than fish by weight.

A year later, an action plan was laid out in a new report 'The New Plastics Economy: Catalysing Action,' which provides a clear transition strategy for the global plastics industry to design better packaging, increase recycling rates, and introduce new models for making better use of packaging. The report indicates that 20% of plastic packaging could be profitably reused, for example by replacing single-use plastic bags with reusable alternatives, or by designing innovative packaging models based on product refills. A further 50% of plastic packaging could be profitably recycled if improvements are made to packaging design and systems for managing it after use. Without fundamental redesign and innovation, the remaining 30% of plastic packaging (by weight) will never be recycled and will continue to destine the equivalent of 10 billion garbage bags per year to landfill or incineration. Innovation in packaging design, recyclable and compostable materials, and reprocessing technologies are likely all required to move this challenging segment forward.

The action plan was produced as part of the New Plastics Economy, an initiative led by the Ellen MacArthur Foundation, which applies the principles of the circular economy and brings together key stakeholders to rethink and redesign the future of plastics, starting with packaging. Supporting this initiative, companies such as Mars, M&S, PepsiCo, The Coca-Cola Company, Unilever and Werner & Mertz have pledged to use 100% recyclable packaging latest by 2025.

Adam Gendell, Associate Director, Sustainable Packaging Coalition, a membership-based



collaborative that works to make packaging more sustainable, explains the demand-supply relationship between the packaging and recycling industries. According to Gendell, the packaging industry has the ability to positively influence both supply and demand of recycled materials.

“The recycling industry incurs a tremendous expense in their sorting operations and filtration of undesirable contaminants. If the packaging industry can create packaging that is easily sorted and not likely to introduce potential contaminants, then it makes the recycling industry’s job easier and ultimately reduces their costs. When their job is easier, supply of recovered materials will increase. Likewise, supply will increase if consumers give recyclers access to used packaging in greater quantities and without undesirable contaminants. With regard to demand, packagers have already embraced recycled content as a means to improve the environmental attributes of their packaging. An increasing demand from consumers for greener products will trickle down and increase demand from the packaging industry for recycled materials. Proper on-package messaging from the packaging industry can educate consumers about the importance of recycled content,” he said.

Virginie Helias, Procter & Gamble’s Global Vice-President for Sustainability, states that for most Procter & Gamble products packaging does not have the biggest environmental impact in a

product life cycle assessment, from production to disposal; that dubious honour belongs to the usage phase.

“Our goal is 90 per cent of our packaging to be recyclable; we are at 86 per cent today.” (Gulf News, 2017).

“
In Europe,
nearly 60
million tonnes
of plastic are
produced each
year, around
40% of which
is used for
packaging

”



EDITORIAL

Give Plastic a Chance

DGrade is building a 12,000-square-metre factory in Dubai to recycle PET bottles into eco-friendly merchandise

DGrade, a manufacturer of eco-friendly products, is offering a solution to the UAE's plastic bottle conundrum by providing a closed-loop supply chain using recycled plastic bottles to make everyday products such as clothing and toys. With high consumption and low recycle rates in the UAE, as well as the imminent Expo 2020 Dubai event, which will see increased visitor numbers and has sustainability at its heart, Dgrade sees an opportunity to use plastic bottles to good effect. The annual consumption of plastic bottles is set to reach half a trillion by 2021, outstripping recycling efforts and jeopardising oceans, coastlines and other natural environments. A million plastic bottles are bought around the world every minute, and the number will jump another 20 percent by 2021. These startling figures revealed by the Guardian in 2017 indicate an environmental crisis that could be as serious as climate change.

The UAE is no exception in this regard and is rated amongst the highest consumers of bottled water due to its climatic conditions and high per capita income, according to a study by Emirates Industrial Bank. In 2011, UAE-based environmental and waste management company Bee'ah estimated that a typical UAE resident bought 450 plastic water bottles on average every year, and the number was expected to only increase.

Plastic bottles are commonly made from polyethylene terephthalate (PET), which can take hundreds of years to decompose in landfills under natural circumstances. In the meantime, the volume of plastic bottles in landfill and oceans is steadily increasing. It is estimated that by 2050, the ocean will contain more plastic by weight than fish and 12 billion metric tonnes of plastic will wind up in landfills. To add to our concern, 95 percent of all plastic ever created is still in existence today.

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DGrade's PET polyester production processes use 50 percent less energy and 20 percent less water than conventional polyester production, and the process creates 55 percent less carbon emissions
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The good news is that PET bottles are recyclable. According to the Stanford Recycling Center, which provides waste collection, processing and hauling services to Stanford University, recycling one tonne of plastic can save 30 cubic yards of landfill space. The bad news is that recycle rates remain relatively low. In the UAE, it is estimated that only around 6 percent of plastic bottles are recycled. This presents a challenge, for both the UAE and the rest of the world, in responding to the exponential increase in recyclable, yet largely non-recycled, products.

The company is currently in talks to finalise funding for a 12,000-square-metre factory in Dubai that will turn plastic bottles into polyester yarn to produce clothing. To date, the USD 50-million project is around 80 percent funded, with suppliers funding the majority of the state-of-the-art German machinery and the balance expected from private equity. Once operational, this will be the largest factory of its kind in the world.

“Our process is far more eco-friendly – we use 20 percent less water, 50 percent less energy and produce 55 percent fewer carbon emissions” says DGrade Founder and Organiser Kris.

The science behind the project is surprisingly simple. The vast majority of plastic bottles are PET, which is polyester. At the fundamental level, the bottles are shredded into flakes, and the flakes then heated and extruded into fibre, which is spun into a yarn. The yarn is then used to produce clothing that is as comfortable as polyester. It can also be blended with cotton for leisure wear and different compounds can be added to help the fabric breathe, making it a versatile yarn with numerous applications. Dgrade’s experience is in garment manufacturing, and the company began working with PET polyester around 10 years ago. Naturally, the processes have benefitted from a steep learning curve. The original product was coarse, not suitable for clothing, but with changes in technology and processes, the yarn has been refined to the point where it competes with regular polyester and other fabrics. It’s efficient, too; it only takes three bottles to make a t-shirt, and six bottles for a polo shirt.

“ The company is currently in talks to finalise funding for a 12,000-square-metre factory in Dubai that will turn plastic bottles into polyester yarn to produce clothing ”

Polyester also has a number of benefits over fabrics such as cotton. It is cheaper to produce than cotton and more stable. Polyester doesn’t shrink or twist, it retains its colour, and it doesn’t require ironing, making it a practical choice. Additionally, as with many kinds of textiles, upstream, the fabric can be broken down to create a coarser yarn for coarser grade fabrics such as carpets and upholstery. DGrade already supplies some of the world’s largest brands, many of which are interested in buying into a greener alternative to conventional products, offering potential market opportunities.

The biggest concern for a manufacturing plant of this size is feedstock. Given the high consumption rates of bottled water in the UAE, it’s evident that supply is available. The challenge is recovering the bottles. To this end, DGrade has launched a joint initiative called ‘Simply Bottles’ with Australian environmental solutions company Closed Loop. The Simply Bottles campaign, sponsored by UAE-based Oasis Water Company, is a plastic bottle recycling campaign targeting businesses, schools, non-profit organisations and consumers to increase the rate of bottle recycling across the UAE. The programme is designed to create awareness around plastic waste and recycling and provide a plastic collection

service for recycling. On an individual level, participants are encouraged to bring the bottles from their homes to their workplaces or schools for recycling.

Not only does this project divert waste from landfill by encouraging recycling and making alternative use of the plastic bottles, but also, makes the production processes more environmentally friendly than conventional methods.

DGrade’s PET polyester production processes use 50 percent less energy and 20 percent less water than conventional polyester production, and the process creates 55 percent less carbon emissions. This is all good news for the environment. The ultimate aim is for the Dubai factory to have a zero carbon footprint.

By recycling PET bottles into quality, eco-friendly merchandise, DGrade is giving plastic a second chance, addressing a pressing environmental problem with an innovative solution.

Editor’s note:

This article is based on information from: (Dubai Eye, 2017)



COMMENTARY

How Blockchain technology can accelerate green economy transition

Despite challenges, its applications for climate action are growing with the support of visionary governments

Pierre Samaties

Chief Executive Officer
innogy International Middle East

Could blockchain technology boost climate action? The United Nations Framework Convention on Climate Change (UNFCCC) recognises the potential of blockchain to improve governance and collective action aimed at tackling climate change.

World governments and businesses working to implement the Paris Climate Change Agreement need all new and cutting-edge technologies at their disposal. As opposed to centralised or decentralized networks, Blockchain prevents monopolistic control over the system. The technology also records transactions openly and permanently, thus fostering transparency and traceability. Therefore, Blockchain could contribute to greater stakeholder involvement, transparency and engagement and help bring trust and further innovative solutions in the fight against climate change, leading to enhanced climate actions.

Blockchain technology, in my view, will revolutionise and accelerate the deployment of renewable energy. It allows for the democratisation of green investment, allowing everyone to participate in funding green investment and contributing to a secure future.

One of the main factors holding Blockchain back so far has been the lack of a common language to

translate what this technology can offer and how it can be applied. That is why examples are very important to paint a picture that all members of the public can relate to.

Also, in order to have real business applications you need to move hand in hand with existing regulation in governments. Dubai is the place where you can get very creative with these technologies because the government is focusing on blockchain technology and encourages innovation unlike many other governments around the world.

Blockchain technology will be as disruptive to the financial industry as MP3 was for the music industry. Blockchain technology will unleash the movement towards a sharing and Machine-2-Machine economy.

In particular this will be amplified, if you combine it with other technological advancements like artificial intelligence and robotics. Imagine self-learning machines that can do their own transactions. Combine UBER with digital currency and autonomous driving and you will get the “self-owning car”. Combine digital currency with smart contracts (automated contracts on the Blockchain) an rooftop PV and you get the “Self-owning Green Power Producer” - too far

fetched? Might be! But the technology opens up tremendous opportunities

For the green economy blockchain technology can be applied for several applications, for example, electric vehicle charging stations, smart contracts and crowdfunding. Let's look at these applications in detail.

P2P transactions at EV charging stations

Blockchain technology can create a peer-to-peer (P2P) marketplace for electric vehicle (EV) charging. For instance, if you have an EV charger in your premises, and you only use it during specific times throughout the day, then you can use an app on your smartphone to allocate the charger to another person when it is idle. You can set the price that you want, but we usually recommend a price that agrees with the current electricity rate. Once the other customer has used the EV charger, the transaction will be credited to your account immediately after the charger is unplugged from the car. The goal here is to enable car owners to pay on the go for electric charging.

This kind of application makes micro transactions very attractive. It will also make your investment in the charging station far more attractive. If you invest 600 euros in a charging station, you have a more attractive business case because you know that you can generate money from the idle time by selling it to another user. One of innogy's startups Motionwerk launched their Blockchain service on over 1,500 charging stations across Germany. So this concept is already coming to life and we are currently developing a prototype to bring this application to this region.

In Germany, we worked with banks to ensure that the currency used to make transactions for the EV charging concept is backed by the Euro. This has been done because of the current status of the digital currency Bitcoin, which has seen a huge gain in value but also an intraday fluctuation of 30%, making it unattractive for business. Hence, the national currency needs to be attached, and for that, the government's support is required.

Smart contracts and green certificates

Blockchain technology can create smart contracts, which allows you to program a contract

which you can put on the blockchain with a guaranteed execution, meaning that if A happens, then B will be executed. This creates trust among all parties involved in a transaction.

For example, you can create a digital twin of a green assets asset that you own. This digital copy is connected to the meter data and whenever you produce one megawatt hour or kilowatt hour of green energy, you will receive a green certificate, coin or token. Some industries are obligated by the government to purchase green certificates in order to demonstrate that they are supporting the green economy. It is like the carbon tax, but with a positive spin. The value of these certificates may increase due to the scarcity in number of producers and the increase in number of parties that need to buy the certificates to abide by regulations and avoid penalties. This creates incentives for households or big industries to invest in renewable energy to generate money through green certificates.

Crowdfunding and micro-investing

Crowdfunding goes hand in hand with green certificates or green contracts. Solar PV assets can be digitalized on the blockchain and a smart contract technology can be applied to ensure that whenever this asset is producing energy, a green

certificate is created or a pay-out is completed. You can then create a new kind of crowdfunding platform where you will be able to invest in a PV project in Africa or Germany or anywhere around the world, knowing that it is backed by a digitalised smart contract. Therefore, as soon as this asset produces a kilowatt hour of energy, you will get your return in accordance to whatever share you put in for a funding. Crowdfunding opens up micro-investment options. Combining crowdfunding with the benefits of Blockchain in combination with internet of things ensures a blend between real- and digital world, which creates more trust in the process because crowdfunding, currently, is a bit like gambling; there is huge uncertainty about project implementation and the money that you will get in return for your investment – in particular if its in a remote region.

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The United Nations Framework Convention on Climate Change (UNFCCC) recognises the potential of blockchain to improve governance and collective action aimed at tackling climate change

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What is Blockchain technology?

In a conventional transaction model, a governing institution, such as a bank, is required to foster a sense of trust between parties and guarantee that there will be no fraud. However, in the world of tomorrow or in the world where blockchain concepts are applied, the presence of an intermediary or middleman is eliminated. This is because the technology of blockchain is a decentralized ledger system where information/transactions are stored across a network of personal computers and verified to ensure that people do not edit records or commit fraud.

As a result, no central company or person owns the system yet everyone can use it and help run it. The people who run the system can use their computer to hold records submitted by others known as blocks that are placed in a chronological chain. Every block on top contains the identification information of the block below and these blocks cannot be counterfeited or changed by anyone else. Consequently, any person that has that blockchain can validate the information stored and all transactions can be tracked down to their origin and where they are now. For instance, this can be applied in the fashion industry to counter product piracy. A luxury brand store can record information about a specific product in a blockchain and the potential buyer can then use an app to track where this bag was manufactured.

This technology was invented in 2009 by a person or a group of people known by the pseudonym 'Satoshi Nakamoto'. It was created during the collapse of the Lehman Brothers and the financial crisis as a countermeasure to real-life currency.



COMMENTARY

One company writing the future with pioneering technologies

With over 60,000 suppliers, ABB is not only ensuring that its own business is sustainable, but holding those it works with to the same high standards too

ABB, the Swiss-based engineering company, says it is tackling climate change on three fronts: By reducing the impact its products have on the environment, improving the efficiency of its own operations, and ensuring its suppliers maintain the same very high standards.

“For ABB, sustainability is all-encompassing. It is about balancing economic success, environmental stewardship and social progress to benefit all of our stakeholders,” said Mostafa Al Guezeri, Managing Director of the UAE, Gulf and Near East Countries, ABB.

“[Sustainability] is an integral part of ABB’s corporate strategy,” he added.

According to Al Guezeri, the company’s sustainability objectives drive how it designs and manufactures products, what it offers customers, how it engages with suppliers, how it assesses financial and non-financial risks and opportunities, and how ABB conducts its businesses with the worldwide community.

Additionally, as a leader in technology, ABB says it is well positioned through its core businesses to contribute to the UN Sustainable Development Goals (SDGs), particularly those on affordable and clean energy, sustainable cities and communities, and efforts to combat climate change.

Just as the multinational targets energy, resource efficiency and a reduction of its carbon footprint through its products and portfolio of solutions,

ABB says it has also been working for many years to manage and reduce the impacts of its own operations.

According to the company, it has set itself a target for 2020: To reduce the energy intensity of its businesses by 20 per cent from a 2013 baseline.

This includes direct fuel consumption and the use of electricity and district heating for manufacturing processes and to operate buildings.

“We also aim to cut greenhouse gas emissions by reducing direct fuel consumption, converting to lower carbon sources of energy and improved handling of sulfur hexafluoride gas,” Al Guezeri said.

To implement the objective, all sites were required to establish an energy savings program and to undertake actions to reduce greenhouse gas emissions,” he added.

By the end of 2016, country energy savings plans were in place for 40 countries, covering 99 per cent of ABB energy use, and more than 280 energy savings projects were under way at ABB sites.

“We are proud of our commitment to reducing our carbon footprint. 390-plus ABB office locations globally are certified to ISO14001 and OHSAS 18001 standards including our UAE and most of the GCC offices,” the Senior Executive said.

Reducing carbon intensity of energy

In order to reduce its carbon energy intensity by 2020 as previously stated, ABB operations in Belgium, France, Italy and the Netherlands now purchase all of their electricity from renewable sources.

Plants operated by Thomas & Betts, a wholly-owned subsidiary of ABB, in these countries will also join the renewable sources programmes as their current contracts expire.

In Sweden, almost 20 per cent of electricity purchased was green energy, whilst globally, 130 gigawatt hours (GWh), or almost 8 per cent of ABB's 2016 electricity, was purchased as certified green electricity, according to the company.

An increasing number of ABB facilities, including in Dubai, have installed, or are installing, on-site photovoltaic (PV) power plants to reduce their environmental impact and demonstrate ABB's solar capabilities.

In 2016, the ABB Al Quoz facility was installed with solar panels designed to generate 315 kilowatts (kW) of power peak load.

These PV plants are now installed at 33 ABB sites in 22 countries across Asia-Pacific, Europe and Latin America.

While contributing only a small proportion of ABB's global electricity needs, these plants are often a key part of local energy strategies to replace diesel generation with low carbon reliable power, the company says.

Another facet of ABB's internal efforts to fight climate change is in its reduction of greenhouse gas (GHG) emissions.

ABB's total GHG emissions (Scope 1 + 2) decreased by 7 per cent in 2016 to 1.38 million tons, with an overall 11 per cent reduction since 2013, according to the company.

"Around 70 per cent of the savings in 2016 was due to an overall reduction in the carbon intensity of electricity supply. That is, CO₂ emissions from electricity consumption were 10 per cent lower in 2016 than 2015, even though electricity

consumption remained essentially unchanged year on year," Al Guezeri said.

It is not just ABB's own operations that it needs to think about, however.

With operations in over 100 countries, ABB manufactures products across 300 lines, and has approximately 60,000 direct material and project service suppliers.

The company says it takes a structured approach to supplier qualification, performance evaluation, classification and development, with the goal to improve supplier quality, on-time delivery and compliance, while consolidating its supply base and reducing risks.

"ABB clearly outlines expectations of suppliers in its Supplier Code of Conduct (SCoC), which reflects the ten principles of the UN Global Compact and the content of ABB's Code of Conduct," Al Guezeri said.

The Swiss-headquartered company says its suppliers play a significant role in helping to ensure that hazardous, prohibited and restricted materials are controlled along the supply chain. ABB has compiled a list of prohibited and restricted substances for its suppliers, referencing international regulations.

Internally, ABB has made a commitment to increase the percentage of its revenue derived from sustainable products.

According to the multinational, 55 per cent of ABB revenue comes from products or solutions related to energy efficiency, renewable energy and eco efficiency.

"Among many other things, we are developing an eco-efficiency portfolio to replace the current energy efficiency portfolio," said Michael Cooke, ABB Head of HSE and Sustainability.

"That includes a project to assess the environmental and social impacts and value created by the eco-efficiency portfolio, and the setting of a long-term greenhouse gas reduction target which many of our stakeholders also want to see. We're also developing a group standard on resource efficiency and waste management," he added.

390

plus global ABB locations are certified to ISO14001 and OHSAS 18001 standards, including our UAE and most GCC country offices

670

global community projects and charities supported in 2016

14

awards for good corporate citizenship globally

9%

reduction in energy usage across all ABB global facilities from 2013 to date

280

plus global energy efficiency projects currently live

15%

reduction in ABB water consumption at operations in water stressed locations in 2016, including the UAE

FEATURE

EGA makes major reductions in NOx emissions as part of Government Accelerators programme

Through the Government Accelerators programme, the company reduced its NOx emissions by 16 per cent in 100 days

Emirates Global Aluminium (EGA), the largest industrial company in the UAE outside of the oil and gas sector, says it has worked with General Electric (GE) and the Ministry of Climate Change and Environment (MOCCA) on the country's Government Accelerators programme.

"Our project was one of five in the first round of the Government Accelerators programme," said an EGA spokesperson, adding: "The target was to reduce our power plants' NOx emissions on full year running hours by 10 per cent within 100 days."

This is equivalent to removing 280,000 cars from the UAE's roads, the spokesperson added. EGA says that they were successful in this objective, exceeding the target and reducing its NOx emissions by 16 per cent in 100 days, equivalent to removing 449,960 cars from the UAE's roads.

Aluminum production is energy intensive: EGA has power plants at both Al Taweelah and Jebel Ali to generate the electricity it requires for its operations.

NOx affects air quality, and is emitted by EGA's power stations, they say.

A key national objective of the UAE's Vision 2021 plan is to improve the air quality index to the point where the country has clean air 90 per cent of the time. NOx is one of four main air pollutants that is included within the calculation of this indicator.

An initiative of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, the Government Accelerators programme is intended to achieve rapid progress in meeting the UAE's climate change objectives.

As part of the Government Accelerators programme, this reduction in emissions was achieved through three initiatives, according to EGA: firstly, through a series of highly technical operational efficiency improvements at both the Jebel Ali, and Al Taweelah, plants.

EGA implemented efficiency improvements at both of these plants by optimising power operations and maintenance programs. All eight efficiency improvement sub-initiatives were completed ahead of the 100 days schedule, and contributed to 41 per cent of the total NOx reductions.

Secondly, through a technology retrofit at Jebel Ali, retrofitting one gas turbine combustion system by installing a water injection skid.

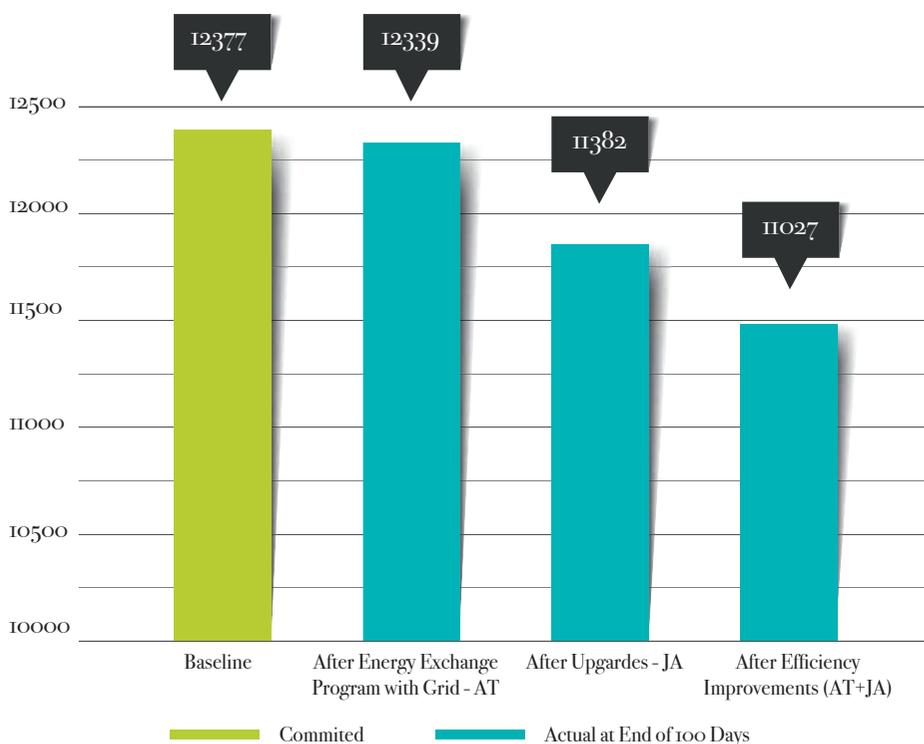
The largest contribution to the reduction, some 53 per cent of the total, came from the installation of a water skid at EGA’s Jebel Ali power station. “The result outperformed our expectations by reducing the NOx emission from 107ppm to 29ppm, 35 per cent better than we anticipated,” a spokesperson said.

EGA and GE teams were able to accelerate the process with innovative methods of dealing with logistics and product manufacturing. The water skid was manufactured in China and flown to the UAE in a total of just 70 days, one-third of the time typically required in the industry to complete such a project.

To avoid delays due to Chinese New Year holidays, EGA says that the final assembly and testing of the skid was conducted at its site.

“Experience and team commitment played a vital role in accelerating the process, along with close cooperation with Al Maktoum International and Emirates Airline Cargo, in order to fasttrack the skid’s arrival in the UAE without deviating from formal procedures,” they said.

EGA Final Trend Results: 16% (on full year running hrs)
1350 tpa NOx Reduced - 449,960 Cars Removed



“Together, the team was able to think outside the box to deliver exceptional results.” And thirdly, through a sustainable energy exchange program with the public grid at Taweelah.

“The team developed an energy exchange program with the public grid at Al Taweelah, which contributed to 6 per cent of the total reductions. This initiative played a role in promoting energy efficiency and utilising the highest efficient units within EGA’s Al Taweelah Power plant, to produce the required extra power during summer,” they said.

The program started on November 18, 2016, and was completed February 26, 2017.

On its collaboration with GE, an EGA spokesperson said: “GE technologies were used for the supply of water injection packages for the gas turbines at Jebel Ali and for Fin-Fan software logic modification to optimise cooler operations at Al Taweelah. This reduced auxiliary load consumption. Pressure wave cleaning was also used to improve operational efficiency and reduce emissions.”

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The target was to reduce our power plants’ NOx emissions on full year running hours by 10 per cent within 100 days: EGA exceeded, reaching 16 per cent in 100 days, equivalent to removing 449,960 cars from the UAE’s roads

SUB-INITIATIVE

- 1 Optimise Fuel Gas Compressors
- 2 Gas Turbine Combustion System Tuning
- 3 Adjust HRSC exit Temperature
- 4 Liquid Fuel (Diesel) Changeover Frequency
- 5 Back Pressure Stack Damper Removal
- 6 Boiler Cleaning (Pressure Wave Cleaning)
- 7 Implement Gas Turbine Fin-Fan Coolers Smart Auto Logic (Start/Stop)
- 8 Implement weekly Earth Hour



EDITORIAL

Betting on a tough survivor to fight carbon emissions

Planting the Ghaf tree, which flourishes against all odds in the UAE's desert conditions, could be the low hanging fruit to lowering the region's carbon footprint

One of the many logical ways to counter carbon dioxide emissions from nature and human activities is to plant more trees, because trees absorb carbon dioxide from the atmosphere and store it for long periods of time, helping stabilise and reduce net emissions. The Middle East region's arid climate and water scarcity make it difficult for large-scale afforestation. The best bet is to plant more indigenous trees that can withstand the harsh conditions specific to the region, and no other species is better suited than the Wild Ghaf.

The Ghaf or *Prosopis Cineraria* is an indigenous species of the UAE, Oman and Saudi Arabia. The small to medium-sized thorny, evergreen tree is one of the sturdiest plants in the harsh desert environment of the UAE, growing on low sand dunes, undulating sand sheets and along margins of gravel plains mostly in the emirates of Abu Dhabi, Dubai, Sharjah and Ras Al Khaimah.

Ghaf trees consume very little water, enrich the soil and help fight climate change. Each tree can sequester up to 34.65 kg of CO₂ emissions per year. The presence of Ghaf in an area indicates that there is water underground. The tree taps water stored deep in the sand, its roots penetrating as deep as 30 meters to access it. Thus, the Ghaf is able to withstand very low rainfall and remain green.

"The Ghaf tree is a great survivor against fierce temperatures, searing winds, and water scarcity. It is estimated that during the summer months a Ghaf tree requires just 6 of litres of water per day, compared to 200 litres a day for a date palm tree," says Tatiana Antonelli Abella, Founder and Managing Director of Goumbook, a social enterprise based in Dubai aiming at raising awareness on sustainability and green living.

In 2011, Goumbook launched the 'Give a Ghaf' tree planting programme, a not-for-profit

initiative aiming to boost awareness on the local ecosystem, protecting fauna and flora from the dangers of desertification, mass construction, water depletion and extinction. The programme raises public awareness about the Ghaf and its values, while encouraging people to plant indigenous trees and raising awareness on water scarcity.

Goumbook has already planted over 35,000 seeds and almost 10,000 trees through the Give a Ghaf programme. Ghaf seeds are initially planted and nurtured in a nursery for about two years, until they grow into healthy seedlings. The young trees are then ready to be planted where natural shade and greenery are needed.

The Give a Ghaf programme runs different initiatives to promote Ghaf tree plantations. Trees are given free of charge to all schools and to UAE nationals who own land and farms. Farmers can apply to receive up to 1,000 trees. Goumbook



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For every kiloton of CO₂ emitted by taxis, the DTC planted Ghaf trees as part of its efforts to accelerate the green economy drive by increasing the greenery and minimising desertification
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Goumbook recently celebrated the 2017 ‘Year of Giving’ by donating 10,000 Ghaf trees to local communities
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recently celebrated the 2017 ‘Year of Giving’ by donating 10,000 Ghaf trees to local communities.

“The aim of the Give a Ghaf tree planting programme is to make the UAE greener and more sustainable. By offering a home to these trees, UAE nationals will be able to take an active role in safeguarding the natural heritage of the UAE. We are ready to work with all landowners who are committed to making their land greener in a sustainable way,” says Abella.

In 2015, the Dubai Taxi Corporation (DTC) launched a carbon landscaping project: for every kiloton of CO₂ emitted by taxis, the DTC planted Ghaf trees as part of its efforts to accelerate the

green economy drive by increasing the greenery and minimising desertification.

A similar concept called carbon farming involves planting indigenous trees in arid regions on a large scale, addressing the root source of climate change: the emission of carbon dioxide by human activities. Alex Walker, a Research Assistant at the Centre for Environmental Policy at Imperial College London, United Kingdom, describes carbon farming as a “common-sense approach to rising carbon dioxide levels, with potentially positive biodiversity impacts”.

Klaus Becker, Director of Carbon Sequestration Consultancy Atmosphere Protect, says that plantations covering just three per cent of the Arabian Desert could absorb all the carbon dioxide produced by cars in Germany over two decades. Furthermore, after a few years, the plants would produce bioenergy in the form of tree trimmings to support the power production required for the desalination and irrigation systems.

“Models show that large-scale plantations can reduce average desert temperatures by 1.1 degree Celsius, which is a lot,” Becker says. He also envisages how large-scale plantations could be irrigated.

“There are billions and billions of litres of sewage that are discharged into the oceans every week,

but instead we could send that water to the desert and plant trees. In this situation, you wouldn’t need any expensive artificial nitrogen to fertilise the trees,” he says.

“Afforestation is a very efficient and environmentally safe approach for carbon sequestration and climate change mitigation. The main limitations to implementing this method are lack of funding and little knowledge of the benefits of large-scale plantation, such as increase in cloud coverage and rainfall. The cost of land is another barrier to widespread tree-planting, especially when there are other uses for the land,” says Abella.

“The key drivers of the ‘Give a Ghaf’ programme are sustainability, leaving a legacy and engaging with the community. To support the Sustainable Development Goals and commemorate the coming 2018 Year of Zayed, the Give a Ghaf programmes invites individuals and organizations to join the campaign and plant Ghaf trees all around the country,” she concludes.

As the late Shaikh Zayed used to say: “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.”

www.goumbook.com

FEATURE

Floating Islands

How artificial islands could help us adapt to climate change: human-made archipelagos could be the next grand idea



By Simon Nunny

Architect

By Joe Quirek

“Seavangelist”, Seasteading Institute, Cofounder and Managing Director of Blue Frontiers

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The Floating Islands aim to provide a sustainable, scalable solution to sea-level change, with French Polynesia well-suited to serve as a test bed for floating communities
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Life on Earth was born in the oceans some 3.6 billion years ago and has continued to evolve to this day. Millions of species and numerous ecosystems inhabit the 370-million-square-kilometre expanse, within its 1.4 billion cubic kilometres of water. For centuries, we have regarded the oceans as an inexhaustible supply of food and a convenient transport route. We’ve long considered the waters to be too vast to be affected by anything we do, but human activity has pushed oceans to their limits.

Our aquatic activities have become a threat. Pollution, unsustainable fishing, offshore mining, coastal occupation and consequently, global warming are having an effect on the largest living space on Earth that is difficult to reverse.

Could the best way to save the oceans be to live on them?

What if every baby born added an incremental improvement to the aquatic environment? If the wealth of the population was tied to the health of the oceans? What if accelerating the rate by which the poorest billion people become prosperous could fuel a mass restoration of the ocean?

A diverse international community of marine biologists, nautical engineers, aquaculture farmers, maritime attorneys, security personnel, investors, environmentalists, and artists believes it is possible. This is the basis of the seasteading movement, a campaign to populate the high seas by building buoyant cities in the oceans.

Young people want a new world, and seasteaders hope to provide this for them. Nearly half of the world's surface is unclaimed by any existing country. Floating cities allow the aquatic generation to create new societies based on 21st-century values, like energy sustainability, ecological restoration, voluntary cooperation, and economic opportunity for all.

It may sound like a pipe dream, but progress is being made. The nonprofit Seasteading Institute was founded in California in 2008 by billionaire investor and philanthropist Peter Thiel, co-founder of Paypal, and Google engineer and political economic theorist Patri Friedman, grandson of Nobel-Prize-winning economist Milton Friedman. The Institute has yet to overcome the engineering challenges inherent in creating cities in international waters, which are less sheltered from wave and tidal action, but building in shallow waters is technically possible and the Seasteading Institute recently signed an agreement with French Polynesia to co-create a seazone with a special government framework for floating islands in the protected waters of a Tahitian lagoon. Start-up company Blue Frontiers is set to administer the seazone and build floating islands designed to adapt organically to sea level change by 2020.

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This is the basis of the seasteading movement, a campaign to populate the high seas by building buoyant cities within the oceans

The Floating Islands aim to provide a sustainable, scalable solution to sea-level change, with French Polynesia well-suited to serve as a test bed for floating communities. The goal of this initial project is to create an incubation hub for blue jobs and environmental stewardship. If the Floating Island Project is successful, French Polynesia could become a leader in a new industry, producing sustainable floating islands for societal innovation.

Dubai-based architect Simon Nummy is designing many of these unique floating islands to prepare for the “Aquatic Age”. Dubai has a head start after all. The Palm Islands demonstrate that people are happy to live on man-made islands and the World Dubai Islands recently unveiled plans to build its own miniature floating replica of Venice, with construction on the AED2.5billion-resort expected to begin in 2018 and be completed by 2020. In addition, over 30 Free Zones in Dubai demonstrate the economic advantages that can be created by experimenting with new legal systems. If the Palm Islands floated and the islands were modular and environmentally sustainable, they could provide an example of the new age of sustainable floating Free Zones.

There are already a host of alternative technologies being implemented around the world's seas. Ricardo Radulovich, an agricultural water scientist from Costa Rica, works to build seaweed farms to transform greenhouse gas and ocean pollution into food for the poor, earning him grants from The World Bank and The Bill and Melinda Gates Foundation. Neil Sims, a fisheries biologist from Australia, seeks to feed the world with sustainable sashimi using free-floating Aquapods that move with the schooling fish to recreate conditions in the wild with negligible environmental impact. This has earned awards from the National Science Foundation and a partnership with Lockheed Martin. Michael Strong, an educational entrepreneur from the USA, plans to propel millions out of poverty with what his supporters have called “a thousand floating Hong Kongs,” based on advanced legal systems, welcoming millions with blue jobs. Meanwhile, Patrick Takahashi, a Hawaiian biochemical engineer, seeks to create sustainable floating eco-cities using Ocean Thermal Energy Conversion (OTEC), a proven green technology that uses the ocean as a solar panel, providing a renewable, permanent energy source for floating cities.

The seasteading movement may be onto something. Welcome to Seavilization.

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Dubai-based architect Simon Nummy is designing many of these unique floating islands to prepare for the “Aquatic Age”

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OPINION PIECE

Be Ready. Climate Change is Coming.



By **Dr. Michael Mortimer**

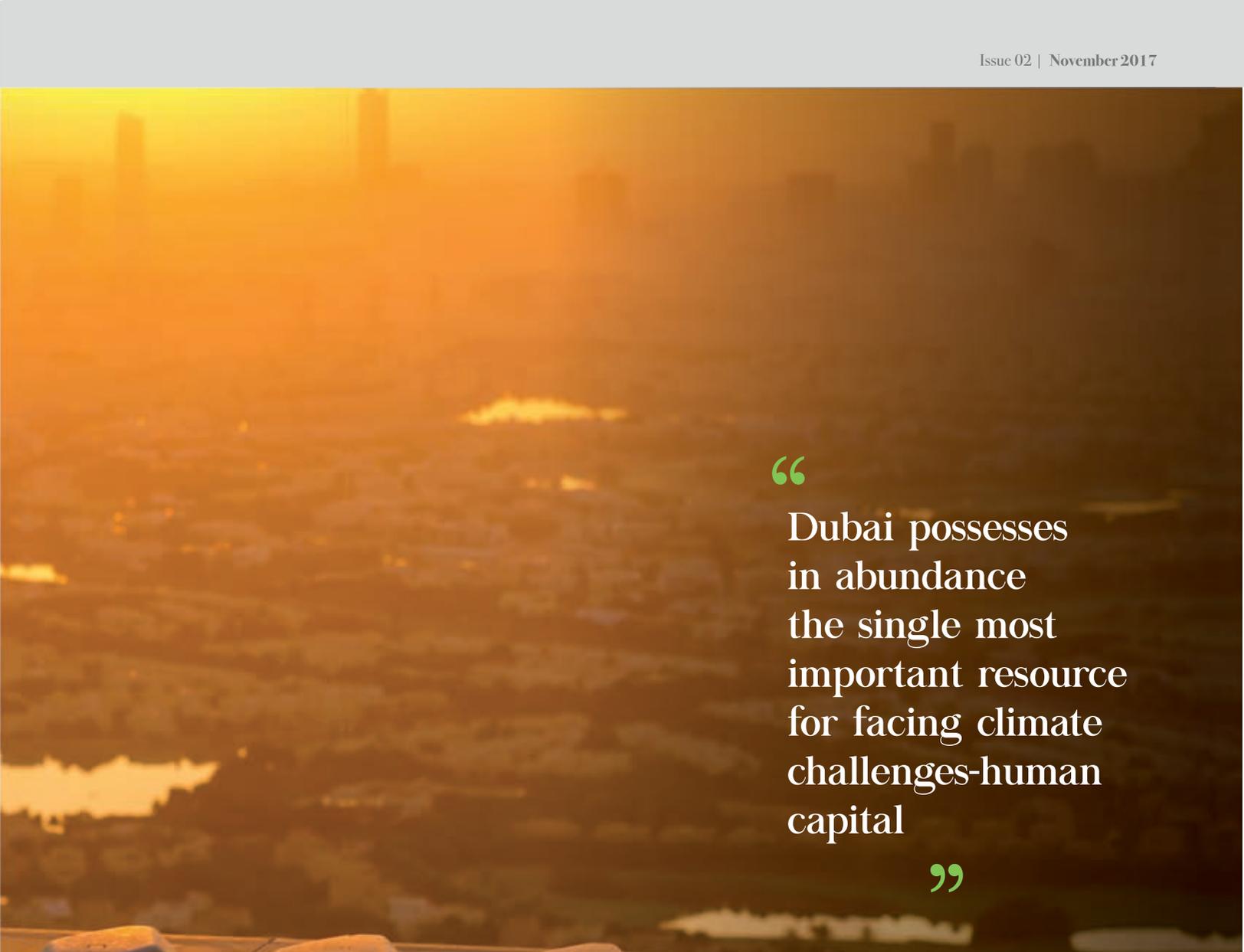
Founding Director of the Center for Leadership in Global Sustainability at Virginia Tech, USA

Global climate change is not for the faint of heart. Its effects are increasingly widespread and disruptive. Rising sea levels, increased temperatures, large-scale human migration, invasive pathogens and diseases, more frequent intense weather events—it's not a pretty picture. Climate change's causes and effects are distributed inequitably among the nations and peoples around the globe—its burdens will not be borne equally. One of the world regions that stands to be affected most negatively by climate change will be the Middle East North Africa (MENA). Even within the MENA, the impacts and the ability to deal with them is widely variable,

with the Gulf states better positioned to respond to threats. Nonetheless, the region overall will face increased peak summer temperatures, much reduced agricultural production, rising sea levels, and precipitous declines in surface water availability.

The United Arab Emirates (UAE) is not immune to these impacts. The UAE's urban areas, GDP, and populations rank among the world's most exposed to the negative effects of a one meter sea level rise. Likewise storm surges will present an increased risk of inundation to coastal communities. Hot summers will get even hotter. And the country's dependence on imported agricultural products will be increasingly vulnerable to both economic and weather disruptions. Dubai faces this same set of threats—it's ranked 2nd highest among MENA cities for potential impacts from sea-level rise. But the

city faces intense business-related risks as well. Consider a few examples. Some sea-level rise projections suggest that as many as 217 square kilometers of Dubai could be inundated. Given the Dubai's concentrated coastal development, this could have profound effects on the city's infrastructure, both public and private. Tourism and aviation contribute approximately 45% of Dubai's GDP and both face threats in a climate changed world. As temperatures rise tourists may be wary of visiting. Hotel infrastructure may be subjected to inundation from rising sea levels. And a recent study suggests that Dubai International Airport may face "non-trivial" costs associated with reducing the weight of aircraft due to the higher peak daytime temperatures. Finally, and perhaps most critically, Dubai's storied history as a coastal trading city nested in an arid country places it at the center of complex supply chains, particularly for foodstuffs. Those



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Dubai possesses
in abundance
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challenges—human
capital
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agricultural goods, sourced from all over the globe, will increasingly be vulnerable to pricing shocks, or worse, climatic events that destroy production.

But all is not bad news. While Dubai was not included in the Grosvenor 2014 Resilient Cities Report (Cairo was the only MENA city included), the analysis methodology of that report suggests some ways of thinking about Dubai's circumstances. With vulnerability—what Grosvenor defined as combination of climate, environment, resources, infrastructure, and community—Dubai clearly has some exposures, particularly with climate and resources as mentioned earlier. But in terms of adaptive capacity, Dubai is well positioned indeed. The factors at play—governance, institutions, teaching/learning, planning systems and funding structures, are all hallmarks of Dubai. In fact,

Dubai possesses in abundance the single most important resource for facing climate challenges—human capital. At the end of the day, even with its vulnerabilities, Dubai has all the markings of a resilient city. If it plays its cards correctly.

There are two prevailing strategies for addressing climate change: mitigation and adaptation. The first, working to slow or stop climate change, and the second, working to deal with the expected impacts and effects if that first part—mitigation—fails. Pragmatically, temporal obstacles to mitigating climate change are forcing adaptation, particularly among global cities that cannot afford to wait and see. While all cities bear a good deal of responsibility for global energy consumption and the associated emissions of GHGs, Dubai is owning its responsibility for mitigating its prominent carbon footprint with programs like the Dubai Clean Energy Strategy 2050. The

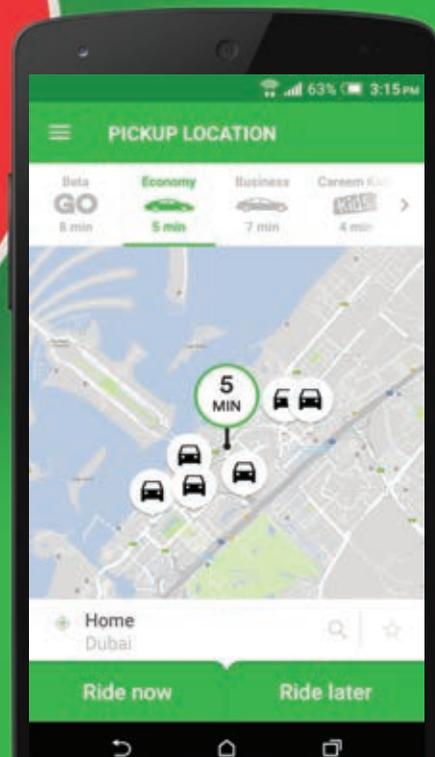
city and the companies that call it home have the opportunity to act aggressively via programs like the Carbon Disclosure Project (CDP). Dubai's Executive Council began CDP reporting in 2017 and prominent companies that do business in Dubai are likewise contributing members.

Adaptation on the other hand will leverage the strengths that Dubai has cultured over decades: technology, innovation, and most importantly leadership. In Dubai and elsewhere it will be leadership that drives effective adaptation; Dubai is fortunate to have that commodity in droves. The climate threats to Dubai's tourism, aviation, infrastructure, and supply chains are too large and too complex for any one organization or any one sector to solve. Leadership will require brokering collaboration across boundaries and across sectors for problem solving. No one ever said tackling climate change would be easy. But as the saying goes, nothing worthwhile ever is.

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COMMENTARY

The Private Sector and Climate Change

By Ivano Iannelli

CEO, Dubai Carbon

Over the past few decades, climate change has shifted from being considered as a side-line issue to being recognised as a serious development challenge. There have been significant accomplishments during this timeframe – global carbon dioxide emissions have stayed broadly flat for the past three years, for example – but there is still some way to go before we achieve the level of international commitment needed to avoid the forecasted catastrophic climate events.

While temperatures continue to climb – this year’s weather has beaten high temperature records in some regions, and 2014, 2015 and 2016 were the hottest years on record – avoiding dangerous levels of climate change is still considered possible. The authors of a letter published in the journal *Nature* in June 2017, including former UN climate chief Christiana Figueres and Hans Joachim Schellnhuber of the Intergovernmental Panel on Climate Change, suggest the next three years will be crucial. They calculate that if emissions can be brought permanently lower by 2020, the temperature thresholds leading to runaway irreversible climate change will not be breached.

This will require unprecedented effort and coordination, not only from governments, but also from businesses, citizens and scientists. The Paris Agreement, adopted by 195 countries at the Paris climate conference (COP21) in December 2015, was a starting point. It laid out

a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C and prompted dialogue and action directed at the issue.

At the 23rd session of the Conference of the Parties (COP23) held in November 2017 in Bonn, Germany, American state bodies, cities and companies that make up more than half of the U.S. economy declared support for the Paris Agreement, in recognition of the importance of climate-change mitigation and adaptation measures.

This kind of private-sector engagement with climate change demonstrates that the business of green economy is opportunistic and valuable to society at large. The American companies supporting the Paris Agreement are undoubtedly driven by revenue, but they also make a clear business case for the return on investment climate change actions make to the bottom line.

There is a growing understanding in the private sector that climate change mitigation and adaptation offers more than business opportunities – it supports business survival. Without action, the effects of climate change will be disastrous and that will impact all of humanity, and a corporate level, businesses bottom lines. If global temperatures jump four degrees by 2100 as projected, droughts, flooding, and storms will wreak financial havoc, affecting businesses of all sizes.

A study by CitiGroup found that excessive warming could shave up to US\$72 trillion off the world’s gross domestic product. Climate change leaves no-one untouched – from individuals to businesses, societies and countries.

The private sector played a pivotal role in making the Paris Agreement happen, and it holds the key to maintaining momentum and fostering much-needed progress as we move forward. While it is necessary for world governmental collaboration to build and populate the policy framework, the private sector is an equally important piece of the climate change puzzle.

As well as businesses viewing sustainability as critical to their long-term success and reducing their own carbon footprints, it is vital that the public and private sector partner to leverage efforts to help nations build resilience and adapt to climate change. Engaging the private sector has multiple benefits, including addressing and implementing climate issues and solutions through financial assistance and investments and technical capabilities, engaging civil society and community efforts, and developing innovative climate services and technologies.

Sustainability and climate issues can, in fact, be a key driver of innovation, much of which comes from the private sector. Like any disruptive force, climate change creates opportunities for companies willing to innovate. This is part of the reason behind the UNFCCC devising its own market-based mechanisms, such as emissions trading and the Clean Development Mechanism (CDM), to spur private investment and research and development in “green” technologies.

There is no single solution to climate change, and there’s no single entity that will own that solution. The key word is partnership. Governments need to create an environment in which the private sector can thrive and in which investments in sustainability-related technology, products and services make financial sense. The private sector can then seize this opportunity by investing in climate change and spurring innovation.

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Climate change
affects everybody
and we all have
a role to play, no
one excluded

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INDEX

Indexes on CO₂ Emissions in the GCC Countries

Country Name	Indicator Name	2010	2011	2012	2013	2014	2015	2016
United Arab Emirates	CO ₂ emissions (kg per PPP \$ of GDP)	0.345	0.327	0.325	0.293	0.345	0.345*	0.345*
	CO ₂ emissions from liquid fuel consumption (kt)	30425.099	22401.703	28382.58	17264.236	65719.974	65719.974*	65719.974*
	CO ₂ emissions from gaseous fuel consumption (kt)	116962.632	130277.509	132712.397	136507.742	127802.284	127802.284*	127802.284*
	CO ₂ emissions (kt)	160812.618	165440.372	176386.367	170706.184	211369.547	211369.547*	211369.547*
Bahrain	CO ₂ emissions (kg per PPP \$ of GDP)	0.586	0.551	0.486	0.533	0.502	0.502*	0.502*
	CO ₂ emissions from liquid fuel consumption (kt)	4118.041	3696.336	1584.144	4440.737	2214.868	2214.868*	2214.868*
	CO ₂ emissions from gaseous fuel consumption (kt)	24554.232	24304.876	24414.886	26200.715	28375.246	28375.246*	28375.246*
	CO ₂ emissions (kt)	29266.327	28650.271	26673.758	31312.513	31338.182	31338.182*	31338.182*
Kuwait	CO ₂ emissions (kg per PPP \$ of GDP)	0.406	0.368	0.381	0.356	0.338	0.338*	0.338*
	CO ₂ emissions from liquid fuel consumption (kt)	60054.459	56603.812	65939.994	61836.621	58495.984	58495.984*	58495.984*
	CO ₂ emissions from gaseous fuel consumption (kt)	28155.226	32885.656	34759.493	34594.478	34590.811	34590.811*	34590.811*
	CO ₂ emissions (kt)	89625.147	91029.608	102334.969	98345.273	95408.006	95408.006*	95408.006*
Oman	CO ₂ emissions (kg per PPP \$ of GDP)	0.351	0.396	0.390	0.381	0.364	0.364*	0.364*
	CO ₂ emissions from liquid fuel consumption (kt)	8547.777	10623.299	12445.798	10524.29	10648.968	10648.968*	10648.968*
	CO ₂ emissions from gaseous fuel consumption (kt)	24708.246	25434.312	24682.577	22533.715	21448.283	21448.283*	21448.283*
	CO ₂ emissions (kt)	47417.977	54029.578	59159.711	61378.246	61169.227	61169.227*	61169.227*
Saudi Arabia	CO ₂ emissions (kg per PPP \$ of GDP)	0.425	0.365	0.384	0.352	0.371	0.371*	0.371*
	CO ₂ emissions from liquid fuel consumption (kt)	359941.719	335985.208	386534.803	359677.695	413230.563	413230.563*	413230.563*
	CO ₂ emissions from gaseous fuel consumption (kt)	137189.804	139731.035	151711.124	153324.604	159257.81	159257.81*	159257.81*
	CO ₂ emissions (kt)	518491.798	499878.106	564842.678	541047.515	601046.969	601046.969*	601046.969*

Source: Data World Bank

* Data from 2015 and 2016 have not been released.

References:

1. (Bloomberg, 2017)
2. (Oxford Business Group, 2017)
3. (Arabian Business, 2017)
4. (Oxford Business Group, 2017)
5. (Gulf News, 2017)
6. (Khaleej Times, 2017)

A photograph of two young boys in a bathroom. The boy in the foreground is wearing blue swimming goggles and a grey shirt, looking towards the right. The boy behind him is also looking right, holding a blue bucket under a chrome faucet. Water is splashing around them, creating a dynamic and playful scene. The background shows a mirror and a window with light coming through.

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