



STATE OF GREEN ECONOMY

REPORT 2015



كربون دبي
DUBAI CARBON



دبي، عاصمة
الاقتصاد الأخضر
DUBAI, CAPITAL OF
GREEN ECONOMY

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STATE OF GREEN ECONOMY REPORT 2015



Green economy is one that results in improved human WELL-BEING and SOCIAL EQUITY, while significantly reducing ENVIRONMENTAL RISKS and ECOLOGICAL SCARCITIES. (...) A green economy (...) is LOW CARBON, RESOURCE EFFICIENT and SOCIALLY INCLUSIVE.



Working definition by United Nations Environment Programme (UNEP), visit the Green Economy Initiative website on <http://www.unep.org/greeneconomy>.



PREVENT THE LOSS OF BIODIVERSITY & ECOSYSTEM SERVICES

NATURAL CAPITAL = CRITICAL ECONOMIC ASSET & SOURCE OF PUBLIC BENEFITS



REDUCE CARBON EMISSIONS & POLLUTION



ENHANCE ENERGY AND RESOURCE EFFICIENCY

CATALYZED AND SUPPORTED BY:

TARGETED PUBLIC EXPENDITURE, POLICY REFORMS AND REGULATION CHANGES

greening of economies

is not a drag but rather a new engine of growth



HIS HIGHNESS SHEIKH MOHAMMED BIN RASHID AL MAKTOUM

VICE PRESIDENT AND PRIME
MINISTER OF THE UNITED
ARAB EMIRATES AND
RULER OF DUBAI



We recognize that preserving our energy resources will be one of the greatest challenges in our drive towards sustainable development. This, however, will not materialize unless the different facets of our society adopt energy conservation principles in their core values. The future generations will be the chief beneficiary of our achievements and the best judge of what we accomplish in this field.



HIS HIGHNESS SHEIKH AHMED BIN SAEED AL MAKTOUM

CHAIRMAN OF THE DUBAI SUPREME COUNCIL OF ENERGY

There is little doubt that the world is at a crossroad. It's evident that a change of thinking is required to meet the needs of the burgeoning world population without causing irreparable damage to the planet. As a responsible global nation, the UAE is committed to developing and implementing innovative solutions to protect and sustain the environment and guide the way for the sake of future generations.

There has been much progress to date in the move towards a green economy, where economic growth and environmental responsibility are given equal importance in the development of a sustainable future. Indeed, the green economy is an engine of growth, providing opportunities for both the public and private sector.

Dubai aims to be at the forefront of the green revolution, providing a role model to the world in energy and efficiency in line with the goals of the UAE's Vision 2021. To this end, under the guidance of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, and Ruler of Dubai, the Dubai Integrated Energy Strategy 2030 (DIES) was developed, to set the strategic direction in securing sustainable supply of energy and enhancing demand efficiency, with the goal of reducing energy consumption in Dubai by 30% by 2030 and diversifying energy sources. It follows that the Dubai Expo 2020 will be a monument to the green economy; a landmark in sustainable development.

Naturally, creating a green economy is not a simple process, but new, energy-efficient technologies and continual research and development are driving a shift in the UAE's ever-growing economy, towards sustainable energy and stable economic growth, in balance with a focus on the environment. In establishing guidelines and frameworks, a clear path is emerging as Dubai also enhances its capabilities as a smart city, with technology playing a crucial role in sustainable development.



In recognition that this is not the domain of government alone, private companies and individuals are being encouraged to participate - and to create new green businesses and integrated green business practices. In addition, private-public partnerships are facilitating efficient infrastructure development. The green economy is a new way of thinking that will continue to propel the nation, and the world, towards a sustainable, prosperous future.

HIS EXCELLENCY BAN KI-MOON

SECRETARY-GENERAL
OF THE UNITED NATIONS



We have a moral and political responsibility to advance sustainable development.

I am pleased to see governments stepping up as never before.

Companies see the investment potential in a green economy. And environmental activists are helping to foster green growth



HIS EXCELLENCY MOHAMMED AL GERGAWI

MINISTER OF CABINET AFFAIRS IN THE FEDERAL GOVERNMENT

The Smart Dubai initiative is anchored in the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, to make Dubai the happiest city on earth.

Sheikh Mohammed's vision for the city is clear: in Dubai, we think of technology innovation as a building block towards creating happiness. We believe sustainability of the environment is vital to everyday quality of life. Indeed, a smart environment is one of the six pillars of the Smart Dubai strategy, along with smart living, mobility, economy, society and governance.

Using smart technology, we enable city departments and the private sector to optimise resources, invest in renewable sources, monitor progress, and share data – all towards the aim of greater sustainability.

Dubai has a strong track record of supporting innovation to reduce our collective impact on the environment across all industries and segments, actively contributing to a Green Economy. Initiatives within the blueprint include sustainable building practices in the construction industry, electric vehicles for public and private transport, smart meters to optimise energy consumption, and connected grids for renewable energy integration.

As part of Smart Dubai, we are implementing progressive environmental technologies across the fabric of the city, we establish Dubai as the global leader in innovation for a sustainable environment and a benchmark for the world's emerging economies.

We invite all public entities and private sector innovators to partner with us on our quest to make Dubai the happiest city on Earth.



HIS EXCELLENCY DR. RASHID BIN FAHAD

MINISTER OF ENVIRONMENT AND WATER

In March 2014, the UAE government hosted the first Global Conference on the Partnership for Action on Green Economy (PAGE) with United Nations agencies. The fact that more than 650 participants from 66 countries were present showed that the shift towards an inclusive Green Economy is no longer a luxury preserved for wealthy countries but has now become imperative to all. There was a clear sense of urgency to change the current development model and pursue a low-carbon, socially inclusive and resource-efficient model that improves human well-being and values natural capital.

The UAE has come a long way in the past few years to meet the challenges of energy and climate change within the framework of the UAE Vision 2021. In January 2012, His Highness Sheikh Mohammed bin Rashid Al Maktoum, the Vice-President and Prime Minister of the UAE and Ruler of Dubai, launched the UAE Green Growth Strategy as a long-term national initiative under the slogan "A Green Economy for Sustainable Development". Under this strategy, the UAE seeks to become a global hub and a successful model of the new economy through the enhancement of the country's competitiveness and of the sustainability of its development and through the preservation of its environment for future generations. Initiatives for building an inclusive green economy have been and will be conducted in six major areas: Green Energy, Green Investment, Green City, Climate Change, Green Life and Green Technologies.

Through its implementation, the Green Growth Strategy will help accelerate and scale up ongoing efforts by the different federal ministries, local governmental departments and the private sector in such areas as energy diversification, renewable energy expansion, resource efficiency enhancement, waste reduction and green transport systems. It will enforce relevant policies already in place and encourage national champions among industry and citizens to find and implement even more innovative solutions. At the same time, a clear national leadership and government coordination are essential to guide a faster transformation into

a green economy. Through the establishment of a cross-cutting policy framework, the Strategy will also help make a clear articulation on the country's green technology potential and needs, prioritize green business and industries as new growth engines and conduct a strategic assessment in every economic policy decision-making.

We therefore highly appreciate Dubai's early adoption of the Green Economy Approach and its firm commitment to realizing it. We would like to congratulate the publication of the first edition of the Dubai State of Green Economy Report, which is an indication of Dubai's strong leadership, and look forward to working together to spread best practices across the UAE.

The PAGE partners have agreed to have another biennial conference in six years' time, simultaneously with the Dubai Expo 2020. We sincerely hope that at that time the UAE will be able to show the world the advancement of its knowledge, innovation and creativity to guide all countries towards a promising, sustainable future.



HIS EXCELLENCY SAEED MOHAMMED AL TAYER

MD & CEO
OF DEWA

DEAR READER,

The United Arab Emirates is the first country in the Middle East and North Africa (MENA) region to commit to a green economy strategy, and Dubai is leading the region in green infrastructure investment from renewable energy and green building to public transport and green technologies.

At Dubai Electricity and Water Authority (DEWA), we take pride in our achievements, which demonstrate our commitment to achieving the vision and directives of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to strengthen the pillars of our green economy, the maintenance of sustainable development, and the future of the emirate. DEWA has been at the forefront in championing a greener world through its concerted focus on promoting renewable energy and the rational use of energy and water.

Also, these achievements exemplify our commitment to fulfil the UAE Vision 2021, the UAE Green Development Strategy and the Green Economy for Sustainable Development initiative announced by His Highness to maintain sustainable development so that it supports long-term economic growth.

The World Green Economy Summit (WGES) organised this year was an initiative of DEWA, under the leadership of the Supreme Council of Energy, which confirms Dubai's transition to a green and low-carbon economy across all strategic economic sectors.

Dubai is also home to the first global multi-stakeholder collaboration initiative, the Dubai Green Economy Partnership, which seeks to spur the sustainable and green growth of the Dubai economy and promotes its position in the global green economy value chain for green and clean technologies and sustainable consumption.

We will continue our efforts by adopting policies and initiatives that spur sustainable development and position Dubai firmly as one of the global cities that are leading the transition to a green economy.

**THANK YOU FOR
TAKING THE TIME
TO READ THE GREEN
ECONOMY REPORT 2015.**

Saeed Mohammed Al Tayer
MD & CEO of DEWA



HER EXCELLENCY HELEN CLARK

ADMINISTRATOR UNITED
NATIONS DEVELOPMENT
PROGRAMME



(...) The [Green Economy] Summit brings together key people from around the world, public and private sector, civil society, international development community, in dialogue on how can we work together to advance sustainable development through green economy, innovation and entrepreneurship across sectors. Overall aim: To drive and influence the global transition to a green economy, which is so urgently needed in today's reality of ecosystem degradation, including in our climate (...).



Helen Clark on the occasion of the 1st World Green Economy Summit, Dubai, April 22nd 2014 via video message

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WELCOME: NOTE FROM EDITOR IN CHIEF

WELCOME TO THE 'GREEN ECONOMY REPORT'.



The world seems to be coming to terms with the limitations of our natural resources and is developing a common understanding that transitioning into a greener economy presents a new engine of growth, rather than a hindrance.

This report is a testament to the commitments made in the Dubai Declaration at the inaugural World Green Economy Summit in April 2014, and is its first major milestone. An initiative of Dubai Electricity & Water Authority (DEWA), the Green Economy summit brought together world leaders united in pursuing a sustainable future through global partnerships that focus on accelerating this transition.

Following through with renewed vigour and supported by the United Nations Development Programme (UNDP), the State of Green Economy Report 2015 examines the nuts and bolts behind the region's existing, albeit burgeoning green economic model, with a clear view of where we aim to be in the coming years. With technology and careful master planning as twin engines bolstering the UAE's growth, Dubai is primed to function as a smart city where each sector is connected, intuitive and efficient, streamlining the nation's urban environment ahead of the millions of expected visitors for Expo 2020 and beyond.

It is the philosophy of this report and the summit to invite everyone to contribute bright ideas and the best initiatives to join the discourse. We hope to hear from you ahead of the next edition, and to see you all in April 2015 at the next World Green Economy Summit.

Enjoy the read.

Michaela Neukirch

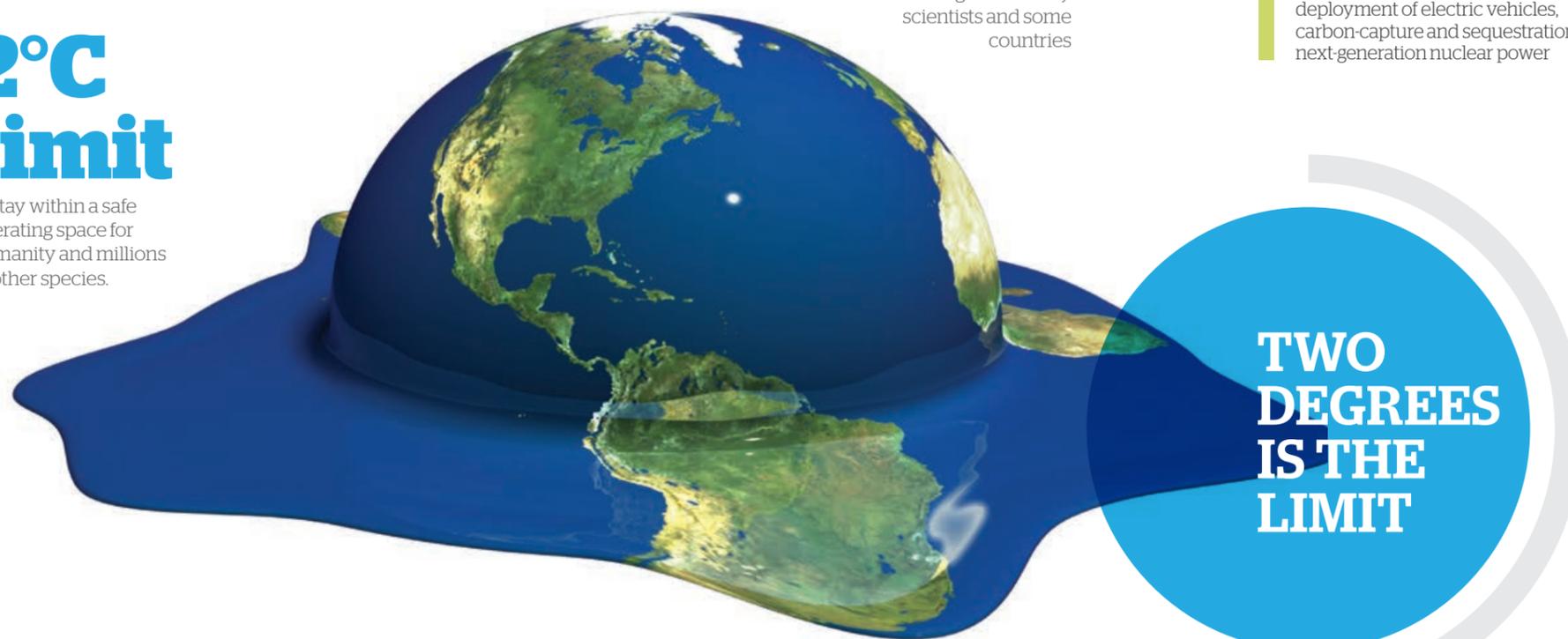
IT IS TIME TO ACT

MESSAGE ON CLIMATE CHANGE TO WORLD LEADERS FROM THE UNITED NATIONS SUSTAINABLE DEVELOPMENT SOLUTION NETWORK

Originally published on <http://unsdsn.org/climate-letter/>, the message and a list of all signatories was presented to world leaders on the occasion of the UN Climate Summit, convened by UN Secretary-General Ban Ki-moon at the United Nations, New York City, on September 23, 2014.

2°C limit

to stay within a safe operating space for humanity and millions of other species.



Human-induced climate change is an issue beyond politics. It transcends parties, nations and even generations. For the first time in human history, the very health of the planet, and therefore the bases for future economic development, the end of poverty and human wellbeing, are in the balance. If we were facing an imminent threat from beyond Earth, there is no doubt that humanity would immediately unite with a common cause. The fact that the threat comes from within - indeed from ourselves - and that it develops over an extended period of time does not alter the urgency of cooperation and decisive action.

The world has agreed to limit the mean temperature increase to less than 2-degrees Centigrade (2°C). Even a 2°C increase will carry us to dangerous and unprecedented conditions not seen on Earth during the entire period of human civilization. Various physical feedbacks in the Arctic, the oceans, the rainforests and the tundra could multiply a 2°C temperature increase into vastly higher temperatures and climate disruption. For this reason many scientists and some countries advocate for 1.5°C or even stricter target.

To give up on the 2°C limit, on the other hand, would be reckless and foolish. We would abandon our remaining chance to stay within a safe operating space for humanity and millions of other species. By holding the 2°C limit, we would retain the global option to adopt an even more stringent emission reduction limit in line with evolving scientific knowledge and technological capacities.



1.5°C

Is even a stricter target for many scientists and some countries

The 2°C limit, or an even stronger target, can be met through long-term national strategies and concerted global cooperation. All countries must commit to a deep decarbonisation of their energy systems, shifting from high-carbon energy (coal, oil and natural gas) to low-carbon energy of various kinds (e.g. wind, solar, nuclear and carbon capture and sequestration, known as CCS). Low-carbon electricity, massive gains in energy efficiency and the electrification of vehicles and heating and cooling systems of commercial as well as residential buildings can lead to a dramatic reduction of carbon-dioxide emissions alongside a growing economy. Changes in lifestyle patterns and urban planning can make another important contribution. The many co-benefits of decarbonization with the deployment of sustainable energy, information and communication

You can add your voice to support this message on www.unsdsn.org/climate-letter/

technologies will include cleaner air and water, enhanced biodiversity, and security of domestic renewable energy resources. Targeted efforts are also required to decarbonize key industries. Finally, countries need to curb greenhouse gas emissions resulting from agriculture, livestock and land-use change, such as deforestation. They must also manage and restore ecosystems to ensure they can serve as a significant net sink for greenhouse gas emissions.

The technological transition during the first half of the 21st century is within reach, especially in light of massive advances in knowhow in recent years. In many parts of the world and in some contexts, solar and wind power are already at "grid parity". Large-scale deployment of electric vehicles, carbon-capture and sequestration, next-generation nuclear power

plants for those countries deploying nuclear power, and other low-carbon energy technologies are all within reach. They can be pushed to commercial readiness and large-scale deployment through concerted public and private programs of research, development, demonstration and diffusion (RDD&D) on a global scale.

We have nearly exhausted the Earth's carbon budget, which measures the cumulative emissions of CO₂ that will likely keep the planet within the 2°C limit. Only through a drastic reduction of carbon emissions between now and 2050, en route to a zero-net emission economy in the second half of the century, can we meet the challenge of remaining below 2°C. Yet, deep decarbonisation can be accomplished. As President John F. Kennedy said a half-century ago, "We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills..."

In our time, humanity again must choose, this time to save our planet from shortsightedness, greed and apathy to avoid catastrophic climate change. This time too, we must organize and measure the best of our energies and skills to stay within 2°C. We call upon you, world leaders, to recognize the gravity of the situation, and to call upon all of us to rise to the occasion. We owe nothing less to ourselves, to future generations and to Earth itself.

COMMENTARY

BY GUIDO SCHMIDT-TRAUB,
EXECUTIVE DIRECTOR, SDSN

At the United Nations Climate Summit on 23 September 2014 world leaders convened to announce practical measures to head off disastrous climate change. At the summit a message from leading scientists and practitioners to world leaders was delivered.

We've just about run out of time to keep the rise of global temperature below 2°C. Even 2°C is enough to create chaos in many parts of the world: higher sea levels, more floods, droughts, ocean acidification, heat waves and extreme storms.

The world promised to act in 2010, but instead emissions have kept on rising. Yet, we can still stay within 2°C if all major economies of the world begin to take strong and consistent actions to decarbonize their national energy systems and reduce emissions from land-use change.

You can add your voice to support this message on www.unsdsn.org/climate-letter/

BY HE ENG WALEED SALMAN, CHAIRMAN,
DUBAI GREEN ECONOMY PARTNERSHIP

Every individual on this planet will agree with the statement above. I hardly find anyone to reject the fact that in some shape or form, our current resource consumption is unsustainable and will lead to drastic change. However, there is a big gap between stating once beliefs and acting on them. We must realize that what we commit to requires us to make an effort and move outside our comfort zone.

We have witnessed strong support from the MENA region, which shares our dedication and has signed the SDSN letter, whilst collaboratively working towards a knowledge platform and Green Economy marketplace to foster replicable and scalable solutions that are suitable to the region.

BY IVANO IANNELLI, CEO,
DUBAI CARBON CENTRE
OF EXCELLENCE

As a foreign resident of the UAE, I cannot help but admire the ability of HH Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler

of Dubai, to set up long term strategies that create a national convergence towards a single common goal.

Recently, with the World Expo bid for 2020, the country moved as one towards achieving a common goal. Likewise, new policies and initiatives are launched regularly, creating a similar unison.

We wish to emulate such successes in a different environment and believe that our ability to share each other's successes is key towards implementing our commitment to the above.

We know that MENA has the entrepreneurship skills that could foster a new best practice in business, a fact that has been proven by the numerous signatories from this part of the world.

MEET THE GREEN ECONOMY.

OVERVIEW

INTRODUCTION

The term "green economy" has peppered international sociopolitical conversations for the past decade, primed to take on the major challenges of the 21st century, including urbanisation, resource scarcity, climate change, and economic volatility.

With a heightened awareness of its economic, social and environmental benefits, 65 countries - a quarter of the world - are currently dedicated to implementing a green economic model in the coming years according to UNEP's Green Economy Coalition, and the UAE is proudly one of them. A focused federal strategy for economic growth has been developed, aiming to position the UAE as a competitive, knowledge-based international powerhouse. The nation's commitment to diversifying and strengthening its green economy is substantiated in the multiple strategies and frameworks in place - from the UAE National Agenda Vision 2021, to the sustainability theme and targets set for EXPO 2020.

Dubai in particular has expressed the determination to take the lead in the region. Initiatives including the Green Economy Partnership, the newly launched Green Jobs programme, the Carbon Ambassador programme and this report stand testament to the Emirate's impassioned dedication to establishing the groundwork for long term follow-through. In April 2014, the first World Green Economy Summit was held in Dubai, leading to the Dubai Declaration - a pledge to develop the Emirate as the green economy capital of the world.

RETHINKING DEVELOPMENT FOR A GREEN TRANSFORMATION

By Leisa Perch
& Kishan Khoday

50 years

of experience in development cooperation in countries around the world

Innovation

is key to the region's future.



The world is undergoing a profound transformation, especially remarkable because it cuts across many different economic, social and environmental dimensions. At the heart of this transformation is the re-emergence of the South at the center of the world economy, and it also places such countries on the cusp of tremendous opportunities for emerging as leaders in the new economy of the future. This is best evidenced in the prospects for a Green Economy, with the opportunity for countries to engage economic, social and environmental 'triple-wins' from new more sustainable approaches to growth and development.

With a focus on innovation for sustainable pathways, green economy solutions at their core address both opportunities and risks. For example, they can help create new high-tech sectors in energy, water and smart city spheres, while at the same time reducing the serious climate, food, water and energy risks facing the world, and the related social or security shocks facing poor and vulnerable communities in particular. This social equity dimension to the green economy framework is a particular focus for UNDP's cooperation strategies and programmes.

Beyond being mere externalities to economic growth, in coming years such risks will bring serious challenges to the core of the world's economies. Pursuing effective green economy responses is thus about more than technology and finance; it is also about rethinking the foundations of development and growth. The type of long-term vision elaborated in the UAE's strategies for green economy holds hope in this regard.

The set of challenges and opportunities highlighted in this State of Green Economy Report is a key call to action for those institutions in the country - and indeed in like-minded countries across the South - aiming to emerge as global thought leaders and a respected voice in the debate over post-2015 sustainable development goals. Its elaboration of local strategies in this area is also coupled with a growing commitment to becoming a global partner for sustainable development to other countries across the South, a goal which UNDP commends and stands ready to support through our global south-south platforms.

As part of the process of engaging the Arab Gulf Research Centre on the challenges of rethinking development through a green economy lens, 2014 saw the convening of the Fifth Annual Conference of the Gulf Research Centre (GRC), including a specific

working group on Green Economy. UNDP and its newest global policy centre - the World Centre for Sustainable Development (also known as the RIO+ Centre) - were pleased to partner in this process, bringing together researchers, policymakers and stakeholders to consider the green economy challenges and opportunities before the Arab region in particular. The challenge of rethinking development resonated strongly in different forms.

A particular theme emerging at the GRC Conference is the tension between evolution and revolution and this also was reflected to some extent in the green economy workshop. The Arab region has experienced great debates in recent years on how this applies to political and social change, but less so on the perhaps equally important topic of how countries and communities govern and manage their natural assets and future sustainability. As noted by some commentators, given the serious trends of energy, water and food insecurity across the entire Arab region, new green approaches to development and growth need to be factored into new thinking locally among policy makers and leaders in the economy, especially among the new generation of leadership. This should go well beyond the mere re-packaging of standard paradigms of reform and progress from the past towards ambitious transitions at this critical turning point and cross-roads for the region's environment, society and economy.

Whether the nature, scope and scale of the region's current state of transformation will influence how a green transformation is undertaken is hard to foresee. It is possible to say that it is unlikely that the broader socio-political changes underway on one hand, and the natural resource and environment risks and opportunities on the other, can remain unconnected debates and processes for very long, if the region is to re-emerge from its current state in a sustainable and equitable manner.

As UNDP's nearly 50 years of experience in development cooperation in countries around the world - including countries in the Arab region - shows, transformative

processes are often behind, beside and beneath large-scale change, whether defined by a slower-paced evolution or a more rapid revolution. Transposed into the context of future prospects for Green Economy solutions in the Arab region, this implies the remaking of long-standing systems and theories of development in the region, often defined by the region's rentier economics as well as strong external pull and push forces.

As reflected at the 2014 Gulf Research Centre debates on green economy, the evolution-revolution dichotomy is seen through interesting and somewhat heated debates where those who believe that evolution often trumps revolution are met forcefully by others who feel that revolution is always a necessary and useful agent for change to overcome strong barriers to change. Pursuing a green economy future in the Arab region likely needs both evolutionary and revolutionary dynamics in terms of a new era of development policy, means to engage issues of both sustainability and equity in resource governance, and ways to engage the benefits of social accountability mechanisms as a foundation of inclusive, participatory decision-making.

Innovation is key to the region's future. Entrepreneurship which brings together economic, social and environmental strands of development will need to accompany the standard forms of economic recovery and growth being pursued. A key element of this is the role that confident and pro-active governments can play in the green economy agenda, for example the effective positioning of China and Brazil for what could well be a green revolution in the making.

The social inclusiveness of such models and processes of change are the heart of calls to implement the social equity promise embedded in the green economy concept. For example, analysis by the International Energy Agency suggests that structural transformation of energy will depend largely on the private sector and households (each 40%) giving strong credence to the need for greater inclusiveness in decision-making. 

Current economic drivers, such as the opportunity costs in the Arab Gulf from growing diversion of oil resources away from exports to surging local electricity and water generation, or growing levels of economic and social vulnerability in resource scarce countries in the rest of the Arab region, are key drivers towards a green economy transition, but may be insufficient in and of themselves to advance a true lasting transformation in development and growth policy.

Though commitment to green economy-related approaches is steady and growing in the Arab region, its pace and scale still lags behind those of ongoing investments in traditional sectors. When a landscape view is taken of the development policies currently in place - with some level of bias towards promoting more choices rather than directing choice and towards policies that focus more on shifting individual behavior as compared to those that can help shift the underlying structures and forms of development and growth. Both are needed. This implies the following related to our vision of inclusive and sustainable growth and development:

(i) Enhancing public/private investments to catalyze green solutions to economic recovery and resilience and enable long-term transformation of development pathways;

(ii) Enabling the role of South-South cooperation as a platform for exchange emerging models of green growth in the South, and as a means to engage Southern providers of public and private finance for green economy goals in developing countries; and

(iii) Applying sound social and environmental principles and safeguards in the process of investment including international and domestic development finance.

UNDP's 2012 report "Green Economy in Action" shows the value of tackling economy, society and environment at the same time and the need for a reset of development frameworks and mind-set alongside a technological revolution. UNDP's Equator Prize, for example, has often rewarded social innovation in hand with technology solutions. These links are important for directing the benefits of a green economy. Left to itself, there is little guarantee that a green economic system will equitably allocate benefits. For example, a recent review highlights estimates of green employment gains in China are mostly likely through indirect employment than through direct employment and sometimes higher in sectors like forestry than the power industry, or iron and steel.

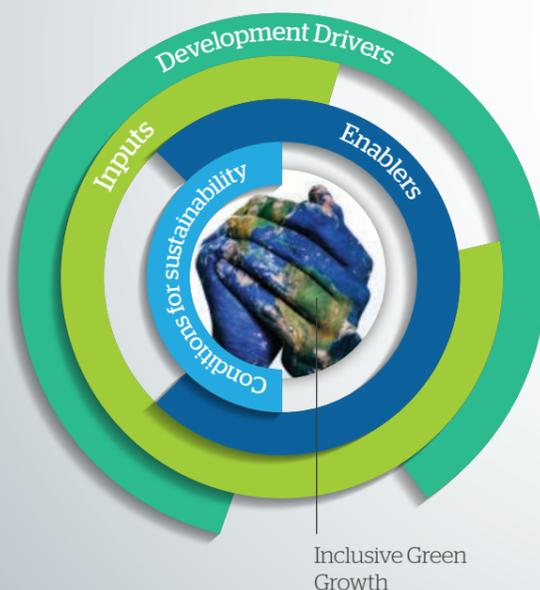
UNDP's broader engagement in green economy thinking, planning and practice, through the Partnership for Action on the Green Economy (PAGE) as well as various elements of dedicated country level projects around the world, also seeks to highlight the scope and scale at which such innovation is needed and possible and to lend support to both innovation and up-scaling. Leveraging the public policy agenda for green economy approaches to development is one of the key areas where value-added lies in future international cooperation. To the right is a comprehensive approach to better frame social equity and environmental sustainability dimensions of green economy.

Research by the RIO+ Centre on how effectively the social equity agenda has mixed in with green growth processes shows the need for more focussed attention on social equity than has been given to date. This is particularly important for the social empowerment agenda in the Arab region, where UNDP cooperation with partners as a whole could make a difference. Inclusive green economies are possible but not without purposive planning, adaptive policy-making and forward thinking.

With our continued and strong presence in the Arab region, and with ever-expanding partnerships across segments of society, UNDP will continue to be a voice for such efforts and an enabling hand for actionable change locally and globally. Learning from green economy movers in the South, like the UAE, will be key to doing so, and UNDP stands ready to jointly pursue the various opportunities highlighted in this State of Green Economy Report within the region and through linking the UAE's solutions to emerging global partnerships for sustainable development through South-South cooperation. *and*



FIGURE 1. CONCEPTUAL FRAMEWORK DESIGNED FOR THE CDKN-FUNDED GREEN GUIDE PROJECT (PERCH, FORTHCOMING)



- Development Planning, Mineral/ Natural Resource Wealth, Water, Food Security and Equity
- Policy, Partnerships, Finance and Investment
- Jobs, Technology, energy and Environmental Security & Innovation
- Environmental Governance, Equality, Resilience, Inclusiveness, Poverty Reduction and Growth

FOOTNOTES

¹ The RIO+ Centre was established in June 2013 and is a RIO+20 Legacy Institution.
² Mariana Mazzucato, The Entrepreneurial State (Anthem Press 2013, New York)
³ UNTT, Public support to private investment for sustainable development: challenges and opportunities, with emphasis on the environmental pillar (UNTT Working Group on Sustainable Development Financing, Chapter 4, UNDESA, New York). Available from <http://sustainabledevelopment.un.org/content/documents/2111Chapter%204-public%20support%20to%20private%20investment.pdf>.
⁴ Pablo Burkolter & Leisa Perch (2014) Greening growth in the South: practice, policies and new frontiers, South African Journal of International Affairs, 21:2, 235-259, DOI:10.1080/10220461.2014.941917.

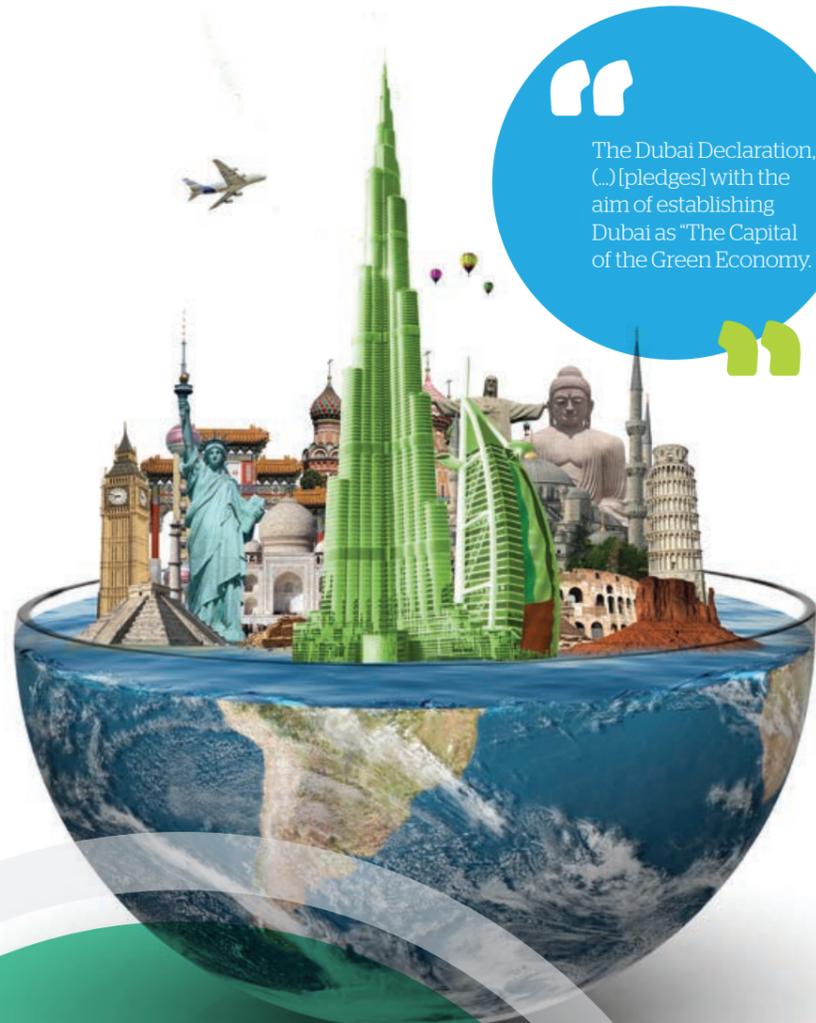
LEISA PERCH
POLICY SPECIALIST

World Center for Sustainable Development (Rio+), Rio de Janeiro

KISHAN KHODAY
REGIONAL CLUSTER LEADER FOR CLIMATE CHANGE & RESILIENCE

UNDP Regional Center for Arab States

COMMITTED TO ACT: THE DUBAI DECLARATION



The Dubai Declaration, (...) [pledges] with the aim of establishing Dubai as "The Capital of the Green Economy."



HE SAEED MOHAMMED AL TAYER SAID,

WE HAVE COME TO THE END OF THIS WORLD GREEN ECONOMY SUMMIT, WHICH HAS BEEN VERY SUCCESSFUL AND GENERATED MANY NEW PARTNERSHIPS, INITIATIVES AND PROJECTS TO DEVELOP A GREEN ECONOMY HERE IN DUBAI, IN THE REGION AND WORLDWIDE. DUBAI HAS DEMONSTRATED THROUGHOUT THIS WORLD GREEN ECONOMY SUMMIT ITS COMMITMENT FOR A GREEN ECONOMY AND SUSTAINABLE DEVELOPMENT.

The inaugural World Green Economy Summit in Dubai (WGES), one of the largest events in the world on the green economy, was a very successful meeting bringing together world leaders united in accelerating the transition to a green economy and sparking many new initiatives, partnerships and projects both locally and on an international scale. In order to build on the outcomes of the Summit and fully confirm its commitment to a green economy, the Summit birthed a groundbreaking commitment to sustainable development by a leading city in the world: the Dubai Declaration. This Declaration outlines a clear roadmap for achieving the sustainable ambitions of key government initiatives as the World Expo 2020 and the UAE Vision 2021.

The Dubai Declaration, signed and announced at the summit by HE Saeed Mohammed Al Tayer, pledges a commitment to establish the World Green Economy Summit as a long-term development platform with the aim of establishing Dubai as "The Capital of the Green Economy", through the development of innovative green financing mechanisms, the showcasing of green projects through the Public Private Partnership Platform and collaboration on an international level. It has already gained support from such prestigious organizations such as UNDP, IRENA and UNFCCC.

Dubai has taken a very active role in international climate negotiations, becoming part of the Road to Paris 2015, a process among business, finance and government to facilitate a binding agreement in Paris during the UNFCCC COP21 negotiations. Placing a strong emphasis on the future, Dubai has as well committed to showcasing and driving the involvement and engagement of youth towards a green economy and climate change.

Following up on the commitments of the Dubai Declaration will be a point of departure for next year's World Green Economy Summit 2015.

As the most significant outcome of the World Green Economy Summit 2014, the Dubai Declaration pledges to make the summit a long-term development platform, with the aim of establishing Dubai as "The Capital of the Green Economy".

The commitments made through this declaration will be followed up over the course of the coming year and serve as a point of departure for WGES 2015.

HIGHLIGHTS FROM THE DUBAI DECLARATION INCLUDE COMMITMENTS TO:

Developing WGES as a key global green-economy platform

Establishing a Public-Private Partnership Platform to facilitate and showcase innovative projects, partnerships and technology

Actively support initiatives and platforms launched out of WGES 2014

Support the development of innovative financing mechanisms for green projects and investments

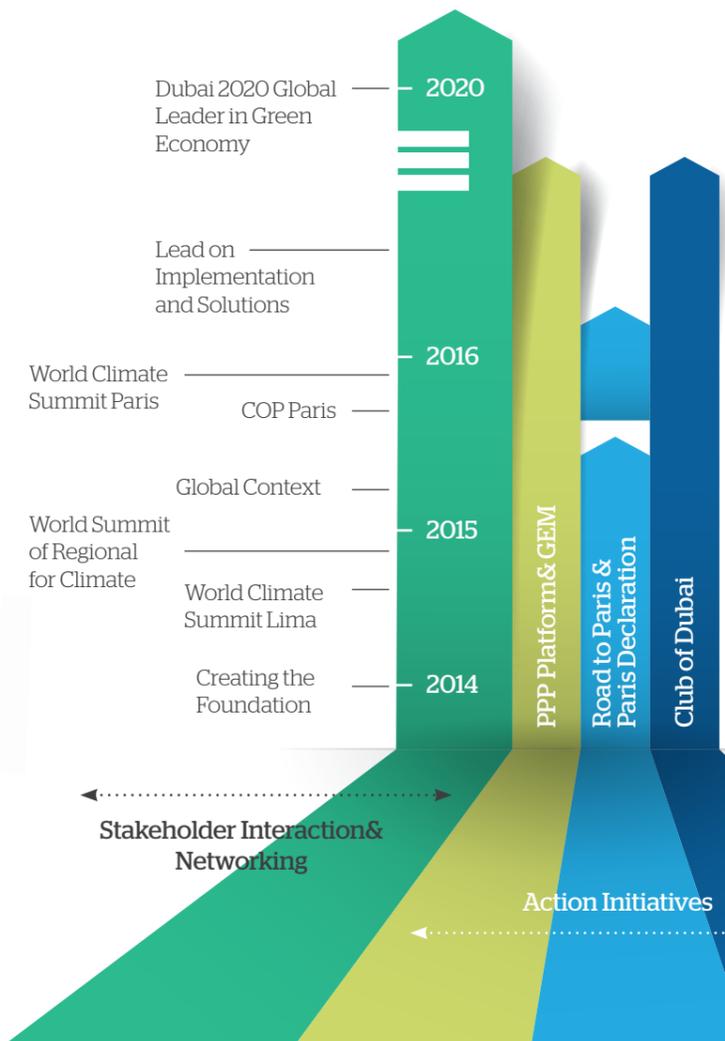
Develop and showcase leading-edge green innovation

Engage the youth in green-economy activities

Publish an annual Dubai Green Economy Report as a platform for discourse *emd*



OUTLOOK ON THE SUMMIT'S AMBITIONS:



THE UAE - BUILDING THE BLOCKS OF A GREEN ECONOMY

By HE Saeed
Mohammed Al Tayer

The UAE is making the transition towards a sustainable economic model based on renewable resources, knowledge-based innovation and low carbon technologies - the key fundamentals of a green-energy future.

Developed nations have long reaped substantial economic benefits from the process of industrialisation; however, in parallel, the growth of this sector has also greatly contributed to global environmental degradation. Ever since the mid-19th century, the rapid progression of industrialisation has significantly enhanced global standards of living, due to cutting-edge (yet often pollution-intensive and resource depleting) technologies. Today, as a result of rising carbon emissions and increasing energy consumption, the world is facing escalating ecological challenges, forcing developed countries to recognise their environmental debt and thus, assume a greener, more sustainable economic approach. In addition to protecting the earth's ecosystem and preventing further environmental scarcities, a competitive knowledge-based green economy - centring on research and innovation - promises natural resource conservation, improved human well-being and of course, continued prosperity. While the transition to a low-carbon green economic model might prove difficult to implement for some, several countries have already embraced the financial, social and environmental gains of a sustainable development perspective.

In recent years, the UAE has demonstrated a strong commitment to developing a domestic-led green economy, as part of its strategy to reduce the nation's dependence on fossil fuels as well as encourage the use of renewable resources and support long-term economic growth. By launching a range of initiatives to reduce its carbon footprint and guarantee a clean energy future, the Emirates has emerged as a leader in the green revolution.

A PIONEERING VISION

The UAE Vision 2021 epitomises the country's ground-breaking eco-pledge. Launched in 2010, the initiative charts the next stage in the UAE's development phase, and its primary goal is to further drive the nation's plans to foster a knowledge-based economic model where growth is stimulated by innovation and through investments in research, science and technology. Encouraging and supporting the UAE Vision 2021 for balanced growth through sustainable sources of energy are intended to ensure that the UAE assumes an important role to find renewable alternatives and options, as well as to look beyond traditional economic models and take a more flexible perspective for a sustainable and diversified economy.

The eco-driven strategy of the UAE Vision 2021 has placed the UAE on the global map for sustainability and it is partly based on this incentive that World Energy Day, 22nd October, was created in Dubai at the inauguration of the World Energy Forum 2012 during 22-24 October 2012, under the patronage of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.



القمة العالمية للاقتصاد الأخضر
WORLD GREEN ECONOMY SUMMIT
22-23 April 2015 ٢١-٢٣ أبريل ٢٠١٥
Dubai, United Arab Emirates دبي، الإمارات العربية المتحدة

DUBAI CAPITAL OF GREEN ECONOMY

The eco-driven strategy of the

UAE VISION 2021

has placed the UAE on the global map for sustainability

TRANSITION TO A GREEN ECONOMY

Knowledge and innovation play an instrumental role in the development of a green economy. After all, it is through investments in research and technology that alternative sources of energy can be initiated and patterns of the ecosystem can be adequately anticipated. In the UAE, Dubai is building on its position as a global hub for trade, finance and tourism to make the transition to a green economy. This enabling environment, impelled by the visionary leadership of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, has transformed the emirate into a model for sustainability.

Dubai's plan to build a knowledge-based economic model was clearly demonstrated in early 2012, when a national initiative to build a green economy was launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum called 'Green Economy for Sustainable Development.'

The Green Economy Initiative promotes low carbon economic growth and an investment-friendly financial climate. DEWA's strategy

is closely aligned to this strategy, as demonstrated by its vision to become a world-class sustainable utility. DEWA supports a wide variety of initiatives to enhance sustainable solutions. This also complements the Dubai Integrated Energy Strategy 2030, which aims to reduce energy consumption by 30% by 2030, through the adoption of energy efficiency initiatives. The implementation of this strategy will strengthen Dubai's leading position in energy security and efficiency, and support a green economy and sustainable development, which emerges from the clear vision of the government.

The Green Economy Initiative is transforming the UAE into a leader in sustainability and a competitive centre for the export and re-export of green technologies and products. The operation introduces a plethora of programmes and policies spanning various sectors - including energy, agriculture, investment and sustainable transport - and which are set to further improve standards of living in the country. Covering the fields of Green Energy, Green Economy, Green City, Green Policy and Programmes, Green Living and Green Technology, the project features regulations which promote renewable energy, encourage green building, reduce carbon emissions, encourage investments, promote waste management and drive green innovations.

The UAE has made sustainable development one of its main priorities, to become a leading player in the region and the world, as it adopts best practices and successful national models that help boost its competitiveness as a knowledge-based economy with world-class human capital supported by a solid integrated infrastructure and a stimulating business environment. This is in addition to effective strategic partnerships between the private and public sectors and the various policies and initiatives that combine efforts towards building a bright future, for generations to come.



HE SAEED
MOHAMMED AL TAYER
MD AND CEO OF DEWA

GREEN GROWTH AND ECONOMIC DIVERSIFICATION

A unified vision for a sustainable future is pivotal to the success of building a green economy. In the past decade, the government of Dubai has spearheaded a host of eco-operations, all of which aim to further integrate green economy policies into the Emirate's development process. In 2011, HH Sheikh Mohammed bin Rashid Al Maktoum, initiated the Dubai Integrated Energy Strategy 2030, a long-term national programme that outlines the plan for a sustainable economy and clean energy future by generating hefty investments as well as new business opportunities and Public-Private Partnerships. The Dubai Integrated Energy Strategy 2030 seeks to diversify sources of energy, reduce energy consumption in Dubai by 30% by 2030 and divert from fossil-fuel energy to eco-friendly sources. Dubai is concerned with all activities related to energy sustainability. We realise the importance of reducing carbon emissions at the international level. This can be clearly seen through our adopting various important initiatives that conserve resources and promote sustainability.

The Dubai Supreme Council of Energy and its member companies all have contributed to Dubai's green development by bridging and harvesting efforts to optimise renewable energy in the emirate. A highly-diversified clean energy sector can considerably help achieve the objectives of a low carbon economy - striking a balance between economic growth and eco-efficiency.

The Supreme Council of Energy and DEWA have made significant achievements to achieve these goals. DEWA opened the Sustainable Building in Al Quoz in February 2014 to become the largest government building in world with a Platinum Rating for green buildings issued by Leadership in Energy and Environmental Design (LEED). This building reduces its energy footprint by about 66% and reduces its water consumption by 48%.

As per the goals of the Dubai Integrated Energy Strategy 2030, DEWA is on track with its development of the Mohammed bin Rashid Al Maktoum Solar Park.

Originally unveiled by HH Sheikh Mohammed bin Rashid Al Maktoum in January 2012, His Highness then opened the solar park on World Energy Day on 22 October 2013 with the completion of the first phase, a 13MW photovoltaic plant, and the launch of the next phase to build a 100MW photovoltaic plant based on the Independent Power Producer model. Eventually, the park will generate 1,000MW of electricity from a range of solar power technologies. As per the Dubai Integrated Energy Strategy 2030, DEWA will diversify the energy mix to increase solar power to 1% by 2020 and 5% by 2030. This important step, will further preserve natural resources and curb carbon dioxide emissions and help establish a clean and healthy environment to live in.

DEWA has also achieved significant savings in energy consumption, by adopting environmentally-friendly technology in the production of electricity and water, as well as launching a number of initiatives that have contributed to the high rates of savings in the consumption of electricity and water to save resources for a better tomorrow.

These include a range of initiatives to promote environmental awareness, such as the Conservation Award in collaboration with the Knowledge and Human Development Authority for the educational sector. Other initiatives include the Best Consumer Awards for the residential and industrial sectors, the Neighbourhood Campaign, 'the Green Footprint campaign promotes the sensible use of electricity and water to conserve natural resources, the Peak Load campaign, Earth Hour celebrations, and several others.

Additionally DEWA also works to develop smart electricity and water distribution networks to achieve the highest possible standards in efficiency and demand management. This is important to reduce the carbon footprint, and achieve significant savings in energy consumption by adopting environmentally friendly ways to generate electricity and energy.

Reduce energy consumption in Dubai by
30%
by 2030

INDUSTRIAL DIVERSIFICATION

Founded in 2011 through an agreement between the Dubai Supreme Council of Energy and the United Nations Development Programme, the Dubai Carbon Centre of Excellence (DCCE) is another strong symbol of Dubai's environmental integrity. The DCCE provides advisory and carbon-aggregation services to both the private and public sector, to further accelerate the transition into a green economy.

To date, the DCCE has registered Clean Development Mechanisms (CDMs) that are directly reducing carbon dioxide emissions in the UAE.

DEWA launched the Etihad Energy Service Company (Etihad ESCO) in 2014 to leverage this regulatory framework and launch energy efficiency projects to further develop the sector. This Super ESCO now accredits ESCOs to build and develop sustainable energy- and resource- efficient systems and solutions for Dubai's buildings.

increase solar power to
1%
by 2020 &
5%
by 2030

THE MOHAMMED BIN RASHID SOLAR PARK SOLAR INNOVATION CENTRE, EDUCATION, EXHIBITION AND BUSINESS CENTRE AND SOLAR INNOVATION HUB.

LOOKING AHEAD

Thanks to the continuous efforts of the Supreme Council of Energy and its members companies, and DEWA in particular, there is considerable evidence that the UAE is on track to become a green economy by committing to achieve its national goals and the directives of its wise leadership. These achievements now create the basis to make even greater successes, as Dubai works towards a brighter, sustainable future, for generations to come. *en.d*

ABOUT THE WORLD GREEN ECONOMY SUMMIT

The World Green Economy Summit (WGES), held in Dubai in April 2014, was the first green summit in the Middle East and North Africa region, bringing together world leaders united in pursuing a sustainable future for humanity by forging global partnerships that accelerate the transition to a green economy.



القمة العالمية للإقتصاد الأخضر
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WGES is an initiative of Dubai Electricity & Water Authority (DEWA) under the leadership of the Dubai Supreme Council of Energy, the organisation that is leading Dubai's transition to a green and low-carbon economy across all strategic economic sectors, and which is also developing the 1,000 MW Mohammed bin Rashid Al Maktoum Solar Park project.



WGES 2014 was held under the theme **"Global Partnerships, Sustainable Future"** and looked to complement the sustainable future vision of the UAE and global efforts to combat climate change by being:

- A strategic enabler for the national green-economy agenda
- A regional and global growth driver of green trade and investment partnerships
- A global green-economy marketplace for technologies, products and services

The summit was organised in partnership with the Dubai Green Economy Partnership, WETEX - the leading Energy, Technology and Environment Exhibition organiser in the region since 1992, and the international green stakeholder platform, World Climate Ltd. WGES 2014 was held at the Dubai International Convention and Exhibition Centre on the 15 - 16 April 2014, alongside WETEX 2014, which attracted more than 1,500 exhibitors and over 20,000 visitors.

The United Arab Emirates is the first country in the MENA region to commit to a green-economy strategy and Dubai is leading the region in green-infrastructure investment - from renewable energy and green buildings to public transport and green technologies.

The Dubai Integrated Energy Strategy 2030 aims to reduce energy demand by 30% by 2030 and diversify the energy mix of the Emirate.

30%

WGES complements the sustainable-future vision of the UAE, from its efforts in combatting climate change, the establishment of Masdar City, and hosting the International Renewable Energy Agency (IRENA) in Abu Dhabi, to the Mohammed bin Rashid Al Maktoum Solar Park project and other leading initiatives, projects and programmes.

Dubai also unveiled the Dubai Green Economy Partnership programme, which seeks to spur sustainable and green growth of the Dubai economy and promote its position in the global green-economy value chain for green and clean technologies and sustainable consumption. The new programme is in harmony with the Dubai Strategic Plan 2015 and the UAE Green Economy Strategy launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, under the theme "Green Economy for Sustainable Development". *em.d*

THE FIRST WORLD GREEN ECONOMY SUMMIT: STRONG ON OUTCOMES

During 15 - 16 April 2014, the inaugural World Green Economy Summit (WGES) was held in Dubai, UAE, which brought together over 1,100 delegates to witness the launch of the first green-economy summit in the Middle East and North Africa region. Over the course of the two days, thought leaders, members of government and business leaders discussed and showcased strategies and commitments for the development of a global green economy resulting in a number of key outcomes.

The Dubai Declaration, outlining the next steps for the World Green Economy Summit and the commitment to develop Dubai as "The Capital of the Green Economy", was signed and announced by His Excellency Saeed Mohammed Al Tayer, Vice Chairman of the Dubai Supreme Council of Energy and MD and CEO of the Dubai Electricity and Water Authority (DEWA). Michele Sabban, Founding Member and President of R20 Regions of Climate Actions, invited Dubai to participate in the Road to Paris, a bottom-up advocacy platform created to support the signing of a binding international climate-change agreement at COP21 in Paris in 2015. Attendees also witnessed the unveiling of the Public Private Partnership Platform, a year-round mechanism to drive projects and partnerships for green business, and the launching of the Green Economy Marketplace, which will take shape over the coming year, and will work with green-growth and green-economy partners such as OECD, ICC, GGGI and UNDP to identify globally scalable models for the development of a green economy.

Several exciting announcements were made during the summit between key partners and businesses attending. DEWA signed an MOU with the South Korean Utility, KEPCO, to form an international centre of excellence for smart-grid technologies.

Looking to develop a funding strategy for green investments in Dubai, an agreement was signed by the World Bank and the Dubai Supreme Council of Energy. UNDP and the Clean Energy Business Council launched the new Arab Business Forum for Sustainable Development and Green Economy in the Arab region, and DEWA announced that they have started working with KPMG for the 100 MW extension of the Mohammed bin Rashid Al Maktoum Solar Park, which will subsequently become the world's largest solar park. HE Saeed Mohammed Al Tayer Vice Chairman of Dubai Supreme Council of Energy stated: "The World Green Economy Summit is an extremely important step towards driving the UAE's development into a green economy, through investment, green partnerships and the creation of a global market for green products, technologies and services. This summit will help us to achieve economic and social development as we seek to battle climate change, and form a roadmap towards a greener economy."

The tangible outcomes of the first World Green Economy Summit are extraordinary and demonstrate the willingness of both the public and private sectors to take the necessary steps towards a sustainable future. Through strong partnerships, community engagement and knowledge-sharing, WGES has the potential to generate green business and catalyse the transition towards a global green economy. *em.d*

By HE Eng. Waleed Salman and André Schneider

WGES 2014 EVENT OUTCOMES

The Dubai Declaration, pledged WGES as a long-term development platform, in the aim of establishing Dubai as "The Capital of the Green Economy". Key commitments in the Dubai Declaration include:

- Developing WGES as a key global green economy platform
- Establishing a **Public-Private Partnership Platform** to facilitate and showcase innovative projects, partnerships and technology
- Develop innovative **green financing** mechanisms
- Showcase **technological innovation**
- Support a global agreement for climate change at COP21 through supporting **The Road to Paris**
- Develop the **State of the Green Economy Report**

I would like to congratulate you all for a most successful and well-organised inaugural World Green Economy Summit. I personally found the conference interesting and informative.

Tong Yen Ho, CEO, Sino-Singapore Tianjin Eco-city



Great progress for an event that is still in its first year of existence! I think this would be a great stop on the Governor's campaign trail for the path to COP21.

Terry Tamminen, Special Advisor to Governor Arnold Schwarzenegger & Former Secretary of the California Environmental Protection Agency

I think [WGES] is a very important opportunity to bring out the 'world' part of the summit, to see how we can connect the emerging successes and innovations of the UAE to the global agenda, to really make the UAE a global partner in sustainable development.

Kishan Khoday, Regional Cluster Leader for Climate Change & Resilience



HE ENG. WALEED SALMAN
DEWA, DSCE, DCCE

Waleed Salman is the EVP for Strategy & Business Development with Dubai Water & Electricity Authority (DEWA) a member of Dubai Supreme Council of Energy, and chairman of Dubai Carbon Centre of Excellence and Dubai Green Economy Partnership.



ANDRÉ SCHNEIDER
WORLD CLIMATE LTD

He is the Chairman at World Climate LTD as well as Vice-President of the Ecole Polytechnique Fédérale de Lausanne

THE ROAD TO PARIS 2015: CREATING A POSITIVE AGENDA FOR A GLOBAL DEAL

By
Jens Nielsen

The UNFCCC Conference of Parties (COP) process is working towards securing a legally binding global climate agreement on curbing carbon emissions, to be made at COP21 in Paris in December 2015, which will come into effect from 2020.

The Road to Paris 2015 is a two-year process towards driving impact and results, launched by World Climate at the World Climate Summit 2013 during the UNFCCC COP19 in Warsaw, Poland. We want to show that business, government and the finance sector believe that growth and jobs can be created through increasingly going green, which is an important aspect to creating a positive agenda in support of the national governments signing a global agreement in Paris.

Furthermore, we see three key factors at play, supplementing UN efforts to secure a global climate agreement: National governments becoming increasingly aware of the relationship between national resource use and their future competitiveness; business moving from primarily defensive moves such as risk management and corporate positioning, to actively pursuing deeper sustainable innovation, also involving partnerships with other stakeholders; and the strong need to increase financing for sustainable infrastructure, which mainly has to come from pension funds and private sources in addition to financing from governments and development banks.

The Road to Paris 2015 is a two-year process towards driving impact and results

National governments become increasingly aware of the relationship between national resource use and their future competitiveness

The Road to Paris 2015 process will convene a group of globally influential, progressive and impactful organisations, leaders and other stakeholders that will promote the green economy based on public and private collaborations, showcase climate change solutions to the UNFCCC and to national and local governments, and gather a large and influential group of organisations behind a declaration to support a global deal in 2015. The World Green Economy Summit 2014 in Dubai was the first event in The Road to Paris programme. It included a keynote introduction by Christiana Figueres, Executive Secretary of the UNFCCC, and a session devoted to discussing The Road to Paris approach.

In her introduction, Figueres, addressing all participants of the summit, stated: "I ask you to actively support The Road to Paris and help mobilise key stakeholders and the organisations involved in their networks as a way to inspire the confidence governments need to achieve an ambitious and effective new

universal climate change agreement in 2015." Also during the opening ceremony of the summit, Michele Sabban, President of R20 Regions for Climate Change, invited HH Sheikh Ahmed bin Saeed Al Maktoum and the Dubai Supreme Council of Energy to join The Road to Paris in order to help build a multi-stakeholder platform. HE Saeed Al Tayer, Vice Chairman of the Dubai Supreme Council of Energy (DSCE), MD and CEO of Dubai Electricity and Water Authority (DEWA) and Chairman of the World Green Economy Summit (WGES) stated: "Dubai will support the UN, R20, and World Climate to the Road to Paris. This process among business, finance, and government to facilitate a binding agreement in Paris 2015, has started here at the World Green Economy Summit 2014, will continue at the World Climate Regions Summit in October 2014 in Paris, and will be again here at the World Green Economy Summit 2015; and then go to Paris to be present there during the COP21 negotiations."

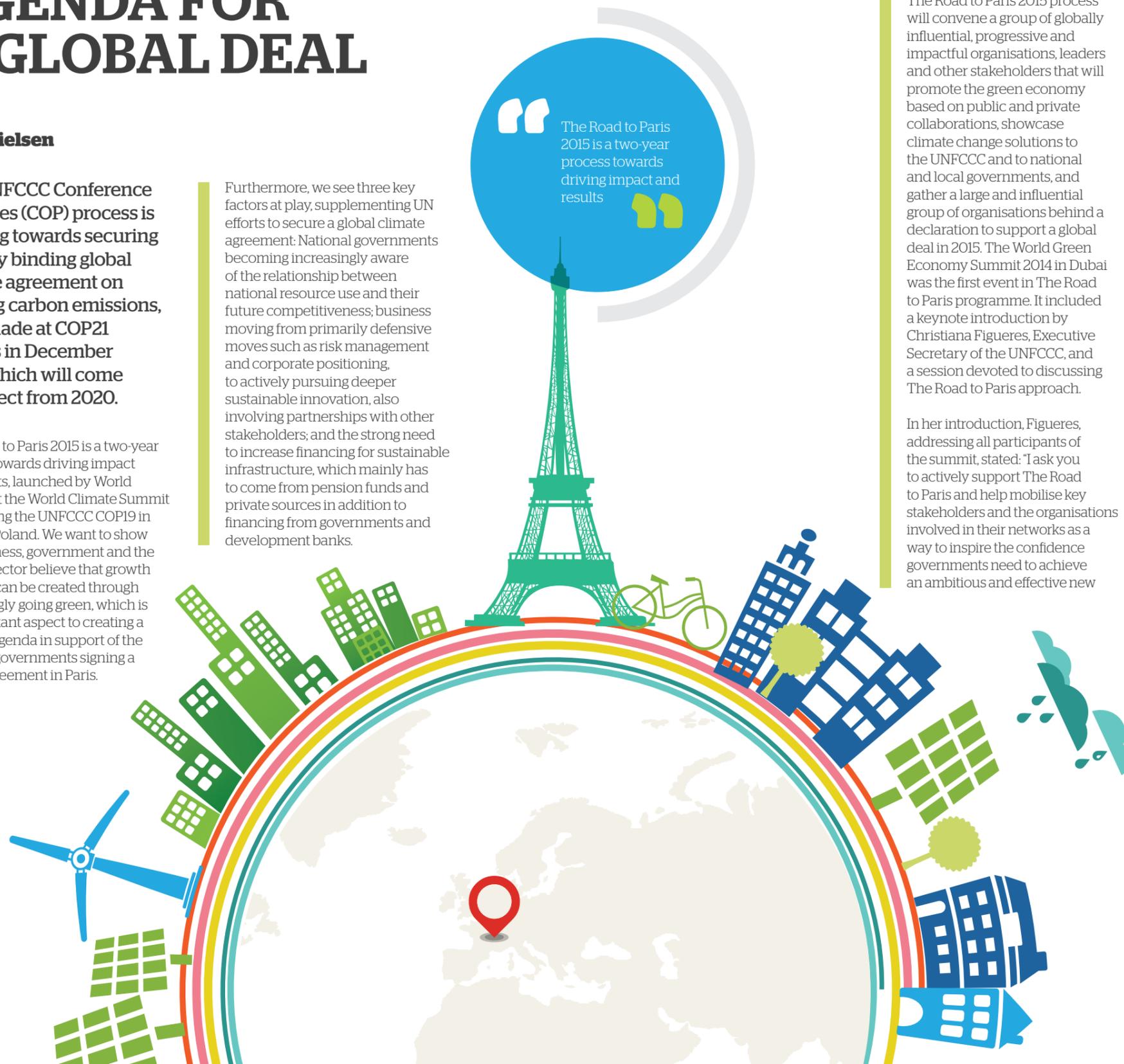
The next event on The Road to Paris will be the World Summit of Regions for Climate in Paris in October 2014, where R20 Founder, former Governor of California, Arnold Schwarzenegger, will invite a coalition of governments and businesses to sign the Paris Declaration, to pledge their support for an international climate deal at COP21. This declaration, with a focus on commitment to partnership and green growth in fighting climate change, will travel to a number of other events, with the aim of collecting over 1,000 signatures from regions, cities, businesses and financiers, which will then be presented to the UN Secretary General and the French President at COP21 in Paris. Christophe Nuttall, Executive Director of R20, stated: "The Paris Declaration is the answer to what has been missing from climate negotiations until now. For the first time, regions, technology providers, investors and civil society will come together to declare support and commit to real actions that will produce real results. Why? So that as a global community we can prosper without damaging our planet." *em.d*

The World Green Economy Summit 2014 in Dubai was the first event on The Road to Paris



JENS NEILSEN
WORLD CLIMATE LTD

He is the CEO of World Climate Ltd. He has worked in more than 20 countries performing strategy work for some of the largest companies in the world.



DUBAI GREEN ECONOMY PARTNERSHIP

In May 2012, HH Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum Crown Prince of Dubai and Chairman of Dubai Executive Council launched the Dubai Green Economy Partnership (Dubai GEP), an innovative concept in that it is the first multi-stakeholder and cross sector partnership to promote green growth in the Middle East. The programmes and initiatives of Dubai GEP aim to enable the growth of green trade and investment and accelerate the adoption of green technologies, products and services across regional and global markets.



HE Fahad Al Gergawi
Secretary General, Dubai GEP

To achieve this goal, a group of forward-thinking entities from both public and private sectors came together and committed to showcase Dubai's vision, strategy and achievements to an influential global audience and forge world-class partnerships. The Founding members of Dubai GEP are:



A collaborative engine was put in place where all founding members constructed a sustainable business framework

A platform which enables government and business leaders to accelerate the adoption of new green technologies and practices



During the conference, Dubai GEP was formally invited to participate in the World Summit of Regions

A collaborative engine was put in place where all founding members constructed a sustainable business framework that incorporated three key pillars of strategic priority:

- Effective communication strategy
- Green economy innovation center
- Gateway for green investment and trade.

This framework is supported by the solid foundation of a strong organization of broad membership base coupled with an overarching canopy of positive economic impact that further promotes investment. The vision of the group is partnership, since none of the goals could be achieved without the cooperation and joint forces of key stakeholders. The central mission is global to support the transition towards a green economy through global collaboration and innovation. The fundamental goals are progressive: primarily, to effectively contribute to the sustainable and green growth of Dubai and UAE economies; secondly, to enable the growth of green trade and investment in regional markets; and finally to accelerate the adaptation of green technologies, products and services worldwide.

GLOBAL PARTNERSHIP INITIATIVE

To build up partnerships outside the UAE, Green Trade Missions to other countries are organized where Dubai GEP brings together top government and business leaders from all over the world with the aim of sharing global best practices and connect in a global effort to achieve a Green and Sustainable Economy. Dubai GEP currently has a number of partners from all over the world: Copenhagen CleanTech Cluster, State of Green in Denmark and Canadian Foundation for Circular Economy, to name a few. The next green trade mission will be in line with the 20th session of the Conference of the Parties to the UNFCCC that is expected to take place in December 2014 in Peru.

SHOWCASE PROGRAMME

As a materialization of the mission of the group, Dubai GEP regularly participates in GLOBE, a biennial international conference and exposition on business and sustainability celebrated in Vancouver, showcasing Dubai's green vision, strategies, and achievements to a very influential global audience to forge new partnerships and investment opportunities, across all key sectors. Similarly, Dubai GEP is an organizing partner of the World Green Economy Summit (WGES) which was established as the first green economy summit in the MENA region in April 2014. During the conference, Dubai GEP was formally invited to participate in the World Summit of Regions (a preparatory event on the "Road to Paris") that will take place in Paris on October 10-11th 2014. The Summit, which is of global importance, will bring together regions and local governments from across the five continents, as well as economic leaders, in order to discuss and prepare a new international agreement on climate change. A delegation from Dubai GEP will attend the international event to showcase Dubai's green economy and open doors to new partnerships and collaborations.

INNOVATION CENTRE

In addition and with the purpose of fostering innovation and forward-looking approaches, Dubai GEP has recently approved a strategic partnership on Green Employment. The Green Jobs Programme is an umbrella framework under which green jobs and education will be tackled in a number of initiatives conceived to achieve the following goals, in line with the UAE Vision 2021 and the Green Economy for Sustainable Development Strategy: shed light on green jobs and education for sustainable development, create a data repository for green jobs and connect the relevant stakeholders for green employment.

In a nutshell, Dubai GEP offers a platform which enables government and business leaders to accelerate the adoption of new green technologies and practices that have a tangible impact on resource efficiency, reducing energy, water consumption and waste, and enabling sustainable living among others.

MULTI-STAKEHOLDER DIALOGUE PLATFORM

Dialogue is an important tool in achieving Dubai GEP's goals. In that context, the Green Leadership Series of events was created as a high profile multi-stakeholders dialogue platform bringing together local, regional and global industry experts from across the sustainability sector to discuss how to support the UAE'S green economy transition through identification of opportunities, analysis of trends and private sector participation in shaping future policies to foster innovation and green growth. On June 5th, the World Environment Day, Dubai GEP held a new Green Leadership Series event in the Address Dubai Mall under the theme "Partnerships Advancing Green Economy". The event gathered a high number of invitees that engaged in questions with the speakers and panelists. New events will be held throughout the year on different topics relevant to the green economy. In addition and with the aim to strengthen the dialogue, Dubai GEP will start a new platform for discussion and knowledge sharing in September 2014: the Business Breakfasts. *emad*



GREEN JOBS AND SKILLS

By **Anna-Maria Fyfe**

Skills development: key to unlocking the green job potential of green economies



ANNA-MARIA FYFE
GREEN JOBS PROGRAMME, ILO

She currently works for the Green Jobs Programme of the International Labour Organization (ILO). Before joining the ILO in 2012, she worked at the International Centre for Trade and Sustainable Development (ICTSD) for the Environment and Natural Resources Programme and has also worked for the International Union for the Conservation of Nature (IUCN).



Shifts in economic activities, (...) will cause structural changes between and within industries

The shift to a green economy and its associated change to more sustainable production and consumption patterns will profoundly change industrial activities and labour markets. The widespread introduction of cleaner technologies and the promotion of eco-innovation in industrial processes, for example, have already begun to impact the nature of work, demanding new skills. Workers are increasingly asked to adapt to new techniques and meet new environmental regulations. In this perspective, skills development is crucial to unlock the job potential of the green economy to provide industries with the required labour force and protect employability as economies go greener. The development of skills for green jobs is crucial to not only foster the transition by matching supply and demand for skills, but also in assisting workers to adjust to rapidly changing workplaces. Apart from being a response to labour market changes, green skills development can also be a potential driver for change that helps accelerate the green economy.

WHAT ARE GREEN JOBS?

Green jobs are decent jobs that contribute to preserving and restoring the environment, whether in traditional sectors such as manufacturing and construction or in new, emerging green sectors such as renewable energy and energy efficiency. Green jobs reduce consumption of energy and raw materials, limit greenhouse gas emissions, minimize waste and pollution, protect and restore ecosystems and enable enterprises and communities to adapt to climate change.

At enterprise level, green jobs can produce goods or provide services that benefit the environment, for example green buildings or clean transportation. However, it is important to note that these green outputs (products and services) are not always based on green production processes and technologies. Therefore, and in addition to this, green jobs can also be distinguished by their contribution to more environmentally friendly enterprise production processes. For example, green jobs can reduce water consumption or improve recycling systems. Yet, green jobs defined through production processes do not necessarily produce environmental goods or services.

Source: International Labour Organization (2013). Green jobs becoming a reality. Progress and outlook. International Labour Office, Geneva.

WHAT ARE THE EMPLOYMENT EFFECTS, RESULTING SKILLS AND CHALLENGES AS ECONOMIES GO GREEN?

The greening of economies will affect employment and thus skill needs in three different ways. First, shifts in economic activities, for instance from those that are less energy efficient and generate higher CO₂ emissions towards those that are more efficient and less polluting, will cause structural changes between and within industries. This will decrease demand for certain occupations and skill profiles and in turn increase demand for others. An example of this source of change is an increasing demand for alternative and renewable energy sources, such as wind or solar power, and a relative decline in the production and use of fossil fuels.

Although new job opportunities arising from greener production are estimated to offset job losses, those who will benefit from new green jobs opportunities will not necessarily be those who will have lost their jobs in so-called 'brown' industries. Retraining workers and upgrading skills are therefore essential to enable workers and enterprises to move from declining to growing sectors and occupations (see table 1). This will facilitate a smooth and just transition to a low-carbon and green economy.

¹This article is based on ILO publications including the following:

- International Labour Organization (2013) Meeting skill needs for green jobs. Policy recommendations. International Labour Office, Geneva.
- International Labour Organization (2011) Greening the Global Economy- the Skills Challenge. Skills for Employment Policy Brief. International Labour Office, Geneva.
- Streitska, O., Hofmann, C., Duran Haro, M. Shinyoung, J. (2011) Skills for green jobs: A global view. International Labour Office, Geneva.

TABLE 1 "GREEN RESTRUCTURING: INDUSTRIES LIKELY TO GROW AND ASSOCIATED RETRAINING NEEDS

INDUSTRY	EMPLOYMENT EFFECT	TYPE OF RESTRUCTURING	TRAINING NEEDS
Renewable energies: wind, wave and tidal power, solar, hydro, biomass, geothermal	Gaining	Absorbing workers from other industries	Skills upgrading: energy efficient solutions, management and entrepreneurship skills, including project management skills Retraining from other manufacturing sectors Retraining for engineers, installers, technicians, operation and maintenance specialists
Green building and retrofitting	Stable or gaining	Restructuring within construction industry and through the value chain (energy, suppliers of materials etc.)	Skills upgrading: energy efficiency, green technologies, new materials, energy auditing/certification
Transport	Stable or gaining <small>(although taxi drivers lose jobs as countries move to mass public transportation)</small>	Intra-industry restructuring	Retraining and skills upgrading into various public transportation jobs
Recycling and waste management	Gaining	Intra-industry restructuring	Retraining from waste collection to recycling; skills upgrading in methane and energy recovery
Water resource management	Gaining	Intra-industry restructuring	Skills upgrading: water conservation and efficient use, wastewater treatment

Second, the introduction of new regulations and the development of new technologies and practices are resulting in the emergence of some entirely new occupations. Emerging green occupations, such as solar panel installers and maintainers for renewable energy generation, call for the provision of relevant training courses and the adjustment of qualification and training systems.

Third, new skills will be needed by workers in many existing occupations and industries in the process of greening existing jobs.

For example, plumbers and architects will require new skills for the adoption of more environmentally friendly practices such as energy efficiency improvements. This will consequently require major efforts to revise existing curricula, qualification standards and training programmes at all levels of education and training.

The degree of skill and occupational change resulting from these employment effects can be measured in both quantitative and qualitative terms. According to the finding of the ILO Skills for Green Jobs: A Global View report,

the number of existing occupations that will change and require updating skills content will by far exceed the number of new green occupations that will emerge. Greening existing occupations will indeed be the most widespread and concerns the largest number of jobs. In terms of qualitative changes, new and emerging occupations more often require higher-level qualifications due to their dependence on new technologies or more sophisticated skills in, for example, networking, organization or consultancy, while changes in existing occupation happen more often at the low and medium-skills levels (see table 2).



Skill shortages already pose a major barrier to transitions to green economies

regional and local) to best address skills shortages in the green economy transition process. Indeed, policies should capture industry needs, both those of business enterprises and those of workers. Social dialogue and tripartite consultations amongst all partners in the decision-making process constitutes the basis of success in this respect. Besides, a good combination of top-down coordinated policy-making with bottom-up sectoral or local initiatives can help best identify industry and training needs and support education and training initiatives.

Measures also need to be forward-looking to identify well in advance skill and related training needs. Labour market information systems and research for anticipating and monitoring skill needs are critical starting points for effective policy cycles. This enables governments and businesses to establish a dialogue and anticipate changes in the labour market, identify the impact on skill requirements, incorporate changes into the system by revising training programmes and introduce new ones, and monitor the impact of training on the labour market. *emd*

TABLE 2. DEGREE OF SKILL CHANGE FOR CHANGING AND EMERGING OCCUPATIONS

DEGREE OF SKILL CHANGE	OCCUPATIONAL CHANGE	TYPICAL SKILL RESPONSE	EXAMPLES
None	None or only quantitative	None or increased training in existing occupation	Bus driver in CNG-fuelled buses; forester
Low	Changing occupation	On-the-job learning or short training courses	Welder in wind turbine production; organic farmer
Medium	Changing or emerging occupation	Short courses or longer continuous training	Energy consultant in building; car mechanic for electric cars or CNG cars
High	Emerging occupation	Initial training, university degree or longer continuous training	Solar energy technician; eco-designer; biofuels technician

Source: Shrestha, Iltis et al. (2011)

WHAT ARE SKILL SHORTAGES?

Skill shortages are the lack of adequately skilled individuals in the accessible labour market with the right type of skill being sought leading to recruitment difficulties.

This could result from basic lack of people, significant geographical imbalances in supply, or a genuine shortfall in the number of appropriately skilled individuals- either at new entrant level, or for higher level skills occupations

Source: National Skills Task Force (NSTF) (1998) Towards a national skills agenda. First report of the national skills task force. Sheffield, DfEE.

CONCLUSIONS

The growing importance of sustainable development and the shift to a low-carbon economy are increasing the pace of change in labour markets and related skill needs. Economies moving towards greener production can seize this potential for green job creation if they deal effectively with the coming structural change and transformation of existing jobs. Skills development is one of the keys to unlocking the job potential of greener economies. The timely supply of relevant and quality skills is indispensable for successful transformations that boost productivity, employment growth and development.

Country experiences are, however, already revealing skill shortages constraining the transition to a greener economy in terms of preparing for some new occupations and in terms of changing the skill profile of a large number of occupations. The capacity of countries to identify and anticipate skills needed in a green and low-carbon economy is crucial to achieve successful transitions. Targeted, coherent and coordinated skills responses with all stakeholders and at all levels are crucial in unleashing the green jobs potential of green economies. Mobilising and ensuring close cooperation between government and social partners are central to the success of skills development strategies. Indeed, promoting social dialogue and ensuring the active participation of all the actors in the world of work are critical to guide the policy-making process.

RESPONSES TO ADDRESS AND ANTICIPATE SKILL SHORTAGES

Skill shortages already pose a major barrier to transitions to green economies and the creation of green jobs, a trend which is likely to be further exacerbated in the future. Severe skill shortages have already been experienced in fast-growing sectors such as renewable energies and energy efficiency.

Both emerging green occupations and existing occupations that are going green are affected by shortages mainly due to the following: underestimated growth of certain sectors, a general shortage of scientists and engineers, the low reputation and attractiveness of some sectors and the general structure of the national skill base.

Responses to tackle skill shortages can be taken at different levels, i.e. enterprise, industry, government etc. Measures can be taken through formal Technical Vocational Educational and Training (TVET) systems as well as through on the job training or retraining programmes of employment services.

Yet, for responses to be effective, there needs to be greater emphasis placed on policy coherence and coordination amongst the different stakeholders concerned, such as ministries, social partners, training providers and enterprises at all levels (national,



New job opportunities arising from greener production are estimated to offset job losses



New skills will be needed by workers in many existing occupations and industries in the process of greening existing jobs

HARNESSING HUMAN CAPITAL FOR A GREEN ECONOMY

By Ivano Iannelli,
Mercedes Durán Haro,
Rachel Bartz
and Suraiya Tasnim

THE UAE'S FIRST
'GREEN JOBS CATALYST'

THE GREEN JOBS PROGRAMME: AT A GLANCE

RESEARCH:

- Qualitative Research
- Quantitative Research
- Database Development

GREEN EMPLOYMENT FACILITATION:

- Green Jobs Dubai LinkedIn Group
- Company Presentations
- Green Jobs Fair

CAPACITY BUILDING:

- Knowledge Sharing Platform
- High Level Panel Discussions
- Newsletters



A major barrier to a smooth transition to a green economy in Dubai is green jobs which are hard to fill



economy, to harness the full potential of national human capital, and to achieve a knowledge based and highly productive economy.

A major barrier to a smooth transition to a green economy in Dubai is green jobs which are hard to fill. This is due to the lack of information of green occupational skills, giving rise to skill gaps and shortages. The Green Jobs Programme, an umbrella framework, adopts the solution to this barrier through developing different initiatives to achieve its objectives of harnessing green jobs.

The first objective of the programme is to shed light on the educational and skill requirements of green occupations in Dubai by carrying out qualitative and quantitative research relevant to green jobs in Dubai. This would identify necessary skills, educational requirements, occupations hardest to fill, green jobs quantification, and analysis which can be used in order to educate today's national youth to harness the national human capital to create a knowledge based economy in line with the UAE Vision 2021

The second objective of creating a data repository of green jobs is to allow all relevant stakeholders to provide and acquire information to facilitate green employment, and to inform policy makers of underlying trends of green jobs. A green directory categorized by green sectors will also be developed from where information can be utilized by any entity in Dubai for its own green jobs purposes.

The third objective of creating a knowledge sharing platform accessible to all is to exhibit the commitment of individual entities in Dubai to achieve sustainability through highlighting best practices, mapping educational requirements across green sectors and showcasing career paths in the green economy.

The Green Jobs Programme addresses the need for integration and collaboration of different stakeholders across the economy - education providers, the government and candidates - in order to achieve renewable energy, sustainable transport, waste management and green building industries. To facilitate collaboration between stakeholders, the programme aims to host high end panel discussions, organize the green jobs fair, aid in partner company presentations, produce bimonthly newsletters with updates of the programme and engage interested parties in social media.

The vision of the programme is to be the green jobs reference platform in the region with ambition to expand to Abu Dhabi, the UAE and then the GCC. The programme is designed to be intrinsically a capacity building tool for all relevant stakeholders, as the concept of green jobs is a particularly new subject pertaining to sustainability in the region.

The Programme has been developed to initiate a movement of likeminded people who are passionate about the country and its development to educate themselves, in order to place Dubai at the forefront of the sustainable development agenda globally. In foresight, the successful realization of the Green Jobs Programme will demonstrate visible commitment and leadership on the part of the Dubai Government in thrusting Dubai to the forefront of excellence in green economy. *em.d*

GREEN JOBS HELP:

1. Improve energy and raw materials efficiency
2. Limit greenhouse gas emissions
3. Minimize waste and pollution
4. Protect and restore ecosystems
5. Support adaptation to the effects of climate change



The vision of the programme is to be the green jobs reference platform in the region



MEET THE CARBON AMBASSADORS

By HE Eng. Waleed Salman

Vision 2021 is about more than building economic resilience - it is a long-term approach to constructing a competitive green economy driven by knowledgeable and innovative Emiratis, and nurturing a sustainable environment to enhance the quality of life across the Emirates. A vital component of this is to integrate sustainable development into the lifestyle of the nation.

Education plays a vital role in ensuring a sustainable economy for the generations to come. In recognition of this, Dubai Electricity and Water Authority (DEWA) in conjunction with the Dubai Carbon Centre of Excellence (DCCE) launched an empowerment programme aimed at university students in the UAE who want to get involved in initiatives in the area of sustainable development, and more specifically in low-carbon development. DCCE is managing the programme on behalf of DEWA, with support from the United Nations Development Programme (UNDP), the Ministry of Foreign Affairs (MoFA) and sponsoring partner DP World.

Officially launched at the Water, Energy, Technology and Environment Exhibition (WETEX) 2014 in April, and titled "Carbon Ambassadors", the collaborative programme consists of workshops and empowerment activities planned throughout the year, paired with a public awareness campaign that builds capability within the community, training students to become active advocates for a low-carbon lifestyle and economy. The annual programme is planned to start and finish each year at WETEX.

The first intake of 40 students has been selected and inducted into the year-long programme, and the participants are already training their gazes on sustainable development, the reduction of carbon emissions and the development of a green economy through participatory workshops and activities designed to build social awareness. While the youth engagement and advocacy programme is open to students of any nationality, Emiratis are well-represented, with the initial intake seeing a strong representation by Emirati females in particular. The class was inaugurated as part of World Environment Day activities on 5 June.

Throughout the year, the Carbon Ambassadors will participate in a series of integrated activities, divided into three key themes: Sustainability, carbon emission reductions and mitigation and adaptation. The themes will be explored through a tailor-made combination of role-play activities, small group discussions, action workshops, presentations by external speakers and film screenings. In addition to these lectures and workshops, there will be site visits, competitions and extracurricular projects designed to cultivate the participants' capacities for critical thinking, creative collaboration and confident, constructive communication on these topical issues. The Carbon Ambassadors will be required to leverage social media and participation to stimulate communities and build awareness around these important subjects.

The turnkey project within the Carbon Ambassadors Programme involves applying creativity and innovation in a team setting, namely in adapting a shipping container to become a functioning, self-sustainable bus stop. The teams are given a limited budget and fixed resources and mentors will be on hand to provide guidelines and support. There are also a series of smaller additional activities, ranging from a lifestyle project, where participants measure consumption



HE ENG. WALEED SALMAN
DEWA

He is the EVP for Strategy & Business Development with Dubai Water & Electricity Authority (DEWA) a member of Dubai Supreme Council of Energy, and chairman of Dubai Carbon Centre of Excellence and Dubai Green Economy Partnership.

and work towards reducing their own carbon footprint, to a photography competition, with the winning shots published in this very same report.

Naturally, advocacy of a sustainable economy doesn't end at graduation from the programme. The Carbon Ambassadors are expected to become tomorrow's green workforce and spokespersons. DCCE will support dedicated and passionate Carbon Ambassadors in moving into positions within the UN framework, the UAE- or emirate level government and the industry, and the programme will feature a networking and alumni component that will aid in extending the programme's momentum.

The Carbon Ambassadors Programme is the essence of innovation, engaging youth volunteers through training and certification to spearhead green development, both over the coming year and in the future. The global business community is clamouring for candidates with sustainability training, meaning more opportunities ahead for both the Carbon Ambassadors and a sustainable green economy. *emad*



(...) The collaborative programme consists of workshops and empowerment activities planned throughout the year



The Carbon Ambassador Initiation ceremony on World Energy Day, June 5th 2014, was attended by HE Saeed Al Tayer, MD & CEO of DEWA, HE Sultan Ahmed Bin Sulayem, DP World Chairman and Chairman of Ports, Customs and Free Zone Corporation (PCFC), Dr. Yousef Ebrahim Al-Akraf, Executive Vice President - Business Support, DEWA, HE Eng Waleed Salman, Chairman Dubai Carbon, Sayed Aqa, UN Resident Coordinator and UNDP Resident Representative.



The Carbon Ambassadors Programme is the essence of innovation



MOBILIZING YOUTH FOR CREATING AN EQUITABLE ENERGY AND SUSTAINABILITY PARADIGM

By
Dr. Dinesh Kumar

In the words of United Nations Secretary General Ban Ki-moon: “Energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the world to thrive.” Universal access to safe and clean energy is central to the goal of building shared prosperity within communities and nations. Amid existing widespread energy poverty in many countries, rising environmental degradation, and escalation of climate change, a new energy paradigm is required, which not only ensures equitable economic and social development, but also addresses the issue of global warming. Any such monumental shift demands a generational global response.

Major efforts by the international community (the UN-led Sustainable Energy for All, post-2015 SDGs, the Climate Summit and many other initiatives) are already underway to transform the current energy system. While world leaders, industry experts, academics, civil society activists and other stakeholders are deeply engaged in this endeavor, Global Energy Initiative (GEI) focuses on the paramount role of youth in meeting the energy challenges of the 21st century. It is imperative to educate and pro-actively mobilize young people on the inter-connectedness between social, economic, and environmental factors in creating a sustainable energy future for all.



**MAKE
THE SUSTAINABLE
ENERGY FOR ALL
A REALITY BY
2030**

67
countries

400

students shared their views on sustainable energy globally

It was on this premise that GEI launched the Students for Sustainable Energy for All (SSEA) program in March 2014 as an awareness and knowledge-sharing global platform to reach out to students in colleges and universities with opportunities to engage in a wide-range of energy and sustainability issues. Through SSEA, GEI is establishing a network of multinational students - a pathway for tomorrow's global-minded leaders who will ensure energy sustainability and the health of our planet. This network is currently operational in 13 countries and would expand to 50 countries by March 2015.

SSEA chapters promote energy awareness by engaging peers, local communities, and other stakeholders on current environmental and energy issues. They organize campus-wide events and implement community-based energy projects as well as share their best practices with other SSEA chapters across the world. The annual Global Energy Essay Contest is another major GEI initiative that provides youth a unique opportunity to share their views on sustainable energy globally. Over 400 students from 67 countries participated in the 2013 essay contest, and we expect participation numbers to double in the 2014 contest.

With the aim of providing a direct youth response to global energy issues and climate change, GEI has recently launched a new youth programme - Young Professionals for Sustainable Energy. This program provides young professionals with a firm intellectual platform to engage in energy issues and think critically about cutting edge solutions to our global concerns. It connects like-minded professionals, energy experts and government officials locally, nationally, and globally. Through this programme, they will be equipped with the professional relationships, knowledge base, and leadership skills essential for success in the energy field.

GEI continues to build on its underlying theme of raising awareness, information sharing, and leadership building through its publication "Global Energy Affairs." This premier bi-monthly magazine brings to the forefront salient global energy issues and trends through insightful analysis by world's leading experts and decision-makers. It has contributed to connecting youth with top energy and sustainability leaders, besides serving as a source of inspiration.

The world needs many more youth-focused programs that can contribute to the creation of new generation leaders - truly global citizens - who are passionate and committed to the integrated goals of green growth and sustainable development for the benefit of all humanity. By making youth innovations an inclusive agenda of its annual high-level event - the World Green Energy Summit - the Dubai Supreme Council of Energy has not only reaffirmed its commitment to an enhanced role for youth in creating a green economy, but has also set a benchmark for youth in the Middle Eastern region and beyond.

Today, transition to a new sustainable energy system is set in motion, irreversibly. The world with collaboration across sectors (social, economic and environmental) needs to move fast to scale-up and strengthen this momentum not only to make the Sustainable Energy for All a reality by 2030, but also to fulfill the legitimate needs and aspirations of humanity. Who else could facilitate and make this happen except a dedicated and sustainability conscious next generation? *em.d*

01. SMART CITY.



HE MOHAMMED ABDULLAH AL GERGAWI

MINISTER OF CABINET AFFAIRS OF
THE FEDERAL GOVERNMENT OF THE UAE

INTRODUCTION

Two-thirds of the world's population resides in cities, resulting in increasing demands on various city infrastructures, including traffic and transportation systems, public safety, healthcare, and energy. Moving away from the general global scenario, forward-thinking cities around the world have tapped into existing technologies to integrate the separate units that build a city - into a centralised, multifaceted unit. The results are tangible, leading to a better quality of life for citizens.

A smart city is an environment that involves many technologies and multiple agents, from sensors placed across the city to collect important data to the mobile devices of its residents. These mobile devices are pivotal in the collation and processing of all this data for optimising city-wide services. With 78% smartphone penetration, Dubai is primed to lead the region as a connected hub.

In 2014, the Dubai Smart City Initiative was announced by His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai. This paved the way for enhanced innovation, comprehensive information technology infrastructure, and the launch of environmental initiatives to promote a seamless living experience in Dubai.

SMART DUBAI FOR HAPPY LIVING



WITHIN ITS QUEST FOR EXCELLENCE, THE EMIRATE OF DUBAI IS TURNING ITSELF INTO A SMART, FULLY INTERCONNECTED LIVING SPACE



COMMUNICATION



INTEGRATION



COOPERATION

On March 5th, 2014, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, launched a strategy to transform Dubai into a smart city, in the presence of Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and General Supervisor of the Dubai Smart City Project.

The initiative will update services in transportation, society, economy, governance and the environment with the aim of transforming Dubai into the smartest city in the world over the next three years. The strategy includes more than 100 initiatives and the evolution of over 1,000 government services into smart services.

It is based on three basic ideas: communication, integration and cooperation. These ideas will enhance communication between the residents of the city and its institutions and facilities through easy access and information-sharing. This can be achieved through the My window to Dubai programme.

Smart Dubai comprises six key pillars: smart life, smart transportation, smart society, smart economy, smart governance and smart environment.

Additionally, in June 2014, the World Economic Forum's Global Agenda Council on the Future of Government, in partnership with the UAE government, launched the guide, Future of Government Smart Toolbox - a report that aims to improve government performance in key areas such as trust, leadership, security, innovation, anti-corruption, bureaucracy and delivery of services.

INFO BOX

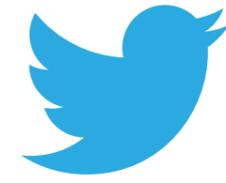
What is a smart city?

A smart city's main aim is to provide better connections and increase cooperation between the Emirate and its residents. It promotes the use of government facilities using the largest possible number of smart applications.

DID YOU KNOW?

The UAE has been ranked number one in the Middle East and Africa region and second in the world in the Government Usage of ICT index in the Global Information Technology Report for 2014, released by the World Economic Forum.

HH | tweet



INITIATIVES IN FOCUS

Energy and Water (Dubai Electricity and Water Authority)

The Smart-Grid Initiative includes eight individual programmes being 1) Advanced metering infrastructure, 2) Asset management, 3) Demand-side management, 4) Distribution automation including electric vehicles and distributed energy resources, 5) IT infrastructure, 6) Substation automation, 7) System integration, and 8) Telecommunication in three programmes:

- Connecting solar energy in houses and buildings: solar systems' surplus of power can be exported to DEWA's grid encouraging the use of renewable energy
- Smart Applications: more than 150 services will speed up connections and ensure faster responses through immediate reconnection, while assisting in conserving power. The first phase is 200,000 meters leading to a final stage of 1.2 million meters.
- Infrastructure and Electric-Vehicle Charging Stations: establishing infrastructure and charging stations for electric vehicles.

Transport & Mobility (Roads and Transport Authority)

Over 22 separate smart-city projects including a unified traffic-control centre, free Wi-Fi on public transport, and an application that steers drivers to available parking plus more than 200 services using smartphones by the end of 2015.

Developments & Research facilities (D3 / TECOM Investments)

Smart hubs where companies can provide smart solutions tailored to meet the needs of customers and facilitate transactions such as licenses, visas, customs and other government services such as the Dubai Design District (D3).

Retail and Shopping (Department of Economic Development (DED))

Solutions and applications that serve the retail trade in Dubai and the transformation into smart businesses.

Services for Nationals and Residents (Dubai Municipality)

Transformation of 450 e-services into smart services, smart parks and beaches that provide specific information on weather conditions, sea, temperatures and safety guidelines, "I-Dubai" and "Smart Address" for municipality services.

Community and Security (Dubai Police)

Smartphone services for interaction with the police.

Customs (Dubai Customs)

Customs services will be accessible via smart watches.

5-D control room

A monitoring centre, tracking progress in transforming Dubai into a smart city and overseeing government projects and service indicators, roads, weather conditions and emergency situations *em.d*

SMART DUBAI STAKEHOLDERS



BECOMING SMARTER

By
Dr. Aisha Bin Bishr



A smart environment programme enabling an efficient, seamless and safe city will lead to an overall improvement in quality of life



THE SMART CONTRIBUTION TO HAPPINESS

Smart Dubai is an initiative, through the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, to make Dubai the happiest city on earth. Dubai will generate happiness by embracing innovative technology to provide a seamless, safe, efficient and enjoyable city experience for all residents and visitors.

"Our ambition is for this project to touch every individual in our country - every mother in her home, every employee at his work, or investor in his project, or child in his school, or doctor in his clinic. Our goal is a happier life for all and we ask God to help us achieve this," said His Highness Sheikh Mohammed bin Rashid Al Maktoum.

Harnessing ICT solutions, promoting public-private partnerships and supporting public programming towards a smart environment is a fundamental dimension of the Smart Dubai strategy - a sustainable environment, made possible by innovation and public awareness, is a critical component in visitors' and residents' happiness.

Smart Dubai also addresses the dimensions of smart economy, smart living, smart governance, smart people and smart mobility. Each of the six dimensions interact to support each other in moving towards the goal of a seamless, safe, efficient and enjoyable city experience.

Through the smart environment dimension, Smart Dubai will achieve innovative resource, pollution and asset management to support the sustainable use of natural resources and the protection of the environment.

Activities on the smart-environment roadmap include: ICT-enabled road management systems to monitor infrastructure and traffic flow; an increased percentage of clean-energy vehicles on Dubai roads including electric and hybrid vehicles; reducing annual electricity consumption per capita; reducing annual CO2 emissions per capita; deploying Smart Grid systems; and supporting the growth of LEED-certified buildings in the city.

By embracing innovation in resource-management technologies, city planners are able to monitor energy consumption patterns, enabling the optimised use of city resources through a data-driven approach to grid planning; anticipate surges and mitigate risks using real-time data; and, through a network of connected applications and open data, allow residents to monitor personal energy consumption and contribute to a smarter environment in Dubai.

A smart environment programme enabling an efficient, seamless and safe city will lead to an overall improvement in quality of life and a more enjoyable experience for all city stakeholders.

A strong allegiance between the green economy and Smart Dubai will empower the city towards the mutual goal of exceptional city experiences for all residents and visitors. *em.d*



DR. AISHA BIN BISHR
EXECUTIVE OFFICE OF
HIS HIGHNESS SHEIKH
MOHAMMED BIN
RASHID AL MAKTOUM

She is the Assistant Director-General of the Executive Office

DEWA POWERS DUBAI'S SMART STRATEGY



DEWA is actively contributing to develop Dubai into a smart city. This is part of a wider effort to achieve the smart city vision of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to transform Dubai into one of the smartest cities in the world within the upcoming three years.

DEWA is undertaking three new smart initiatives. The first is to enable customers and property owners to connect distributed solar panels to DEWA's power grid under the Distributed Renewable Resource Generation programme. This initiative will encourage households and building owners to install photovoltaic solar panels to produce electricity and use it locally within their premises and for their own use, and any surplus electricity generated can be fed into DEWA's grid.

The regulatory framework governing the Distributed Renewable Resources Programme, which incorporates the technical standards for equipment and their connection procedures, is being finalised to enable the first pilot connections soon.

The second initiative is to install smart meters and implement smart applications that will provide more information about energy use and ensure faster responses through automatic reconnections. This will enhance the peace of mind and quality of life of Dubai's citizens and residents, and promote the use of smart resources to improve sustainability.

DEWA has started a five-year plan to replace conventional mechanical and electromechanical meters with smart meters, providing its customers with automatic, detailed current, and historical readings. Customers can access these readings to monitor their actual consumption over specific periods of time to better understand and manage their bills to identify energy-efficiency measures. Smart meters will

support the installation of renewable sources of energy in residential, commercial and industrial sectors by comparing energy usage between its consumption and generation. DEWA alone will install 200,000 smart meters over the next three years all over Dubai. The work on the first stage has already started and is expected to be completed before the end of 2015.

The third initiative is the implementation of an infrastructure of electric vehicle charging stations at various locations across Dubai, which supports the introduction and use of electric vehicles within Dubai and contributes to enhancing DEWA's grid efficiency.

DEWA supports the introduction of electric vehicles as they decrease air pollution and protect the environment against the impact caused by traditional vehicle emissions. DEWA will establish the infrastructure in collaboration with several stakeholders, such as car manufacturers, Dubai's airports, Dubai Municipality, shopping malls, petrol stations, the Dubai Roads and Transport Authority (RTA), hotels and car parks.

Initially, DEWA will start work on installing 100 charging stations in various parts of Dubai. The work is expected to be completed within a year, and will require coordination with Dubai Municipality, customer representatives, and other stakeholders.

The three initiatives are an integral part of the Smart Dubai Initiative as well as a comprehensive Smart Grid strategy that DEWA will implement over in the coming 25 years. This strategy will support the conversion of electricity and water networks to support the development of new services, use new energy technologies, enhance network management and control, and enable Dubai's residents to better manage their requirements for energy and water.

Making grids smarter doesn't just support Dubai's drive to become a Smart City; it is also a key element of DEWA's strategy to ensure a brighter, sustainable future for Dubai, which is the objective of the Green Economy for Sustainable Development initiative of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.

By making sustainable development a reality, the Emirate's future looks bright on so many levels. *em.d*

SUSTAINABILITY IS ROOTED IN SMART CITIES

By Saeed Al Abbar and Marie-Hélène Westholm-Knebel

THE CHALLENGE TO THINK AND BUILD GREEN TO MAKE CITIES SMART

With numerous initiatives and events announced at the federal and local levels, 2014 has seen a major turning point in the way the UAE authorities connect urban planning with the broader concept of green economy for sustainable development. In line with the UAE's Vision 2021 and a global movement under the United Nations Environment Programme's auspices, efforts to promote smart cities have placed sustainability, green innovations and environmental education on the frontline of UAE policies and projects.

According to the United Nations Environment Programme report 'Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication', "unique opportunities exist for cities to lead the greening of the global economy". As per this report, building "green" will not only have a positive impact on urban, social and economic development, but it will also foster change and initiate cooperation between stakeholders to subsequently implement effective green building regulations and rating systems; adopt energy efficient technologies/equipment, and ensure that sustainability and best practices are applied by contractors and developers from the inception of construction projects.

With these concepts highlighted, Dubai hosted the first World Green Economy Summit in April 2014, showcasing the country's leadership in the MENA region to commit to a green economy strategy. The Summit reinforced the country's commitment to set ambitious targets on energy efficiency and water management; to encourage global partnership, and to further develop green technologies and services contributing to the reduction of the country's carbon footprint.



MARIE-HÉLÈNE WESTHOLM-KNEBEL
EGBC

She is a Technical Officer at the Emirates Green Building Council and oversees the good conduction of various projects and taskforces.

INTEGRATED APPROACHES, ENGAGED STAKEHOLDERS AND SUSTAINABLE COMMUNITIES

Prompted by the need for green infrastructure, various programmes have translated theory into best urban practices throughout the UAE:

The Abu Dhabi Vision 2030 Urban Structure Framework Plan, also called 'Plan Capital 2030' developed by the Urban Planning Council (UPC) has provided governmental authorities with guidance to develop urban policies that embrace sustainability while conserving local cultural identity and the environment. Thanks to CitySense, a smart information system designed to compile and measure the Emirate's sustainability performances, and combined with regulatory efforts, namely Estidama and its Pearl Rating System, Abu Dhabi has demonstrated its strengths as a model capital in which infrastructure and urban planning showcase the pillars of sustainability while boosting economic and social development.

Also developed by UPC, through site visits, research, public and technical consultations, and collaboration between governmental agencies, Plan Al Ain 2030 and Plan Al Gharbia 2030 Regional Structure Framework are other examples of how sharing best practices has successfully helped various Emirates reach the same level of urban development.

The Dubai Smart City Initiative launched in 2013 by His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, is a clear demonstration of the local response to the federal vision.

Under six key pillars (communications, infrastructure, transport, electricity, urban planning and economic services), the government of Dubai has implemented an integrated approach in which nearly a thousand¹ governmental agencies and bodies connect and cooperate to boost the economy and utilise technology to centralise data management. Administrative procedures have been simplified by encouraging end-users to take advantage of modern communications tools (fibre optic cables, phone applications) and therefore contribute to a paperless administration.

Along with these measures, efforts to develop public transportation networks (opening of the Dubai Tram and extension of the Dubai Metro lines) and sustainable communities (Sustainable City) have further reinforced connectivity and accessibility.

WHEN TECHNICAL INNOVATIONS MEET SUSTAINABLE URBAN PLANNING

In line with the Dubai Smart City Initiative, Dubai Electricity and Water Authority (DEWA) announced its five-year plan to install 250,000 smart metres, which allows authorities to measure energy and water consumption in buildings and help label their performance. This programme will support the Emirate's plans to develop energy labelling and benchmarking for buildings, and help reach its target to retrofit 30,000 existing governmental buildings by 2030. The launch of smart energy grids by DEWA should also enhance the city's access to greener energy and therefore reduce the growing pressure on the electricity network.

Increasingly more stringent regulations and standards in the country have also forced the market for construction materials, equipment, and IT systems to innovate and improve performance. It remains crucial to continuously educate stakeholders and organisations on the financial, social and environmental benefits of designing and building "green" so that the performance bar is continuously raised.

CONCLUSION:

THE FUTURE OF UAE'S CITIES

Managing urban growth is and will remain a global challenge that needs to be tackled, among other things, through responsible urban policies and education. The UAE has clearly demonstrated regional leadership by making "green" and "smart" intrinsic components of these policies, while organisations such as Emirates Green Building Council have become key platforms for the interaction of public and private sectors. *en.d*



SAEED AL ABBAR
AESG, EGBC

He is the Director of AESG. He is also the current Chairman of the Emirates Green Building Council and is the Vice Chairman of the World Green Building Council MENA Network.

FOOTNOTES

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SMART ENERGY NETWORKS: THE FOUNDATION OF SMART CITIES

The [global] smart energy industry is expected to see the largest growth, from \$22.9 billion in 2010 to \$80.7 billion in 2016



LEARNING FROM INTERNATIONAL BEST PRACTICES

The success of any smart city relies on creating and supporting a smart energy system. A recent market report estimates that of all smart city investments, the smart energy industry is expected to see the largest growth, from \$22.9 billion in 2010 to \$80.7 billion in 2016.

So what is a smart energy system? Also called a smart grid, it is one that knows in real time where a transformer has blown and automatically reroutes power to keep the lights on. It's a system that collects and manipulates data from sensors, smart meters and other intelligent devices to give operators a complete view of the energy infrastructure - for instance, how much power solar installations are generating.

A smart city resembles a smart grid. It also uses sensor networks to monitor and optimize everything from transportation to waste management to public safety and other critical infrastructure. But, you can't have a smart city without the underlying smart electric grid and information and communications technologies (ICT) that together create a city's "system of systems".

By Alice Cowman & Jesse Berst

TECHNOLOGY IS THE EASY PART

Surprisingly, technology is the easy part. There are already numerous examples of smart energy success stories. For example:

- Tianjin Eco-City in China uses a single communications network that measures, collects and analyzes data from water, electric and gas meters, providing actionable insights to help achieve energy and water conservation goals.
- Chattanooga, Tennessee in the U.S. deployed smart grid technologies that resulted in a 55% reduction in power outage times saving businesses an estimated \$40 to \$45 million annually.
- Masdar City in Abu Dhabi has become a showcase in sustainable urban development; its initiatives have led to a 40% reduction in demand for energy and water compared to what it otherwise would have been.

THE CULTURE OF INNOVATION

Clearly, smart technologies are not a thing of the future; they exist today. The hard part for city leaders is developing a culture that embraces the new approaches that smart cities require. To lead true innovation, every city needs to:

- Create a roadmap
- Embrace open standards
- Forge partnerships across public and private sectors

DEVELOPING A ROADMAP

The path to a smart city is a long one. It can easily take 5 to 15 years to make smart technologies pervasive. For cities uncertain where to begin, smart energy is a logical starting place given its critical role in the system of systems.

But knowing where to start doesn't negate the need to know where you want to end. Each city's priorities are different depending on many factors such as their existing infrastructure and demand projections for the future.

That's why a roadmap - a simplified outline of the major steps to becoming a smart city - is essential. A roadmap is not a master plan or a detailed project plan. Rather, it's a way for cities to build stakeholder consensus around a high-level view of their future - and that's no easy task.

Nonetheless, many experts suggest a roadmap should include at the least five elements:

- An assessment of where you are
- A vision for where you want to go
- Project plans for the key components
- Milestones to mark progress
- Metrics to measure and prove success

EMBRACING OPEN STANDARDS

To successfully achieve smart city goals, different technologies from different vendors must be able to work together in order to exchange information and talk to each other.

Not just any standards will do; the goal is "open" standards - those defined by an industry group. There are hundreds if not thousands of standards that apply to some aspect of urban life, which is a challenge. Fortunately in the smart energy space, the International Electrotechnical Commission has created a free Smart Grid Standards Mapping Tool which makes it easier.



JESSE BERST
SMART CITIES COUNCIL

He is the founder and Chairman of the Smart Cities Council.

FORGING PARTNERSHIPS

Given the challenges of financing major infrastructure improvements - not to mention the jurisdictional melange of boundaries in many regions - forging strong partnerships is often the only way to achieve smart city objectives. It is important to identify the required stakeholders at the outset so that delays or even project failures are not experienced when a different municipality, utility or private sector partner is suddenly required down the line.

Just outside Paris, for example, a consortium of local utilities and corporate partners are creating IssyGrid, France's first smart grid neighborhood. Test homes and businesses are equipped with energy monitoring devices. Data from them is processed, analyzed and provided to citizens so they can see their usage patterns and ways to conserve. The result: a 10% to 20% reduction on IssyGrid utility bills.

Like roadmapping and embracing open standards, partnering is the smart way to build smart cities.



ALICE COWMAN
CLEAN ENERGY BUSINESS COUNCIL

She is the CEO for the Clean Energy Business Council.

ADDITIONAL NOTES

The Smart Cities Council is an industry coalition that supports cities with the Internet's largest source of free smart city tools, resources and case studies, including the groundbreaking Smart Cities Readiness Guide and the Smart Cities Financing Guide. For more information about the Council, please contact Sandra Baer, Cities Director, Sandra.baer@smartcitiescouncil.com.

The Clean Energy Business Council is a member-based not for profit organization supporting the development of smart sustainable cities within the MENA region and, in particular, that of open standards and policies that maximize efficiency and the use of low carbon energies in future smart energy networks.

CONCLUSION:

The UAE is embracing smart energy with pilot projects in energy and water. The CSP (Concentrated Solar Power) plant in Abu Dhabi, which has just come online this year, and the upcoming rooftop solar programme in Dubai are excellent examples of meeting energy demand through clean energy sources.

As projects like these demonstrate, technology really is the easy part. The more difficult challenge is to form strong partnerships and encourage an open, collaborative dialogue as you create a shared smart city vision that will be the foundation for smart decisions now and into the future. *enrd*

Smart energy industry growth expected
from **\$22.9 billion** in 2010
to **\$80.7 billion** in 2016

SMARTER TRANSPORT SYSTEMS

HOW VIRTUAL CONNECTIVITY WILL
INFLUENCE THE DUBAI RESIDENT ON THE GO



The optimal utilisation of technology is a step forward towards developing the smart city infrastructure which Roads and Transport Authority (RTA) seeks to epitomise under the UAE Strategy for Green Economy Development directives by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, besides being a rich source of corporate development.

RTA has updated its strategic plan for 2014-2018 to bring the goals in line with Dubai Government initiatives and targets in accordance with the UAE Strategy for Green Economy, with the key vision of making Dubai a smart city, endorsed by HE Mattar Al Tayer, Chairman of the Board and Executive Director of the RTA to address the first strategic goal: Smart Dubai.

HE Mattar Al Tayer stated that revising the RTA's strategic goals is consistent with the directives of the Dubai Leadership "to transform Dubai into a smart city where human beings become the core objective of development".

In order to achieve this goal, RTA is planning to introduce smart buses, smart taxis, smart rail, smart roads and smart parking services which will cover RTA operations in supporting the vision of transforming Dubai to a smart city. As such, this will have an impact on reducing dead-mileage, reducing waiting time, and minimising fuel consumption, eventually presenting Dubai as both a smart city and green city.

This comes off the back of a number of recently launched new initiatives, including Wi-Fi services on intercity buses and internet-connected bus shelters to help achieve the government's plans to become a fully-fledged smart city in time for Dubai Expo 2020. The ultimate aim is to connect the city's infrastructure to the internet and make it more accessible to citizens via smartphones and other smart devices. Dubai taxis will offer free Wi-Fi in all cars by the end of the year as part of the push to create a smart city.

As part of this plan, the RTA also wants to open a city-wide command and control centre to integrate all of its transport offerings. The day to day control of the different modes of transport will continue to be managed independently, but the main control centre will look at integrating everything to help to ease congestion; provide reliable and up to date information to users; and ensure smoother operations across the board.

As a milestone, RTA won the Best Smartphone Service Award as part of five accolades awarded to the RTA in the first edition of the Hamdan Bin Mohammed Smart Government Programme.

RTA is committed to continue introducing innovative technological approaches which serve the public and bring customer satisfaction through world-class services, as well as leveraging business processes in a way that ensures the realisation of our strategic objectives by effectively contributing to shaping the future of Green Dubai. *em.d*

DUBAI SMART GOVERNMENT: GREEN & SMART FOR SUSTAINABLE DEVELOPMENT

By
HE Ahmad Bin Humaidan

HARNESSING TECHNOLOGY TO MINIMIZE DUBAI'S CARBON FOOTPRINT

Dubai Smart Government (DSG) has made major progress in its transformation to a smart government that is eco-friendly and green and is aligned with the UAE Vision 2021 which calls for consolidating the competitive position of the UAE in a changing green global economy.

DSG encourages its employees to practice the Reduce, Reuse, Recycle on a daily basis, and has planned its programmes so as to reduce its carbon footprint. All DSG employees are encouraged to segregate waste under their desks into three bins: plastic, paper and general waste, with monthly reports being received as to how much waste was successfully recycled. Employees are also encouraged to bring and donate items that can be given to the needy to encourage reusing. These include shoes, bags, cooking utensils and clothes.

Together with its government partners, DSG provides an array of more than 1500 smart services that minimize paper, printing and poisonous inks. DSG's electronic archiving, green bills and video-conferencing facilities further reduce the city's carbon-footprint. ICT assets and services are shared among 39 Dubai government entities who all use the unified government resources planning systems that include a common finance platform, supply chain, HR, payroll, purchasing, ePay, call-centre etc. Thus DSG continuously minimizes any wastage in the use of resources and contributes to a green economy.

From a customer perspective, further environmental and financial savings come about since customers do not have to travel to government departments, wasting fuel and having trouble with parking and traffic jams. DSG's statistics for ePay back up this claim, since 1.8 million transactions in 2010 increased to 4.5 million transactions by the end of 2013, a 250% increase in just three years.

The next stage in our progress towards a green government is to effectively harness the power of the smartphone and go beyond using SMS services to effectively use mobile apps, in line with the directives of HH Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, who said: "I want the citizens to be able to process all their government transactions in one place, on a one-mobile stop shop." The UAE has one of the best communications infrastructures in the world, with the highest mobile and smartphone penetration rate in the world. A study published by Google in 2013 showed the UAE's smartphone penetration rate was 73.8% followed



HE AHMAD BIN HUMAIDAN
DUBAI SMART GOVERNMENT

He is the Director-General of Dubai Smart Government and part of the Higher Committee for the implementation of the Dubai Smart City Project.

حكومة دبي الذكية
Dubai Smart Gov



The Dubai Smart Gov mPay app which was released in 2012 has already been downloaded about 76,000 times



UAE's smartphone penetration rate was 73.8% [in 2013] followed by South Korea, Saudi Arabia, Singapore, Norway, the UK and the US



Dubai Smart Government envisages that the smartphone will play an even greater role in a green smart city environment through social media, smart polls, crowd-sourcing and decision making. Towards this end, it has introduced the MyID project, which enables all customers to get unified access to all electronic and smart services provided by Dubai Government entities through one single sign-on which is linked to the Emirates ID card. The MyID project is in line with the future roadmap of Dubai Government which provides a customer-centric personalized government experience in a smart city, for all citizens and residents through value-added services on smartphones which will include information and reminders that can be adapted in real-time to situation and location.

Together with its government partners, Dubai Smart Government has created and is enhancing its many mobile solutions including smartphone apps and mobile payment gateways. It has classified more than 60 smartphone Dubai Government apps into 7 categories: business and economy; healthcare; education; security and justice; community and social development; transportation, environment and infrastructure; and tourism and events apps. The Dubai Smart Gov mPay app which was released in 2012 has already been downloaded about 76,000 times and has been reengineered to accept all kinds of smartphone payments including electricity and telecommunications fees, traffic and water bills and voluntary donations.

Dubai Smart Government recognizes its responsibility to environment sustainability and will lead by example in its continued quest to develop services and apps that are aligned with the UAE Vision 2021 which aspires for the UAE to be among the leading countries in the world, which not only enjoys a high standard of living, but also lives within a nurturing and sustainable environment. *em.d*

ADDITIONAL NOTES

Commenting on the remarkable increase in the use of eServices, HE Ahmed Bin Humaidan, Director General of Dubai Smart Government, said: "These results are a clear indication of the growing pace of eTransformation in Dubai, further reflected by the growing demand for ePay to complete government transactions. They also express the strong confidence of our customers in this highly efficient and secure solution. ePay contributes to the national economy and helps create a sustainable green environment, since it reduces traffic movement and congestion, by avoiding unnecessary visits to government counters, thereby reducing wastage of assets and enhancing the green economy of the nation. We have come a long way in providing our clients with cutting-edge smart government applications in various fields, specifically in financial dealing which is the most sensitive for both individual and corporate users." ¹

Commenting on the activation of the linkage with DIB, HE Ahmed Bin Humaidan, Director General of DSG, said: "The GRP systems provided to government entities are vital infrastructure that they rely on for managing their core resources, help increase productivity, save the time and effort of government entities and suppliers and support electronic payment between the two parties. They also support the government's shift towards a sustainable green environment by eliminating the need to exchange paper documents, minimizing the effect of vehicle movement and providing a secure environment for paying money, thereby contributing to boosting the national economy." ¹

PLANNING THE CITIES OF THE FUTURE

By **Jeremy Bentham**

MEETING THE CHALLENGES OF RELENTLESS GROWTH IN URBAN CITIES

Cities help define our global civilisation. For hundreds of years, they have been the hubs around which we organise ourselves politically, commercially and culturally.

The challenge is huge. The United Nations projects that the world's population will grow from roughly seven billion today to nine billion by the middle of the century - the equivalent of 14 million people every week. At the same time, the number of people living in cities is expected to rise from 3.6 billion in 2010 to 6.3 billion in 2050.

Why does urbanisation matter? Because well-designed and managed cities can act as powerful engines for economic development and prosperity - and help to nurture innovation and collaboration. However, bad urban planning puts pressure on essential resources like energy, water and food. Demand for all three is already expected to rise by between 40 and 50% by 2030.

That's why we must take the challenge posed by accelerating urbanisation seriously.

The Shell Scenarios team is the company's task force on research into global problems. The report 'New Lenses on Future Cities' published in partnership with the Singaporean government's Centre for Liveable Cities, identifies a number of areas for action.

The first is urban planning which focuses on the efficient use of resources. The design and layout of a city has a powerful impact on its resource needs. Compact, more densely populated cities like Hong Kong use significantly less energy per person than sprawling cities like Los Angeles. Why? For example, because people live closer to where they shop, work and play - and therefore use less energy to get around. When those compact cities are served by reliable, cleaner transport networks, energy use is reduced even further.

We can encourage the use of smaller cars powered by electricity or hydrogen fuel cells, as well as trucks fuelled by liquefied natural gas, cleaner vehicles which are ideally suited to life in compact, more integrated cities and a perfect complement to advanced transport systems. These will take time to reach mass scale, but are already becoming a familiar sight in some cities. In the meantime, cleaner-burning fuels like gas-to-liquids diesel can improve air quality - a major health consideration in urban settings. The use of global positioning technologies to monitor freight transport in and around cities can help managers to task vehicles as

efficiently as possible - ensuring that no journey is wasted or duplicated. Integrating water, sewerage, waste and power systems more effectively would allow the recycling of the water and energy they consume. And switching coal-fired power stations to cleaner-burning gas would reduce carbon emissions and improve the quality of our cities' air.

Another essential aspect is effective leadership. Whether that leadership comes at the national, regional or city level, it needs to be forward-looking, transparent, flexible and informed by a clearly expressed vision. Our cities also need leaders who are good at implementation - at 'getting things done' - and who are capable of building the kind of collaborative, cross-sector partnerships which make it possible to take the steps needed.

Truly sustainable urban development is not easy. But it can be done. Fifty years ago, Singapore was very different from the city we know today. A quarter of the population of 1.6 million lived below the poverty line. But thanks to a decades-long programme of pro-active urban development - including the construction of Singapore Changi airport, the Mass Rapid Transit subway system, and an island-wide system of expressways - the city's prospects have been transformed. With limited land and natural resources, Singapore has succeeded in creating an environment in which its economy and its people are thriving.

In seeking to learn from Singapore's example, no one is suggesting there is a 'one-size-fits-all' model for urban development. Different cities have different requirements, according to their geography, their finances, their political and institutional capacity and their infrastructure.

But while no two cities, and no two development plans, can or should be the same, there are important principles from which we can learn. Above all, we must understand the benefit of collaboration between government, business and civil society, because it's only by working together that cities - homes to billions of people - can be the sustainable hubs we need them to be. *end*



JEREMY BENTHAM SHELL

He is the Vice President of Shell's Global Business Environment team, a core corporate strategy activity best known for developing the Shell Scenarios.



People living in cities is expected to rise from **3.6 to 6.3** billion in 2010 billion in 2050

SMART CITIES EMBRACE INNOVATIONS IN MESH NETWORKING TECHNOLOGY

By
Dimitris Drakopoulos

OPTIMIZING ENERGY EFFICIENCY THROUGH INTELLIGENT MESH NETWORKING TECHNOLOGY

The success of Smart Cities relies on the implementation of advanced telecommunication technologies to optimize services and environmental conditions. Smart Cities should facilitate the integration of the existing infrastructure into innovative technologies that deliver sustainable performance and increase profitability.

The pillars to secure the successful deployment of innovative technologies for sustainable development are:

- **Collection systems:** measurement of real-time city data in an efficient and uninterrupted manner;
- **Communication networks:** reliable transmission of large-volume data among the nodes of the network and subsystems;
- **Integrated management centre:** manage and process the incoming information, performing the appropriate decisions when required to ensure enhancement of 'city-assets'.

Smart Cities are dependent on the capability of wirelessly transmitting and managing critical information in real-time. Mesh technology allows the remote management of city's lighting, security and environmental data with an unmatched transmission capacity.

For example, the existing outdoor lighting infrastructure is being used to efficiently collect and transfer data to an energy management platform that incorporates two-way communication between a remote

control center and each lighting pole. The basic operational principle is based on the concurrent transmission of different types of information under one or two mesh networks that operate in parallel, deploying equivalent properties. The data processing cycle consists of three stages: a) Detecting, b) Transmitting and c) Performing.

The unparalleled usability of this system integrates an unlimited number of nodes and allows different organizational topologies according to application.

The control center operator has all real-time and historical data available to configure basic operations or schedule advanced tasks:

- Lighting poles can be programmed to switch on and off or dimmed, optimizing the electricity consumption in public places;
- Video surveillance cameras can be integrated to analyze the traffic volume and therefore, to automatically adjust the light intensity across motorways;
- Soil humidity and air temperature sensors can be used to determine the exact amount of water needed for irrigation purposes, reducing the water usage by nearly 30%;
- Waste sensors can be placed in each container to detect whether they are full or empty and schedule the garbage track routes accordingly;
- A range of environmental sensors/ detectors can be deployed to oversee various conditions enabling an effective response to emergency situations.

Implementing this technology can deliver high quality services in a manner that reinforces cost reduction, sustainable management and asset performance. *em.d*

DID YOU KNOW?

EMRA software using mesh technology can save up to 70% of energy consumption.

Source: http://www.emra-co.com/intelligent_lighting_solutions/



DIMITRIS DRAKOPOULOS
EMRA LLC

He is Business Development Manager for EMRA LLC, a UAE dynamic organization that provides a full array of innovative integrated technologies powered by clean energy sources.

POWERING A SUSTAINABLE, SMART FUTURE

By
Saleem Al Balooshi



SALEEM AL BALOOSHI
du

He is the executive Vice President of Network Development & Operations in du

A key component to the impending rise and growth of Smart Cities - touted as cities of the future - is sustainability. Sustainability in a Smart City goes beyond initiatives that benefit the environment as convenience and ease of use for vital functions are equally important. These futuristic citadels are built upon connectivity provided by the information communications technology (ICT) industry and telecommunications companies have the biggest roles to play in supporting the smart movement. These can include government functions, which makes smart government - or the e- and mGovernment movement - crucial to a Smart City's success.

The momentum has already gathered pace and, du has pledged full support to the UAE leadership's vision for achieving a sustainable smart future for the nation, and does so by applying smart solutions across all aspects of its business and throughout several vistas of UAE's society, from developing network infrastructure to helping government agencies to develop apps for e- and mGovernment.

du supports Smart City infrastructure by assisting in the virtualisation of governmental services from bill payment to appointment making and everything in between, placing governmental processes at the fingertips of citizens. The Directorate of Residency and Foreigners Affairs and the Ministry of Environment are just two examples of governmental agencies that have partnered with du to develop customised applications, which streamline and simplify interactions for Dubai's citizens.

It is noteworthy that typically, network solutions required to power a smart city are quite energy-intensive. In order to make its operations more environmentally sustainable, du introduced hybrid energy solutions in its base transceiver station sites, with 209 sites converted as of December 2013 and more being added throughout 2014. These reduce the amount of diesel fuel consumed by using batteries that draw on solar power. To date, this has conserved 4.5 million litres of diesel fuel, resulting in a reduction in CO₂ emissions of 11,850 tonnes, with further savings of more than 1.5 million litres of diesel fuel and 3,950 tonnes of CO₂ emissions expected by the end of 2014.

Additionally, du's Smart Telecom Building Infrastructure Guidelines support the UAE's Smart City initiative by ensuring high speed, high quality connectivity for citizens, no matter where they are, by providing building developers with guidelines for a sustainable approach to the integration of communications services in buildings. This will ensure the continued, seamless quality of connectivity as technology evolves and thrives. *em.d*

DID YOU KNOW?

¹ tonne of CO₂ avoided equals to almost half a truck of waste recycled than landfilled.

Source: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>

INTERVIEW: DILIP RAHULAN

**Dilip
Rahulan**
Founder & CEO
of Pacific Controls


PACIFIC CONTROLS
باصيوليك ك انزولز

Q1. HOW IS PACIFIC CONTROLS CONTRIBUTING TO THE UAE VISION 2021?

D.R.: Pacific Controls has established the Middle East's largest Data Center campus in Dubai, which is certified as a world-class facility by Uptime Institute. This facility is hosting cloud-computing services for the private and public sectors with an investment of over AED 500 million. The facility is today one of the first software-defined data centres offering cloud-computing infrastructure services to customers in the Middle East. The UAE Vision 2020 requires leveraging cloud computing for analysis of large databases for business intelligence and real-time management of integrated government services. Pacific Controls is proud to be the pioneering cloud-services provider in the Middle East.

Q2. HOW WOULD YOU DEFINE A SMART CITY?

D.R.: A smart city means different things to different people. For us, a smart city is the outcome of all government and private-sector services being integrated to deliver real-time big-database analytic services for management and optimisation of business intelligence, enabling smart service ecosystem management and providing these services to the residents of the city as a service on demand. ➔

THE UAE
VISION 2020
REQUIRES LEVERAGING
 **CLOUD
COMPUTING**
for analysis of large databases for
BUSINESS INTELLIGENCE



GREEN ECONOMY FOR SUSTAINABLE DEVELOPMENT

Partnership for action on GREEN economy (PAGE)

A CONFERENCE ON PROGRESS AND PROSPECTS

The Partnership for Action on Green Economy (PAGE) is a joint initiative by UNEP, ILO, UNIDO and UNITAR to provide comprehensive assistance to countries seeking to develop and implement inclusive green economy strategies.

The inaugural conference on PAGE was held in the United Arab Emirates, under the Patronage of His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of UAE and Ruler of Dubai. The two day event took place from 4 to 5 March 2014.

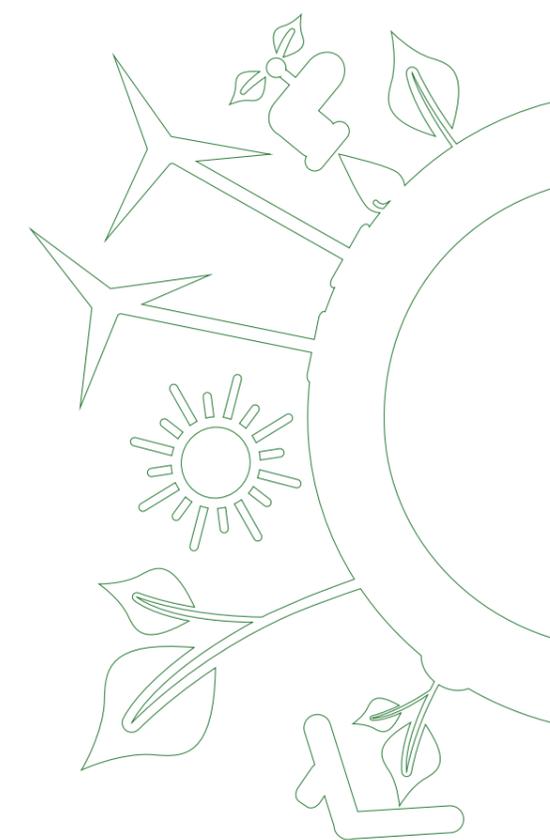
The conference was an opportunity to review international experience and progress related to green economy in the context of sustainable development and poverty eradication. It also considered how greener economies can contribute to the emerging post-2015 development agenda.

More than 450 participants from 66 countries, including 27 Ministers, representing governments, the private sector, civil society and development agencies, attended the meeting.

The conference was opened by the UAE Minister of Environment and Water, followed by representatives from PAGE countries and PAGE partners, including UNEP Executive Director Achim Steiner.

THE OBJECTIVES OF THE CONFERENCE WERE THE FOLLOWING:

- 1 Take stock of best practices and lessons learned in advancing an inclusive green economy through policy reforms and shifting investment into key areas of the economy that produce jobs, social equity and income;
- 2 Share this knowledge through interactive thematic sessions geared toward developing a set of general principles and policy recommendations to realize economic, social and environmental benefits from transitioning to inclusive green economies; and
- 3 Explore the multiple pathways and partnerships - including PAGE - available to countries as they lead these transitions within their national contexts. *em.d*



Q3. WHAT IS YOUR GROWTH PLAN FOR THE GLOBAL COMMAND CONTROL CENTER THAT MONITORS ENERGY-CONSUMING METRICS REMOTELY, CURRENTLY ACROSS THE U.S, CHINA, INDIA AND THE UAE? HOW CAN THE CENTRE HELP IN DEVELOPING INTERCONNECTED SMART CITIES?

DR.: Pacific Controls has strategically partnered with Jones Laing LaSalle, a global leader in real-estate development and facilities management, to provide our managed services to the United States, China and India. The joint service offered by the two companies is branded as Intellicommand. Intellicommand offers an end-to-end city-management platform, providing real-time managed services for smart-city infrastructure.



Q4. WHAT ARE SOME OF THE CHALLENGES YOU HAVE FACED IN ASSISTING DUBAI TO BECOME A SMART CITY?

DR.: Development of a smart city is a dynamic process and involves the integration of various services in the government and private sector. This integration is one of the biggest challenges that needs to be addressed through knowledge exchange and integration of service. There is a whole new business culture that is emerging out of real-time business intelligence.

Q5. WHAT ARE THE INTERNATIONAL BEST PRACTICES THAT YOU FOLLOW IN YOUR CENTRALISED IT CLOUD SYSTEMS?

DR.: Pacific Controls' commitment to best practices is proven by its commitment to sustainability. Our world-class Data Centre Campus infrastructure is benchmarked to international sustainability standards and is a Tier III Uptime Institute design and construction certified facility. We are following ITIL standards for all of our IT infrastructure and IEEE & Cloud Standards Council of ITU for cloud-computing infrastructure.

Q6. PACIFIC CONTROLS HAS A RANGE OF HARDWARE AND SOFTWARE TOOLS. WHICH ONE DO YOU THINK PLAYS THE MOST IMPORTANT ROLE IN SMART CITIES AND WHY?

DR.: Pacific Controls' Galaxy 2021 platform is a software platform that provides end-to-end city-management capability and integrates machine-to-machine applications from all service providers. The artificial intelligence embedded in the Galaxy Platform, called GBots, is the unique value proposition our platform offers our customers. Delivering real-time information into the cloud - enabling business intelligence and governance data to manage the ecosystem of a smart city - and the capability of integrating data from the internet creates a unique value proposition for managing a smart city.

Q7. HOW HAS THE MARKET RESPONDED TO YOUR EMIRATES ENERGY STAR PROGRAMME?

DR.: Pacific Controls is happy that the Emirates Energy Star program has tremendous support from the government sector. Currently we are implementing the Emirates Energy Star programme in multiple government departments.

Q8. WHAT INSPIRED YOUR COMPANY'S COMMITMENT TO SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL IMPROVEMENT?

DR.: Pacific Controls has always been committed to corporate social responsibility, and as part of this commitment Pacific Controls has been responsible for delivering technology for sustainable development. *em.d*

'GREEN DEAL' FOR DUBAI?

By **Rajan Phakey**

Introduced in January 2013, the "Green Deal" is the UK government's flagship policy designed to upgrade the energy efficiency of Britain's homes and buildings. How does it work, and can Dubai learn any insights from the British model?

ENERGY EFFICIENCY IN BRITAIN

The UK government's energy efficiency strategy comprises many different policies, and a significant focus is on policies aimed at reducing electricity bills through energy efficiency. Buildings in the UK are amongst the least efficient in the world. Buildings that leak heat and waste energy account for 38%¹ of the UK's total greenhouse gas emissions, and result in higher energy bills.

HOW THE GREEN DEAL WORKS

The Green Deal lets homeowners (and businesses) pay for the cost of energy-saving home improvements through savings on their energy bills. There are four steps involved in the Green Deal: assessment, finance, installation, and repayment.

The first step is to assess the energy efficiency and how energy is used in a property. The basic principle is that the estimated future savings on energy bills must outweigh the cost of repayments. An accredited assessor will decide whether this test is met, and then recommend energy saving improvements that are tailored to the home, such as double glazed windows or boiler upgrades.

The second step is deciding who will arrange and finance the improvements. A person can approach various accredited providers for quotes. Since the finance is repaid over time, a fixed rate of interest may be charged. If the homeowner agrees with a quote, they will enter into a contract with the chosen provider.

The third step involves the provider arranging for home improvements to be installed by an accredited installer.

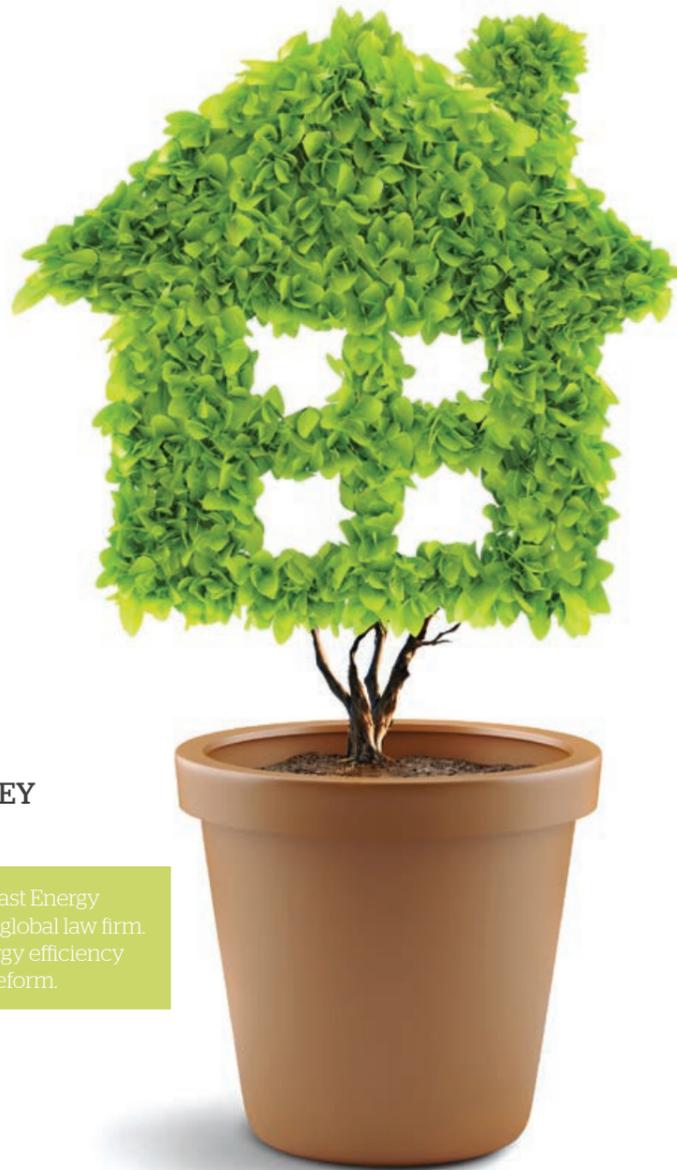
The fourth step is repayment. Repayments are made in instalments over the long-term, through the customer's energy bill. The electricity supplier will pass the payments on to the finance provider. Crucially, the regular

payments are limited to the value of the predicted energy savings, and are made until the loan is fully repaid.

In addition to the method of repayment, the Green Deal includes various other novel features when compared to conventional home improvement schemes. For example, the loan is attached to the home, not the borrower. Therefore if a person sells a property, the new owner or occupier is then obligated to continue making the repayments. The principle is that the person benefiting from the cost-savings will make the repayments. The UK government has provided special grants to many homeowners to encourage them to participate in the scheme.

RAJAN PHAKEY DENTONS

He leads the Middle East Energy practice at Dentons, a global law firm. Rajan advises on energy efficiency projects and market reform.



COULD IT WORK IN DUBAI?

As part of any analysis, Dubai would of course look to learn lessons from how the UK has implemented the model. The Green Deal has faced some difficulties in its first year of operation. Many of the concerns relate to the cost of finance and the complexity of the scheme, and this has resulted in a slow take up of the policy.

At its core, however, the principles that underpin the Green Deal are actually quite simple and they could be applied in Dubai.

As with any new policy, its success would depend on a number of different factors, such as ensuring the policy works in conjunction with other policies (such as the effect of any subsidies on utility bills) and is consistent with meeting the overall strategy (such as targets on efficiency improvements).

In Britain, the people who will benefit most from the Green Deal are those who live in cold or draughty houses and use a lot of energy. Given the difference in climate, a corresponding policy in Dubai, would likely give greater emphasis towards incentivising home improvements that yield cost savings through more efficient cooling, such as more-efficient air conditioning units.

These are just some of the relevant issues. There would be many more that would need to be addressed. Given the Dubai Government's commitment to reducing carbon emissions and increasing energy efficiency, the future for the Green Deal in Dubai as a smart city looks optimistic. *emd*

ADDITIONAL NOTES

How the green deal will work for consumers



Impartial property assessment to determine what work needs to be done.

The customer can take the assessment to several Green Deal Providers to get a variety of quotes.

Green Deal measures installed and paid for by preferred Green Deal Provider.

Householder or business begins repaying work through charge on electricity bill.

Source: <http://www.switch.com/gas-electricity/news/2012/09/27/is-the-green-deal-a-good-deal/>

THE DUBAI DESIGN DISTRICT (d3)

Dubai Design District (d3) is the latest development from Tecom Investments and is the greenfield pilot site for the Dubai Government's Smart City Strategy. d3 will invest in sustainable and smart initiatives throughout the development that foster sustainable economic growth, support high quality of life, manage resources wisely and provide access to information. In doing so, d3 will facilitate awareness of the Smart City strategy that encourages governance, participation and ultimately changes behavior, while continuously improving the life of citizens at d3.

d3 will adhere to the six Smart City pillars: Economy, Governance, Mobility, Living, Environment and People. As such, the d3 master plan has been designed to promote sustainability according to the Smart City pillars including infrastructure that conserves energy, manages resources efficiently and reduces carbon emissions. For example, d3 is planning to introduce a public energy and water consumption dashboard to increase awareness of consumption levels to encourage conservation.

Part of what d3 is planning to implement as initiatives to facilitate continuous improvement of sustainable practices include:

- Smart Metering
- Real Time Personalized Dashboard
- Incentivized Recycling Program
- Advanced Lighting Controls
- Solar Hot Water Renewable Energy
- Advanced Parking Management
- District Cooling System
- Heat Energy Recovery
- Demand-driven Systems
- Grey Water Treatment System
- Energy Management System

The success of these sustainability practices will be monitored in accordance with an approved set of Key Performance Indicators extracted from the data generated by a network of sensors monitoring the smart initiatives in place. *emd*



¹ <https://www.gov.uk/government/policies/helping-households-to-cut-their-energy-bills/supporting-pages/green-deal>

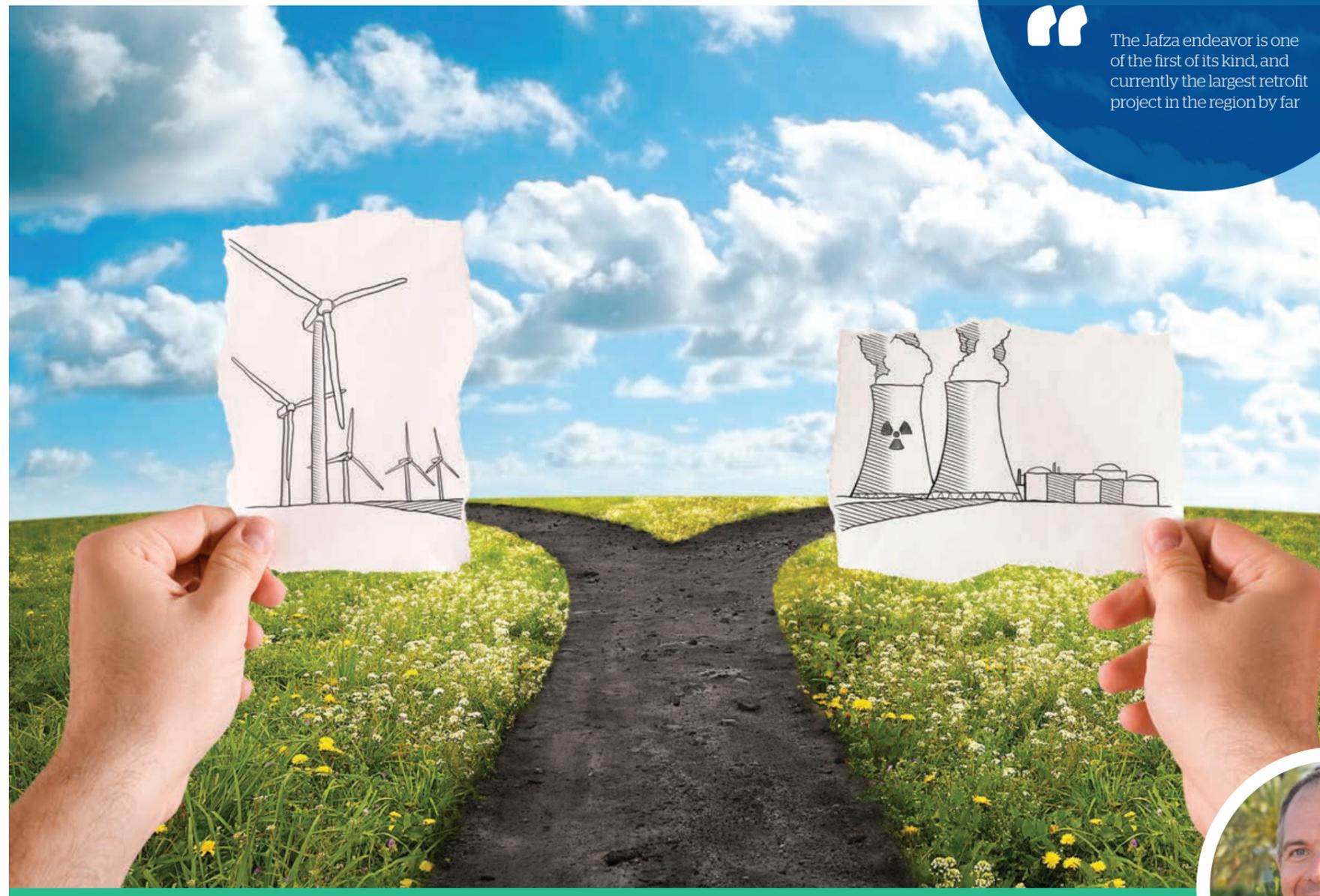
JAFZA: PIONEERING ENVIRONMENTAL INNOVATIONS

By
Stephane le Gentil

A STRATEGY FOR ENERGY EFFICIENT BUILDINGS

Economic Zones World (EZW), in collaboration with Etihad ESCO, is undertaking the task of retrofitting 120 existing buildings in the Jebel Ali Free Zone (Jafza), a subsidiary of EZW. Established back in 1985, with a growing number of tenants and businesses on its premises, the free zone is continuously working to increase its operational efficiency and improve its carbon footprint.

The Jafza endeavor is one of the first of its kind, and currently the largest retrofit project in the region by far. As the Energy Service Company (ESCO) market begins to firmly establish itself in the UAE, Jafza would have served to pave the way for pioneering innovation to reduce energy demand among the buildings and infrastructure projects in the region.



The Jafza endeavor is one of the first of its kind, and currently the largest retrofit project in the region by far



STEPHANE LE GENTIL
ETIHAD ESCO

He is the Chief Executive Officer of Etihad ESCO. Stephane is a renowned expert in the Energy Performance Contracting sector.

Etihad ESCO business model



ADDITIONAL NOTES

Source: <http://www.etihadesco.ae/?pressreleases=etihad-esco-and-ezw-eye-energy-efficiency-projects>

Source: <http://www.etihadesco.ae/wp-content/uploads/2014/05/Guide-to-ESCOs-on-how-to-participate-in-the-Dubai-Buildings-Retrofit-Programme.pdf>

The enhancement project overseen by Etihad ESCO has already completed the feasibility study stage, whereby the Super ESCO has audited and analyzed the energy and water consumption for the 120 buildings situated in different locations within the free zone. The current stage is the creation and launch of a project through a competitive selection process for (ESCOs) to respond with proposals that aim to achieve a minimum target of 20% savings annually through the use of energy performance contracting.

With Etihad ESCO arranging financing in collaboration with participating financial institutions, the building retrofit program is on track, with the tender set to be released by the end of 2014. This will be followed by the selection of an ESCO to undertake the project in 2015, and implementation will commence in 2016 to produce the anticipated savings.

Through a rigorous review and evaluation process of tender proposals submitted by ESCOs, Etihad ESCO will select the most suitable ESCO for the project and oversee all implementation processes, including detailed design and engineering, installation, commissioning and measurement and verification (M&V) in accordance with international standards throughout the remaining stages. By 2016, Etihad ESCO and Jafza will be able to measure tangible savings, allowing the free zone to effectively reduce costs and enhance long-term energy performance savings in their existing buildings. Retrofitting existing brown buildings would thus increase energy efficiency in Jafza and truly transform it to a smart and sustainable city. *enr.d*



Etihad ESCO has a clear vision to make Dubai one of the most sustainable cities in the world and to make Dubai's built environment a leading example of energy efficiency for the region and the world

HE Saeed Al Tayer

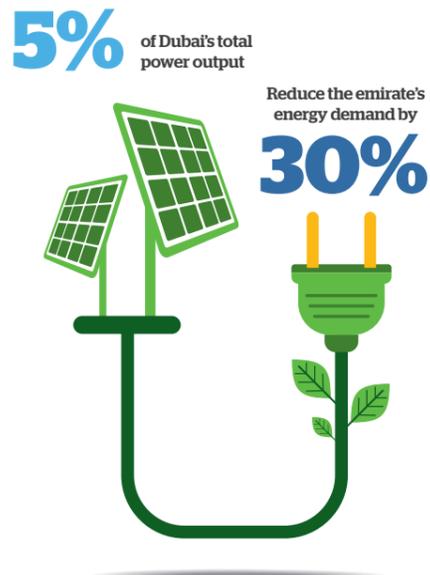


CATCHING THE SUN ON DUBAI'S ROOFTOPS

The implementation of the Distributed Renewable Resources Generation (DRRG) programme into the DEWA electricity grid began in April 2014. This programme connects solar energy to houses and buildings, which will encourage the use of renewable energy, and increases its share in the energy mix to help achieve the Green Economy for Sustainable Development initiative and the national agenda of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.



Strategy 2030 to use renewable energy sources to generate



This initiative is one of three key initiatives that DEWA will implement to achieve the vision of HH Sheikh Mohammed bin Rashid Al Maktoum, to transform Dubai into the smartest city in the world, enhance quality of life in Dubai, and achieve sustainable development.

The DRRG programme is the first of three of DEWA's Smart Dubai Initiatives. Connecting solar energy to houses and buildings, DEWA aims to encourage households and businesses in Dubai to install photovoltaic solar panels and connect them directly to Dubai's electricity grid. These grid-connected solar systems will enable users to generate their own electricity and export any surplus to the electricity grid.

This objective means a lot of work needs to be done on the DEWA

electricity grid in order to ensure that the highest technical, safety and compliance standards are in place for the safe and reliable connection of solar panel systems to the grid. This work will be done during the technical implementation phase that includes first test connections by Q4 2014 during the pilot stage of the programme.

In 2011, the Dubai Supreme Council of Energy adopted the Dubai Integrated Energy Strategy 2030 to use renewable energy sources to generate 5% of Dubai's total power output and reduce the Emirate's energy demand by 30% by 2030. In 2012, HH Sheikh Mohammed bin Rashid also launched the Green Economy for Sustainable Development Initiative, demonstrating the UAE leadership's dedication to shifting the focus towards sustainable energy as the key factor in Dubai's efforts to deliver sustainable economic, environmental and social growth.

The abundance of solar resources in this region clearly points to solar power generation as the main future source of energy to mitigate projected increases in electricity demand and support the diversification of energy sources through the use of solar power. The first big initiative to meet the set targets was the launch of the Sheikh Mohammed bin Rashid Al Maktoum Solar Park in 2013. In addition, with the introduction of this (Connecting Solar Energy to Houses and Buildings) initiative, DEWA has committed to establishing a market for residential and commercial roof-top solar systems that will greatly contribute towards meeting Dubai's long-term energy goals and also educate and encourage the citizens of Dubai to live more sustainably and collectively contribute towards their well-being, for generations to come. *em.d*

GREENING THE ACADEMICS

By
Dr Youssef Al Assaf

INITIATIVES FOR ADVANCING EDUCATION IN SUSTAINABILITY AND ENERGY EFFICIENCY IN DUBAI

One of the main areas of focus at RIT Dubai is to support the realization of the UAE Vision 2021 in vital areas such as sustainability, energy efficiency and sustainable environment through capacity building within the UAE workforce. This focus is nothing new for the **Golisano Institute for Sustainability (GIS)** at our main campus in New York. Described as "a living lab," GIS represents RIT's ongoing commitment to the environment. GIS offers one of the world's first Ph.D. programmes in sustainable manufacturing and industrial development. The institute conducts leading research in alternative energy, remanufacturing, nanotechnology and sustainable production for a wide range of industries worldwide. As one of our global campuses, RIT Dubai benefits from this knowledge and offers a professional program in which GIS specialists share their expertise with other experts in Dubai.



DR. YOUSEF AL-ASSAF
RIT DUBAI

He has been the President of RIT Dubai since 2013. Prior to RIT Dubai Dr. Al-Assaf was the Dean of the College of Engineering (CEN) at the American University of Sharjah (AUS).

INFO BOX

About Rochester Institute of Technology (RIT Dubai)
RIT Dubai is a not-for-profit global campus of Rochester Institute of Technology, NY which is one of the world's leading technological institutions. In Dubai we are offering high-quality U.S. bachelor's and master's degrees in engineering, computing and business, which are also UAE accredited. RIT Dubai is furthermore organizing the International Conference on Sustainable Energy & Environment (ICSEE-2015), to be held in Dubai from 7th to 9th, December, 2015 under the patronage of HH Sheikh Ahmed Bin Saeed Al Maktoum, Chairman of The Dubai Supreme Council of Energy and Group Chairman of Dubai Silicon Oasis.

INTERVIEW: DR. MOHAMMED AL ZAROONI

Dr.
**Mohammed
Al Zarooni**
Vice Chairman &
CEO of Dubai Silicon
Oasis Authority

HOW TO TRANSFORM A HIGH-TECH PARK INTO A SMART CITY



سلطة واحة دبي للسيليكون
Dubai Silicon Oasis Authority



Q1. WHAT STRATEGY ARE YOU PLANNING TO IMPLEMENT IN ORDER TO TRANSFORM THE HIGH-TECH PARK DUBAI SILICON OASIS (DSO) INTO A SMART CITY?

Dr. M.A.: In order to transform Dubai Silicon Oasis (DSO) into a Smart City, we have developed a comprehensive strategy that is directly aligned with the directives of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai to transform the emirate into a Smart City.

As part of our smart strategy, we aim to introduce smart projects and initiatives over several phases. By achieving set milestones, DSO will transform and become a unique model that implements the latest Smart City concepts. To support the achievement of these milestones, we have set systems in place and planned processes which relate to what would be best suited for this city taking into consideration environmental conditions, cost of implementation, potential challenges, and ability to develop and replace these systems.

Our strategy also focusses on improving the quality of life and work at DSO through offering continuous services and the latest smart solutions. We will also take into consideration developing new smart projects that support smart energy, smart mobility and smart business processes including smart entertainment and lighting systems, smart screens, smart devices charging docks and smart bus stations.

Moreover, we will focus through our projects on developing smart applications and robotic technology solutions as well as optimizing renewable energy resources. We will also work on utilising smart grid apps to facilitate communication with our stakeholders and visitors to the high-tech park.

We will also focus on engaging with leading international Smart Cities to establish a centre of excellence. This centre will provide specialisation in Smart City sciences to researchers as well as encourage collaboration with world renowned academics.



Q2. THE SUCCESSFUL INSTALLATION OF WIRELESS INTERNET (WI-FI) THROUGHOUT DSO MADE IT THE FIRST FREE ZONE IN THE REGION OFFERING FREE WIRELESS INTERNET ACCESS. WHAT ARE THE DETAILS OF THE WI-FI PROJECT?

Dr. M.A.: DSO is making steady progress in supporting our leadership's vision of positioning Dubai as a key destination for business and tourism. DSO's Wi-Fi project reiterates our priority to provide a world-class experience to our business partners by incorporating global practices and standards.

As part of this priority, we recently completed the Oasis project network offering free wireless internet (Wi-Fi) access throughout the DSO premises. Complimentary Wi-Fi access is available across an area of 7.2 square kilometres, making DSO the first zone in the region to offer free and uninterrupted online access.

As a result, the Wi-Fi deployment allows users who are living or working at DSO to experience the 'Internet of Things' philosophy and benefit from smart network solutions that enable machine-to-machine (M2M) communication services. The network enables individuals and companies to connect seamlessly through facilitating VOIP (voice over internet protocol) services. Additionally, it promotes community services such as traffic updates and emergency response mechanisms.

Q3. HOW MUCH DID IT COST TO INSTALL WIRELESS INTERNET ACCESS ACROSS THE AREA?

Dr. M.A.: The installation cost of the Wi-Fi project launched in early 2014 reached AED1.5 million. The cost included setting up 350 access points, 160 connectivity stations and 20 main stations to provide coverage to all public areas within Dubai Silicon Oasis.

The project was delivered over two phases. Phase 1 of the project enabled Wi-Fi access at the DSO headquarters, Cedre Shopping Centre, Semmer Villas, and the parking lots adjacent to these areas. Phase 2 expanded Wi-Fi access throughout the DSO premises. The network registered more than 84,817 users within six months of its launch.

The Wi-Fi installation was deployed in collaboration with Emirates Wi-Fi that continues to provide maintenance services and technical support. ➔



Q4. YOU HAVE ALSO RECENTLY LAUNCHED SILICON PARK. TELL US MORE ABOUT THE PROJECT?

Dr. M.A.: 'Silicon Park' is DSO's first integrated Smart City project that complements the vision of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to shape the emirate into a leading global Smart City. Offering an attractive lifestyle for DSO residents, workers and visitors, the project will reflect Dubai's Smart City vision that focuses on life, society, mobility, economy, governance and the environment.

Comprising 97,000 sq m of office space, 25,000 sq m of commercial space, 20,000 sq m of residential area, and a 115-room business hotel, Silicon Park will offer value-added facilities such as restaurants, cafes, health and fitness centres, running tracks and cycling trails, prayer rooms, a shopping centre and an underground parking for more than 2,500 cars.

Work on the AED1.1 billion project has begun and is set for completion by Q4 of 2017.

Q5. THE EXECUTIVE COMMITTEE OF THE DUBAI SMART CITY PROJECT CLASSIFIED SILICON PARK AS A GREEN FIELD PROJECT. WHAT MAKES THIS PROJECT DISTINCT?

Dr. M.A.: We are proud of DSO's accomplishments to date towards becoming a smart project. Compliant with the UAE's LEED-certified green building standards, Silicon Park will use green building materials and control mechanisms in addition to solar panels and double-glazed windows to reduce heat absorption.

The buildings will feature green roofs, made up of plants and trees that need little water to grow and thrive in direct sunlight. In addition, the project will benefit from using renewable energy and incorporate measures to maximize energy efficiency.

Silicon Park will also include smart lighting systems that use motion sensors responsive to vehicular and human movement. Smart street light poles will be equipped with digital signboards that can be remotely controlled through an application. Advanced technologies will be leveraged to limit water consumption and encourage recycling procedures at homes and offices for re-use in

irrigation. These mechanisms will serve to minimize the ecological impact and reduce the carbon footprint.

Additionally, the smart building design will integrate innovative shading techniques for common areas that can be used for community activities all year round. Temperatures in the shaded areas will remain eight to 10 degrees cooler than the surroundings.

The project will feature facilities such as health and fitness centres, as well as running and cycling trails that enhance the concept of modern, healthy living.

The Silicon Park project will be completely free of fossil fuel powered vehicles. Instead, electricity-powered automobiles will serve as the primary form of transportation. A number of charging stations will be set up across the area that can be accessed by all residents and visitors with electric vehicles. The project will also include other means of transportation such as smart rechargeable electric bikes.

Q6. YOU HAVE VISITED SOME OF THE MOST FAMOUS SMART CITIES IN THE WORLD, SUCH AS BARCELONA, AMSTERDAM AND MADRID. WHAT ARE THE OUTCOMES FROM THESE VISITS?



Dr. M.A.: DSO continuously seeks to build mutual cooperation and exchange experiences with all Smart Cities in the world. We have signed three MoUs during our visits to some of these Smart Cities.

The first is with Barcelona City Hall. The agreement was signed with Xavier Trias, Mayor of Barcelona, in the presence of Manel Sanroma, CEO of Barcelona Smart City, and Jordi Cornet, President of Barcelona Free Zone.

The second MoU was signed with Amsterdam Economic Board (AEB), represented by Ton Jonker, AEB's Chief Executive Officer.

These two agreements mandate DSOA to collaborate on an individual basis with both entities to drive technical and academic partnerships. DSO and each of the European organizations will work on joint research projects, conduct joint symposia and host thought leaders while exploring the possibility of collaborating on innovative projects.

The third MoU was signed with Spain's Universidad Politecnica de Madrid (UPM) to promote technical and academic collaboration in Smart City concepts. As part of the agreement, UPM is set to offer a cutting-edge post-graduate program in Smart City concepts - Master's in Smart City Sciences (MCS) - through the Rochester Institute of Technology-Dubai. This program will be delivered by academicians from prestigious universities such as the University of Oxford, Harvard University, Universidad Politecnica de Madrid, London Business School and the Rochester Institute of Technology. The course is set to equip local cadres with specific knowledge of Smart City applications.

We are also in the process of signing a new MoU, which we hope to announce soon.

Q7. YOU RECENTLY LAUNCHED A NEW ENTREPRENEURSHIP CENTRE IN THE REGION. PLEASE TELL US MORE ABOUT THE CENTRE AND ITS RELATION TO THE EXISTING INCUBATOR 'SILICON OASIS FOUNDERS'? WHAT ARE THE TECHNICAL DETAILS OF THE PROJECT?

Dr. M.A.: Dubai Technology Entrepreneurship Centre (DTEC) was conceptualised to provide existing and emerging high-tech entrepreneurs and start-ups with a highly motivating and efficient work environment. The facility will support entrepreneurial activities and boost the creativity of talented technology enthusiasts. Spread over 3600 square meters, DTEC is set for launch in Q1 2015 as the largest entrepreneurship centre in this region. The project has generated considerable attention since its announcement. We have received great interest from young, ambitious entrepreneurs who are looking to benefit from its services and support.

The centre has been designed to accommodate 1,000 entrepreneurs, providing them with consultancy, mentoring, workspace facilities and networking opportunities during their incubation phase. DTEC will offer an enabling environment that encourages the exchange of ideas and information. Emerging entrepreneurs will have complete freedom to focus single-mindedly on their business practices. DTEC complements Silicon Oasis Founders (SOF), a technology incubator that provides support to seed ventures. To date, SOF has helped establish six projects and has supported over 200 entrepreneurs in planning their projects. We are also in the process of providing investment support to three new companies, and look forward to increasing this number throughout 2014.

The incubator has helped consolidate our vision and given us extensive experience to shape a successful entrepreneurship sector. We now have the capability to support projects and facilitate their business growth until they develop into independent and self-reliant entities. We are confident that such efforts will eventually lead to the generation of fresh employment opportunities for nationals and residents alike. *end*



BUILDING A GREEN LEGACY

By
Hamad Buamim



DUBAI CHAMBER'S
GREEN BUILDING
ACHIEVEMENTS
THROUGH
17 YEARS



In 2009, Dubai Chamber was awarded LEED Existing Building accreditation - the first building in the Arab world and only the fourth outside North America at the time



HAMAD BUAMIM
DUBAI CHAMBER

He is the President & CEO of Dubai Chamber of Commerce & Industry. He also serves as the Deputy Chairman of the World Chambers Federation - ICC in Paris.



Dubai Chamber of Commerce and Industry is headquartered in one of the Middle East's greenest buildings. The 18-storey tower designed by the Japanese architect Nikken Seikkei is certified Leadership in Energy and Environmental Design (LEED) Platinum by the United States Green Building Council - the highest possible rating from this internationally recognised organisation.

Dubai Chamber has employed a strategic eco-programme since 1997. This has helped the organisation reduce costs, enhance efficiency and productivity and create a healthier and more environmentally aware workforce.

In 2009, Dubai Chamber was awarded LEED Existing Building accreditation - the first building in the Arab world and only the fourth outside North America at the time. The same year, the organisation undertook a major retrofit project to upgrade the building after almost 15 years in constant use. The retrofit was based on LEED guidelines and helped the organisation achieve LEED Platinum status.

Between 1998 and 2013, Dubai Chamber reduced its energy and potable water consumption per person by 63% and 92% respectively, accumulating an estimated monetary saving of USD 5.8 million.

While the majority of gains came from simple low-cost initiatives, such as turning off AC and lighting

after hours, a number of innovative practices with attractive payback periods were also applied.

These included using recycled water for landscaping and toilet flushing and capturing condensate for the fountain and washroom systems. Such initiatives led Dubai Chamber to receive an energy star rating of 91%, meaning it is more energy efficient than 91% of comparable buildings in the US.

Dubai Chamber's green building achievements have taken 17 years of focused efforts. Not only has the organisation benefited from significant financial savings, but employee satisfaction in its premises rose by 30% at the same time, demonstrating the strong business case for going green. *em.d*



It is more energy efficient than 91% of comparable buildings in the US



02. CLEAN ENERGY.



HE SAEED AL TAYER

VICE-CHAIRMAN, DUBAI SUPREME
COUNCIL OF ENERGY (DSCE);
MD & CEO, DUBAI ELECTRICITY
AND WATER AUTHORITY (DEWA)

INTRODUCTION

The multilayered world of energy is constantly evolving, and with it, the energy sector in the UAE. With the action plan outlined in the Dubai Integrated Energy Strategy 2030, the Emirate aims to reduce energy demand by 30% by 2030, while diversifying the energy mix with 71% from natural gas, 24% from nuclear and clean coal, and 5% from solar energy.

Domestic demand for energy has been spurred on in recent years by Dubai's rapidly increasing population, concentrated urbanisation and sharp economic growth. This trend is projected to continue across the world, with global electricity demand projected to increase by 60% according to IRENA. In line with these figures, Dubai is preparing by moving away from conventional energy sources in phases.

IRENA highlights Dubai's newly created "culture of conservation", built on energy efficiency and awareness of the Emirate's solar irradiance potential. In the context of the global socio-economic effects of renewable energy expansion, this chapter highlights how further economic benefits, such as job creation and the development of new sectors, can speed the transition to a green economy, possibly through South-South trade of renewable energy.

STATE OF CLEAN ENERGY IN THE UAE

By
Frank Wouters

IRENA
International Renewable Energy Agency



The UAE's renewable power-generation capacity is the highest among the six countries of the Gulf Cooperation Council (GCC)



Since its founding in 1971, the United Arab Emirates (UAE) has been characterised by its petroleum-dependent economy. The country's high per-capita income, comfortable living standards and rapid economic growth stem - directly or indirectly - from oil and gas wealth. In the past five years, however, the UAE has also emerged as a key player in global efforts to promote sustainable, renewable energy.

This is linked, in part, to efforts to develop high-tech industries and diversify the domestic economy. The government increasingly recognises that the use of gas and oil at less than market prices for power generation and water desalination wastes precious long-term resources. In addition, in accordance with international commitments to mitigate climate change, the UAE seeks to reduce its emissions of carbon dioxide (CO₂), which are currently among the highest per capita in the world.

The federation's two largest Emirates have adopted targets to scale up solar and other renewables, with Abu Dhabi aiming for 7% of electricity capacity from renewables by 2020 and Dubai for 5% renewable-electricity capacity by 2030. While these targets appear relatively low, they represent an enormous change in the approach of a country that has, until recently, obtained electricity entirely by burning natural gas or other petroleum products. Dubai's Supreme Council of Energy is developing a 48-square-kilometre solar park, where the first 13 megawatts (MW) of capacity were commissioned in 2013. The goal is to install 1,000 MW, enough to meet the target for installed capacity in 2030.

The UAE Capital, Abu Dhabi, has activated the 100-MW Shams 1 plant, one of the largest concentrated solar power (CSP) plants in the world and the first of its kind in the Middle East. CSP technology combines well with gas-based heat and power applications and offers flexible output with increasing energy-storage options.

In addition to Shams 1, smaller solar projects, mostly in Abu Dhabi's clean-tech hub, Masdar City, provide about 12 MW of solar photovoltaic (PV) power capacity, while a wind-energy demonstration project provides 1 MW. A waste-to-energy plant in the emirate of Ras Al Khaimah generates nearly 3 MW of renewable power. In total, the UAE's renewable power-generation capacity is the highest among the six countries of the Gulf Cooperation Council (GCC), although others are also pursuing increasingly ambitious plans, particularly with solar and waste-to-energy projects.

Hundreds more megawatts are to be commissioned in the next few years. Abu Dhabi's 100 MW TAQA waste-to-energy plant is scheduled to be up and running by 2017. Schemes for solar rooftop PV are being discussed in both Emirates, with Abu Dhabi considering 500 MW of decentralised solar PV on rooftops. Further installation of solar and other renewable-energy capacity up to 2030 should open the market for even faster acceleration in the decades that follow. With sizeable renewable-power production, the UAE could trade surpluses with neighbours on the GCC grid, reducing overall power-generation costs further.

Potentially, the UAE could even achieve 15% renewable power generation by 2030 using the technologies available today, according to analysis by the International Renewable Energy Agency (IRENA). Renewable energy use in UAE buildings could reach a similar level - lower than leading markets, but a considerable stride in the direction of long-term energy sustainability. (See the related article, REmap 2030 and the renewable energy outlook in the United Arab Emirates) [↗](#)

REFORMS NEEDED FOR ENERGY TRANSITION

Energy consumption per capita in the UAE is among the highest in the world, stemming from energy-intensive heavy industries as well as the deep-rooted practice of providing cheap fuel and power to the population. Dubai has begun to gradually increase electricity tariffs to reduce wasteful behaviour and create a culture of conservation. Energy-efficiency standards are improving for UAE buildings as well.

For now, amid lingering perceptions of almost boundless oil and gas wealth in the Gulf, fossil-fuel consumption remains heavily subsidised. Middle East and North African countries collectively account for about half of the world's pre-tax energy subsidies, which mostly apply to petroleum products or electricity, according to the International Monetary Fund (IMF). Pre-tax subsidies in MENA reach 8.6% of gross domestic product and a staggering 22% of government revenues, far higher than in other parts of the world. The UAE, followed by other major Middle East oil producers, has recognised that oil creates more value when directed to industries like petrochemicals or exported to the world market.

The GCC grid needs to be strengthened to include renewables in planning, with the underlying market mechanisms in place for effective trade of renewable electricity. Energy-pricing structures must also be re-examined so that energy subsidies, if made available, will enable, rather than inhibit, cross-border trade. At the same time, clear, sustainable policies are needed to encourage accelerated renewable-energy deployment.



INNOVATION AND COMMITMENT

Although deployment is at an early stage, the UAE is already firmly on the world map for research and development (R&D) in renewable-energy technologies. Abu Dhabi's Masdar Institute has made ground-breaking discoveries in storage and dust-control - the kinds of improvements that will make large-scale solar facilities more feasible and cost-effective, including in desert climates that are rich in sunshine, yet prone to dust storms.

At the same time, Masdar - which built Shams 1 with European partners - has emerged as a major investor in solar and wind power projects worldwide, tying the region's fortunes to the global energy transition and ensuring synergies with projects at home.

The UAE has further underlined its commitment to future energy sustainability as the host country of IRENA, established in Abu Dhabi in 2011 and encompassing over 160 participating countries worldwide. The UAE has contributed actively to IRENA projects such as the Global Atlas for Renewable Energy, an open-access resource-assessment tool intended to help policy-makers and investors appreciate the full extent of renewable-energy potential. The UAE, through the Abu Dhabi Fund for Development (ADFD), is also working closely with IRENA to stimulate innovative renewable-energy projects in developing countries, with a seven-year project facility extending concessional loans worth USD 350 million.

IRENA is set to move at the end of 2014 to purpose-built, sustainable headquarters in Masdar City, where a clean-tech business hub and low-carbon community has started to take shape. *em.d*

YOUR ROOF, OUR POWER PLANT



After many years in which solar powered electricity generation in the Middle East has been limited to a few research and testing facilities, a handful of utility scale solar parks and a scatter of small scale off-grid systems, DEWA is launching the first large-scale programme enabling solar grid-connected distributed generation in the region.

HOW THE INTRODUCTION OF GRID-CONNECTED POWER GENERATION FROM PHOTOVOLTAICS WILL REVOLUTIONISE THE DUBAI ENERGY SECTOR



SOLAR FOR GOOD

DEWA customers will soon be allowed to install PV panels at their premises and connect them to DEWA's power distribution grid. Given the non-controllable nature of solar power generation (driven by the day-night cycle and weather conditions), the advantages of grid-connected systems compared to the off-grid solutions are significant. In the case of off-grid, the only way to cope with the mismatch between solar power generation and the user's electricity needs is the use of highly expensive electricity storage systems. The same mismatch is instead easily handled by grid-connected generators: whenever the generating unit is producing more power than required at the premises, the excess energy is fed into the grid, to serve the power needs of other customers.

To close the loop, the benefit for the customer feeding energy into the grid is the fact that DEWA will offset such electricity from the customer's bills, as established by the Executive Council Resolution that is due to be published in the near future, setting the legal framework for the distributed renewable energy generation in Dubai. The remuneration scheme that will be applied is the most suitable of the available choices, primarily because of the significantly higher solar yield that Dubai enjoys. To encourage a drive to protect the environment and corporate social responsibility commitment, the right formula is evident by the significant interest that DEWA has already received from customers about the initiative.

The programme is currently undergoing a pilot stage, during which DEWA is working with a handful of customers to set up PV systems from 5kW to more than 1MW, connected at low or medium voltage levels to DEWA's power distribution grid. In parallel, DEWA is putting in place the key elements that will enable the full programme rollout next year: procedures for connection requests and handling, standards for connections and equipment, accreditation scheme for developers, technical internal capabilities and an upgrade of billing systems to handle net metering.

The acceleration of solar grid-connected distributed generation will contribute towards multiple important objectives: fulfilling Dubai's smart city vision (the programme is one of the three 'smart initiatives' launched by DEWA, together with the rollout of smart meters and electric vehicles enabling infrastructure); diversifying energy sources by increasing the share of renewables in the electricity mix as targeted by the Dubai Supreme Council of Energy Integrated Energy Strategy 2030 (5% by 2030); promoting growth of the Green Economy for Sustainable Development initiative; fostering the creation of a value chain of developers catering for the needs of residential, commercial and industrial users that will install solar systems to generate their own green energy; and protecting environment by reducing the UAE's carbon emissions footprint.

In April 2014 the International Humanitarian City (IHC) partnered with Panmed Renewable Energy LLC to launch a 5.6 MW Rooftop Solar Photovoltaic Power Project in Dubai. The launch coincided with the Green Week and WETEX 2014, demonstrating the actionable outcomes of such green knowledge sharing platforms.

The solar power project will utilize readily available rooftop space to exploit a renewable source of energy, resulting in both environmental and economic benefits. IHC aims to effectively transition away from carbon-emitting energy sources and benefit from long-term energy cost savings, while reducing the burden on the national power grid.

The project includes preliminary stages of design, development and construction, as well as the testing, commissioning and completion of the plant, the first of its kind in IHC. It is being structured by the Dubai Carbon platform to benefit from the Clean Development Mechanism under the United Nations Framework Convention on Climate Change.

The IHC Solar Rooftop Project comes in the wake of DEWA's expansion of the Mohammad Bin Rashid Al Maktoum Solar Park, which plans to increase capacity from 13 MW to 113 MW while the park will increase its generation to 1000 MW by 2030. *em.d*

INNOVATING TO POWER A GREEN ECONOMY

By **Ahmed S. Nada**

A green economy, according to the United Nations Environment Programme (UNEP), is one that “results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.” While seemingly altruistic, the concept is by no means unrealistic; its viability has been substantially improved by innovations in renewable energy, which would arguably be the lifeblood of such an inherently sustainable economy.



AHMED S. NADA
FIRST SOLAR

Ahmed S. Nada is the Vice President for the Middle East at First Solar.



(...) At the turn of this century, the total installed capacity (...) was 1.5 gigawatts (GW); less than 15 years later, First Solar alone has six times that installed worldwide



Today, it is evident that we are already experiencing a new energy revolution; one that is redefining the global power generation portfolio and is centered on the growing realisation that renewables – and solar in particular – are no longer a subsidised extra, but rather, a need-driven necessity. Consider this: at the turn of this century, the total installed capacity for solar photovoltaic (PV) modules was 1.5 gigawatts (GW). Less than 15 years later, First Solar alone has six times that installed worldwide and according to analyst’s estimates, the global industry-wide installed capacity at the end of 2013, was 137 GW.

By all indications, it would be a safe bet to assume that the share of renewables is set to grow exponentially, an encouraging sign for the creation of sustainable economies, and the International Energy Agency (IEA) has predicted that as much as 25% of the world’s gross power generation will come from renewable-energy sources by 2018. The obvious by-product of this growth will be an increasingly cleaner and more sustainable global energy-generation portfolio.

As a direct result of renewables beginning to account for even larger portions of energy being produced, we are on our way towards fulfilling two of the three criteria required for a green economy: a low carbon footprint and the efficient use of natural resources.

We are already seeing that, driven by economics and unprecedented reliability, utilities companies in the Middle East – where countries like the United Arab Emirates and Jordan are leading the way with solar-energy investments – and around the world, are strategically investing in solar. What is significant is that these investments are not simply being made as a means of complying with green legislation, but because there is a growing belief that sunlight has come of age as a reliable and affordable energy source, which has the ability to stand shoulder-to-shoulder with conventional power generators.

However, when stepping back for perspective, it’s important to recognise the role that innovation has played – and will continue to play – in carving a space for renewable energy in the global power-generation portfolio and in enabling the creation of a green economy. While the adoption of renewable energy was historically held back by a combination of high costs, low efficiency and reliability, today, companies such as First Solar have succeeded in addressing these challenges, thanks to intensive innovation.

Simply put: innovation is rarely, if ever, accidental and were it not for our commitment to research and development, which includes some of largest investments in the industry, we would not be in a position to complement and, often, compete with, conventional energy sources.

It is no coincidence then, that innovation is the common thread that runs through all of the different elements of the green economy. It is innovative thinking, combined with visionary leadership, that is required to turn the concept into a reality; it is innovation that will help sustainably produce the energy which, in turn, will be a catalyst for growth and development, powering communities and economies; and it is innovation that will drive the creation of opportunities and, therefore, the jobs that will enable greater social inclusion.

While renewable energy will help power the green economy, there is no doubt in my mind that it is innovation that will shape it. *e.m.d*

LOOKING BEYOND FOSSIL FUELS

By **Rabia Ferroukhi,**
Diala Hawila and Arslan Khalid

GLOBAL SOCIO-ECONOMIC BENEFITS
OF **RENEWABLE-ENERGY** DEPLOYMENT



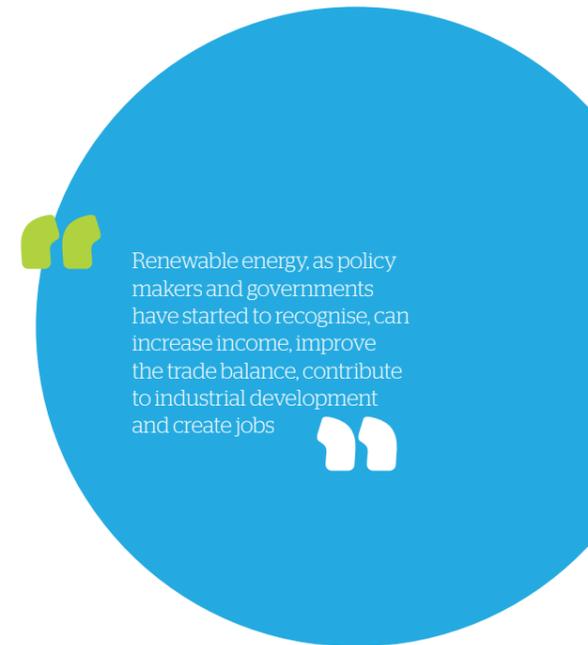
Renewable-energy technologies have experienced rapid deployment in recent years, mainly driven by the ambition to mitigate climate change, improve energy security and enhance energy access. With many economies facing lower growth, however, socio-economic benefits have also come to the forefront of the policy-making debate and strategic choices made by countries. Renewable energy, as policy makers and governments have started to recognise, can increase income, improve the trade balance, contribute to industrial development and create jobs.

Renewable-energy deployment helps mitigate global climate change through the avoidance of greenhouse gas emissions. The latest report by the Intergovernmental Panel on Climate Change calls for substantial increases in the proportion of electricity generated from renewable sources to help avert catastrophic climate change. The same measures help to reduce local pollution associated with the burning of fossil fuels. In March 2014, the World Health Association reported that 7 million premature deaths annually are linked to air pollution - to put this in perspective, 2.3 million people died from the AIDS pandemic globally in its worst year in 2005.

Renewable-energy technologies can also contribute to improving energy security by diversifying a country's energy mix and reducing import dependence, alleviating geopolitical risks and mitigating the impact of oil price volatility. Reducing these financial risks goes hand in hand with trade-balance benefits. For fuel-importing countries, renewable energy can replace imported fossil fuels, thereby reducing import bills. Global spending on net imports of fossil fuels amounts to around USD 2 trillion annually. Yet there are also financial benefits for fuel-exporting countries, where domestic fuel prices are often heavily subsidised. By reducing domestic fuel consumption, substitution with renewable energy can maximise the amount available for exports at global market prices. For example, renewable-energy targets that have been set in the Gulf Cooperation Council (GCC) countries could result in cumulative savings of approximately USD 200 billion.

For developing countries grappling with energy-access challenges, renewable energy technologies can contribute greatly to the alleviation of energy poverty. This, in turn, leads to reduced burning of combustible firewood, helping prevent illnesses attributable to cooking with solid fuels, and premature deaths among children. In addition, renewable-energy deployment enables many productive uses and brings an array of benefits in a development setting; from reducing the time spent gathering fuel and thereby improving people's education possibilities to driving economic growth through the establishment of small-scale enterprises. The establishment of a local solar, wind or bioenergy installation presents the opportunity for the creation of further energy-related businesses. For instance, mobile-phone charging has become an increasingly important local business in rural areas of developing countries.

For policy-makers, economic issues such as increased income and job creation are becoming key considerations in relation to energy choices. However, specific analysis and empirical evidence on this important subject remain relatively limited. The lack of sufficient, reliable data on renewable energy deployment and its impact remains a challenge, especially in developing countries.



Renewable energy, as policy makers and governments have started to recognise, can increase income, improve the trade balance, contribute to industrial development and create jobs

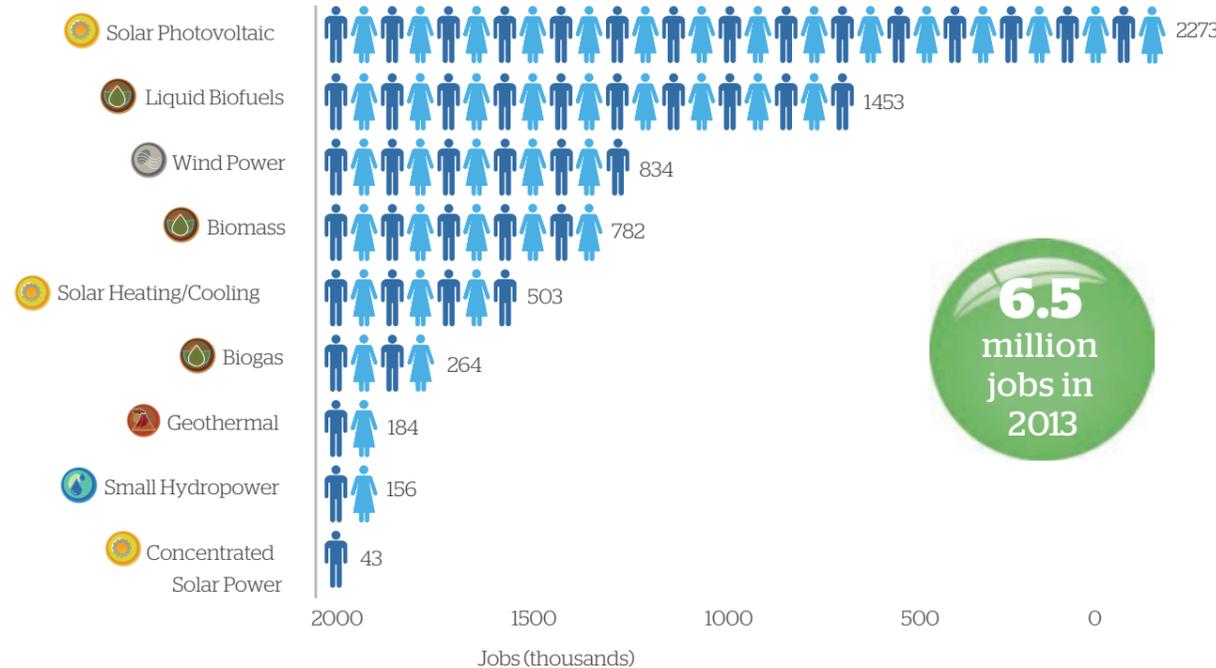
ECONOMIC GROWTH

Several studies have shown that the overall impact of renewable-energy deployment on a country's gross domestic product (GDP) is positive despite limitations of existing approaches to assess this fully. For example, a recent study in Mexico estimated that developing 20 gigawatts (GW) of wind-power capacity by 2020 could lead to an increase in GDP of between USD 7.9 billion and USD 28.5 billion, depending on the level of domestic manufacturing of renewable-energy components, representing between 1.6% and 2.6% of the country's GDP in 2010. In China, the photovoltaic (PV) industry, including manufacturing of solar panels for the world market, generated about USD 52 billion in 2013 alone and created more than 1.6 million jobs. With 2.6 million jobs in total, China is the largest renewable-energy employer, accounting for 40% of total jobs in the sector.

JOBS

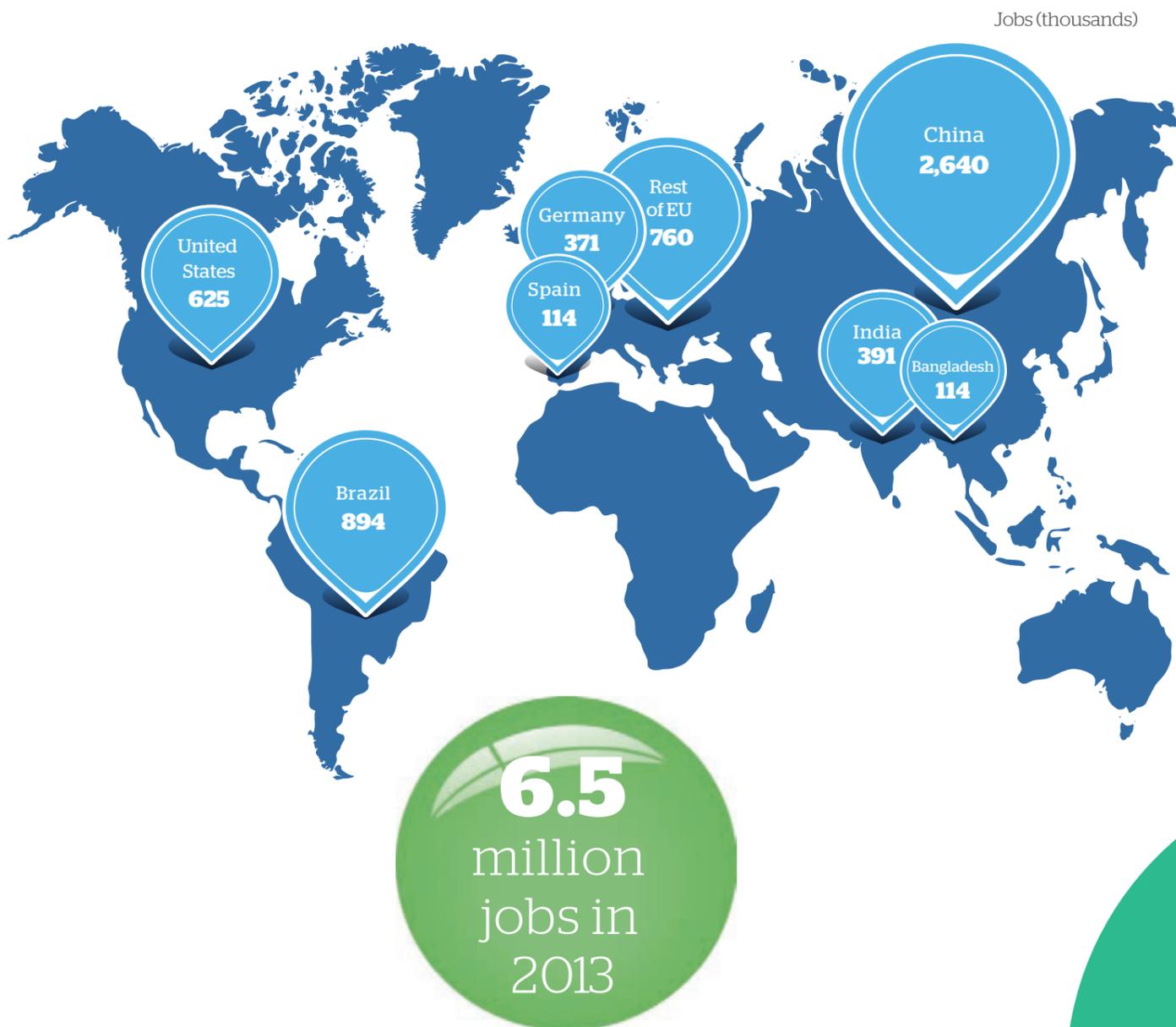
Overall employment in the sector has been growing at a steady pace. Data indicates that the renewable-energy sector has already become a major employer in several key markets, supporting around 6.5 million direct and indirect jobs in 2013, up 14% from 2012. China, Brazil, the United States, India, Germany, Spain and Bangladesh are the largest employers. Employment in solar and wind energy has been shifting from developed to emerging countries, especially in the manufacturing and installation segments of the value chain. Asian countries have made remarkable strides. In Bangladesh, the world leader in installations of small solar home systems, for example, the number of direct jobs has grown from 60,000 in 2011 to more than 100,000 in 2013, mostly in installations, but also in panel assembly and operation and maintenance. Japan and Malaysia are also adding more jobs, particularly in solar-PV manufacturing.

Globally, solar PV and wind are the most dynamic technologies in terms of number of people employed. Solar-PV jobs, in particular, have tripled since 2011, outpacing job growth in the wind-energy industry for the last three to four years. In 2013, the solar-PV sector accounted for 2.3 million jobs, largely concentrated in China. Trends show a rapid increase in jobs related to PV installation, driven by growth in demand in countries such as China, Japan and the United States. Jobs in the manufacturing segment of the PV value chain remain relatively stable, with growing demand for modules absorbing some of the recent oversupply.



6.5 million jobs in 2013

RENEWABLE ENERGY EMPLOYMENT IN 2013 BY TECHNOLOGY



ASSESSMENT OF SOCIO-ECONOMIC EFFECTS

New jobs, as well as other socio-economic effects, amount to value creation from the deployment of renewable energy. Such benefits can be observed along all segments of the value chain, as well as in supporting processes.

The potential for creating value domestically depends to a large extent on the level of development of a country's renewable-energy sector. The larger the level of deployment and the potential size of the market, the more of these activities can be carried out locally, thereby increasing value creation. With a broad range of policies influencing value creation, countries need to develop an optimal policy mix for their particular conditions to generate maximum socio-economic benefits.

POLICIES TO MAXIMISE BENEFITS

To begin, policies supporting renewable-energy deployment are essential as market-creating measures, to trigger investments into the sector. These are most effective when they foster stable and long-term market development of solar- and wind-energy technologies, while at the same time allowing for continual adaptation to keep pace with dynamic markets and technological advances. Depending on the type of deployment policy adopted, the value created can vary in intensity along the different segments of the value chain. For instance, tax reductions can create value in installation and operations and maintenance, while auction schemes can contribute to other socio-economic priorities.

Increasingly, countries are looking to reap additional benefits from renewables by creating a domestic industry. Turkey provides an interesting example of coordination between energy-deployment policies based on feed-in tariffs, local content requirements for energy installations, and strengthening firm-level capabilities in the private sector through industrial-upgrading programmes and the promotion of joint ventures.

To reinforce domestic industrial development, the policy mix must also take account of promoting education and training in the field of renewable energy. Education and training are indispensable to avoid skills gaps and labour shortages that can hinder further deployment, as is being experienced in many countries today. Anticipating the skills required in the sector is vital in identifying ways to meet these needs. Malaysia's National Renewable Energy Policy and Action Plan, to take one example, includes human-capital development as one of its three main elements and proposes a variety of educational and supporting measures to meet the demand for skills in the sector.

As technology costs fall, renewable energy sources are becoming ever more cost-competitive against fossil fuels for a growing range of conditions and locations around the world. When all the benefits are taken into account, large-scale renewable-energy deployment makes sense as the basis of sustainable future energy planning – not just to mitigate climate change, diversify the energy mix and improve energy access, but also to achieve broader social and economic goals. *em.d*

“ In March 2014, the World Health Association reported that 7 million premature deaths annually are linked to air pollution ”

SOUTH-SOUTH TRADE IN RENEWABLE ENERGY



Developing countries collectively accounted for well above one-third of new installed [solar PV] capacity [globally] in 2013



By
Steven Stone

INCREASING OPPORTUNITIES FOR A GLOBAL GREEN ECONOMY

International trade accounts for about a third of the global economy and is growing at around five per cent per annum. While trade has traditionally been concentrated in the so-called 'North', there is growing evidence that countries in the 'South' are increasingly trading together. Renewable energy technologies are playing an increasingly important role in South-South trade, which at the same time is contributing to the global transition to a green economy.

Overall South-South trade in manufactured products has grown faster (15.9 per cent) than global manufactures trade (9.7 per cent, excluding intra-EU trade). Similarly, South-South trade in renewable energy goods, as measured in the recent UNEP report, grew faster (29.4 per cent) than global trade (excluding intra-EU trade) in the same sectors (at 26.7 per cent) from 2004-2011.

Growing South-South trade in renewable energy goods is being driven in part by increasing demand for new installations in developing countries. For example, solar photovoltaic (PV) capacity installed globally during 2013 was almost a quarter larger than in 2012. But while demand declined in Europe, there was strong growth in China and in several other developing country markets. Developing countries collectively accounted for well above one-third of new installed capacity in 2013. In wind, developing countries collectively added 20.7 GW of new wind installations in 2013 - 14.6 per cent more than in 2012 - accounting for over 58 per cent of new capacity added globally.

Increasing South-South trade offers developing countries an important means of accelerating their transition to a green economy. The global market in low-carbon and energy-efficient technologies is projected to nearly triple between 2010 and 2020, while global trade in environmental goods and services (EGS) - which includes renewable energy technologies - is expected to reach up to US\$1.9 trillion by 2020. This trade is bringing new economic, environmental and social benefits to developing countries by reducing greenhouse gas (GHG) emissions, enhancing rural and off-grid access to energy and improving energy security, among other advantages.

The employment creation potential of renewable energy is also particularly high. Estimates suggest that by 2030 - either directly or indirectly - 20 million people could be employed in the renewable energy sector. This potential is most pronounced in the manufacturing and services activities related to solar PV and wind-powered energy. Figures show that services actually make up two thirds of the environmental goods and services market.

The UNEP report, *South-South Trade in Renewable Energy: A trade flow analysis in selected environmental goods*, highlights the need for targeted investments, enabling policies and capacity building to support the switch from fossil fuels to alternative, clean technologies. The report examines South-South trade flows in several renewable energy products and their components, including solar PV cells



and modules, wind turbines, hydroelectric turbines, biomass feedstock, solar water heaters and solar lighting equipment, as well as other select environmental goods.

The report finds that South-South trade already makes up a large proportion of global trade in some renewable energy goods. For instance, South-South trade in wind-powered generating sets made up only around six per cent of global trade in that category in the period from 2009 to 2012. However, South-South trade in biomass-based energy generation and hydropower made up 45 per cent of global trade in selected trade flows.

Several countries, including Ethiopia, Kenya, Morocco, Saudi Arabia and South Africa, have announced long-term plans for installing large quantities of commercial-scale wind power, while others including Bangladesh, China, India, Indonesia, Nigeria, the United Arab Emirates and Viet Nam have emerged as important markets for solar PV cells and modules.

South-South EGS trade is one way countries can accelerate their transition to a green economy because it provides new opportunities for developing countries to participate in global value chains. It also provides access to more appropriate and affordable goods for developing countries, responding to similar technology needs and prevailing local conditions. In addition, regional trade and investment agreements allow developing countries to increase regional production and foster international economic cooperation.

Overall, the report finds that global prices for EGS, and in particular for renewable energy technologies, have been falling. As the cost of renewable energy production approaches that of fossil fuels, investment in renewable energy is likely to increase.

Government policy, including fiscal incentives, feed-in tariffs and minimum use requirements, has had a major impact on the EGS market and trade trends in recent years. In the renewable energy sector, for instance, fluctuations in government policy have both stimulated and repressed demand for new installations.

Trade policies are also critical for deploying EGS worldwide. The reduction or elimination of trade restrictions among developing countries can facilitate South-South access to EGS, but it can also introduce trade competition. In order for trade liberalisation to contribute to the green economy transition, it requires flanking policies, which could include taxation or regulation, to ensure that the positive economic, social and environmental benefits of trade are realized.

In 2007, developing countries as a group went from net importers to net exporters in renewable energy goods. According to the report, this trend appears to have been led by trade in solar PV cells and panels.

Asian developing countries - the largest players in South-South trade - make up the majority of South-South trade, while developing countries in Eastern and South-Eastern Asia account for a large share of the trade in selected products associated with the solar PV, biomass and small hydro sectors.

A number of positive developments provide favourable conditions for enhanced South-South trade in renewable energy products. These include falling prices of renewable energy technologies and equipment, faster growth in renewable energy investment in developing countries and the increasing importance of developing country markets as drivers of trade in renewable energy products.

*This article is a summary of the findings from the recent report, *South-South Trade in Renewable Energy: A trade flow analysis in selected environmental goods*, published by UNEP.

KEY TRENDS

Solar PV makes up the majority of South-South trade in renewable energy in value terms. Most of this trade has been driven by intra-regional trade in Eastern and South-Eastern Asia, both by the growing demand for solar PV for energy generation and the demand for PV components along a value chain.

The global solar PV market has grown rapidly. Between 2004 and 2011, global annual solar PV capacity additions increased at an average annual rate of more than 80 per cent. However, the solar PV industry has been affected by overcapacity, resulting in continuous reductions of prices of PV cells and modules and negative or low profit margins. Whereas global solar PV

manufacturing capacity has continued to increase in recent years, the margins have become increasingly tight. This means other parts of the value chain are increasingly important.

In terms of trade measures, solar PV panels face little or no tariff barriers with most countries providing duty-free access to their markets. However, key components, such as inverters, face relatively high tariffs in certain developing countries.

Chinese exports have provided low-cost renewable energy goods to emerging PV markets, both in Asia and other developing regions. In addition, end-market demand in China itself is growing rapidly, making China also an importer and providing market opportunities for other Asian developing countries.

With regard to wind energy, opportunities for trade continue to arise, despite falling values of global and South-South trade in wind-powered generating sets from peak levels in recent years. For example, the emergence of new developing country markets, the significant export capacity of developing country wind companies and the successful participation of developing countries in value chains by manufacturing components are all playing a role in this area.



STEVEN STONE
UNEP

He is the Chief of the Economics and Trade Branch of the United Nations Environment Programme (UNEP)



In wind, developing countries collectively added 20.7 GW of new wind installations in 2013 - 14.6 per cent more than in 2012 - accounting for over 58 per cent of new capacity added globally



TRADE POLICY INITIATIVES AND INCENTIVES

The UNEP report identifies several opportunities for South-South trade in renewable-energy products, installation, innovation and diffusion. It shows that renewable energy products are increasingly being supplied to developing countries by other developing countries, due to increasing global cost competitiveness and shared needs. Some examples include small off-grid solar PV systems, solar lighting and community wind turbines.

The report notes that there is a need to design appropriate incentives for renewable energy that do not distort South-South trade in environmental goods. Otherwise, incentives including government subsidies may have implications under international trade rules, including South-South trade. However, incentives could also have a positive impact on trade by encouraging increased domestic production of renewably-generated energy and creating demand for associated goods and services. In certain cases, the report suggests that trade policymakers could consider time-limited exemptions from global trade rules to provide additional policy space to developing countries seeking to grant subsidies to renewable energy manufacturing.

The implementation of trade policies that are favourable to local renewable energy potential, including relaxed barriers to trade in intermediate goods, could also be considered. The reduction or elimination of import duties and non-tariff barriers on renewable energy goods, including components, for instance, could promote the domestic availability of affordable renewable energy products. Trade agreements at the regional level could also facilitate South-South trade.

Declining global costs of renewable energy equipment, in particular solar PV cells and modules, are making investments in renewable energy more attractive. In many countries, off-grid renewable energy projects in solar, wind and hydro are already cost-competitive with conventional sources. Investment initiatives, such as promoting new renewable energy installations to increase domestic generating capacity, on-grid and off-grid, could lead to cheaper, more secure and more abundant electricity supplies.

However, policies are needed to harness the full range of green economy benefits from renewable energy installations. Apart from improved electricity supply and greater energy security, renewable energy investment can deliver a reduction in fossil fuel production and imports, cleaner production, rural electrification and new employment opportunities in downstream services, such as renewable energy installation, operation and maintenance.

Creating the right incentives is critical for enabling the deployment of environmental goods and services. These could include financing mechanisms, such as the Clean Development Mechanism (CDM) and the Green Climate Fund (GCF) of the United Nations Framework Convention on Climate Change (UNFCCC), among others. Export finance initiatives launched by regional development banks could also bolster South-South renewable energy deployment.

It will be important for countries to strategically consider investments for developing domestic manufacturing capacity suited to global renewable energy value chains as well. For example, countries seeking to build up a certain degree of export manufacturing or downstream service capacities can focus on parts of the global value chain where local companies may be competitive, such as in solar PV components and module assembly.

Some regions have begun building institutional support through regional mechanisms. Investing in domestic downstream skills development to ensure an adequate pool or talent pool is also important, as a skilled domestic renewable energy labour force could be key in attracting further investment in the sector.

CONCLUSION:

South-South trade in environmental goods is one of the most dynamic areas for developing countries, and offers opportunities to accelerate their transition to a greener economy. Trade in renewable energy technologies is facilitating this transition, providing countries with options to meet their growing energy needs and deliver on their sustainable development goals. *emd*

ATOMS FOR PEACE

By
Louis Plowden-Wardlaw



We believe that Eisenhower's "Atoms for Peace" can be in full commercial operation by 2030 - cost effective, safe, scalable nuclear energy - only some 6 decades late



LOUIS PLOWDEN-WARDLAW
TERRESTRIAL ENERGY

He is Head EMEA and General Counsel of Terrestrial Energy Inc, a Canadian company commercialising its Generation IV molten salt reactor technology.

COST EFFECTIVE, SAFE, AND SCALABLE NUCLEAR ENERGY

THE 2030 ENERGY CHALLENGE

Unprecedented challenges lie before us over the next 15 years. Simple population growth - an additional 1.3 billion people - and the growth in wealth and aspiration in non OECD countries will drive a growth in energy demand, estimated at 50PWh - 4000 fossil-fuel plants. Climate change and geopolitical uncertainties render long-term reliance on oil, coal and natural gas untenable. McKinsey estimates that by 2030 there will be 440 new cities and four billion new middle class consumers. Challenges in energy and food production, and ecosystem-services degradation will require ingenuity and coherent policies to address.

A NUCLEAR RENAISSANCE?

Over the past few years, interest in nuclear power has quietly begun to revive.

At its low point following Fukushima, fears as to nuclear safety led Germany to accelerate the phasing out of its nuclear programme, leading this champion of renewable energy to increase its fossil-fuel requirements thereby growing its CO₂ emissions to address base-load power requirements while the rest of Europe lowered CO₂ emissions. Policy-makers now realise that this may have been an error. In the UK and Canada, disenchantment with State-led initiatives has led state nuclear laboratories to be repurposed in the service of the private sector and innovative international collaboration.

Generation IV nuclear reactors, six reactor types chosen by a panel of experts to address nuclear challenges, and enshrined in an international treaty in 2001, are on the agenda. Small modular reactors based on conventional nuclear technologies are now available. Private companies such as Transatomic, FLiBe, Terrapower, and ourselves are driving innovation.



Over the next 15 years(...) a growth in energy demand [is] estimated at 50PWh - 4000 fossil fuel plants.



A NEW PARADIGM

Nuclear fission was discovered in 1938. It took seven years to create the atomic bomb. Eisenhower gave his "Atoms for Peace" speech in 1953, but against the background of the Cold War, technological lock-in to a type of reactor - the pressurised water reactor produced in 1954 for nuclear submarines - crowded out far more promising civilian nuclear technologies such as Molten Salt Reactors (MSRs).

Conventional nuclear power does not deserve its tarnished reputation, but such nuclear-power stations are expensive to build and to decommission, leading to a high cost of energy at a time when cost innovation is needed.

A new social contract on safety and cost has to be delivered along with cost innovation if nuclear energy is to be acceptable to the public.

Our company, Terrestrial Energy Inc, based in Canada, is addressing this through its Integral Molten Salt Reactor (IMSR) technology - MSRs being the most viable Generation IV option. The IMSR can demonstrate:

- Sub-coal costs of power
- Scalability
- A completely new narrative for civilian nuclear safety - ("walk away" safe, unable to meltdown and operating at one atmosphere pressure not 160)
- A completely new narrative for civilian nuclear waste - the viability of nearly complete fuel recycling changes the longevity of the waste problem to 300-500 years from some 300,000 years
- Flexibility in siting - suitable for remote communities
- 700 degrees Celsius operation enabling industrial usage in, amongst others, mining, oil-sands extraction, desalination, hydrogen production and ammonia production
- Fuel availability - burning abundant low enriched uranium; and
- Excellent proliferation resistance in an geopolitically uncertain world (hopeless for weapons)

To impact the issue, these factors must be demonstrable - hundreds, if not thousands, of facilities must be capable of being built on a pure commercial basis without excessive lead times or public disquiet.

The history of nuclear innovation at the dawn of the nuclear age demonstrates that with concerted effort, focus and application of capital, nuclear power can effect profound change in a short time; we believe that Eisenhower's "Atoms for Peace" can be in full commercial operation by 2030 - cost effective, safe, scalable nuclear energy - only some six decades late. *em.d*

THE VALUE OF A negaWATT

By
Adam Weber



conducted over 50 energy audits in Dubai alone, saved customers AED

5 million

a year on their DEWA bills, and reduced their greenhouse gases emissions by

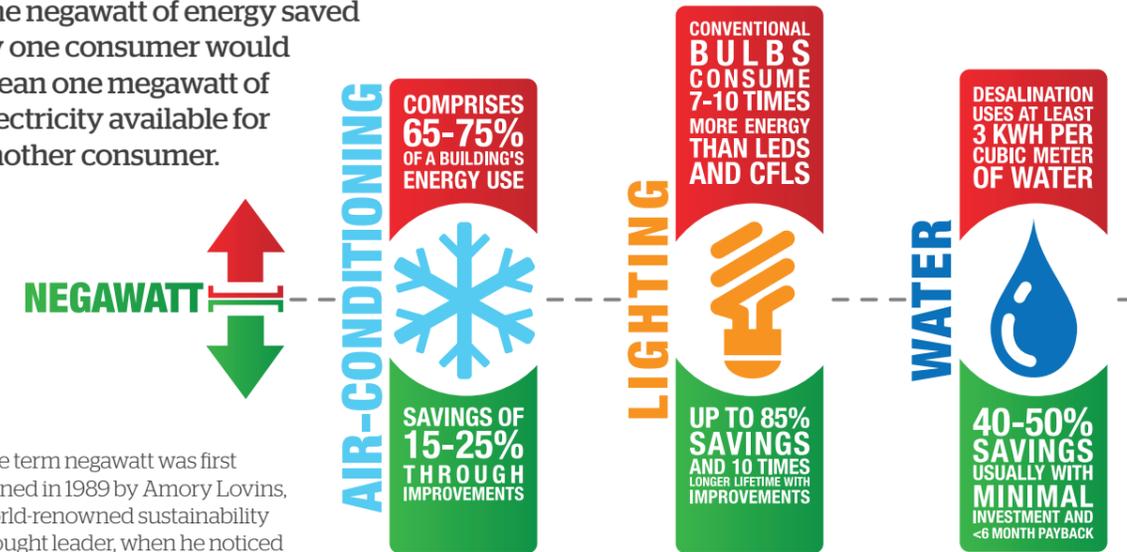
8,500

tonnes of CO₂ per year.

A WIN-WIN-WIN SCENARIO FOR DUBAI'S GREEN GROWTH



Negawatts may be the key to a green economy in Dubai. A negawatt represents a conceptual unit of energy savings, coming into play every time someone shuts off a light when they leave a room or when an A/C system is tuned properly. In essence, a negawatt can be thought of a commodity allocated within the energy market from one consumer to another; one negawatt of energy saved by one consumer would mean one megawatt of electricity available for another consumer.



The term negawatt was first coined in 1989 by Amory Lovins, world-renowned sustainability thought leader, when he noticed it as a misspelling of the word megawatt in a report. Lovins concluded that the word was a tidy way of capturing the value of energy efficiency.

Negawatts are especially crucial for buildings in Dubai, which comprise 70% of the city's overall electricity consumption. Because they are tied to a commodity as fundamental as energy - something everyone uses all the time - negawatts contribute to every facet of Dubai's green economy, supporting individuals, businesses and government. They are indispensable for several reasons.

First, every dirham saved by a residential, commercial or industrial DEWA customer via negawatts is a dirham freed up to reinvest elsewhere, thus contributing to the resilience of the city's increasingly diverse economy. In a place as fast-paced and competitive as Dubai, homeowners and building managers don't always have the luxury of making decisions based on environmental impact. Instead, they must allocate limited resources to getting the most from their buildings over their lifecycle.

Pursuing negawatts presents a means of accomplishing both ends; it is common to uncover 10-30% energy savings in buildings for investments with a simple payback of 2 years or less. This potential holds true for homes, hotels and hospitals alike.

Second, negawatts help lighten the government's burden of supplying energy. Dubai currently generates 99% of its electricity using natural gas, the vast majority of which is imported. More negawatts mean fewer fuel imports, which means more energy security. In addition, because electricity in Dubai remains subsidized for both citizens and expats, DEWA reaps extra savings from negawatts. The government doesn't have to absorb the cost of subsidies on energy that is never used.

Third, the business of purveying negawatts is itself a ripe opportunity for the wider economy. Indeed, there is already a rapidly flourishing market for energy saving services in Dubai. Looking ahead, the DSCE estimates that a total investment of AED 3 billion will be required to meet its goal of completing energy saving retrofits on 30,000 buildings by 2030.

The market has already picked up around this potential. For example, Smart4Power and ALEMCO offer turnkey negawatt solutions for new construction and existing buildings by providing energy audits, integration of energy efficient solutions and monitoring and verification of savings. Proper optimization of the energy saving measures is implemented during the electromechanical construction and installation as well as during facilities management. As big advocates of the negawatt, we have so far conducted over 50 energy audits in Dubai alone, saved customers AED 5 million a year on their DEWA bills, and reduced their greenhouse gases emissions by 8,500 tonnes of CO₂ per year.

In the end, negawatts yield triple bottom line growth for Dubai's emerging green economy. They represent a win-win-win scenario because they benefit people, the planet, and profits. They mean lower energy consumption, lower overhead and lower carbon emissions. In Dubai, negawatts are already at work. DEWA reported in May that Dubai's annual per capita consumption of electricity fell 4.2% between 2010 and 2013, from 16,022 kWh to 15,346 kWh. *em.d*

ELECTRIC VEHICLES

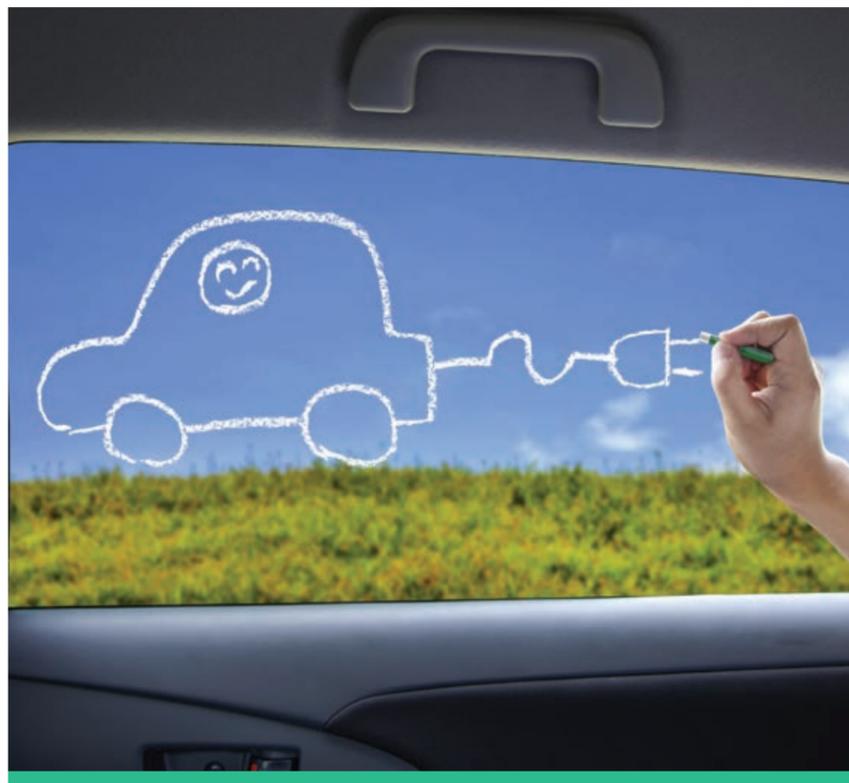
By
Dr. Amro M. Farid

ENERGISING THE ADOPTION OF ELECTRIFIED TRANSPORTATION IN A SMART CITY

Electric transportation is emerging as key enabler for energy efficiency and meeting CO₂ emissions reductions targets in smart cities of the future. Five key considerations must be taken into account to energise the adoption of electric transportation in the Dubai Smart City.

As Dubai proceeds in its development as a smart city with sustainability goals, one subject to which it must pay particular attention is that of electric transportation. Indeed, electric vehicles (EVs) can have a well-to-wheel efficiency double that of their counterparts - internal combustion engine vehicles. Coupled with a strong commitment to mass public transit, a smart city can make major inroads to reducing its CO₂ emissions per capita.

Despite this advantage, multi-modal electric transportation sits at the centre of three competing needs: people's needs to move about in their daily lives, a sustainable transportation infrastructure and a robust electrical power grid to support both. The design, planning and operation of such a large complex city-wide system requires new and highly analytical methods to ensure cost efficiency and a high level of technical performance.



“ the new concept of “online-electric vehicles” allows for roadways that inductively charge the bus battery while it is moving - thus eliminating range constraints. ”

GETTING THE ELECTRIC TRANSPORTATION USE CASE RIGHT

Smart cities implement multiple modes of transport in order to maximise the convenience for their residents. This requires further consideration when reviewing electric transportation. A typical electric vehicle has a range of approximately 150kms and requires between half an hour and several hours to charge. Much research considers a fairly mild-use case: EVs as private vehicles in densely populated cities with a fully developed public-transportation system. Therefore, the most appropriate Dubai EV-user is one primarily interested in downtown driving and much less so in the expanding neighboring areas. Another interesting EV private-use case is as a second-car used primarily for running family errands.

The real potential for electric transportation is within commercial and public-use cases. Electric commercial fleets - like courier services and taxis - can be dispatched on appropriate routes in a timely fashion, considering battery range and charging time. Similarly, public electric buses move along well-planned routes that can be matched to these constraints. Furthermore, the new concept of “online-electric vehicles” allows for roadways that inductively charge the bus battery while it is moving - thus eliminating range constraints. Similarly, electric trams and trains have dedicated electrical infrastructure along their travel routes.

At Masdar Institute's Laboratory for Intelligent Integrated Networks of Engineering Systems, we have been hard at work to develop robust, quantitative, and analytical methods that use “microscopic” transportation-vehicle simulation to maximise the benefits of electric transportation.

GETTING THE CHARGING INFRASTRUCTURE RIGHT

The adoption of electric transportation requires a thoughtful consideration of the size, type, and placement of charging stations. In public modes of transport, the routes are fixed and the electrical supply is designed accordingly. With EVs, however, the charging infrastructure must meet the desired-use cases in order to ensure that the EVs are maximally available.

While much research assumes home-charging, other use cases are more likely to demand charging stations placed in key locations across the city. These locations may include well-known landmarks, hotels, malls and parks.

Each charging station can handle a certain capacity of EVs; be it large stations sited at malls or smaller ones attached to existing gas stations.

Finally, the charging rate can vary from 10-50kW per EV. On the upper end of this range, fast chargers have been reported to bring charging times down to as little as 30 minutes. Our recent work shows that the three charging infrastructure aspects of charging station placement, size and rate improve the EV availability to greater degrees in order of first mention.

STRENGTHENING THE EXISTING POWER INFRASTRUCTURE

Electric transport is as much a part of the electric grid as it is of the transportation system. Its need for charging requires a power grid fit for purpose. Here, the concern is if multiple co-located EVs charge simultaneously, then the required power can exceed the static limits of distribution-system transformers and lines. Our recent work shows that this effect is exacerbated by the EV-penetration level but can be managed by careful design of the charging infrastructure.

EV transportation behaviour also imposes a variable power load on the grid which, if left unmitigated, acts much like renewable-energy integration. Power-grid operators would naturally have to work actively to mitigate this variability to keep the power grid in balance.



DR. AMRO M. FARID
MASDAR INSTITUTE

He is Assistant Professor & leads the Laboratory for Intelligent Integrated Networks of Engineering Systems at the Masdar Institute of Science & Technology.

COORDINATING THE PLANNING OF TRANSPORTATION AND ENERGY INFRASTRUCTURE

Consequently, the electrification of transportation requires integrated planning decisions. In addition to the cost of procuring the EVs themselves, it is necessary to carefully consider the cost of the associated charging infrastructure, and the required power-grid upgrades. This is a complex techno-economic decision which spans multiple government agencies.

The cost of power-grid upgrades can be shifted away from a power-system operator by keeping charging stations relatively small at slower charging rates. In contrast, the costs of a charging-system operator can be shifted to the power-grid operator with relatively large and fast charging stations. All the while, the charging infrastructure cannot lose sight of the uses for which it was originally intended.

Naturally, there are real common-good “sweet-spots” here, beyond the interests of multiple stakeholders. The optimisation frameworks for such integrated transportation-energy planning do not yet exist, and are a ripe subject for research and development.

COORDINATING THE OPERATION OF TRANSPORTATION AND POWER SYSTEMS

Electric transportation also requires intelligent real-time operational decision-making. Consider an EV taxi-use case. The taxi operator must both dispatch the EV to the client and manage the queues of EVs that require charging. A charging infrastructure operator must coordinate the charging times of the EVs once they arrive.

Finally, a power-grid operator may be interested in using vehicle-to-grid schemes, where EV batteries balance the power grid particularly in the presence of renewable-energy generation. Again, these four complex techno-economic decisions are very much interlinked and span multiple government agencies.

While the literature has reported techniques on each of these decisions individually, our recent work is the first to demonstrate their coupling. Therefore, the control and optimisation methods for making these intelligent transportation-energy operations decisions are essential to bring about an effective adoption of electric vehicles. *em.d*

BIOFUELS GET YOU THERE GREENER

By Yousif
Bin Saeed Al Lootah

LEARNINGS FROM THE BIOFUEL PILOT PROJECT

One of the factors that have held green initiatives back in the past is the perception of higher costs associated with renewable energy. This misconception is being shattered through the concerted efforts of all stakeholders in the energy sector.

It is now widely accepted that the long-term benefits of a viable green energy initiative far outweigh the initial costs. The bigger challenge now is to engage customers to be active participants in new and path-breaking initiatives, which are an imperative today.

Lootah Biofuel, too, is debunking the aforementioned misconception with its biofuel initiative, which today generates close to 4.7 million litres of biodiesel - generated from used cooking oil - that powers some 5,000 vehicles.

Research undertaken in the U.S. has proved that biofuel reduced net carbon dioxide emissions by 78 per cent compared to traditional diesel. Today, biodiesel is recommended for use by the U.S. Environmental Protection Agency and the European Union Environment Commission.

Although a late entrant to the industry, biofuels are gaining significance led by two fundamental factors: A growing population that has an increasing demand for fuel for automotive use, and the rising price of fuel.

Increased domestic consumption of fuel has a spiral effect on the economy and environment. First, it increases oil bills, especially in the absence of adequate refinery capability to address local demand.



**YOUSIF BIN SAEED
AL LOOTAH**
LOOTAH BIOFUELS

He is the Executive Director of S.S. Lootah Group and CEO of Lootah Biofuels.

Secondly, it causes losses to the exchequer in terms of fuel subsidy. Finally, increased dependence on traditional fossil fuels for powering the economic wheel has a lasting detrimental impact on the environment.

The use of biofuel addresses all three of these concerns, as demonstrated by the Lootah Biofuels project. The potential for biodiesel, generated from used cooking oil, is very high in the UAE which is focusing on driving its hospitality and tourism sectors as part of economic diversification.

With the number of hotels and restaurants in the city increasing - and set to grow especially in the run-up to Expo 2020 and beyond - the ability to source feeder stock cheaply and adequately is even more promising in the future.



THE BIOFUEL PILOT PROJECT

The Lootah Biofuels project was undertaken on a non-subsidised model by working on locally available knowledge, technical knowhow and resources. This is a positive message that complements the vision of Dubai to promote localised innovation in the renewable energy sector.

Biodiesel is produced from vegetable oil through transesterification, which results in Methyl Ester (biodiesel) and glycerol. Methyl Ester has properties that are similar to diesel and can be used as a fuel blend without need for modifying the diesel engines.

Used cooking oil that is otherwise wasted and creates environmental hazards to produce biodiesel in Dubai has also supported Dubai's focus on reducing its ecological footprint. It has helped the Municipality reduce expense on drain maintenance and in ensuring that the used cooking oil does not return to the food chain, as reuse of cooking oil has been proved to be detrimental to health.

The pilot project has already brought together all stakeholders in the supply chain - from restaurants to waste management companies to biofuel producers and end-users. Significantly enough, the production and distribution of biofuel by Lootah Biofuels has been achieved cost-effectively and is viable in the long run.

A central aspect to steering the project was to educate the restaurant sector to source used cooking oil. The project was initially tested in Lootah Group's own fleet vehicles and has since gained the support of the Dubai Municipality, the Roads & Transport Authority and school transportation providers.

The data from over a year of testing shows positive results, underlining the potential for recognising biofuel blends in the UAE for a more sustainable transport sector.

THE PATH FORWARD

While the project has been successful in Dubai, there are challenges to be addressed including the smooth management of the supply chain, regulating price volatility as production depends on feedstock availability and developing market acceptance for biofuel (B5). These are not insurmountable, especially with growing awareness and regulatory support.

Customers including RTA have contributed to the expansion of the green profile of Dubai's public transport with 10 biodiesel powered buses having joined its fleet. The first green bus was launched in 2012 as a pilot project and the fleet has been expanded after successful trials. These buses, powered by a mixture of B5 and diesel, have helped to reduce fuel costs by 7 per cent and carbon dioxide emissions by 34 per cent.

This is but a small and significant step towards a greener Dubai. The active participation of all stakeholders will contribute to achieving the city's sustainable development goals - thus creating a lasting 'green legacy' for our future generations. *em.d*

“ [RTA] buses powered by mixture of B5 and diesel have helped in reducing fuel costs by 7 per cent apart from 34 per cent reduction in carbon dioxide emissions ”

INTERVIEW: MOUNIR BOUAZIZ

NATURAL GAS, PAVING THE WAY FOR RENEWABLES



Mounir Bouaziz
VP, MENA Region,
SHELL

Q1. HOW CAN DEVELOPMENTS IN THE NATURAL-GAS INDUSTRY AFFECT ENERGY-MIX CHOICES AND IMPACT CLIMATE CHANGE?

M.B.: The world is running two equally intense races in parallel: one for economic development, competitiveness and poverty alleviation and the other to address climate change. Over a year ago, I returned to university - Cambridge, but this time as a member of a group of executives from around the world addressing environmental and sustainability issues as part of the Prince of Wales Sustainability Leadership Programme. This was my Eureka moment, when I could clearly visualise the worst consequences for our planet if no action is taken to address the most critical climate-change issues. I also became firmer in my belief in the crucial role of natural gas in the decarbonisation of the energy system and tackling some of our most pressing environmental challenges.

Global demand for energy will continue to increase, driven by economic progress and population growth, and evidently

not one single source of energy can meet this increasing demand. This increase is not without an environmental price. Average global temperatures have already increased by 0.8°C compared with pre-industrial levels and projections are compatible with an additional increase in long-term temperature of between 2.8 to 4.5 °C. No country will be immune to the impacts of climate change, but the distribution of impacts is likely to be inherently unequal and tilted against many of the world's poorest regions, which have the least economic, scientific, and technical capacity to cope and adapt.

This reality will continue to lead to revised fuel choices and an increased level of energy-mix diversification trends. We have seen natural gas, the cleanest fossil fuel, playing a significant role in modern and sustainable energy mixes and being the core of a cleaner

energy system. This increase is driven by the clear environmental benefits of natural gas along with several economic considerations such as its global availability, transport flexibility and its price competitiveness versus other fuels.

Meanwhile, continued innovation in gas opens up diverse future applications offering significant performance and environmental benefits. One such application is Liquefied Natural Gas (LNG) in transport. LNG offers significant cost savings compared to diesel (up to 30%) and potential reduction in well-to-wheel GHG emissions of up to 20%, compared to diesel and HFO engines. In March 2013, Shell also launched the first 100% LNG-powered barge Greenstream currently operating on the Rhine and the company is pursuing the Canada Green Corridor project to supply LNG along a truck route in the Canadian province of Alberta.

Q2. HOW CAN INCREASED DEPLOYMENT OF A FOSSIL FUEL SUCH AS NATURAL GAS SUPPORT THE CREATION OF A GREENER ECONOMY?

M.B.: Renewables will play an increasingly important role in the global energy mix and could grow by 60% or potentially even double by 2035, according to Shell New Lens Scenarios. Nuclear energy will also play a role as the policy landscape stabilises, following the Fukushima accident in Japan. Despite this, fossil fuels will continue to represent around 65% of energy demand by mid-century.

The energy sector is by far the largest source of greenhouse gas emissions, accounting for more than two-thirds of the total in 2010. Natural gas is cleaner than the other fuels commonly used for power generation because it emits the least amount of CO₂ when compared to gas, oil, coal or Liquefied Petroleum Gas (LPG).

In the power sector, coal plants account for nearly three-quarters of all greenhouse gas emissions. Of this, around 75% of current coal-based power generation capacity deploys subcritical technology, capable of achieving maximum net efficiencies of around 38%.

A study commissioned by the European Gas Forum showed that in Europe, switching from coal to natural gas is the fastest and most affordable way to reduce CO₂ emissions in the global power sector over the next 20-plus years, producing savings of up to Euro 500 billion or Euro 150-250 per household each year.

Also, the most recent United Nations Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report on mitigation clearly stated that GHG emissions from energy supply can be reduced significantly by replacing current world-average coal-fired power plants with modern, highly efficient natural gas combined-cycle power plants or combined heat and power plants.

What has happened in the US is an eye opener. The shale gas revolution has resulted in gas increasingly displacing coal in power generation, significantly supporting decarbonisation efforts. According to the US Energy Information Administration, carbon-related emissions dropped by 3.8% from 2011 to 2012. It specifically credits the increase in natural gas-fired power generation.

Singapore, which bears a great deal of resemblance to Dubai, opted for switching its fuel mix away from fuel-oil to natural gas for power generation and avoiding coal altogether in a strategic move to address climate-change challenges. Today natural gas accounts for over 82% of the country's energy mix and the switching continues.

Seen through these lenses, I believe that natural gas is uniquely positioned to address the climate-change challenges of today and form the basis of a secure, competitive, affordable and sustainable energy future. However, the role of natural gas cannot be taken for granted. Around the world governments and policy-makers have a unique opportunity to ensure that policies and regulations recognise the many benefits of natural gas.

Q3. CAN COAL PLAY THAT ROLE?

M.B.: Coal produces twice the CO₂ of natural gas. The majority of coal plants are also designed to provide steady base-load power to the grid, with very little ramping flexibility. They become inefficient if they are operated below maximum output, increasing marginal emissions of CO₂, NO_x, and SO₂ pollutants.

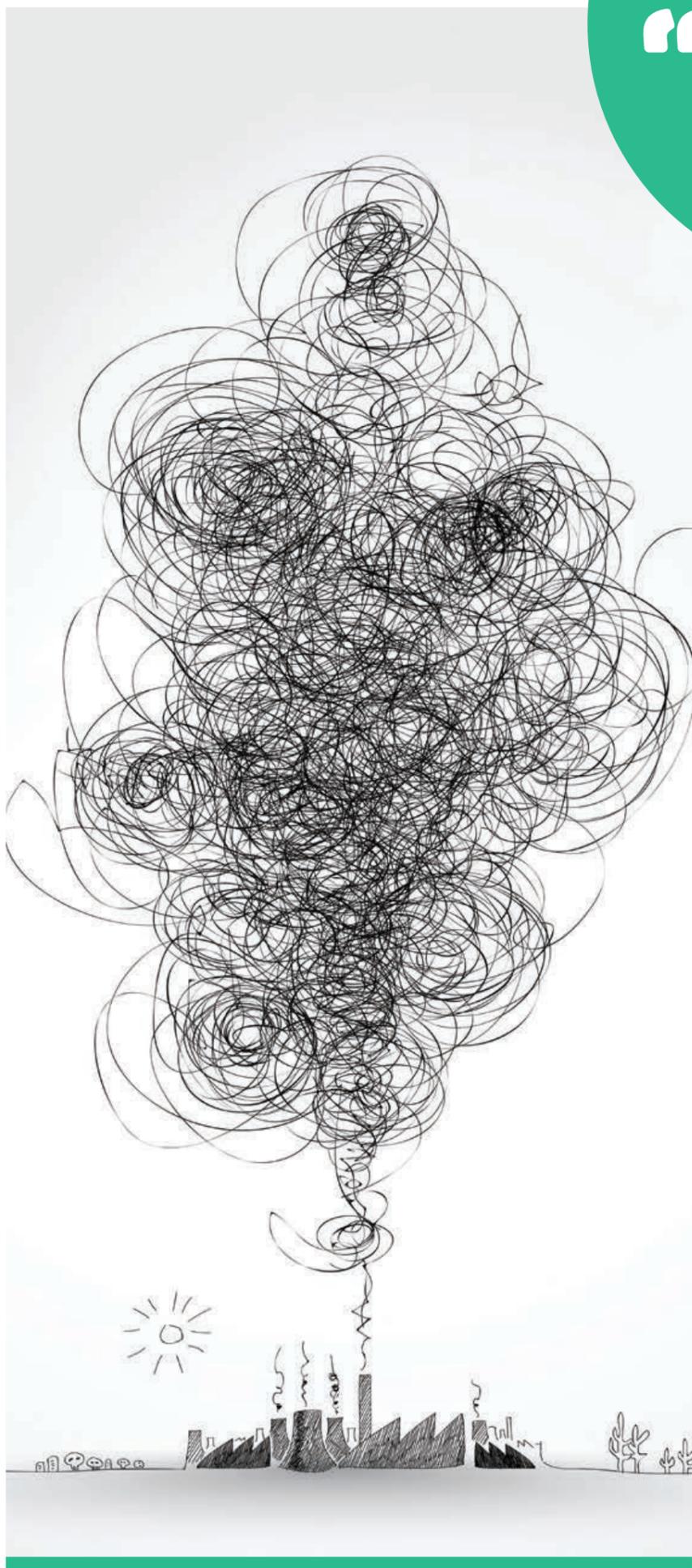
Q4. SO YOU DO NOT BELIEVE THAT NATURAL GAS AND RENEWABLES ARE IN COMPETITION?

M.B.: Gas plus renewables could be a winning combination. At one stage the advocates of renewable and new nuclear technologies were concerned that the lower cost of natural gas could potentially impede the growth of zero-carbon energy. But the US shale boom is the clearest example of the potential for cleaner, more affordable energy to be a catalyst for accelerating decarbonisation and innovation. The fears of natural gas "crowding out" other low-carbon technologies are overstated and misplaced.

In reality, intermittent renewables like solar and wind can benefit from natural gas as a reliable source of backup power. With lower capital costs and a cleaner stream of power-plant emissions than coal, natural gas also offers a potential development platform for new carbon-capture technologies. As the share of renewables continues to grow, power-system operators will need to increasingly rely on capacities of backup power.

The expansion of gas-fired power plants could therefore accelerate the integration of intermittent power into existing grid systems. New natural-gas plants are very flexible - they have ramping rates of approximately 8% per minute and can reduce their output to 80% capacity with a minimal heat-rate penalty. New Combined Cycle Gas Turbine (CCGT) plants that are specifically designed to offer flexibility to a renewables-heavy grid system can ramp to 150 MW in 10 minutes and to full load in 30 minutes. ➔

In reality, intermittent renewables like solar and wind can benefit from gas as a reliable source of backup power



“ Average global temperatures have already increased by 0.8°C compared with pre-industrial levels and projections are compatible with an additional increase in long-term temperature of between 2.8 to 4.5 °C ”

Q5. HOW CAN YOU EXPLAIN THE INCREASED UTILISATION OF COAL IN EUROPE?

MB.: The EU has made progress towards meeting its energy and climate objectives - greenhouse gas emissions are falling and the share of renewables is growing. However, a combination of policy and market conditions has led to unintended consequences that threaten to undermine the vision the EU has set out for a sustainable, globally competitive, low-carbon economy.

A low carbon price (resulting from a surplus of EU ETS carbon allowances) and imports of cheap coal from the US (partly a consequence of the shale gas revolution) have supported an increase in coal-fired power as a proportion of the European energy mix.

This has led to the European Energy Paradox: an energy mix characterised by significant investment in the prioritised supply of (subsidised) renewables (with high costs passing through to the consumer) backed up by high carbon coal.

The result is that carbon reductions delivered by significant investments in renewable energy are being cancelled out by increasing coal-based power generation. At the same time, natural gas, which produces 50% less CO₂ emissions than coal, is being squeezed out of the mix. This is neither a cost-effective nor efficient way to decarbonise and risks entrenching coal in the European energy mix.

I would certainly not recommend a renewables-plus-coal formula as it has proved to be counterproductive. Renewables-plus-gas is not only cost effective, but ultimately a cleaner and greener pathway. *em.d*

ALSTOM CARBON CAPTURE SOLUTIONS

AN ALTERNATIVE APPROACH TO MITIGATE CLIMATE CHANGE

Carbon Capture and Storage (CCS) technology has the potential to provide optimum efficiency as well as environmental and commercial benefits to customers now and in the future. There are many reasons for this belief, including:

- Carbon Capture and Storage (CCS) is the only known technology capable of capturing at least 90% of CO₂ emissions from the world's largest emitters.
- Reducing energy-related emissions to tackle climate change will be 40% more expensive without CCS.
- Under the IEA's New Policies Scenario, even achieving a 3.6°C pathway would still require 67GW of installed CCS plants globally in 2035 (56GW in coal and 11GW in gas).
- It is essential in order for coal and a range of industrial processes (e.g. cement, steel or refining) to limit global temperature increases to not more than 2°C to prevent adverse climate change impacts.
- In addition, as the proportion of intermittent renewables grows, we will continue to rely on fossil plants for flexible back-up power - CCS is the only way to decarbonise these resources.

As a leader in clean coal technologies and, in particular, Air Quality Control Systems, Alstom has been at the forefront of CO₂ capture developments. Based on an intensive Research and Development (R&D) programme, 13 pilot plants have been constructed around the world and today CO₂ capture technologies are ready for large-scale deployment.

ALSTOM IS ADDRESSING DIFFERENT TECHNOLOGIES:

CO₂ capture in oxy-combustion

This consists of fossil fuel combustion in a mixture of oxygen, produced in an Air Separation Unit (ASU) and re-circulated flue gas, resulting in a flue-gas rich in CO₂ (free of nitrogen contrary to conventional fossil-fuel power plants).

CO₂ capture in post-combustion

This is based on chemical absorption processes. Flue gas is in contact with a chemical solvent which reacts with the CO₂. Raising the temperature reverses the reaction - releasing CO₂ and allowing the solvent to be recycled. Alstom has developed a proprietary post-combustion system: Chilled Ammonia Process (CAP). Alstom has also developed an amine based process, jointly developed with DOW: Advanced Amine Process (AAP).

Second generation technologies

Alstom is actively evaluating second generation CO₂ capture technologies such as Chemical Looping Combustion (CLC) and Regenerative Calcium Cycle (RCC) which may also offer attractive solutions.

Once the CO₂ is captured, it can either be transported for permanent underground storage or used for CO₂ enhanced oil recovery or production of chemicals (urea, methanol or carbonates).

Despite its huge potential, CCS deployment is not yet widely accepted, partly due to cost issues. Alstom works with governments to help secure policies that maximise and support what businesses can do to drive large-scale CCS demonstration and deployment. Commercial-scale demonstrations are urgently needed to validate and optimize CCS technology and drive down costs. Governments must act now to support these demonstrations and to provide a long-term and robust regulatory framework to give an incentive for investment. *em.d*

By **Sophie Hennes**



She is the Director, Environment & CSR for Alstom Thermal Power

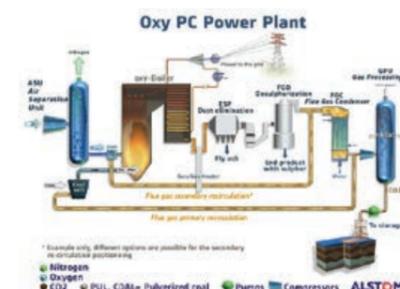


Figure 1: OXY fuel process layout



Figure 2: Chilled Ammonia Process layout

03. SUSTAINABLE LIFESTYLE.



HE MATTAR AL TAYER

CHAIRMAN OF THE BOARD AND
EXECUTIVE DIRECTOR OF THE ROADS
AND TRANSPORT AUTHORITY (RTA)

INTRODUCTION

Consumer behaviour can be pivotal in a green economy, stimulating the private sector to produce sustainable products and the public sector to set environmentally ethical standards and regulations for best practices. Green living as a global standard encompasses this way of life, keeping sustainability, ethical manufacturing and design at the core of all consumption choices - from what you eat to what you wear. Sustainable products are designed to be resilient, suggesting greater value for money for consumers. Additionally, these products are made with a strong end-of-useful-life strategy in mind -either biodegradable in composition, or designed for reuse.

In Dubai, consumer brands are beginning to fashion their products and services to cater for the more environmentally discerning consumer. But as in any other country, changing behaviour in the long term cannot work through environmental consciousness alone. The keys to market penetration are the benefits that already have an impact on consumer choices: convenience and cost.

The following pages illustrate this line of thought, with the Middle East's first green service station, e-mobility in the sports and luxury class, organic food production and the reduction of water consumption through advocating the benefits of conservation.



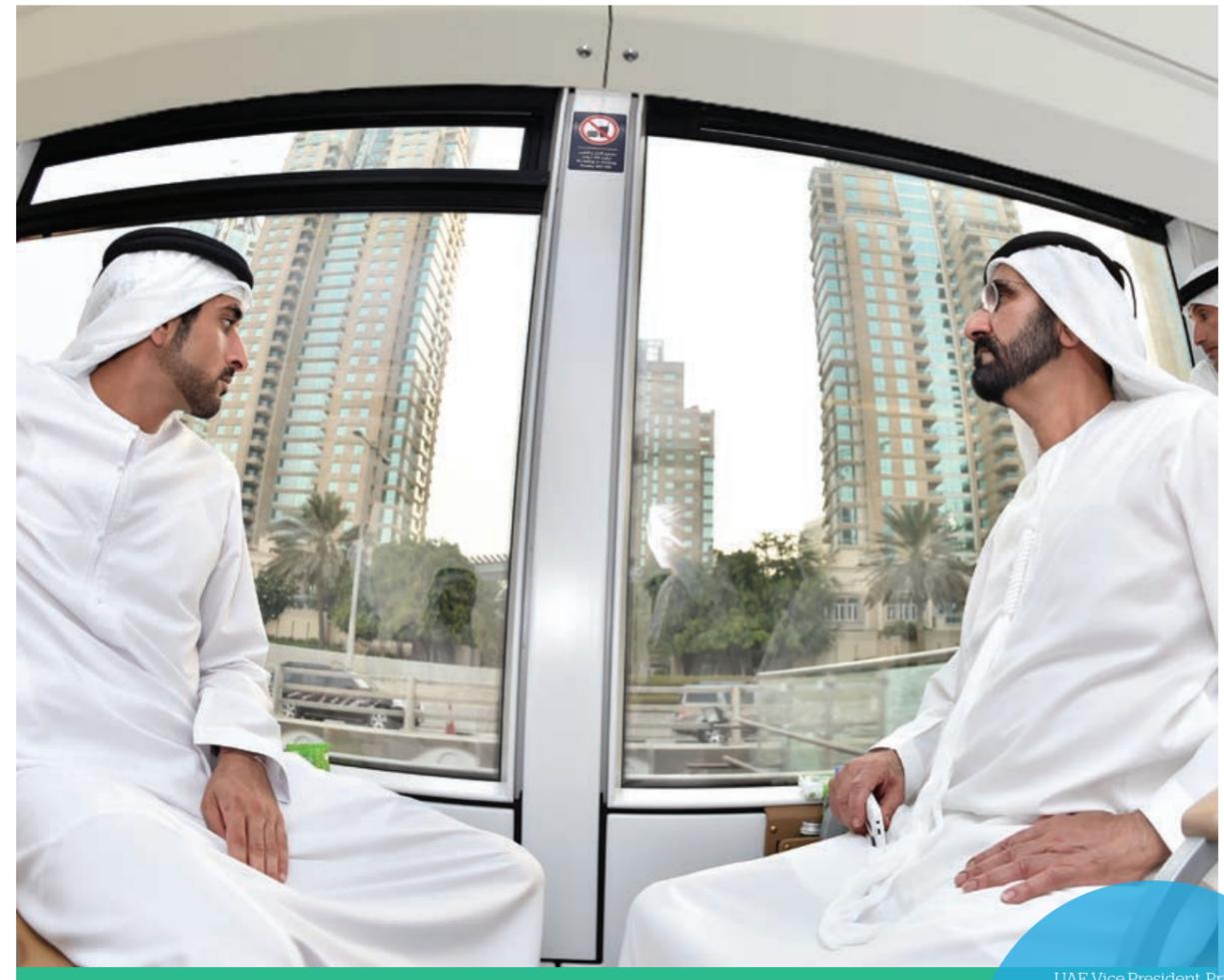
UNOSSC

DRIVING SUSTAINABLE LIFESTYLE CHOICES

By
Alistair Stranack



Target to reduce consumption by
30% by 2030



UAE Vice President, Prime Minister and Ruler of Dubai His Highness Sheikh Mohammed bin Rashid Al Maktoum and the crown prince His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum taking a ride on the Dubai tram during launching its trial run in 2014.

HOW THE DUBAI INTEGRATED ENERGY STRATEGY BUILDS ON INTERNATIONAL EXPERIENCE TO CREATE A WORLD-CLASS MODEL OF DEMAND SIDE MANAGEMENT

DUBAI'S ENERGY TARGETS

The Dubai Integrated Energy Strategy (DIES) sets out an ambitious target to reduce consumption by 30% by 2030, bringing per-capita consumption below that of the US.

While industrial schemes typically deliver cost-effective savings, the importance of the commercial and residential sectors in Dubai (70% of end user energy demand) means an effective approach will need to address these sectors, and in doing so, drive sustainable behaviour at the consumer level. Any initiatives will need to address either transport or buildings - together the two key areas of consumer energy usage.

Even though building codes have seen the green credentials of new buildings improve significantly, the existing stock will be responsible for the majority of energy usage for some time to come. The energy regulator RSB is now looking to address this issue with a demand-side management approach.

Driving sustainable consumer choices while maintaining the lifestyle that has made Dubai famous will be a key challenge for government. As in many endeavours, Dubai can learn from other countries' experience, but must develop its own solutions that address the specific needs of the emirate's unique environment. The integrated approach set out in the DIES appears to do exactly that, but will need careful implementation if it is to achieve the targeted results.

LEVERS FOR CHANGE

Dubai's success to date has focussed on addressing the supply side where it has intervened in the market directly to alter the products, services and infrastructure to which consumers have access. This can be achieved either through prohibition of unsustainable products and behaviours, or through provision of superior sustainable alternatives. An excellent example of the latter is the Dubai Metro.

Opened in 2009, the Metro saw 210 million passenger trips in 2013. Statistics show that 20% of Dubai Metro users have cars but prefer to commute by metro. Its success lies not in giving consumers a "green" alternative to the car but by offering a better solution overall - 70% of passengers cite time savings as

their reason for taking the Metro. A key lesson from this is that consumers will make green choices, provided there is a broader welfare benefit. The alternative option on the supply side is to limit

access to unsustainable products. Dubai recently followed the trend set in many countries of prohibiting the sale of incandescent light bulbs. Other countries' experience in his area has been mixed with consumer and retailer stockpiling and grey imports lessening the impact of the ban.

At the other end of the spectrum are 'pure' demand side approaches - providing consumers with the information required to make sustainable choices. These can range from awareness campaigns to schemes highlighting the energy performance of buildings and appliances.

Denmark's building Energy Performance Certificate scheme required assessment and labelling for all buildings, providing consumers with high quality information on the energy efficiency and operating costs of properties. However, despite Denmark's high energy costs and environmental

credentials, reating this awareness failed to materially affect consumer behaviour. The scheme saw limited investment in energy saving measures, with consumers prioritising other areas of home improvement, showing limited appetite to invest, or preferring to use savings to increase welfare by raising internal temperatures. To influence behaviour

Sustainable lifestyle for achieving higher energy savings



The Dubai Integrated Energy Strategy (DIES) sets out an ambitious target to reduce energy consumption by 30% by 2030, bringing per-capita consumption below that of the US

without restricting consumer choice, governments have intervened at the economic level, with a range of taxes and incentives. The more compelling of these is to add cost to negative actions. Examples abound - with taxation applied globally to energy usage or carbon emissions. There are also examples of charging for specific actions. In 2003, the London Congestion Charge introduced a daily Dh30 fee for cars entering the central zone. The introduction had an immediate impact, with a 15% drop in traffic, as drivers made the switch to public transport, demonstrating the effectiveness of appropriate penalty charges in promoting desirable behaviour.

However, attempts to use subsidies to drive positive behaviour have been less successful, and demonstrate the importance of a deep understanding of consumer behaviour. The French government's 2008 'feebate' scheme, rewarding consumers for purchasing less polluting vehicles, saw a 5% step reduction in emissions per kilometre. However, the reduction in vehicle purchase and running costs were accompanied by an increase in new car sales and total miles, resulting in an increase in total energy consumption.

In the buildings sector, the UK government offered incentives to encourage householders to invest in solar energy, with the option to sell power back to the grid. However, the incentives were so attractive that uptake was far above expectations - driven by entrepreneurs offering householders no-risk returns - and soon proved unaffordable, so the scheme was cancelled. This again shows the need to structure schemes and set subsidy levels at the right level to drive savings.

FOOTNOTES

¹ <http://environment.nationalgeographic.com/environment/sustainable-earth/pictures-ten-countries-with-the-biggest-footprints/>

DUBAI'S CHALLENGE

Although Dubai has seen success to date, with supply-side focussed initiatives such as the Metro and Green Building Codes, the forthcoming demand-side management approach will prove more challenging, and will need to address a number of considerations:

First and foremost is the understanding that consumers are unlikely to choose green actions without a compelling welfare-based reason. Green solutions must be cheaper, more convenient or mandated to get consumers to switch from less sustainable alternatives.

Increasing the relative cost of unsustainable actions is the most effective way to influence behaviour as it gives consumers immediate and clear-cut choices. Investment subsidies work well for informed investors - businesses and commercial organisations - but consumer investment decisions are less predictable, often involving more complex and less quantitative trade-offs.



ALISTAIR STRANACK
CREDO'S DUBAI OFFICE

He leads Credo's Dubai office and advises governments, regulators and companies on policy, strategy and transactions, working extensively in energy, business and infrastructure services, as well as healthcare, education and industrials.

Providing better quality information to inform consumer choice is a necessary but not a sufficient mechanism - incentives must also be aligned. This is likely to be a major consideration in the development of demand-side management in Dubai. For example, in many properties, communal charging mechanisms limit consumers' ability to affect energy usage and charges (for most expatriates, the fixed municipality housing fee is by far the largest component of their DEWA bill). In addition, there is invariably a disconnect between energy efficiency investment and return - with tenants benefitting from landlords investment. Without action to align the incentives that guide behaviour, energy usage disclosure is unlikely to have a significant impact.

An integrated approach will be key to drive the required changes, with a combination of improved information, economic incentives and compulsion driving consumers towards sustainable decisions. Dubai is a unique environment and so while experience in other countries can help guide policy, any solution must be based upon an in-depth understanding of Dubai consumers' behaviour. Dubai's energy reduction targets are ambitious, and in this area as in many others we will need to develop ground-breaking solutions to deliver on our ambitions. With integration at its core, Dubai's strategy is on track to reinforce its position as a regional and global leader in the field of energy savings. *em.d*

SUSTAINABILITY.

economic
environment
social



Driving sustainable consumer choices while maintaining the lifestyle that has made Dubai famous will be a key challenge for government

SAVING TO BE BETTER

By
John Webster



If the corporate sector [in the U.S.] increases efficiency by 3% per annum it could unlock \$190 billion in savings by 2020



Dubai's Integrated Energy Strategy establishes an **AGGRESSIVE SET OF ENERGY GOAL** of meeting **30%** EFFICIENCY TARGET

ENERGY SAVING



THE ROLE OF BEHAVIOURAL SCIENCE IN CLIMATE STEWARDSHIP

Dubai's Integrated Energy Strategy establishes an aggressive set of energy goals, but let's face it: meeting a 30% efficiency target will be a very big challenge to face.

So what if we could just ask people to use less energy? Researchers have tried - but programmes that encourage people to save power just because it's environmentally safer or economical usually don't change long-term habits. However, there is a clever tactic from social psychology that can make a lasting impact, which is to compare the same people's energy use to that of their neighbours.

No one wants to be labelled as wasteful. Everyone wants to show their best side and come out on top, including in Dubai, a city where we have done customer-based research. Scientists call this approach a normative comparison. It is a kind of nudge - a proven approach to changing behaviour that can help collect taxes, improve public health and boost voter turnout, among many other behavioural aspects. Applied to home energy use, it

is an astonishingly reliable means to motivate people to take action and save, nudging them toward actions like turning down the air conditioner when they're away.

What happens when you scale this kind of approach over an entire region? In the Middle East, a savings programme based on normative comparisons and other behavioural science principles could save enough to power 1.5 million European households. Moreover, implementing these programmes could be far less expensive than developing other forms of clean energy.

Forward-thinking utilities in nine countries have already rolled out successful behavioural efficiency programmes, but their potential in the Middle East is largely untapped. Per-capita electricity usage in Dubai ranks among the highest in the world, and the savings potential is right up there, too. The next big win for the planet may not be a field of solar panels or a new emissions cap. It may well be people themselves, who are motivated to become better climate stewards than their neighbours down the block. *em.d*



JOHN WEBSTER
OPOWER

He is the VP of Marketing & Strategy, overseeing both corporate marketing and solutions marketing teams, and holding responsibility for Europe, the Middle East and Africa.

SUSTAINABILITY AS A CSR COMMITMENT

By **Saeed Abdullah Khoory**

ENOC'S INITIATIVES FOR A SUSTAINABLE FUTURE

ENOC is among the first organisations in the UAE to integrate environmental sustainability as a Corporate Social Responsibility (CSR) commitment.

Sustainable development and the community are integrally linked. The success of sustainable initiatives requires the committed and enthusiastic participation of all stakeholders, in particular the community and customers. ENOC has been at the forefront of identifying and engaging the community as part of its sustainable development initiatives.

As an organisation that has one of the strongest and well-established customer interfaces, ENOC is in a unique position to be able draw on its customer base to strengthen awareness on environmental issues and engage the community to be active participants in green initiatives.

The extensive service station network of ENOC and the organisation's direct engagement with the community through its convenience stores and other retailing operations, in addition to the customer-centric focus of its subsidiaries, gives the group a strong edge in promoting green products and services.

Through its CSR campaign 'Human Fuel' - ENOC's flagship initiative organised in partnership with the United Nations World Food Programme and Dubai Charity Association to raise funds to address global hunger - ENOC is highlighting the importance of environmental sustainability.

Another green CSR activity is Tadweer, a laptop recycling project in partnership with Dubai

Municipality. The company also undertakes emergency response workshops, conducts environmental competitions among school children to raise awareness among the future generation and annually takes part in the 'Clean Up the UAE' campaign.

Over the years ENOC's volunteers, under its TarabuT initiative, have taken the lead in participating in public awareness campaigns and engaged actively in environment-oriented initiatives. Saeed Khoory, Chief Executive Officer of ENOC, says: 'ENOC is committed to participating in initiatives that have a transformational impact on the community. We partner in social causes as well as events that help conserve our environment. The launch of our TarabuT programme has given further momentum to the participation of our employees who realise the importance of being socially responsible individuals.'

ENOC's public awareness initiatives to promote environment-friendliness include the opening of the Middle East's first green service station, as well as a focus on promoting CNG as a clean fuel. ENOC is also driving awareness on the use of the ultra-low-sulphur Green Diesel which is more sustainable because it has only 10ppm of sulphur compared to 500ppm in the diesel used in the region.

ENOC and its subsidiaries have unveiled several green products and services. In addition to the waterless car wash, ENOC has developed green lubricants, which improve the efficiency of engine performance, last longer, are less environmentally damaging and help reduce emissions by improving overall engine performance. ENOC also has developed new "green" synthetic oils for use with newer generation engine designs.

Similarly, EMGAS has unveiled an innovative fuelling system designed to

power forklift trucks, assuring improved performance, prolonged engine life and reduced maintenance and lifecycle costs. This high quality propane promotes rugged performance and consistent lifting power, while also benefiting the environment by producing significantly fewer emissions than comparable fuels and removing the possibility of harmful fuel spillage.

Reflecting its commitment to green practices, EMGAS, the winner of the CSR

Label Award from Dubai Chamber, also secured the Environmental Performance Certification (EPC) from the UAE Ministry of Environment & Water in 2010 for the Jebel Ali Plant, in 2011 for the Umm Al Quwain Plant and in 2012 for the Ajman Plant.

ENOC has also won Asia's top laurel for Best Corporate Social Responsibility Practices at the Asian Leadership Awards as well as The Bizz Award, one of the most

prestigious business awards worldwide, for outstanding corporate social responsibility practices.

"Through our focus on CSR we strive to fulfil the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai, to establish Dubai, not only [as] a world-class city but also a city that cares, in addition to upholding our nation's 'green vision.'" *emad*



ENOC is also driving awareness on the use of the **ultra-low-sulphur GREEN DIESEL** which is more sustainable because it has only **10ppm** of sulphur compared to **500ppm** in the diesel used in the region



SAEED ABDULLAH KHOORY
ENOC

He is the CEO of ENOC.

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FEEDING AN APPETITE FOR ORGANIC FOOD

By
Renu Ojha

HYDROPONICS, A FEASIBLE
SOLUTION FOR AGRICULTURE

The future of the organic food sector in the GCC in general, and the UAE in particular, is very bright. Rising population, growing income levels, changes in eating habits and access to new technology are resulting in the continuing growth of local production and consumption food levels.

The resultant increase in demand and government focus on food security is likely to see more investments in the regional local food production sector and in the homegrown units being established. There is substantial investor interest in farming, poultry, dairy and meat processing projects.

CONSUMER TREND

Big Focus on Health and Wellness

While there is growing awareness and drive about healthy living, obesity rates are high and diabetes is a one of the main concerns in the region. As a consequence, demand for healthy food, locally grown and possibly organic, is expected to increase. It is a fast growing segment where consumers are battling

the bulge and food producers and marketers are contributing to the fight against obesity.

Supporting Eating Local and Organic

Locally grown food has a dual effect of supporting both the local economy and community. Consumers today are aware that purchasing locally grown and produced food is not only good for their health, but also a means to reduce the carbon footprint associated with food transport.

Farmers' markets have blossomed in popularity in the UAE recently as residents start to take a keen interest in the provenance of what they are eating in order to maintain a healthy lifestyle and a healthy environment. These markets enable customers to buy locally grown and organic ingredients supplied directly from those who grow them. The key pillars to sustainability are the economic, environmental and social impacts on the consumers' communities. Making enlightened choices when buying fair trade sugar, chocolate, coffee and tea and by purchasing environmentally friendly products is a very valuable signal to business interests.





Locally grown food has a dual effect in supporting the local economy and community



ORGANIC



FRUITS AND VEGETABLES

Growing organic products in the region is accompanied by great challenges. Four-fifths of the UAE is characterized as desert with arid climatic conditions and limited availability of agricultural resources - only 13 per cent of the soil is suitable for irrigated farming in the UAE and about 7 per cent potential agricultural land lies in the northern emirates, especially in Ras Al Khaimah, according to the national soil map prepared by the Environment Agency of Abu Dhabi.

The UAE is the second-largest food market in the GCC after Saudi Arabia¹. Since 2004, the UAE's food consumption has grown briskly at a compound annual growth rate (CAGR) of 6.2%. With rising population and affluence levels, Alpine Capital forecast food consumption in the UAE to grow at a CAGR of 4.2% during

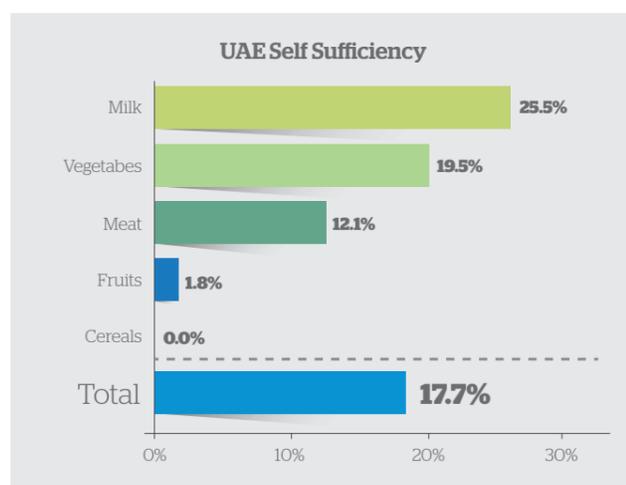
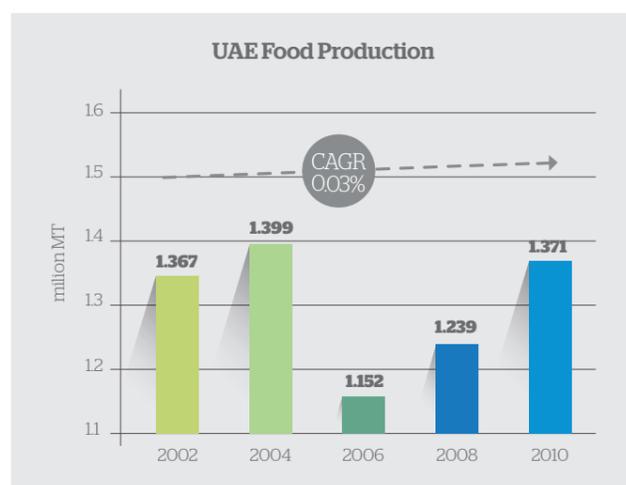
2012-2017, thus continuing the current uptrend. Furthermore, the country is a major tourist destination with many travelers arriving from across the world. Apart from its strong macroeconomic and demographic factors, tourism requirements would play a vital role in boosting food consumption in the UAE, especially organic varieties.

Unlike Saudi Arabia, the UAE has a considerably even consumption pattern across food categories. During 2012-2017, meat (4.8%) and milk (4.7%) segments are expected to register the highest growth rates, followed by fruits (4.7%), vegetables (4.4%) and cereals (2.6%). Other food categories that include pulses, sugar, oil, fish, eggs and potatoes are expected to register a strong growth rate of 5.2% during the period. The current and expected consumption patterns in the

UAE reflect the preference for high-value protein-rich foods over the traditional food categories.

The UAE Ministry of Environment and Water recently approved 18 farms for organic branding. It plans to introduce a certification regime that allows organic food to be grown in the country and sold locally and internationally. However, the former requires clear labelling and traceability. To address that issue, the Ministry recently started drafting laws and regulations needed to protect and trace its organic food. The Ministry stated that the Emirates Authority for Standardisation and Metrology certifies organic farms and imported organic foods in the UAE. Organic products are provided with certification logos, and officials select random organic product samples for laboratory checking.

UAE food production and self sufficiency



Source: FAOSTAT, Arab Agricultural Statistics Year Book, Alpen Capital



HYDROPONICS, A FEASIBLE SOLUTION FOR AGRICULTURE

Hydroponics is a soil-less technique of growing plants using mineral nutrient solutions in water. This technique is very useful for growing plants in regions with unfavorable climatic conditions or with significantly limited arable land, such as the GCC. In addition, it consumes nearly 70-90% less water than that required in conventional soil-based agriculture, as hydroponics allow the recycling and reuse of water. Given its various benefits, several GCC governments have tried to implement this technique. The initiatives adopted by them include: (a) The UAE government has extended loans totalling AED 3 million (US\$ 0.8 million) to farmers to convert to hydroponics to grow fruits and vegetables; (b) The Khalifa Fund for Enterprise Development, an Abu Dhabi government organization that helps develop the emirate's businesses, has provided almost AED 650 million (US\$ 176.9 million) in financial support for the agricultural sector since its launch five years ago².

The home grown organic food sector is thriving, and the number of organic farms has also increased due to various schemes to encourage local production. In October 2013, the UAE Ministry of Environment announced that it is making progress in supporting organic planting techniques. The ministry said that advancements were being made in enhancing food security and stepping up bio-security, including projects to guide and support planters and farmers. Among the initiatives, high quality inputs for agricultural production requirements are to be provided at a reduced rate in order to help farmers adopt new agricultural techniques such as aqua farming and organic farming.

By 2015, the Ministry aims to provide for at least 40% of the emirate's vegetable consumption through local production. Previously, many farmlands were used for production of forage, such as Alfalfa and Rhodes grass. Forage, however, consumes large amounts of water, which is scarce in Abu Dhabi. Marketing assistance is also being provided to farmers, most of whom have small landholdings. The partnership with a specialist in agricultural project management helped them to access new technologies, such as hydroponics, which involves growing plants in nutrient solutions instead of soil. Around 16,000 farmers are now a part of this initiative.

Currently, the industry is in the nascent stage compared to that in the West. Demand for organic food in the GCC is currently on par with the levels that prevailed in the US and Europe during the 1980s. However, with increased regional prioritisation of health and safety, growth in demand for organic food in the GCC is likely to outpace that for all other food categories over the next decade. *e.m.d.*



RENU OJHA BLUE PLANET GREEN PEOPLE

She is a social entrepreneur and co founder of Blue Planet Green People- an organic company working with local communities

FOOTNOTES

¹ http://www.academia.edu/5914972/GCC_Food_Industry

² <http://www.alpencapital.com/downloads/GCC%20Food%20Sector%201%20May%202013.pdf>



Obesity rates are high and diabetes is a one of the main concerns in the region



KEEPING UP WITH THE EVER-INCREASING DEMAND FOR WATER

By
Marwan Abdulaziz

MORE EFFECTIVE WATER MANAGEMENT AND CONSERVATION WILL REDUCE THE NEED FOR DESALINATION

The UAE is facing serious water challenges as rainfall is sporadic and winters become progressively drier each year. In addition, population figures have more than tripled in less than three decades. Groundwater is fast depleting as the UAE has one of the highest water usage levels per person in the world, consuming an average of 550 litres per day¹.

After groundwater, the second-largest water resource in the UAE is desalination, accompanied by significant concerns including a sizable carbon footprint, damage to the fragile marine ecosystems and a significant financial burden. Global Water reported that the UAE is spending about \$800 million (AED2.9 billion) per year on building, operating and maintaining desalination plants and predicts that this figure will jump by over 300 per cent to \$3.22 billion (AED12 billion) by 2016².

The UAE Government has placed water management and conservation as a cornerstone of sustainable economic development. It has increased efforts to develop technology to aid renewable energy, water and power conservation. For example, desalination plants based on a friendlier reverse osmosis model are being built to replace the energy-intensive distillation process used today. In addition, the 'aquifer recharge project' in Liwa, Abu Dhabi will enable 26 million cubic metres of desalinated water to be stored in an aquifer in case of emergencies.

At present, around 93 per cent of waste water currently goes out to sea unused³. Utilising this resource would help us provide the vast amounts of water needed in the UAE and ease the burden on desalination facilities.



Desalination plants based on a friendlier reverse osmosis model are being built to replace the energy-intensive distillation process used today

These initiatives have also opened doors for foreign investment into the UAE as industry leaders look to explore the relatively untapped market in this region. It is here, with its first-class technical and community infrastructure and key partnerships with the business community and government authorities, that EnPark plays a major role. We provide our industry companies with a one-stop platform on which to identify and capitalise on investment and growth opportunities by championing environmental sustainability.

It is also time to dispel any notion that desalination provides an inexhaustible supply of water as an excuse to avoid sensible use. By implementing small changes such as reducing the flow on the wash-basin faucet, conserving water while washing cars, taking quicker showers and water-conserving swimming pool maintenance, we are doing our part to conserve this life-giving resource for the next generation. *e.m.d*

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MARWAN ABDULAZIZ ENPARK

Marwan Abdulaziz is the Executive Director of EnPark, focusing on energy efficiency, green building, renewable energy, and waste management.

REFERENCES

EnPark, a member of TECOM Investments, is a Free Zone Business Park dedicated to facilitating and fostering the growth of the alternative energy and environmental industries.

EnPark is a home for organisations operating in the energy efficiency, renewable energy, waste management and green building sectors. EnPark provides regulatory and legislative support to its licensees, offering a platform for sustainable business operations through the integration of eco-friendly policies, standards, education programmes and technologies, combining environmental, social and economic elements to reflect Dubai's benchmark for sustainable development.

FOOTNOTES

¹Research by Swinburne University of Technology in Melbourne and the University Putra Malaysia

²<http://www.emirates247.com/business/economy-finance/uae-desalination-plant-spending-to-jump-300-2010-10-12-1.302849>

³<http://m.gulfnews.com/opinion/keeping-up-with-the-demand-for-water-1.1176869>

MAI DUBAI

THE LAUNCH OF MAI DUBAI INTRODUCES THE LATEST PLAYER IN THE BOTTLED WATER INDUSTRY IN THE UAE.



Mai Dubai LLC is a new business venture in the bottled drinking water industry. Being a subsidiary of DEWA, it follows the same high standards of quality as that of other bottled water companies.

Mai Dubai's automated water factory houses the latest global technology in bottled drinking water, and is governed by the latest international protocols. The factory currently operates in compliance with policies and procedures described in the HACCP and ISO certificates and aims to be awarded ISO certification later this year. The unique red colour in the corporate identity logo of Mai Dubai symbolises vigour, vividness, happiness and prosperity. As for the bottle itself, the design was inspired by the modern nature of Dubai's architectural designs.

Mai Dubai will target the following sales channels: tail (mass distribution of key accounts and direct sales delivery), home and office delivery through sales of 5-gallon bottles and export markets.

Mai Dubai's management strongly believe that success cannot be maintained without a long-term commitment to the wellbeing of the community and the environment, and therefore, the management team has planned for short- and long-run sustainability, and made sustainability an integral part of its mission statement. *e.m.d*

CHARGING ALONG THE TRACK

DUBAI ELECTRICITY AND WATER AUTHORITY IS PREPARING THE WAY FOR AN INFLUX OF ELECTRIC VEHICLES IN DUBAI BY BUILDING THE CHARGING STATIONS THEY NEED TO KEEP THEM GOING.

By the end of 2012, over 180,000 electric vehicles had been travelling the world's roads and by 2020, a projected 20 million will do so, according to the Electric Vehicle Initiative. This new breed of vehicle will be pollution-free and offers the promise of sustainable transport for the world. With new battery technologies and more choices of vehicles now available, electric vehicles can increasingly be found on Dubai's roads today. DEWA is supporting the introduction of electric vehicles, as they decrease air pollution and protect the environment from the impact of motor-vehicle emissions with plans to build a robust charging infrastructure for electric vehicles. This is essential for electric vehicles to be adopted, as greater numbers of people and businesses focus on them for their environmentally-efficient transport needs.

This effort is part of DEWA's smart grid strategy and implementation roadmap and supports the Smart City initiative. DEWA is responsible for implementing this charging infrastructure across the Emirate, supported by its world-class power transmission and distribution networks.

The initial rollout includes the installation of 100 charging stations by the second quarter of 2015, along with the necessary supporting information technology that will provide open accessibility for all types of electric vehicles.

The multi-vendor, multi-standard and interoperable infrastructure will include three types of charging options: home charging stations, public alternate current charging stations and fast-charging stations.

هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

DEWA is supporting the introduction of electric vehicles, as they decrease air pollution and protect the environment from the impact of motor-vehicle emissions.

Fast Charge points, primarily installed in gas stations, will be the quickest way to charge electric vehicles and are capable of recharging a battery to 80% capacity in less than 25 minutes

Home charging stations will allow electric vehicle users to charge their vehicles overnight, while public charge points will be introduced in areas such as hotels, malls, public car parks and intermodal sites, such as metro stations, tram stations and airports, alongside the initial rollout of domestic charging points in residential properties.

Fast Charge points, primarily installed in gas stations, will be the quickest way to charge electric vehicles and are capable of

recharging a battery to 80% capacity in less than 25 minutes. With an extensive charging network across Dubai, electric vehicle drivers will never be far from a charging point.

DEWA is working to achieve the objectives of its roadmap to roll out an electric vehicle charging infrastructure to ensure that, as a utility, it can provide the best possible utility support for electric vehicles. For the rollout to be successful, every stakeholder involved needs to commit to it. This also includes the willingness of the industry

sector and consumers to embrace the new opportunities. DEWA will work with car manufacturers of electric cars, as well as the Roads and Transport Authority (RTA), and Dubai Municipality to coordinate the locations of the charging points. DEWA will also work with a range of organisations on the siting and construction of car-charging stations, such as ENOC for locating charging stations in petrol stations, hotels and tourism centres, public and private clubs, car parks, airports and other locations. *em.d*

E-MOBILITY

HOW ELECTRIC VEHICLES ARE BECOMING A REALITY IN DUBAI

By
Daniel Medawar

**A PEEK INTO THE AUTOMOTIVE FUTURE:
THE BMW i8 PLUG-IN HYBRID EV
HITTING THE STREETS OF DUBAI IN 2014.**



“
Dubai's
government
is also working
to create an
ecosystem for EVs
”

Electric vehicles (EVs) have been around for a while - in fact, just as long as the modern car itself. Dating from the late 19th century, the pioneering years of the automobile, early adopters in large cities such as Paris replaced their traditional horse-drawn carriages with electrically powered wagons. These first generation EVs were basically carriages where the horse and reins were replaced by an electric motor and a battery. The advantage was that these new-fangled electric wagons produced no foul odours, did not soil the streets, and were almost completely silent. At their peak around 1900s, given their early advantages, electric vehicles had a market share of 38%, compared with 22% for internal combustion vehicles, in the US for instance (Source insideEVs).

To the surprise of many, electric vehicles already existed in large numbers in the past.

Even though the market for electric vehicles became quieter for much of the 20th century, EVs are now on their way back to the mainstream. Today, we are at an inflection point where a second revolution is fundamentally changing the technological landscape in the automotive industry.

Since 2010, electrified vehicles are back on the agenda in different forms and shapes - and unlike in 1912, EVs are not the incumbents but the challengers this time. Driven by rising costs of fossil fuels, the need to reduce CO₂ emissions, increasing consumer awareness for a sustainable lifestyle and an appetite for new technologies, there is a new momentum for electric and hybrid vehicles.

These macro trends, combined with rapid technological advances in high-voltage components, are paving the way for a dramatic increase in market share of EVs within the next 5 to 10 years.

Governments in places such as California, the Netherlands and China have already introduced comprehensive schemes to promote the adoption of EVs via monetary incentives such as purchase rebates and tax breaks as well as everyday usage-benefits such as free parking, free charging, access to bus lanes, as well as exemption from congestion charges in large cities like London, Milan or Oslo. All these incentives combined make EVs a unique value proposition to customers, by making personal mobility more convenient for users than a conventional car.

It is worth noting that the cities and regions that have laid the regulatory framework to support electric vehicles are boasting the highest share of electric vehicles globally. For example, in California, where the California Air Resource Board (CARB) implemented a low-emission vehicle scheme in 2014, of all new cars sold, 10% were already hybrid or electric (Source: CNCDA.org).

The oil-rich northern European country Norway is another success story: in Norway, the EV share of total car sales has sharply risen in the last two years to reach a staggering 14% in 2014 of total vehicle sales. In addition, the highest monthly sales of any car ever, was achieved by an EV in June 2014. The success can partly be explained by benefits such as dedicated parking spaces, free charging and exemption from sales tax (Source: electrive.net).



Moreover the market launch of new attractive models from premium manufacturers is also helping to move EVs from the niche to the mainstream. It is thus not surprising that while Norway is traditionally a very small market for BMW, it has been a lead market for the new BMW i3. Since the launch of new attractive EV models and the introduction of plug-in electric vehicles (PHEVs), combining electric driving with a larger range, sales are now also reaching noticeable levels in other countries such as the UK, Germany and China.

So what does all this mean for Dubai? First, electric vehicles are coming. BMW and AGMC commercially launched the BMW i8 in July 2014 and have thereby taken the first step to bring electric mobility to customers in Dubai, with a visionary sports car that redefines the plug-in hybrid segment. Second, Dubai has all the right requisites to be a leader in sustainable mobility: similar to California, it is one of the most progressive and fast-moving places in the world. Dubai's people are open and eager to embrace new technologies and innovative products, as smart phone and digital media adoption rates show (72% in 2013, according to Ipsos MediaCT).

Despite some sceptics' claims that there will be no market for EVs as long as oil is still cheaper than water, it is clear that, thanks to DEWA's initiatives, Dubai is moving rapidly towards a smart city with renewable energy sources. Renewable power from sun, wind and water can fuel electric cars emissions-free and at low cost, without depleting any oil reserves.

Dubai's government is also working to create an ecosystem for EVs to make ownership attractive and comfortable in everyday use. Examples from advanced EV markets show that incentives, infrastructure and smart services help to overcome initial customer concerns regarding infrastructure by catering to the charging needs of electric vehicle drivers. Working together with manufacturers such as BMW, DEWA is planning to deploy a connected

network of charging stations. This network will allow drivers to locate charging points via their smartphone or navigation system, and re-charge their EVs in public places such as malls or hotels.

With all these initiatives and an attractive portfolio of electric vehicles being rolled-out, it is thus quite possible that in Dubai combustion engines and V12 big-blocks will slowly be replaced by electric vehicles. It is a development similar to the horse-drawn carriages that were replaced by motorised carriages on the streets of Paris in the 19th century. Last but not least, apart from their sustainability benefits, electric cars provide an exciting driving experience and have a unique selling point with their rapid acceleration and immensely smooth ride, as anyone who has driven a BMW i3 or i8 can clearly attest. *emd*



DANIEL MEDAWAR
BMW

He is working as BMW's E-Mobility Rollout Manager for the Middle East and has previously conducted research about electric vehicles at the University of Cambridge, UK.

DID YOU KNOW?

The BMW i8 plug-in hybrid EV is hitting the streets of Dubai in 2014.

HYBRIDS STEPPING UP THEIR GAME

By
Altar Yilmaz

THE WORLD'S FIRST PLUG-IN HYBRID IN THE LUXURY CLASS

The most recent and exciting evolutions and commitments to the future of the automotive industry have not been made in racing, but in moving in the direction of sustainable hybrid technology.

To give an unexpected example, Porsche - with the introduction of the Cayenne S Hybrid in 2010 - was one of the first to offer hybrid vehicles to Middle East customers. Since then the company has been at the forefront of electric mobility in the high-end performance segment and continues to push the boundaries of possibilities in the field known as e-mobility.

The latest addition to the hybrid model range is the Panamera S E-Hybrid, the world's first plug-in hybrid in the luxury class. The plug-in hybrid drive, with its system power of 416 HP and the ability to sprint from a standstill to 100 km/hr in 5.5 seconds, delivers the same level of performance as a V8 engine. NEDC fuel consumption is just 3.1 litres per 100 km, which equates to CO₂ emissions of 71 g/km.

Porsche's hybrid offer in the sedan segment manages considerable distances in the completely silent all-electric drive, with a range of up to 36 kilometres and a maximum electric driving speed of 135 km/h.

The new Panamera S E-Hybrid offers four driving modes that can be selected by three pushbuttons on the centre console. The E-Power mode enables largely all-electric driving. When E-Power is deactivated, the operating strategy switches to the Hybrid mode. This essentially freezes the momentary charge state of the high-voltage battery to conserve electric driving range for the next stage through a city.

The E-Charge mode can be used to efficiently charge the high-voltage



The plug-in hybrid drive, with its system power of **416 HP** and the ability to sprint from a standstill to 100 km/hr in 5.5 seconds, delivers the same level of performance as a V8 engine.

battery during the drive. The Sport mode ensures typical Porsche high performance and a further enhanced sporty character through a more responsive handling.

The car's lithium-ion battery can be charged in three different ways to maximize owner flexibility and convenience: (a) from any electrical socket via the integrated on-board charger and the standard Porsche Universal Charger (AC), (b) while driving when the electric motor acts as a generator and (c) through brake energy recuperation. *e.m.d*

ADDITIONAL NOTES

NEDC = New European Driving Cycle, used for verifying and testing environmental performance of a car. Checks fuel consumption, CO₂ emission and other pollutants.



ALTAR YILMAZ PORSCHE MIDDLE EAST

He is the Sales Director for Porsche Middle East and Africa FZE. Altar's remit includes introducing the brand's first plug-in hybrid in the luxury class - the Panamera S E-Hybrid.

PRINTING THE FUTURE, ERASING THE PAST

By
Pradeep Kumar

TOSHIBA'S ECO PRINTER IS A WORLD FIRST THAT ALLOWS YOU TO USE THE SAME SHEET OF PAPER AS MANY AS FIVE TIMES



Paper manufacturing is the third-largest user of fossil fuels worldwide and the largest industrial user of water per pound of finished product, yet little is being done to reduce demand. Despite talk about paperless offices, the International Institute for Environment and Development estimates that 95 per cent of business information is still stored on paper. Add to this the 115 billion pages used annually for personal computers and it's clear that paper production comes at a significant environmental cost.

In recognition of this impact, Toshiba has launched the world's first eco-friendly multifunction printer system with erasable toner. The e-STUDIO306LP/RD30's capability in erasing images and text from printed documents means printer paper can be re-used & recycled, reducing waste and environmental impacts.

The printer comes with copy, print, scan, and fax functions and uses a unique toner which can be erased by applying heat using the sidekick device, the e-STUDIO RD30. For archival purposes, this eraser unit can be configured to scan documents to a network file location or USB drive before erasing. Once erased, the paper is returned to the unit's upper drawer for reuse. If the paper has reached its usable limit, it is sent to the unit's bottom drawer to be recycled.

The innovative system allows users to reuse the same sheet of paper as many as five times, reducing paper consumption by 80 per cent and CO₂

TOSHIBA
Leading Innovation >>>



PRADEEP KUMAR TOSHIBA GULF FZE

He is Senior Manager at Toshiba Gulf FZE for Middle East, Africa & Turkey, and Head of Business Solutions Division.

emissions by up to 55 per cent. Given that recycling just one tonne of paper saves 682.5 gallons of oil, 7,000 gallons of water, and 3.3 cubic yards of landfill space, as well as leaving 17 trees standing, it is clear this kind of innovation offers positive environmental benefits along with considerable office cost-savings.

Furthermore, the printer design incorporates bio-based plastics, which use raw materials extracted from plants, producing approximately 20 per cent less CO₂ during production when compared with petroleum-based plastics. With these green attributes, the Toshiba e-STUDIO306LP/RD30 was awarded the gold winner in the category Most Innovative Product of the Year by Best in Biz 2014 International and winner for the Best Eco Product in The Australian Business Awards 2014. *e.m.d*

04. RESPONSIBLE TOURISM.



**HE
HILAL
ALMARRI**

**DIRECTOR GENERAL
DUBAI DEPARTMENT OF TOURISM
AND COMMERCE MARKETING (DTCM)**

INTRODUCTION

Winning the EXPO 2020 bid at the end of 2013 has placed the global limelight on Dubai once again, and in the lead up to the international fair, the Emirate has emerged as an aspirational host of mega events, cemented in its ambitious master plan to place sustainability at the forefront of its planning and execution.

Dubai is charging ahead with a holistic approach on planning this mega event in a manner that minimises its environmental impact while maximising socioeconomic benefits. With a target of 25 million visitors, the expo aims to continue the city's trajectory in sustaining its place as a global trade and tourism hub.

In this chapter, the brains behind the master plan for Expo 2015 in Milan outline their experience, before Dubai takes the reins in the 35th edition of the historic world's fair.

Anticipating the spike in footfall, the Dubai Tourism and Commerce Department is already laying strategic foundations to ramp up the city's hospitality and transportation infrastructure over the next six years. Global efforts to form partnerships combatting high carbon emissions in the aviation industry are supportive of this, with the UAE GCAA addressing this issue by committing to a pioneering action plan.



GREENING MEGA-EVENTS

By
John O'Brien

THE UNDP EXPERIENCE IN MINIMISING ENVIRONMENTAL IMPACT AND MAXIMISING THE SOCIAL AND ECONOMIC BENEFITS OF EVENTS

As environmental concerns play an increasingly more important role on the world agenda, the greening of mega-events has become a priority for event organisers around the world. While it is recognised that mega-events can have a positive effect in promoting economic development through job creation, skills development, and international branding, it is also acknowledged that they can have negative consequences, such as environmental damage during construction and the operation effects of event venues, including increased greenhouse gas (GHG) emissions leading to a higher carbon footprint. For mega-events to be greened, they need to take specific steps to consider and mitigate negative environmental impacts, calculate their carbon footprint and develop a comprehensive carbon-offsetting strategy.



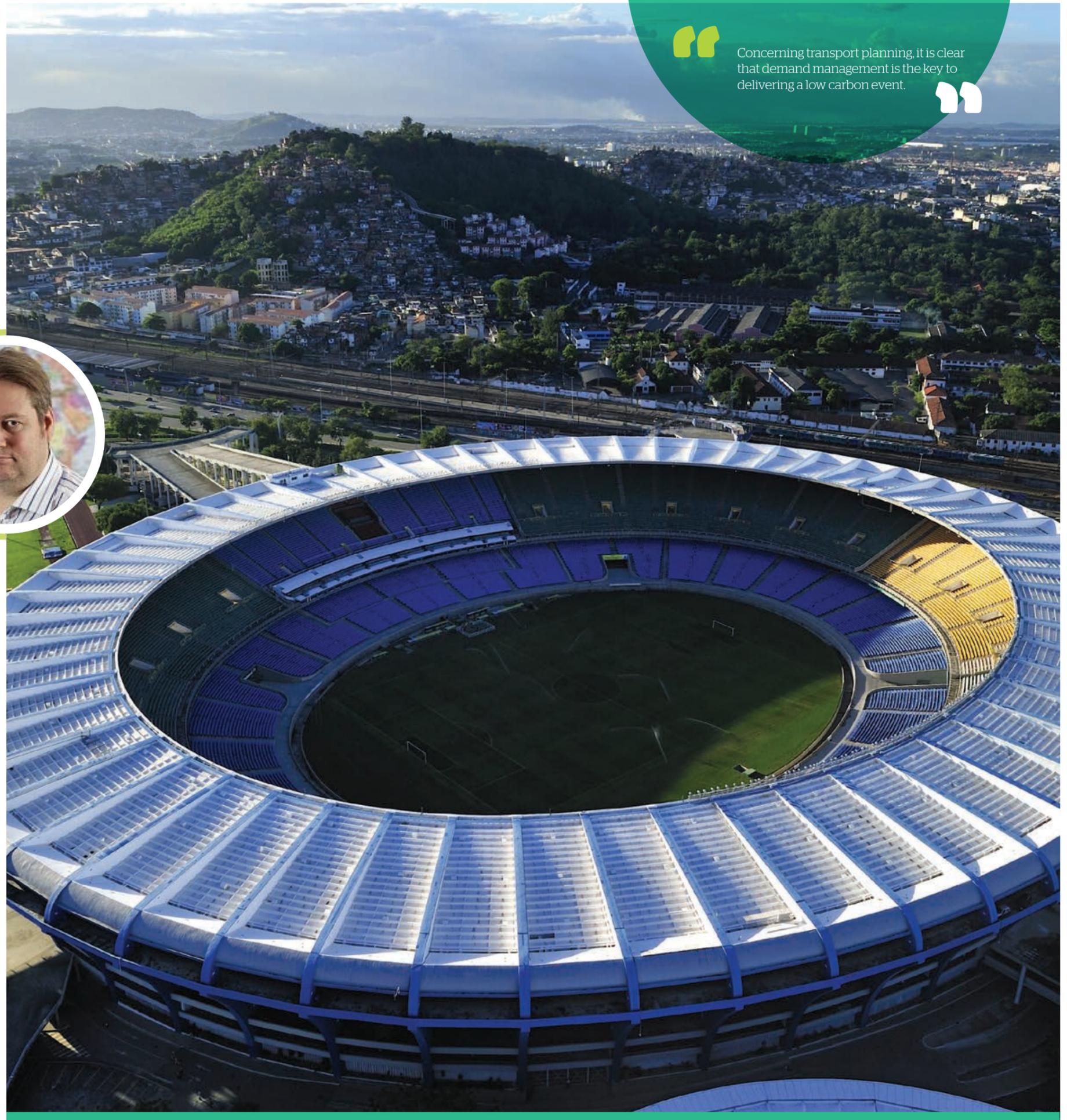
JOHN O'BRIEN
UNDP

He is the Regional Technical Advisor for Climate Change Mitigation of UNDP.

UNDP has significant experience in supporting the greening of mega-events around the world, working in close partnership with the Global Environment Facility (GEF). This includes experiences with the 2008 Summer Olympics in Beijing and the 2010 World Expo in Shanghai, promoting a low-carbon campaign for the 2010 Commonwealth Games in India, promoting sustainable transport for the 2010 FIFA World Cup in South Africa, and the development of a green action plan and carbon-offset programme for the 2014 Sochi Winter Olympics.

These experiences have given UNDP important insight into what it takes to ensure mega-events are successfully greened. The first and most important lesson is that it is critical to start planning early and recommendations need to be finalised while planning is underway and before construction starts. It is no use, for example, to develop a green action plan for event organisers which includes recommendations for improved energy efficiency in buildings, increased use of renewable energy, or sustainable transport, if the construction of event venues and roads has already started and major infrastructure projects are underway.

This was a major issue with the UNDP-GEF Greening Sochi Olympics project, which went through an extended approval process lasting several years. The project only started at the end of 2011, by which time construction for the event was already well underway. The Green Action plan, which the project hoped to develop, had to be shelved in favour of an alternative approach aimed at contributing to a green legacy for Sochi. At the heart of this legacy were recommendations for a carbon-offsetting program for the Russian government. 



Concerning transport planning, it is clear that demand management is the key to delivering a low carbon event.





Carbon offsetting is problematic as there are different interpretations of a carbon-neutral event and the GHG emissions that need to be offset. Organisers going carbon neutral through carbon offsetting need to understand which GHG emissions they intend to offset. Will the offsetting cover construction and operation of event venues only, or will it also include GHG emissions associated with athletes and spectators? How will GHG emissions be calculated and how will data be collected, monitored and verified? More than 50 national reporting systems for GHG emissions currently exist, so it is important to select internationally recognised guidelines, such as the methodologies created by the project-based mechanisms of the Kyoto Protocol - the clean development mechanism (CDM) and joint implementation (JI).

For example, in the case of the Sochi Olympic games, the UNDP-GEF project estimated GHG emissions at 218,000 tonnes of CO₂ considering only emissions from the Sochi Organising Committee, but if all construction-related and spectator-travel GHG emissions are included, total emissions were estimated as 5,103,000 tonnes of CO₂ - a massive increase.

UNDP has also learned what it takes to promote sustainable transport for mega-events. First, lower-carbon travel choices need to be incentivised by offering free or discounted travel. For international sporting events, it is now standard practice that ticket holders to match events can utilise free public transport simply by showing their match tickets. Overseas travel is more difficult to manage - carbon offsetting provides the only mitigating option as reducing GHG emissions associated with aeroplane travel is not yet feasible.

On transport planning, it is clear that demand management is the key to delivering a low-carbon event. Early transport modelling should include the measurement of carbon and GHG emissions. This modelling should include not just peak flows, but also loading (how full the vehicle is), to best utilise spare capacity. It is also essential to have robust, reliable, and accurate transport data, distinguishing between day-trippers and long stayers, as each place different demands on the transport system. Data should not ignore non-ticketed spectators also, whose movements are less predictable and whose numbers are less certain.

The London Olympic Organising Committee (2012) developed the Sustainable Sourcing Code for green procurement. In the case of the Sochi Olympics, a similar document was developed by the Russian State Corporation Olympstroy entitled "Environmental requirements for manufacturers (suppliers) of basic construction materials, goods, structures for Olympic venues". All mega-events aiming for a green orientation need to develop guidelines for green procurement and ensure these guidelines are followed during the construction phase.

Finally, we come to the post mega-event transfer of knowledge. There are important lessons learned from one mega-event to another and not all lessons are venue and country specific. It is important in the case of mega-events such as Olympic Games, FIFA World Cups, and World Expos that the organisers of previous events spend time post-event to transfer knowledge, discussing what worked and what could have been done better in terms of mega-event greening with future hosts. *em.d*

TOURISM HOTSPOT GOING GREEN

HE HILAL AL MARRI ON RESPONSIBLE TOURISM AND ITS CONTRIBUTION TO DIVERSIFYING AND GREENING DUBAI'S ECONOMY

Dubai's growth into one of the world's leading tourism destinations has been fast. From 5 million hotel guests in 2004 to 11 million in 2013, tourism has become one of the pillars of the emirate's economy and crucial in the long-term diversification strategy, which has propelled Dubai on to the global stage.

Much is said on the subject of Dubai's beneficial location on the world map, the city being situated between the economies of the west and the new economies of the east. But it has taken the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai, and the

combined efforts of the government and the private sector to leverage that location and transform Dubai into the connecting hub of the world, a leading global business location and the fifth most visited city by international visitors with an appeal that is continually enhanced with more hotels, events and attractions.

With such growth comes the responsibility to ensure that the impact on the environment is minimal. We must look at all elements of the value chain to reduce and control the industry's carbon footprint and impact on the environment. With a number of successful initiatives already in place, largely geared towards educating stakeholders across the industry - and indeed our visitors themselves - DTCM is working hand-in-hand with our partners in the development and implementation of a roadmap that will ensure the continual development of a sustainable tourism industry.

“ But it has taken the vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum (...) and the combined efforts of the government and the private sector to leverage that location. ”

POINT OF VIEW

His Excellency
Hilal Al Marri
Director General
of DTCM

“ With such growth comes the responsibility to ensure that the impact on the environment is minimal ”



GREEN TOURISM STRATEGY

By
Yousuf Lootah

Dubai is an internationally renowned hub of tourism – the fifth most visited city in the world by international visitors, with a long-term strategy to become the world's number one family, events and business destination. In 2012, Dubai welcomed 10 million tourists for the first time and stated the ambition to welcome 20 million per year by the end of the decade: in 2013, the emirate received 11 million visitors, demonstrating that the first steps towards achieving the target had been made with haste.

Source: 1 The National, 7 March 2013



YOUSUF LOOTAH, MBA
DTCM

He is the Executive Director of
Dubai Tourism Development &
Investments at DTCM



A compelling mixture of the warm waters of the Arabian Gulf, a futuristic cityscape and boundless desert provides a destination offering that keeps on growing – from luxurious beach and desert resorts to a growing mid-market offer; the world's biggest and most spectacular shopping malls; unique experiences such as the Dubai Fountain, standing at the top of the world's tallest tower and skydiving over The Palm Jumeirah; the charm of Arabian heritage; sampling the menus of the 200 nationalities that call Dubai their home; and a bursting calendar of festivals and events – Dubai never stops asking 'What's next?'

An economy where tourism is such a key component, as is the case in Dubai, makes an exhaustive use of resources including energy, land, etc. Thus, it is imperative to have a sustainable strategy in place for the use of these finite resources.

With Dubai's win of the Expo 2020, the incorporation of sustainability into tourism and the economy as a whole is reflective of the Expo's shared sub-theme. Set to be one of the most sustainable Expos of the world, there is momentum being built around energy and water conservation, and Dubai's Strategic Plan 2015 addresses the sustainability criteria that need to be met in the tourism sector.

The Strategic Plan 2015 identifies tourism as one of the key drivers of future economic growth, which needs to be accompanied by a sustainable approach that protects the environment at international standards and preserves the national culture and way of life.

A holistic approach is required for a Green Tourism Strategy. The Plan clearly states that sustainability cannot be achieved in the tourism sector without its adoption in the parallel enabling sectors of human capital, productivity, innovation, institutional framework and laws and regulations. ➔

In, **2013**
the Emirate
received



11 million
visitors

The Dubai Department of Tourism and Commerce Marketing (DTCM) has developed each of these enablers in the travel and tourism industry. With 88,000 hotel rooms already in the emirate's inventory, the Government is targeting between 105,000 and 115,000 by the end of 2016. Such an increase in hotel supply has to be accompanied by green principles to ensure that natural resources are utilized resourcefully.

Green tourism is a relatively new concept in the region. Many environmental initiatives in the sector fail to take off due to resistance by management and lack of appropriate skills. Other challenges include lack of environmental awareness, shortage of resources and facilities, lack of funding and investment to finance and smart environmental technologies.

In the face of these hindrances towards green tourism, innovation is essential. For instance, DTCM launched the Green Tourism Award in 2009 to encourage conservation and eco-friendly practices that aim to reduce the carbon footprint of Dubai's tourism industry. A team from DTCM, Dubai Municipality, DEWA and other relevant entities inspect sites and allocate points for a set of environmental criteria to select the award winner. The Award sets the hotel establishments and travel service providers in a competition towards adopting green programs and services. Hussain Nasser Lootah, Director-General of Dubai Municipality applauded the Green Tourism Award stating "this prestigious award not only offers the opportunity to showcase the ecologically-friendly practices and their green credentials, but also encourage others to improve their resource efficiency, reduce carbon footprint, mitigate impacts of climate change, thus bringing a lot of significant benefits for the people of Dubai and beyond."

A Training Solutions Centre has been established to provide high quality training to all levels of human resources including general managers, tour guides, concierge, housekeeping and vendors. Since 2008, DTCM has hosted a large series of educational workshops attended by more than 2,200 tourism stakeholders.

In line with the vision and directives of His Highness Sheikh Mohammed bin Rashid Al Maktoum,



Vice President and Prime Minister of UAE and Ruler of Dubai, to turn Dubai into a green and sustainable state, DTCM launched the first ever initiative to reduce carbon emissions in the hospitality sector by setting goals for each year, achieving a 20 percent reduction of CO2 in 2011.

In June 2012, DTCM launched another initiative, Together for a Green Environment, to improve the service standards in the green tourism industry and to align the growth of the sector with the pillars of green economy. Seminars and workshops are held for tourism industry professionals to educate them on sustainable tourism, best solutions and technologies, environmental policies and best environmental practices.

Another incentivizing award introduced by the Emirates Green Building Council and supported by DTCM is the internationally recognized Green Key label. The label encourages hotel operators to adopt systems and programs that advance environmental development and standards. The benefits are not only to the environment but also to the hotels in the form of cost savings on water, energy, and waste.

Apart from greening the hospitality sector, green tourism also includes protection of wildlife. The Arabian Gulf has a rich eco-system with a wide variety of marine species, including sea turtles and the world's second-largest population of dugongs (sea cows). Visitors explore the marine life through snorkeling, scuba diving and wreck diving. The government has been working to restore the fragile reefs that are damaged by construction to promote eco-tourism.

Desert nature tours are another popular nature-based activity that support eco-tourism by allowing tourists to explore the local wildlife, including Arabian Oryx, caracal, hyenas and desert foxes,

as well as to view desert landscapes and sunsets. Similarly, the al Maha Desert Resort, located in Dubai's biggest nature conservation site, offers nature walks, desert safari, and sunset camel rides. To maintain these natural tourist attractions, conservation is essential.

These initiatives are just the start of a longer term strategic roadmap to reduce the impact of the tourism industry in terms of the consumption of energy and water; the production of waste; and the increase in transportation required to cope with rising visitor numbers. With the ambition of 20 million international visitors per annum by 2020, the ecological footprint of this large circulation of visitors cannot be ignored. *em.d*

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THINK BIG THINK GREEN

By
Ivano Iannelli

Mega-projects & mega-events have always been a source of debate when looking at benefits and costs. There is fierce competition to host such events and, in many cases, there are always numerous and visible complains ahead of the events itself. However the intrinsic value of Mega-events lies in their economic impact and ability to capture under a single programme a number of key developmental initiatives meant to improve the livelihood of the hosting society. In fact, mega-events are key enablers of economic growth and social development. ➡



ECONOMIC GROWTH

When addressing the economy, we look at the aggregated amount generated from transactions. Essentially an economy is made up of millions of transactions categorised by industry, sector and market. When His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, launched the Policy of "Green Economy for Sustainable Development", it had an immediate effect: people started asking questions and converging to a common long-term goal.

Mega-events are catalysts for infrastructure programmes as they actively and accurately forecast latent revenue streams. In economic terms, Dubai Government has also been referred to as "Dubai Inc.", given its business sense and promotion of the private sector. This appellation is a synonym of governmental efficiency. Traditionally, economic performance of governments has been criticized as it is often very difficult to determine whether revenues collected provide direct benefits to the population.

This is not the case for Dubai. Revenues, traditionally generated from taxes in most countries, are generated from emirate-level enterprises. Conventional practices are challenged and improved. Communication has been a key enabler for innovation and, in a melting pot of world cultures, Dubai has turned its key advantage into a methodological approach whereby government sponsored events (e.g. summits) are designed to meet the expectations of key participants, thus creating a comfortable environment where ideas can mingle.

TIME HORIZON

When a Mega-event is planned, often a Special Purpose Vehicle (SPV) has to be created to drive and manage the activity, often across several years and in coordination with multiple stakeholders. In many cases, a working group of different entity representatives is created to coordinate the complexity. In some instances, members change, and organisational involvement and focus may shift to the detriment of the end result. In the case of Dubai, the governance structure set up initially for the management of the bid represents the commitment made to the world, and as such is key to defining the way forward.

The UAE will celebrate its Golden Jubilee, the 50th anniversary of the Federation in 2021. Vision 2021 drives a convergence through a set of indicators and performance metrics in line with key thematic areas including the green economy, resource efficiency and sustainability.

Mega-event infrastructure development often incorporates elements that are not commercially viable at the time of the announcement. An example, solar shading is mature as a technology, even though the use of solar-flexible materials, such as nets or soft structures are still not mainstream. As a key large "buyer" of such technology is identified, the elasticity of market demand shifts and ancillary impact arises. Venture capitalists are probably the first to see the trend, as they scout for technologies that can be commercialised within the suggested timeframe. Although today we are usually looking at a 4- to 6-year horizon for the delivery Mega-event infrastructure, industry experts foresee the maturity cycle of new technologies will be longer than that. In comparison, a very common product such as LED lighting is expected to reach its maturity in about 3 to 5 years according to its industry spokespersons.

A Mega-event should spur technological growth ahead of its normal maturity. When planned according to socio-environmental benefit, Mega-events should target the feasibility of next-generation technologies to both meet the green economy target and ensure a legacy above and beyond GDP growth.



Green, in its truest sense, addresses an environmental benefit visible from the 'Business As Usual' (BAU) scenario



GREEN GROWTH

The ability to capture the green economy potential of a Mega-event is in the knowledge products generated. The construction of a new road, for example, often reduces traffic congestion and directly reduces the amount of fuel burned by vehicles in traffic jams and traffic congestion.

Green, in its truest sense, addresses an environmental benefit visible from the "Business As Usual" (BAU) scenario.

The first hurdle appears when identifying the BAU scenario. There is currently no baseline that identifies what are best practices in Mega-events. This is probably where the UAE culture will be able to play a role. The country's stated ambition towards governance and excellence will play a pivotal role in defining the methodology used to capture such complexities and relationships.

The United Nations, in its preparations for the Climate Change UNFCCC COP21 in Paris in 2015, is strongly supporting the use of sectorial baselines. These are "snapshots" of the resource consumption patterns and efficiency of any given industry, which are used as a means of identifying best practices.

The process to define baselines is collegiate and participatory, whereas the process to collect data and the

actual calculation algorithm are certified at UN standards and only need to be verified to achieve accredited status.

A market based mechanism would then use such baselines to identify the value derived from deviation. The comparability of different approaches based on their resource efficiency becomes quantifiable to bank standards. The perspective is always linked to the ability to generate transactions under an economic approach. Therefore multiple sectors are invited to participate and banks play a key role in the replicability and scalability of piloted processes and technologies.

In order to compare the value of efficiencies, multiple indicators are taken into account. Furthermore the actual product is not taken in isolation, but looked upon within its own value chain utilising two models:

- Value Chain Analysis
- Cradle to Grave (Life cycle analysis)

The two have the immediate effect of augmenting the project's boundaries to its socio-environmental scope, but also facilitate stocktaking of both green economy and GDP alongside green jobs.



GREEN JOBS

A striking feature of the green economy is its ability to introduce new job specialisation and categories, which further increase the number of transactions. In recent years, Dubai has embarked on what is known as Dubai Integrated Energy Strategy 2030, while renewable energy and demand side management activities have already been rolled out.

As a result, new companies have entered and a new range of services is developing. This includes simple activities such as cleaning services for solar panels to the more articulated sub-industry manufacturing solar car park shading. As a result, financial institutions have relocated to the country their renewable energy debt specialists who have relocated with families and attracted additional friends as visitors who have increased the demand on the hospitality sector. This simplistic metaphor is a snapshot of the green economy at work and how green jobs are created.

According to the International Labor Organization (ILO), green jobs are central to sustainable development and respond to the global challenges of environmental protection, economic development and social inclusion. By engaging governments, workers and employers as active agents of change, Mega-events promote the greening of enterprises, workplace practices and the labor market as a whole. These efforts create employment opportunities, enhance resource efficiency and build low-carbon sustainable societies. *em.d*



IVANO IANNELLI
DUBAI CARBON

He is the Chief Executive Officer of Dubai Carbon, an expert on green procurement and logistics and an advocate for green economy.

THE GREEN VALUE OF MILAN EXPO 2015

By
Massimo Prezioso

Expo Milano 2015 is the first universal green-economy fair. This single event will give Italian and international firms focused on green investments the opportunity to be exposed to new ideas and alliances while showcasing their best practices to a global community, both during and after the event. The Expo aims to be a global best-practice event, in terms of its sustainable design and green procurement processes, to be followed in subsequent large-scale global events.



MASSIMO PREZIUOSO
ADVISOR

He is an advisor in the energy, engineering and infrastructure sector.



Milan Expo 2015 is a unique forum for setting up a new era of sustainable and green-growth policies that will start in Europe and follow through to the UAE (through the Dubai Expo 2020) and the USA (through the Transatlantic Trade and Investment Partnership), which could reshape the global economy.

At Rio +20 in June 2012, Heads of State and Government renewed their commitment to ensuring the promotion of an economically, socially and environmentally sustainable future for our planet and for present and future generations. Among other actions, they recognised the importance of promoting cleaner production and products and boosting green growth.

According to the Official website, Expo Milano 2015 is a non-commercial universal exposition with some unique and innovative features. Not only is it an exhibition, but also a process, one of active participation among a large number of players around the theme of "Feeding the Planet, Energy for Life". It is sustainable, technological, thematic and focused on its visitors. Running from 1 May to 31 October, 2015, the Expo will host over 130 exhibitors. This expansive exhibition site, covering one million square metres, is expected to welcome over 20 million visitors.

Expo Milano 2015 is a golden opportunity for Italy and Europe to show how this can be achieved, by implementing workable sustainable solutions throughout the lifecycle of the event.



Expo Milano 2015 is the first universal green economy fair with some very unique and innovative features.

To this end, Expo Milano 2015 wants to set the standard in:

SUSTAINABLE DESIGN, CONSTRUCTION, DISMANTLING AND REUSE

Today, the building sector accounts for 30 to 40% of the world's energy consumption and about 30% of current world CO₂ emissions¹. The sustainable solutions incorporated in the guidelines for design, construction, dismantling and reuse provide suggestions and references on how to improve the performance of temporary buildings and exhibition spaces.

GREEN PROCUREMENT*

Expo Milano has introduced Green Procurement Guidelines to provide suggestions and recommendations on how to easily include relevant criteria to reduce the environmental footprint of products and services in their life-cycle. Green procurement is also a major driver for innovation, providing industry with real incentives for developing green products and services and stimulating markets towards more sustainable solutions.

Expo Milano 2015 provides an opportunity for Europe to take (for the second time, after having led the global agenda for Climate Policy with its "20-20-20") a lead role in the new era of sustainable growth and green investments.

According to a recent study on the leading export industries in various countries, engineering products are a major contributor to Italian exports. The Milan Expo could give a strong boost to a sustainable production and consumption path that is already emerging, as data from the Green Italy 2013 report on Italian green investments shows.

The main consequences of green investments are an increase in exports, innovation in the production system and increased turnover. In order to be competitive, Italian firms must focus not only on quality but also sustainability, thus going green will be an important component for the success of Italian industry long-term.

TO SUMMARISE

Expo Milano 2015 could strongly influence the European and global political agenda by putting the environment and sustainability at the centre of a new green era.

The main goal could be with the EU - USA **Transatlantic Trade and Investment Partnership**, which could be enhanced with new, innovative, sustainable conditions.

At the same time, Expo Milano 2015 has a strong responsibility to provide a successful example, in terms of organisation and vision, for its successor, Expo Dubai 2020, which will be crucial for a transformational change of UAE economy and society.

Milan and Dubai have to work together to help lead this new era of global green growth. *em.d*

DID YOU KNOW?

Expo 2015 SpA Green Procurement

Since 2009, 60 tenders have been awarded for the supply of goods and/or services and consulting, at a total of €19,578,776. In 12 of these, regarding amounts that cover 60.8% of the total economic value, candidate-companies were also assessed on the basis of a series of green requirements, such as the commitment to reduce the environmental impacts connected with providing the subject service or supplies.

Source: <http://www.unep.org/sbci/pdfs/sbci-bccsummary.pdf>

INTERVIEW: ANDRÉ SCHNEIDER



**WORLD GREEN ECONOMY SUMMIT'S
PUBLIC PRIVATE PARTNERSHIP PLATFORM:
TURNING DUBAI INTO A GLOBAL ECONOMY HUB**



André Schneider

Chairman at World Climate
LTD and Vice-President
of Ecole Polytechnique
Fédérale de Lausanne

Q1. THE PUBLIC PRIVATE PARTNERSHIP PLATFORM WILL BE ONE OF THE MAJOR INNOVATIONS FOR THE WORLD GREEN ECONOMY SUMMIT 2015, WHAT IS ITS PURPOSE?

André Schneider: The Public Private Partnership Platform will be a world-wide unique platform for developing solution-oriented public-private partnerships between business, financial institutions and local and regional governments. This platform will assist governments, public authorities and other operators to learn about and identify the best innovative solutions for their challenges and projects in their green-development endeavours. Top business and financial institutions will showcase innovative solutions and offer financial support, to ensure that each green-development challenge is matched with an appropriate solution. In short, with this new platform, Dubai will further enhance its position as a global hub for the green economy.

Q2. WHO ARE THE PARTICIPANTS OF THIS PUBLIC PRIVATE PARTNERSHIP PLATFORM?

André Schneider: Awareness of the need for sustainable development has been built among key stakeholders internationally. Now it is time to increase the knowledge and capacity about solutions and successful projects through workshops and direct match-making among participants, ultimately to spur global distribution and the scaling-up of green solutions in infrastructure. We are primarily looking at participants such as solution-providers, system-integrators, financiers, experts and buyers representing both public and private sector.

Q3. WILL THIS PLATFORM ONLY BE AVAILABLE DURING THE WORLD GREEN ECONOMY SUMMIT?

André Schneider: No, naturally, during the World Green Economy Summit this platform will be physically present as a kind of marketplace to foster direct talks and collaboration between buyers and solution-providers. The platform will also be available throughout the year through a dedicated website, facilitating the match-making between governments and innovative business and financial institutions. Through this website, we will also support participants in the platform to connect in order to build win-win solutions to meet the challenges of green-economy development.

Q4. WHAT DO YOU BELIEVE WILL MAKE THIS PLATFORM A UNIQUE OFFERING FOR PARTICIPATING STAKEHOLDERS?

André Schneider: My work with Global Infrastructure Basel and other sustainability platforms has shown me that often project owners, for example cities or utilities, struggle to select the best solutions and find alternative financing, as such projects commonly move beyond their self-financing capabilities. The PPP Platform in the first instance will support project owners, but what is even more important for stakeholders is to ensure that the public-private partnerships created for such projects are constructed within a sustainable framework, and the PPP Platform will support stakeholders by providing sustainability and financial checks of the PPPs formulated. This step is important to ensure that during public tender solution-providers are selected, the right solutions are looked at, and long-term financial sustainability of these deals is assured. *emd*

“Dubai will further enhance its position as a global hub for the green economy.”



INTERNATIONAL AVIATION'S ENVIRONMENTAL COMMITMENTS

By
Michael Gill



Total jet-fuel consumption in 2013 aviation industry **73 billion** gallons
producing **700 million** tonnes of CO₂



GLOBAL EFFORTS UNITE TO FORM PARTNERSHIPS COMBATTING HIGH CARBON EMISSIONS

As the aviation industry celebrates the 100th anniversary of the first commercial flight on January 1, 1914, it stands on the brink of an unprecedented era of development in international air travel. The scope of the industry today is impressive: nearly 1,400 airlines operating services to around 4,000 airports with a commercial fleet of over 25,000 aircraft, and helped through the skies by 173 air-traffic management providers. In 2013, the industry served over 3 billion passengers on 36 million flights and nearly 50,000 routes. The industry supports over 58 million jobs and generates 3.4% of global GDP (or USD 2.4 trillion in economic activity), and looking at the benefits on a local basis, almost 15% of the UAE's GDP¹.

But going beyond the bare numbers, what is often overlooked are the social benefits that rapid, safe and good-value air travel brings to the wider economy and to society. Our modern lives rely on easy transport across continents in order to do business, to bring families together and to maintain friendships. The industry comes into its own in regards to remote communities, where for education, medical treatment and business, air transport is the only feasible option.

With those benefits comes an impact on the environment. The industry's total jet-fuel consumption in 2013 was about 73 billion gallons, producing some 700 million tonnes of CO₂, which is around 2% of the total CO₂ produced globally. In order to remain sustainable and to warrant its license to grow, the aviation industry needs to address its CO₂ impact. This presents many challenges, but also great opportunities for the sector that we are pursuing vigorously.

Reducing fuel burn and emissions - along with continual progress on minimising noise - has been a constant focus of the aviation industry. Emissions per passenger have been cut by well over 70% since the 1960s. However, the current global momentum to tackle CO₂ and other greenhouse-gas emissions dates back to 1992 with the adoption of the UN Framework Convention on Climate Change (UNFCCC). In 1997, the Kyoto Protocol to the UNFCCC was adopted. This specifically recognised the unique and international nature of the aviation industry by excluding it from the scope of the UNFCCC and asked for aviation emissions to be dealt with by the International Civil Aviation Organisation (ICAO). ➔



MICHAEL GILL
IATA, ATAG

He is the Director, Aviation Environment, IATA & Executive Director, ATAG

¹ <http://english.alarabiya.net/en/business/aviation-and-transport/2013/03/05/-Aviation-sector-contributes-more-than-39-billion-to-UAE-s-economy-.html>

At the same time, the aviation industry has taken a proactive and far-reaching approach to dealing with its climate-change impact. The aviation industry has been transparent, honest and even courageous in owning up to the challenge that it faces, taking charge of dealing with its 2% of global CO₂ emissions.

Thus, in 2008, the industry developed a four-pillar strategy for reducing aviation's CO₂ emissions:

- new technology, including sustainable low-carbon alternative fuels;
- operational efficiency;
- better infrastructure; and
- appropriate global market-based measures.

The following year, a set of worldwide targets for reducing emissions was adopted. The aviation sector committed to cap its emissions from 2020 and to halve its emissions by 2050, as compared with 2005 levels. Those targets remain some of the toughest carbon goals agreed by any business sector in the world and we remain committed to working through ICAO and its member States to meet the targets.

At the 38th ICAO Assembly in 2013, the industry reaffirmed its commitment to working with governments to build a firm platform for the sustainable development of the industry. After two weeks of intense negotiations, in which the UAE played an important role, ICAO members agreed to a landmark resolution charting the way forward for tackling aviation's climate-change impact. That resolution agreed on the development of a global Market Based Measure (MBM) for international aviation to be effective from 2020. It also requested that the work on the specific design elements of that MBM be completed by the next ICAO Assembly in 2016.

The work has moved forward at an impressive pace, with industry participating closely in the discussions. Technical elements, such as the development of standards for the monitoring, reporting and verification of emissions and the quality of offsets that could be used for the global MBM, are well advanced. Moreover, there has been positive progress in the more political discussions on issues like geographic scope, the need to take into account special needs of airlines from developing countries, and emerging markets and enforcement.

We are within touching distance of a historic agreement to implement the global scheme and no other industry is in that position. But we need to build on the momentum gained at the 2013 ICAO Assembly.

It is worth bearing in mind that the global MBM is only one pillar of the strategy; an MBM will help fill the gap while other technological and operations solutions mature. This broader package of measures includes new technology such as lighter-weight materials, advanced engine and airframe designs, and sustainable alternative fuels. Each new generation of passenger aircraft is around 15-20% more fuel-efficient than its predecessor, and the Gulf carriers such as Emirates and Etihad Airways have been particularly strong in operating a young, fuel-efficient fleet, and in pushing manufacturers to create even better-performing designs in the future.



GLOBAL EFFORTS UNITE TO FORM PARTNERSHIPS COMBATTING HIGH CARBON EMISSIONS

Much of the focus in recent years has been on addressing CO₂ emissions and rightly so. However, there is so much more that can be done by partnerships between government and industry to encourage the development of aviation in an environmentally sustainable manner. Some critical thoughts are the following:

Aviation, tourism and travel are crucial to national economic growth and need to be supported as strategic priorities

A long-term approach needs to be taken to infrastructure planning, particularly in the fast-developing economies of the world

The use of next-generation technologies has to be fostered by research partnerships and the prioritisation of aviation as a user of alternative fuels. Biofuels really could become an everyday reality for the airline industry but we need support from government.

There is the possibility of environmental and capacity improvements through better air-traffic management, reducing fuel burn and noise impact. However, this requires fundamental reforms and much greater regional coordination. The Gulf faces a significant challenge in this regard as traffic volumes increase.

IATA strongly believes that partnership between governments, industry and civil society working together on these areas is key to addressing aviation's environmental challenges and allowing us to take full advantage of the benefits that aviation has delivered to the world over its first 100 years. *emad*

UAE'S CIVIL AVIATION GOES GREEN

By **HE Saif Mohammed Alsuwaidi**

The aviation sector is one of the main drivers of economic growth in UAE, constituting almost 15% of national GDP in 2012¹. In recent years, the sector has witnessed rapid growth due to the fast-paced development of the local economy and the success of the UAE's national airlines. Thus, to remain competitive in the international market, the General Civil Aviation Authority (GCAA) has taken the pre-emptive step of aligning the domestic aviation industry's growth with environmental protection to minimise resource consumption while maximising operational efficiency.

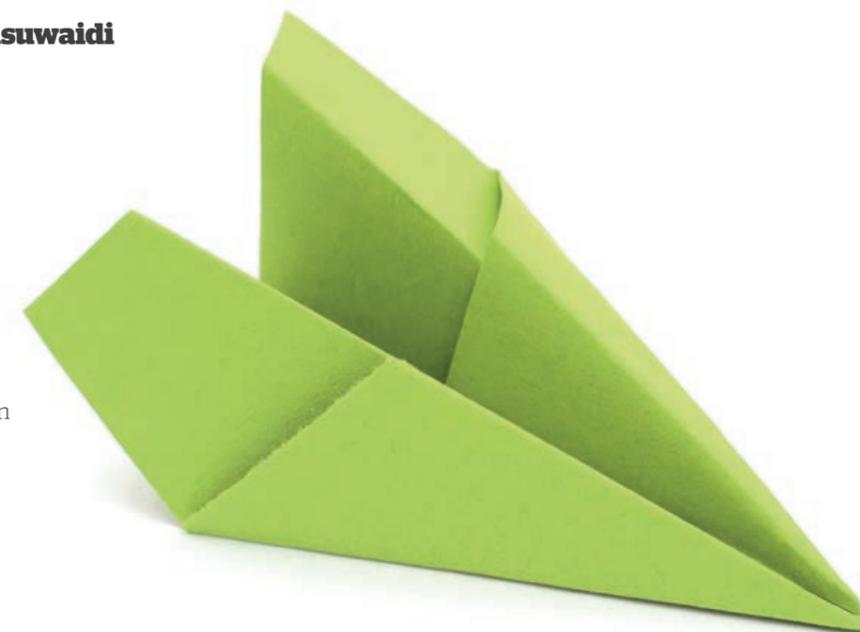
The GCAA developed a national environmental policy for the civil aviation sector in 2012 following two years of discussions with all stakeholders, including state governments, airlines and airports, in sync with Dubai's initiative on developing a green economy for sustainable development.

As a Member State of the International Civil Aviation Organization (ICAO), the GCAA committed to a State of Action Plan (SAP) to reduce its aviation carbon footprint. The plan - as implemented in the UAE - specifies the need to reduce the impact of the aviation sector's carbon emissions on climate change and recognises the need for implementation of relevant environmental laws and regulations in the UAE.

Strategic partners in the civil aviation sector, such as the Emirates Group, are encouraged to produce regular environmental reports to help develop policies and procedures that adopt best practices and cost-effective

measures and which have a positive economic impact. There is also an emphasis on technical and scientific research that supports the development of a sustainable transport system.

SAP also highlights the environment-friendly practices that the UAE's aviation sector currently follows such as the use of fuel-efficient aircraft and awareness initiatives. 



HE SAIF MOHAMMED AL SUWAIDI
GCAA

HE serves as Director General of General Civil Aviation Authority (GCAA) since 2008. HE was appointed in 2010 and re-elected in 2012 as Chairman of Arab Civil Aviation Commission Council.

Source: <http://english.alarabiya.net/en/business/aviation-and-transport/2013/03/05/Aviation-sector-contributes-more-than-39-billion-to-UAE-s-economy.html>

“ The GCAA committed to a State of Action Plan (SAP) to reduce civil aviation's carbon footprint ”

There has been consideration given on how the country can voluntarily contribute to the global goals of international aviation and identify appropriate future mitigation measures.

The Dubai Carbon Centre of Excellence has assisted in developing the second phase of SAP, which is currently under review by GCAA.

GCAA's support of ICAO is not limited to a commitment to the State Action Plan. In June 2013, GCAA hosted the Committee on Aviation Environmental Protection of the International Council of ICAO for the first time in the MENA region, bringing the UAE to the centre stage of the international aviation sector. Forty-six delegations from the international aviation community convened to follow up on international efforts to measure progress in reducing aircraft greenhouse gas emissions and pollution.

The GCAA has served as an observer on the international environmental protection committee in preparation for joining as a full member in the 2016 General Meeting. The Environment Committee of the Civil Aviation Authority of the UAE has pledged to provide the ICAO's environmental programmes with the necessary support, subject to available resources and expertise.

In August 2013, the GCAA announced the UAE's stance on international aviation and the environment in an official document titled The position of the United Arab Emirates on the international aviation sector and climate change, adopted by HE Saif Mohammad Al Suwaidi, Director General of the General Civil Aviation Authority, and ratified by HE Sultan Bin Saeed Al Mansouri, Minister of Economy and Chairman Board of Directors of the General Civil Aviation Authority, after consultation and coordination with local authorities, including the Ministry of Environment and Water and the Ministry of Foreign Affairs.

HE Sultan Bin Saeed Al Mansouri commented on the occasion: "The United Arab Emirates is proud that the State's aviation sector is the first sector that supports a unified position on this important issue, as the failure to apply the global system at the sector level will lead to the presence of non-harmonised group of national and regional actions, which could lead to a range of multi-leveled and conflicted systems and then lead to the counter-productive results on economic development."

The GCAA appeals to the International Civil Aviation Commission to organise a similar unified position in the international arena so that there is fair competition between airline companies. The Consultative Group, organised by the Secretary General of the United Nations, Ban Ki-moon, at the Copenhagen Climate Change COP15 conference in December 2009, was an effort to reach a consensus on partial financing of climate change mitigation and adaptation activities through the aviation sector.



However countries remain divided on the suggested measures. For instance, the UAE supports the existence of a global project to swap emissions from the international aviation sector as a climate change mitigation measure. However, it opposes the suggested of imposing tax on all international flights and a global tax on aviation fuel. Hence further negotiations are needed before a global civil aviation environmental law can be finalised.

Nonetheless, within a few years, the UAE has emerged as a leader in the region and a pioneer in adopting a national environmental policy for its aviation sector, serving as a role model for other sectors in the economy as well as for neighbouring countries. The UAE remains committed to building a diversified economy based on knowledge and innovation. *em.d*

“ Within a few years, UAE has emerged as a leader and a pioneer in the region in adopting a national environmental policy for its aviation sector. ”

A CHANGE OF HEART AND COLOUR IN TOURISM

By Marie-Hélène Westholm-Knebel

GREEN TOURISM AND THE HOSPITALITY SECTOR IN THE UAE

With an increasing number of luxurious hotels and resorts flourishing in the country, combined with one of the highest carbon footprints in the world, the United Arab Emirates is not seen as a leader in reducing the hospitality sector's impacts on the environment. However, local and federal authorities, along with several other organisations, have launched, and are launching various initiatives to raise awareness and promote green tourism as a trend for the future. ➔



MARIE-HÉLÈNE WESTHOLM-KNEBEL
EMIRATES GREEN BUILDING COUNCIL

She works as Technical Officer for the Emirates Green Building Council and oversees the good conduction of various projects and taskforces.



DUBAI AND ABU DHABI **80,000** existing rooms by the end of 2013 **and over 20,000** new hotel rooms to be added by 2016



TRENDS AND EXPECTATIONS

In its 2014 research covering results for the hospitality sector in 2013, Jones Lang LaSalle analysed the coming trends for Dubai and Abu Dhabi as the hospitality hotspots for the region - with nearly 80,000 existing rooms by the end of 2013 in these two Emirates only and over 20,000 new hotel rooms to be added by 2016. The impact on the environment will be significant if building infrastructure and operations are not designed to the highest green standards.

The award of Expo 2020 to the UAE will also boost the sector, as Dubai alone is expected to welcome 25 million visitors in the year of the event, 70% of whom will be coming from abroad (reaching the target set by Dubai Tourism and Commerce Marketing of attracting 20 million tourists annually by the end of the decade). To cover this future demand, the number of hotel rooms in Dubai is expected to reach 160,000 by 2020, obliging the authorities to anticipate this sector's potentially negative impact on the environment.

FEDERAL VISION AND GREEN BUILDINGS REGULATIONS

Under Vision 2021 and the Green economy for sustainable development frameworks, the federal authorities have initiated several regulatory programs to encourage all industries to adopt sustainable measures and green targets in order to reduce their ecological footprint.

As such, the existing regulations (Dubai Green Buildings Regulations and Specifications) and rating systems (LEED and Estidama Pearl Rating) are paving the way for new construction, obliging owners, contractors and developers to apply sustainability and best practice from project inception.

GREENER OPTIONS AND NATURAL CONSERVATION

Along with strong consumer demand and initiatives started by international hotel chains, the push for green tourism is also supported by government authorities, who, for instance, give green hotels visibility through award programmes (Dubai Green Tourism Awards, Middle East Hotel Awards) and introduce a competitive element through various benchmarking initiatives.

Involving guests and staff remains crucial to raising awareness and helping conserve energy and water. Most hotel chains now operate water-conservation programmes, inviting guests to change their linen or towels every second day to reduce energy and water consumption, along with offering cultural eco-friendly activities such as desert eco-safaris, bird watching, kayaking in the mangroves and so on.

ECO-CERTIFICATIONS

Green tourism in the UAE is also gaining recognition through various eco-certifications that award hotels for their positive environmental performances. At this stage, there are four recognised certification programmes in the country of which Green Globe, Earth Check and Green Key have taken a lead in assessing the energy, water and waste management of hospitality facilities. The fourth certification programme, Blue Flag, helps raise environmental awareness and standards for beaches and marinas nationwide.

hotel rooms in **Dubai** are expected to reach **160,000** by 2020

WHAT IS THE FUTURE FOR THE GREEN HOSPITALITY SECTOR IN THE U.A.E.?

The hospitality sector in the region is evolving at full speed, and despite the fact it is often considered unsustainable, it represents a great potential for change and innovation. Tourists coming to the UAE from all over the world bring high expectations for green measures: eco-certifications, waste recycling, and water and energy conservation initiatives are now more mainstream and this obliges hotels to respond faster if they want to maintain their standing against the increasing competition.

Along with other organisations in the country, the Emirates Green Building Council serves as a dynamic platform to share best practices and encourage measures towards greener operations and infrastructure. Through its hospitality sector-based programme, EmiratesGBC is responding to hotels' needs by developing a set of training modules that cover key areas of action on energy efficiency, water and waste management, sustainable equipment and green activities. These modules, prepared and presented by the Council's members, will soon be announced and are planned to be conducted throughout 2015. *em.d*

INFO BOX

Along with the other eco-labels present in the U.A.E., Green Key is gaining momentum by supporting the development of sustainable initiatives in the local hospitality sector and encouraging and educating hotels to reduce their ecological footprint.

Designed as a non-governmental and not-for-profit programme, Green Key was developed in 1994 in Denmark and adopted by the Foundation for Environmental Education in 2002. As the largest global eco-label for accommodation, with more than 2,100 hotels certified in 45 countries, Green Key covers various sets of criteria which include energy, water, waste management, sustainable F&B, as well as the environmental education of management, staff and guests.

Emirates Green Building Council has been the national operator for Green Key in the U.A.E. since 2013, aiming to increase awareness and provide

hotels with the necessary knowledge to fulfill the mandatory requirements. As of June 2014, 24 hotels located throughout the country have been awarded with this certification while more are currently engaged in the review and auditing process. With the strength of the expertise of its corporate members, EmiratesGBC conducts the audits, while a National Jury comprised of professionals from local and national organisations (including DTCM, EWS-WWF) validates the audit recommendations.

To learn more on Green Key, visit <http://www.emiratesgbc.org/index.php/programs/green-key>.

To learn more on Emirates Green Building Council, visit www.emiratesgbc.org.

RESOURCES

Main Resources

- Dubai Green Tourism Awards, Official Page
- Dubai Department of Tourism and Commerce Marketing, Directories of Hotels
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- <http://www.thenational.ae/business/industry-insights/tourism/hotel-room-rates-up-in-dubai-as-delegates-check-in>
- <http://www.afedmag.com/english/ArticlesDetails.aspx?id=95>

GREEN HOTELS CERTIFICATION

By
Arabella Willing



 **ENERGY**
Consumption

 **Sustainable**
WATER PRACTICES

 **Waste**
RECYCLING

 **ECOSYSTEMS**
Preservation



In the laundry, steam is recovered and rinse water is reclaimed.



ARABELLA WILLING
PARK HYATT
ABU DHABI

She is the resident marine biologist of Park Hyatt Abu Dhabi

GREEN HOTELS CERTIFICATION

From inception, the environmental footprint of Park Hyatt Abu Dhabi has been of utmost importance. The property is positioned within a conservation area, and was built in accordance to LEED silver standards. This early commitment influenced our decision making at every stage, with a preference for the best in efficient and sustainable technology.

ENERGY CONSUMPTION

The roof of the building is equipped with 305 solar panels which transfer enough energy to meet the demand for hot water. The centralised cooling system provides cold water for the air conditioning and the hotel has implemented a cutting-edge electronic property-management system in both interior and exterior areas. Sensors determine the activity level and automatically adjust the temperature and lighting, whilst taking into account the external climate. In areas with prolonged low activity, such as unused meeting spaces, the air-conditioning units are set back to a minimum or shut off completely and drapes and blinds are drawn to reduce heat gain from the sunlight. Deep overhanging roofs shade the walls, helping to minimise thermal gain. The walls are well-insulated and the roof topped with white stones to reflect and insulate, helping keep the building cool in summer and warm in winter. We use LED or CFL fittings wherever possible and motion detection indoors, while the exterior lighting is controlled by light sensors.

SUSTAINABLE WATER PRACTICES

In the laundry, steam is recovered and rinse-water is reclaimed. We've installed low-flow appliances with aerators on all fixtures. Showers operate at 10.5 L/min and taps and flushes 5L/min. All urinals, and back of house toilets and taps are equipped with motion sensors, while front of house toilets are all dual flush.

There is extensive use of desert plants for landscaping, reducing the irrigation demand. The drip irrigation water is supplemented with reclaimed air-conditioning condensate.

WASTE RECYCLING

We recycle plastic, metal, paper, wood, electronics and textiles. We use china, glassware and linen napkins that can be washed and reused, and water coolers and Zip Hydrotaps provide filtered boiling and chilled water in restaurants and back of house areas, reducing the need for bottled water. We use non-toxic cleaning chemicals and low VOC (volatile organic compound) paint.

ECOSYSTEMS PRESERVATION

We exclusively serve sustainable fish and our menus contain information about the UAE Choose Wisely Campaign to help spread awareness and lower the demand for threatened local species.

Saadiyat Beach Blue Flag certified, an internationally recognised award for beaches that follows strict criteria relating to environmental management. The beach is home to a range of indigenous flora and fauna and is a nesting ground for the critically endangered hawksbill turtle. Park Hyatt Abu Dhabi employs a resident marine biologist who implements strict environmental standards behind the scenes and organises environmental workshops and excursions for guests.

We regularly organise beach clean-ups and conservation workshops for local school children. We support local wildlife organisations including the Emirates Natural History Group, The UAE Dolphin Project, The Emirates Wildlife Society and The Marine Turtle Conservation Project. *em.d*



Turtles holding on Saadiyat Island, Abu Dhabi

05. GREEN FINANCE.



**HE
ESSA
KAZIM**

**GOVERNOR
DUBAI INTERNATIONAL FINANCIAL
CENTRE (DIFC)**

INTRODUCTION

At the root of it, the success of environmental initiatives, both locally and globally, comes down to dirhams and fils. With the access to capital, along with a supportive investment climate, pilot projects can take off on a larger scale, establishing an environment led by research and innovation. Additionally, successful investments are designed with longevity in mind.

Emirati culture is based on a strong belief that the financial sector needs to operate based on socially conscious and responsible principles. Islamic finance can play an integral part in promoting sustainability as a key element, highlighting the relationship between risk and profit and the social responsibilities of financial institutions and individuals. In this system, lenders are fundamentally interested in the success of the investments and their contribution to society.

This chapter presents case studies in the UAE - in Dubai in particular - where innovative finance mechanisms have encouraged green investments. Custom-made bonds and carbon pricing are more than mere ideas, and along with establishing green sukuk are set to transform the foundations of the financial sector in the region for years to come.

GREENING THE GLOBAL ECONOMY

By
Michael Bennett

OPENING THE CATASTROPHE BOND MARKET TO DEVELOPING COUNTRIES



MICHAEL BENNETT
WORLD BANK

He is the Head of Derivatives and Structured Finance in the Treasury Department of the World Bank.

Over the past few years, a clear consensus has begun to emerge on the urgent need to green the global economy. Faced with the potentially devastating economic and social impact of rapidly rising temperatures, an increasing number of businesses and governments have begun to shift to less carbon-intensive forms of economic activity. While more investment in green technology is needed, this move toward a greener world economy is expected to accelerate in coming years.

CLIMATE CHANGE, NATURAL DISASTERS AND THEIR ECONOMIC IMPACT ON DEVELOPING COUNTRIES

Despite the greening trend, certain consequences of climate change are likely irreversible and are already being felt. One such impact is the increasing frequency of extreme weather events in many parts of the world, such as powerful tropical cyclones, unprecedented flooding and severe droughts. From super-storm Sandy in the United States to typhoon Haiyan in the Philippines to flooding in the Balkans, extreme weather events are now regularly dominating world headlines. A recent report published in the *New England Journal of Medicine* found that since the 1970s, the number of geophysical disasters (such as earthquakes and volcanoes) has remained relatively stable, but the number of weather-related disasters has increased significantly¹.

In addition to their often devastating human toll, natural disasters can have an extremely adverse economic impact on countries. The economic consequences

of disasters can be particularly calamitous for developing countries, since they typically have low levels of insurance penetration. For example, in 1998, hurricane Mitch caused uninsured losses in Honduras equal to 34% of the country's GDP. In comparison, hurricane Katrina in 2005 caused uninsured losses in the United States that were less than 1% of the country's GDP. Overall, during the period 1980 to 2004, only about 1% of natural disaster-related losses in developing countries were insured, compared to approximately 30% in developed countries.

At the same time that climate change is increasing the frequency and severity of weather events, other factors, such as deforestation and increased urbanisation in highly climate-vulnerable areas, are adding to the magnitude of weather-event-related losses. According to a recent World Bank report, economic losses globally from natural disasters

have increased from an average of US\$50 billion per year in the 1980s to just under US\$200 billion annually in the last decade, with 74% of those losses due to extreme weather.

Since most governments in developing countries retain the majority of their disaster risk, responding to natural disasters can put a significant fiscal burden on governments that need to reallocate budget resources to finance their disaster response and recovery efforts. Such budget reallocations, combined with lower revenues caused by decreased economic activity following a disaster, result in less money available to fund other government priorities, thereby magnifying the negative developmental impact of the event. With climate change exacerbating the frequency of extreme meteorological events, the fiscal burden of natural disasters on developing countries is expected to continue to rise.

THE GROWTH OF CAPITAL MARKETS RE-INSURANCE INSTRUMENTS

One way governments in developing countries can respond to the significant development challenges posed by natural disasters is to make use of the rapidly developing insurance-linked capital markets to obtain protection against disaster-related fiscal losses. During the past decade, capital-markets instruments, such as catastrophe bonds and swaps, have become an increasingly important part of the global re-insurance market. These instruments now represent around 15% of the total volume of global catastrophe re-insurance. Catastrophe bonds, in particular, have grown at a rapid pace since their introduction in the 1990s. In just the first half of 2014, for example, US\$5.7 billion of catastrophe bonds were issued, compared to about US\$2 billion issued for all of 2005.

Catastrophe bonds allow entities that are exposed to natural-disaster risk, such as insurance companies, to transfer a portion of that risk to bond investors. In a typical catastrophe-bond structure, the entity exposed to the risk (known as the sponsor of

the bond) enters into an insurance contract with a special purpose vehicle (SPV) that issues the bonds to investors. The SPV invests the proceeds of the bond issuance in highly rated securities that are held in a collateral trust, and it transfers the return on this collateral, together with the insurance premiums received from the sponsor, to the investors as periodic coupons on the bonds. If a specified natural disaster occurs during the term of the bond, some or all of the assets held as collateral are liquidated and that money is paid to the sponsor as a pay-out under its insurance contract with the SPV. If no specified event occurs, the collateral assets are liquidated on the maturity date of the bonds and the money is paid to the investors. In other words, investors risk losing some, or all, of their principal if a natural disaster occurs and in exchange receive a coupon that reflects the insurance premium for such risk.

Catastrophe bonds benefit sponsors by allowing them to access a bigger pool of capital (i.e. the trillions of dollars held by bond investors) and in general longer coverage periods than conventional re-insurance. For investors, on the other hand, the attraction of these bonds are the relatively high returns and the low level of correlation with other asset classes, such as equities and conventional bonds.



Economic losses globally from natural disasters have increased from an average of \$50 billion per year in the 1980s to just under \$200 billion each year in the last decade



1 http://www3.med.unipmn.it/papers/2013/NEJM/2013-11-07_nejm/nejmra1109877.pdf

THE APPEAL TO INVESTORS OF 'DEVELOPING COUNTRY NATURAL DISASTER RISK'

The catastrophe bond market began in the 1990s with US-based insurers transferring through the capital markets a portion of the natural disaster risks to which they had the largest exposure (mainly hurricanes in the Southeastern US and earthquakes in California). These risks are known in the property insurance market as peak perils. Despite the rapid growth of the catastrophe bond market over recent years, the risks that are covered by catastrophe bonds remain highly concentrated in these peak perils, as well as only two other perils - windstorms in Europe

and earthquakes in Japan. As a result, catastrophe-bond investors are eager to invest in other types of risks that will provide a diversification benefit to their catastrophe-bond portfolios. In fact, the demand for catastrophe bonds that reference diversifying risks is so strong that these bonds generally price at a significantly lower level than bonds with an equivalent level of risk that reference the main perils in the market.

The desire of investors for diversifying risks creates an obvious potential benefit to governments in developing

countries. By bringing such diversifying risks to the market, developing-country governments find that they can obtain attractive pricing and a high level of demand for their transactions. In addition, governments of developing countries that demonstrate to the market that they have taken pro-active steps to protect their public finances against the impacts of natural disasters may benefit in other ways as well - for example, investors may feel more secure setting up businesses there or may require a lower credit-risk premium to purchase their conventional sovereign bonds.



during the period from 1980 to 2004, only about 1% of natural disaster related losses in developing countries were insured, compared to approximately 30% in developed countries



global economic losses from
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\$50 billion per year in the 1980's
to just under
\$200 billion per year in the 2010's

THE WORLD BANK AND 'DEVELOPING COUNTRY CATASTROPHE BONDS'

As part of its work in the area of disaster-risk management, the World Bank is focused on making the catastrophe-bond market more accessible to its clients. While the high demand for diversifying risks creates an incentive for developing-country governments to obtain natural-disaster insurance protection through the catastrophe-bond market, there remain significant barriers to entry into this market for governments. These barriers include: a lack of familiarity among many government officials with re-insurance in general and the catastrophe bond market in particular; limited or non-existent modelling of the natural-disaster risk exposure of many countries; potential political risks of purchasing insurance protection when the pay-out is uncertain; and discomfort of many government officials with the complex legal documentation and relatively high transaction costs required for these kinds of transactions.

Helping clients overcome these kinds of barriers is one of the objectives of the World Bank's work in this area.

The World Bank's first foray into the catastrophe-bond sector was in 2009 when it created the MultiCat programme. This programme, for which the World Bank acts as arranger, allows clients to sponsor catastrophe bonds using a common documentation platform that makes issuance more efficient, in terms of both time and cost, than doing a stand-alone transaction. Under the MultiCat programme, the client sponsoring the transaction establishes an SPV to act as issuer of the bonds and then enters into an insurance contract

or other risk-transfer arrangement with the SPV. The Government of Mexico chose to use the MultiCat programme to sponsor catastrophe bonds covering both earthquake and hurricane risk in 2009 and then again in 2012.

More recently, the World Bank expanded its range of catastrophe-bond services for clients by creating the Capital-at-Risk Notes programme. This programme eliminates the need for an SPV or for the collateral arrangements that are required in a conventional catastrophe-bond structure. Instead, the World Bank issues the bond supported by the strength of its own balance sheet and hedges itself through a swap or similar contract with a client. By eliminating the need for an SPV and a collateral trust, the programme allows the World Bank to transfer risks from its clients to the capital markets in an efficient way with minimal transaction costs.

The World Bank issued the first catastrophe bond off its Capital-at-Risk Notes programme in June 2014. The transaction was a three-year issue linked to hurricane and earthquake risk in 16 Caribbean countries. To hedge its obligations under the bond, the World Bank entered into a catastrophe swap with the Caribbean Catastrophe Risk Insurance Facility (CCRIF) (a risk-pooling facility for the 16 countries) that mirrors the economic terms of the bonds. If the bond is triggered by a referenced natural disaster of sufficient intensity, the principal amount of the bond will be reduced and an equivalent amount will be paid to CCRIF under the swap. →



(...) while the number of geophysical disasters (such as earthquakes and volcanoes) has remained relatively stable, the number of weather-related disasters has increased significantly.



CONCLUSION:

Despite the efforts being made to green the global economy and mitigate the impacts of climate change, rising temperatures are already leading to more frequent and extreme weather events in many parts of the world. These natural disasters can strain the resources of governments, particularly in developing countries where private insurance is limited and governments bear the primary financial burden of dealing with disasters. In the case of truly catastrophic events, the resulting fiscal strain can delay or set back a country's economic development to a significant degree.

Catastrophe bonds are one tool that developing-country governments can use to protect their public finances against the impact of natural disasters. The catastrophe-bond market has attracted large amounts of new capital in recent years, as investors look to this market as a potential source of attractive, uncorrelated returns in what otherwise is generally a low yielding/high correlation investment universe. This influx of new capital has pushed down pricing and created a favourable environment for sponsors. Developing-country governments can benefit from this surge in demand for catastrophe bonds, particularly since they are bringing attractive diversifying risks to the market. The World Bank is working with its clients to facilitate this process and make the catastrophe-bond market an efficient source of risk transfer for developing countries. *em.d*



GREEN SHIFT IN THE FINANCE SECTOR

HE ESSA KAZIM ON HOW TO FINANCE GREEN ECONOMY

The creation of a more sustainable future or a new green economy that is resource efficient, which reduces carbon emissions and prevents further loss of ecosystems, will not be cheap.

Financing challenges must be overcome immediately as substantial financial resources will be required, given that infrastructure, materials and technologies present such large upfront costs. Therefore, it is increasingly important that we look at ways of raising capital and directing investment away from natural-resource and carbon-intensive investments.

Governments and the private sector need to work together to facilitate capital-raising or re-channeling trillions of dollars from existing assets to finance a more sustainable economy with a greener future. Policymakers around the world must also work together to provide sufficient regulatory and financial incentives for increased consumption and production of renewable energy.

In a region where energy subsidies are already high, this will require significant commitment from all stakeholders to encourage the widespread use of renewable sources of energy. The DIFC is playing a leading role by actively encourage corporations to adopt more sustainable practices and meet the financing needs of a green economy. Our clients are also on board through investments in the development of sustainable projects across the MEASA region. *em.d*



In a region where energy subsidies are already high, (...) [it] will require significant commitment from all stakeholders to encourage the widespread use of renewable sources of energy



POINT OF VIEW



His Excellency
**Essa
Kazim**

Governor
of DIFC



Financing challenges must be overcome immediately



INTERVIEW: HE FAHAD AL GERGAWI



**HE Fahad
Al Gergawi**
CEO, Dubai Investment
Development Agency
(Dubai FDI)



Q1. YOUR EXCELLENCY CAN YOU EVALUATE THE OPPORTUNITIES FOR INVESTMENT IN ENVIRONMENTALLY- FRIENDLY BUSINESSES AND TECHNOLOGIES IN DUBAI?

HE FG.: Dubai is at a pivotal point in its energy life cycle. As the population grows, so does the demand for power and energy and the need to efficiently manage waste. Major projects such as the solar park, changing to more-efficient light bulbs, the first bio-diesel project, and the carbon neutral warehouse are just the beginning. Global technologies are evolving at an exponential rate and Dubai is the perfect catalyst to develop, deploy and test those technologies.

Dubai's unique geography and infrastructure also provide the right opportunity to export clean technologies, particularly to energy-hungry Asian markets. In addition to being well-connected within the Middle East, Dubai serves as the best link to fast-growing markets across Africa as well as South and Central Asia.

Dubai FDI is consistently reviewing new strategies and technologies around the world that would be consistent with the green economy initiative of His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai. The sector has the government's support, and several policies have been issued to encourage investment in green technology. Investments in the sector look promising, and growth possibilities are present in several energy production and consumption sub-sectors.

Q2. WHAT ARE SOME ADVANTAGES THAT YOU BELIEVE THE EMIRATE OFFERS FOR COMPANIES IN THE SECTOR LOOKING TO EXPAND TO THE GULF AND THE MIDDLE EAST?

HE FG.: The FTA (Free Trade Area) and GAFTA (Greater Arab Free Trade Area) agreements already in place help support cross-border transactions through Dubai. More importantly, Dubai is a melting pot of cultures, which makes penetrating those markets with the cultural mindset already in place a key value added. Additionally, Dubai's connectivity in the region and with other companies along the supply chain is crucial to ensure a

seamless offering of services. Dubai has always been a place for entrepreneurs to test their ideas, develop a proof of concept and then globalise the idea or technology. Dubai FDI - as the investment development agency of the Department of Economic Development and the leading constituent of the Dubai Green Economy Partnership (DGEP) - ensures that investors will always prefer Dubai as the place to grow their business.

Additionally, Dubai sits in the middle of a fast-growing consumer market of over 2.2 billion people spread across the Middle East, North Africa and South Asia, with many connections to the key cities in these markets. The ease of doing business in Dubai along with the tax-free environment and attractive lifestyle choices remain a major draw for people and businesses worldwide.

Q3. HOW CAN DUBAI FDI FACILITATE COMPANIES LOOKING TO INVEST IN GREEN TECHNOLOGIES IN DUBAI?

HE FG.: Dubai FDI helps investors identify sector-specific opportunities as well as connects them to a network of both government and non-government enablers, and supports investors throughout the investment lifecycle. The key services provided by Dubai FDI are:

- Offering advisory services on location and type of enterprise formation
- Connecting companies with investors, authorities and other related parties as needed
- Advocating policy changes that help remove impediments to investment and its growth

Q4. WHAT ARE YOUR EXPECTATIONS FOR THIS YEAR IN TERMS OF FOREIGN INVESTMENTS INTO DUBAI?

HE FG.: The key sectors of Dubai's economy, particularly logistics, trade and tourism remain robust, and optimism is steadily increasing in sectors such as real estate and construction. We are seeing growth in multiple sectors and expect double digit growth in FDI this year. *emd*

Inviting Possibilities
Together we can transform our potential into Dubai's reality

11m
The volume of hotel guests visiting Dubai in 2013

RETAIL POWER
Dubai is the world's second most important retail destination

CONNECT
Dubai is home to more than 200 nationalities

100%
Foreign ownership in Free Zones. Dubai also offers 0% taxation

DUBAI FDI
مؤسسة دبي للتنمية الاقتصادية
An Agency of the Department of Economic Development - Government of Dubai

www.dubaifdi.gov.ae

THE DUBAI INTERNATIONAL FINANCIAL CENTRE PROMOTES THE GREEN ECONOMY

By
HE Essa Kazim

When it comes to creating a new green economy, we are faced with little choice. In our current environment, by 2050 humans would require three Earths to sustain their hunger for natural resources. Following years of resource depletion and environmental pollution, it is now critical that we develop a greener and cleaner economy for a sustainable future. A green economy looks to reduce environmental risk and resource depletion and prevent loss of ecosystems, whilst simultaneously encouraging economic growth, human well-being and social equity. But all of this comes at a cost.



HE ESSA KAZIM
DIFC, DFM

HE Essa Kazim is the Governor of Dubai International Financial Centre (DIFC), Chairman of Dubai Financial Market (DFM) and a member in Dubai Supreme Fiscal Committee.

Establishing a greener infrastructure involves large upfront costs when it comes to materials and technology. Financing a green and inclusive economy has been estimated at US\$6 trillion per annum. As one can imagine, the cumulative financial requirements for a green-economy transformation globally will be a massive sum.

Part of the challenge is establishing systems and policies for the transition to a green and inclusive economy that make financial sense. For many public and private companies operating in our existing economic environment, the incentive to move to greener systems simply is not there. When the cost of low-carbon and resource-efficient energy systems are significantly higher than fossil-fuel alternatives especially due to fossil-fuel subsidies, the incentive to go green vanishes.

Globally, we are beginning to witness the development of innovative policy measures which integrate environmental and social factors into financial systems across the world. Examples of these are green bond principles designed to provide guidance to issuers and encourage transparency and disclosure, green credit guidelines which encourage banking institutions to actively adjust credit structures to protect against environmental and social risks, and sustainability disclosure requirements on stock exchanges.

Across the MENA region, the strong economic and demographic growth associated with rapid urbanisation means increasing energy supply to meet electricity, air conditioning, desalinated water, and transport needs. The World Bank estimates that by 2040, the region's total investment needs in the energy sector will exceed US\$30 billion a year, about 3% of the projected regional GDP¹. A recent study of energy investment from 2013 to 2017 estimates that investment of US\$147.5 billion in power generation will be needed, of which US\$63.1 billion will be in the GCC².

Reports show that it would take a small percentage of the total surface of the Earth's deserts to generate sufficient renewable energy to meet daily global electricity demand. There are currently 106 renewable projects in the pipeline for the Middle East, and if policymakers across the region continue to work together to reduce subsidies for fossil fuels and put in place incentives for investment to create a greener environment and economy, this number should increase rapidly over the coming years.

Dubai was the first country in the region to adopt a long-term national initiative to build a green economy under the Green Economy for Sustainable Development programme launched in 2012. Alongside this initiative, in the same year His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and Chairman of Dubai Executive Council also launched a public-private partnership titled "Dubai Green Economy Partnership". Together with Dubai's leading energy and transport authorities as well as several private bodies, the Ministry of Economy is one of the eight founding partners. As part of the initiative's mandate, it will address regional development challenges with practical project management and financing models through collaboration with international investors, financial institutions and public-private partnerships.

1 <http://www.ifc.org/wps/wcm/connect/c6a15e8042cbdd4daa2bee384c61d9f7/Knowledg+issue+05+v6.pdf?MOD=AJPERES&The%20Potential%20of%20Renewable%20Energy%20in%20MENA>

2 <http://www.middle-east-online.com/english/?id=56414>

STRESS-TESTING INVESTMENT FUNDS

By
Ivano Iannelli

Recently, many global investment, hedge and pension funds have been asked to stress test their portfolios against carbon emissions. This simple request is of profound relevance and importance.

Globally, the threat of climate change is strongly affecting policy and regulations across industries. As such, investments in real estate may be less profitable if green building codes require retrofits of existing buildings. Similarly, as the world convenes annually to discuss international policy, Paris 2015 is earmarked as the event where the successor to the Kyoto Protocol should be adopted.

A new global treaty on climate change will certainly affect the conventional way to do business, and the investment community needs to know exactly what their carbon liabilities look like. "Carbon Emissions" is an auditable unit of environmental impact. Many countries have adopted market-based mechanisms, such as incentive-based regimes,

and non-market mechanisms, such as taxes and regulations. Although such regimes are meant to foster a green economy, they do impose a liability on certain types of industries. An easy example would be planning the exit strategy of a coal-fired power-plant IPP just ahead of regulatory constraints, or reconsidering a real estate development deal based on energy labelling in lieu of a different one which, although more profitable, has a more exposed risk profile.

Stress-testing investment portfolios against climate change policies is essentially an exercise where a new class of risks are assessed and quantified while also looking at a more valuable aspect, namely resource efficiency. Based on CO2 as a lowest common denominator across all resources, the use of benchmarks allows assessing how efficiently resources are utilized, and operational improvements can then be economically evaluated against feasibility.

While the purpose of the exercise is to mitigate and quantify risks while benchmarking performance, the real value is the ability to align portfolios towards liquid capital markets where financing is more cost-effective and always below market rates. Greening investment portfolios grants access to multilateral development banks funded platforms which have been actively supporting low-cost financing aligned to public policy, especially in the socio-environmental sphere. *em.d*



IVANO IANNELLI
DUBAI CARBON

He is the CEO of Dubai Carbon Centre of Excellence (DCCE)



The Dubai International Financial Centre (DIFC) is a UAE federal financial free zone situated in Dubai and was established to create an environment for growth, progress and economic development in the UAE and the wider MENA region by providing the necessary legal, business and physical infrastructure to international standards. DIFC actively encourages corporations to adopt more sustainable practices, and has held workshops in the past to discuss clear energy finance in the MENA region.

DIFC is also home to some of the region's leaders in forging a green economy. As an example, Deutsche Bank is a co-founding shareholder of Desertec, a unique industry initiative which is developing reliable, sustainable and climate-friendly energy supplies in the MENA region. Desertec promotes the framework necessary to transition to renewables through knowledge transfer and scientific cooperation and fosters exchange and cooperation with the private sector through a network of scientists, experts, economists and supporters. Attijariwafa Bank, another DIFC client, is leading the way for change as one of the two banks that facilitated the 300MW wind farm at Tarfaya in Morocco. Construction began in 2013 and once finished, it will be the largest wind farm in Africa and will contribute 15% of Morocco's target for renewable energy development. The bank also helped to obtain debt financing for the project.

In June 2014, DIFC signed an agreement with Etihad Energy Services Company (Etihad ESCO) to reduce the energy consumption and carbon footprint of all DIFC properties. This agreement is part of Etihad ESCO's mandate to create a market that meets the growing need for energy-efficient solutions in Dubai.

Under this agreement, Etihad ESCO is concluding a feasibility study, evaluating existing DIFC-owned and built facilities, and has identified promising sustainable energy savings. The Super ESCO will subsequently initiate a competitive selection process to identify the local ESCOs tasked with implementing energy-saving measures and upgrading the 15 existing DIFC buildings. Etihad ESCO will also provide financing, and project management services to ensure the final upgrades conform to international energy-saving standards.



Moving forward, governments, banks and institutions need to work together alongside the private sector to transparently align financial systems with sustainable development to ensure that capital is no longer allocated only to high-carbon and resource-intensive assets. Policymakers need to focus on the rules that govern deployment of capital within the global financial system to ensure it focuses on sustainability. *em.d*

GREEN FUND: HARVESTING THE POTENTIAL OF THE PRIVATE SECTOR IN A GREEN ECONOMY

By
Abdul Nasser Akil Abbas



Dubai
is to spend
AED 55 billion
on energy-saving measures
in a bid to **cut electricity
consumption**
30% by
2030

Utilising the potential of the private sector in the environment focal area is key to a green economy. However, investors and traders often choose traditional over innovative or simple over complex. As such, there is a lot of inertia when getting new processes, technologies and innovation in place. The complexities of going green must be counterbalanced and facilitated to compensate for potential inertia.

Access to finance is often the first barrier. Dubai has always stated that finance is not a problem for strong projects and initiatives, and access to funding is comparably easy here. However, the process can be tedious and may reject promising green activities when they challenge conventional practice.

A green fund has several benefits. It acts as an economic commitment, stating the larger intention of an entity to see the implementation of a strategy or vision. A capitalised market would attract key players from the industry and spawn numerous SMEs in ancillary and primary functions.

It would also provide transparent access to selection criteria and qualifiers, thus enabling the relevant stakeholders to harmonise their activities to the strategy set forth.

In addition, a green fund is a key regulatory tool; as access to such a vehicle is only warranted upon fulfilment of specific conditions and for specific projects. The local financial market also embarks on a policy of alignment by redistributing risks along the newly established fund as a benchmark. As an example, a bank co-investing with the fund will assume certain risks to be mitigated, while funding outside of the fund may require additional risks to be evaluated and factored into the pricing.

Dubai has embarked on a long-term energy strategy, known as the Dubai Integrated Energy Strategy 2030 (DIES 2030). This long time horizon will cover the implementation of several programmes and activities. Although the economic viability of the programmes is known, local banks may not have the expertise to evaluate them, despite wanting to support key national strategies. At the same time, international banks have expertise deployed across the globe, but sometimes lack the knowledge of local conditions. The result, in the best possible outcome, is costly debt.

A green fund may act as a market enabler. It may finance all or part of projects. It may be a support tool to facilitate the involvement of financial institutions as well as support the creation of bank products and tools that foster additional green-economy transactions.

The green fund, from a governmental standpoint, also provides tangible value, as environmental risks are lowered. With lower risks, costs associated with adaptation and mitigation can be reduced and channelled back into the fund to provide more cost-effective access to green capital.

Dubai's activities are ambitious and far-reaching. The green-fund vehicle is currently being researched to ensure that the green-economy potential is properly harvested for the benefit of the business community. *em.d*



**ABDUL NASSER
AKIL ABBAS**
DEWA

He is Senior Director Treasury in Dubai Electricity and Water Authority (DEWA).

FINANCING THE GREEN ECONOMY: THE CLEAN ENERGY PERSPECTIVE

By
Alice Cowman

With all the good intentions in the world, risk averse financiers still want a return on a green economy investment. How do you ensure you can finance the type of development that meets green economy criteria and make money? In particular, why is financing still an issue for clean energy? There are many answers to this.



ALICE COWMAN
CLEAN ENERGY
BUSINESS COUNCIL

She is the CEO of the Clean Energy Business Council.



First, there is the staggering level of investment required - the IEA estimates that \$1 trillion a year is required to meet clean energy targets by 2030. Secondly, there is the lack of policy and budgetary support for clean energy policy, with priority shifts for many countries in light of budgetary crises. Thirdly,

even for those more developed clean energies that can compete on cost with dirtier rivals such as coal, oil and natural gas, they are not competing on a level playing field. The UAE alone spent 6% of its GDP on pre-tax energy subsidies. Clean energy will not necessarily deliver a premium to encourage investors to take the leap. This is seen in the green

corporate bond markets where issuers have not received a pricing premium from the markets from a green tag. Investors like the tag but they are not willing to receive lower than expected interest rates for it¹. Financing is now at the center of the debate for green economy initiatives.

The Clean Energy Business Council (CEBC) partner association Bloomberg New Energy Finance is trying to kick-start innovation in the finance space with its new FIRE program. These initiatives aim to galvanize 1 billion dollars per annum of investment in the cleantech area and have to be actionable i.e. not a fund or a conference. The following are those most relevant to the aims of the UAE:

1	2	3
FIRING UP ENERGY EFFICIENCY FINANCING	CREATING PRIVATE SECTOR DEMAND	MAINSTREAMING GREEN BONDS
<p>In the IEA's climate mitigation scenarios, energy efficiency accounts for 45% of 2030 energy reductions. Dubai has set a target to reduce energy consumption by 30% by 2030. Scaling-up energy efficiency financing to meet such ambitious targets has been extremely difficult around the world. In response to this, the European Bank for Reconstruction and Development (EBRD) is leading an initiative to fire up energy efficiency financing by capacity building within local banks and commercial institutions.</p> <p>As Dubai embarks on a planned 30,000 building retrofits, it is fundamental that this sort of capacity building occurs in order to ensure that banks get comfortable with the type of 'assets' and 'security' available to them in these types of transactions.</p>	<p>It is not all about policy. Market demand is important and a second interesting initiative very relevant to this region is creating a business renewables resource centre to enhance renewable energy investment and procurement by large non-energy companies. Many companies in the region have embraced energy efficiency projects but are understandably hesitant to move to clean energy when they are unsure about investment costs and payback periods.</p> <p>A business research centre could educate companies across the manufacturing, construction and business sectors on how powering their businesses from clean energy could be economically beneficial as well as lower the transaction and implementation costs for such projects.</p>	<p>The final initiative pertinent to the UAE is led by Merrill Lynch to mainstream four types of green bonds. The team will take steps to promote use of proceeds, municipal, project and asset backed securitisation green bonds for large-scale investors by eliminating barriers. There has yet to be a green bond issued in MENA but it is only a matter of time and this type of initiative could create large-scale demand amongst investors for such a bond.</p> <p>The MENA region is in an excellent position to capitalize on initiatives that have worked in the rest of the world, avoid the mistakes of others and to think big when it comes to financing. The region cannot afford to deliver all its sustainability projects off balance sheet, and innovation is required not just in technology but in finance if efficiency and clean tech targets are to be met. <i>em.d</i></p>

¹ <http://about.bnef.com/white-papers/green-bonds-market-outlook-2014/>

ETIHAD ENERGY SERVICES (ETIHAD ESCO): A YEAR IN MOTION

By **Stephane le Gentil**

The UAE is a region witnessing a new era that is shifting away from energy-consuming infrastructure to energy-efficient buildings in order to achieve long-term, sustainable energy efficiency in line with the key objective of the Dubai Integrated Energy Strategy 2030 of reducing energy demand by 30% by 2030.

In order to achieve the 30% target, Dubai has created a Demand Side Management Strategy (DSM) to reduce electricity and water consumption and manage energy consumption in the Emirate. The strategy, the first of its kind in the region, will initiate the creation of different markets across Dubai to further incorporate energy-efficient solutions into everyday living. The DSM strategy consists of eight programs that include: building regulations; building retrofits; district cooling; standards and labels for appliances and equipment; water reuse and efficient irrigation; outdoor lighting; tariff rates; and demand response. A dedicated entity has been appointed to oversee each programme, with Etihad Super ESCO being in charge of overseeing all ESCOs in Dubai to implement the building retrofit programme.

Etihad Energy Services (Etihad ESCO) is Dubai's official Super ESCO and the first in the region, created to spearhead the development of a viable ESCO market through management of energy-performance contracting projects. Its aim is to upgrade Dubai's existing buildings from energy-inefficient to energy-efficient infrastructure through a business-friendly approach as well as serving as a conduit between the public and private sectors to finance energy-efficient infrastructure in Dubai.

The aim of a Super ESCO is to drive the creation of a viable ESCO market by supporting the capacity-building of local ESCOs and by initiating the first projects to jump-start the market. Etihad Super ESCO provides building owners with a number of assessment and auditing services, prior to initiating a competitive selection process for third-party ESCOs. Our scope of work includes site audits, detailed design and engineering assessments, commissioning, and measurement and verification (M&V) services in accordance with international standards. We also offer comprehensive energy-efficiency, water-efficiency, and operational-efficiency solutions that address the growing needs of Dubai's energy industry.

The Energy Performance Contracting (EPC) model is used to engineer technical solutions that generate savings guaranteed by the contractor. This model, based on international standards, allows up-front transparency with the owner and assigns accountability for guaranteed savings to the contractor. Through its own engineered solution and project implementation, the ESCO guarantees, measures and verifies the contractually agreed-upon level of energy savings using internationally recognised methods and protocols. The methods stipulate that if the savings guaranteed at the start of the project are not met, the ESCO is required to compensate building owners and match the difference.

The utilisation of an EPC model backed by an ESCO guarantee creates reliable revenue streams drawn from the energy savings made over the tenure of the project. In a guaranteed-savings model, building owners will recover their



STEPHANE LE GENTIL
ETIHAD ESCO

He is the Chief Executive Officer of Etihad ESCO. Stephane is a renowned expert in the Energy Performance Contracting sector.

investment from energy-savings generated as a result of implementing the energy-conservation measures. In a shared-savings model, the captured revenue streams then become the basis of payment for the installed equipment which allows building owners to avoid up-front capital costs and perhaps direct the same capital to more pressing core business needs.

As part of our mandate at Etihad ESCO, we are responsible for creating the right environment for ESCOs working with several stakeholders in Dubai to ensure the market is thriving with a minimum number of hurdles, and building the confidence of the market in the energy performance contracting model. We remain committed to building mutual trust among various stakeholders through supporting a streamlined process for

energy-performance contracting and energy conservation that will drive efficiencies and set industry benchmarks. We have already established strategic partnerships with government and semi-government agencies, including the Dubai Supreme Council of Energy (DSCE), Dubai Carbon Center of Excellence (DCCE), Dubai Regulatory & Supervisory Bureau (RSB), Dubai Municipality (DM), Dubai Electricity and Water Authority (DEWA), and the Roads & Transport Authority (RTA), while additionally selecting financial institutions to provide project financing.

Our projects reflect Dubai's commitment to lead by example, beginning with our first partnership with DEWA. In 2013, Etihad ESCO and DEWA signed a two-part project agreement to further enhance energy efficiency in Dubai and enhance DEWA's commitment to the DSM strategy and the Dubai Integrated

Energy Strategy 2030. The first part of the project will entail the replacement of all outdoor lighting at DEWA power stations in Dubai, in addition to the replacement of indoor lighting in some of the DEWA power-station buildings. The second part will see Etihad ESCO managing the retrofitting of seven DEWA buildings including DEWA's own head office. Two tenders have been launched in the market; one to choose a specialist lighting ESCO to execute the lighting-retrofit project, and another to select an experienced ESCO for the retrofitting the targeted seven buildings. ➔

Another project involves Economic Zones World (EZW) to retrofit over 120 existing buildings in the Jebel Ali Free Zone Authority (Jafza), a subsidiary of EZW. The Jafza endeavor is one of the first of its kind, and currently the largest retrofit project in the region. With Etihad ESCO arranging financing in collaboration with participating financial institutions, the building retrofit programme is on track with the tender set to be released by the end of 2014. Followed by the selection of an ESCO to undertake the project in 2015, the implementation process is set to commence in 2016 to produce savings.

By 2016, Etihad ESCO and Jafza will be able to measure tangible savings, allowing the free zone to effectively reduce costs and enhance long-term energy performance savings in their existing buildings.

Our most recent project is in conjunction with the Dubai International Financial Centre (DIFC), whereby we are concluding a feasibility study via a thorough evaluation of the existing DIFC-owned built-up facilities, and have identified promising energy savings in the iconic Dubai landmark. A project will be floated in the ESCO market to identify specialist companies to implement appropriate energy-saving measures and upgrade the 15 existing DIFC buildings. Etihad ESCO will provide financing, project management and performance services throughout the duration of the agreement to ensure the final upgrades conform to international energy-saving standards.

With new projects in the pipeline, combined with the high potential of existing buildings in need of updating, our aim to jump-start the creation of an energy-services industry that embraces best practices is in line with our commitment to providing world-class services and standards in energy-performance contracting in the Emirate of Dubai. *em.d*



DO YOU SPEAK “RESOURCE EFFICIENCY”?

By
Michaela Neukirch

TAKE THE BIRD'S EYE PERSPECTIVE ON OPERATIONS AND GET VOCAL ABOUT IT



Have you heard about HH Sheikh Mohammed Bin Rashid Al Maktoum launching Dubai's smart city initiative? Possibly you have: on Twitter.

Considering the push for green economic development the country has been experiencing since 2011, it is not surprising that interest has risen in measuring and speaking up about related performance. The rapidly increasing number of GCC entities reporting on their sustainability performance; the blossoming industry of energy and green economy themed conferences; or even the array of contributing entities to this very report is testament to this. Communication of one's performance is a journey that best starts with measurement and data gathering. Amongst all possible business aspects in focus, resource efficiency has been in the spotlight and is pivotal for the business consultancy within Dubai Carbon - an angle that serves the region's business-driven mind-set well. We use carbon emissions to quantify sustainable, efficient and far-sighted operations as it makes different aspects of value creation, or even entities, tangible and comparable amongst themselves.

And rather than citing a moral obligation or legal requirement, we aim to align the interest in saving on operational costs with the environmental costs within the broader scheme of climate change. The resulting GHG inventories or carbon footprints can be the basis for informed management of overall business performance.



MICHAELA NEUKIRCH
DUBAI CARBON

Michaela is the Senior Manager for Public Programmes & Affairs at Dubai Carbon, focal point for sustainability reporting and the editor of the center's publications.

On the other hand, the gained information can be communicated: in formats such as marketing materials, the corporate website or thematic third party publications, conferences, formal presentations to the board, or in a more structured manner in environmental reports or sustainability reporting - if extended by performance in the social dimension.

As quantifying the bottom line is often subjective, existing reporting platforms offer guidelines on how to process and present information. We have seen the merits of reporting platforms; at the very least they provide people in charge with knowledge and a support group, but on a broader level they make people and their entities accountable. You can track the effect within networks on a variety of topics and for sustainable practices, with platforms including the UN Global Compact, the Global Reporting Initiative (GRI), Carbon Disclosure Project (CDP) to name a few.

Another means of communication that have picked up momentum are conferences or knowledge products, where initiatives, innovation and progress made by governmental entities on a local and federal level are shared. Less structured than reporting, these are often better suited to engage stakeholders and



encourage collaboration. Publications like the State of Energy Report have been successfully launched in the UN Headquarters in New York and due to their success, were extended to cover country-level issues and grew into annual publications. The State of Green Economy Report in your hands, an extension to the hugely successful first World Green Economy Summit held in April 2014, will provide a half-year review of the discourse on the progress in greening economies. Other summits, conferences and exhibitions are gaining momentum and importance every year, amongst them Abu Dhabi Sustainability Week, WETEX and Dubai Green Week or the Partnership for Action on Green Economy (PAGE) all of which initiated strong partnerships between participating entities that materialised in real projects in the aftermath.

Communication on responsible business practice has been gaining importance, but has always had deep roots in the country's culture. There has traditionally been a deep sense of responsibility and connectedness towards the community as stakeholders, rather than the shareholders, and with it, the need to communicate. Back then, it was the traditional majilis of tribal leaders. Nowadays, this has been replaced with impressive activity on social media. How many other Prime Ministers announce legislation and public holidays on Twitter unfiltered to the citizens? *em.d*

THE SEARCH FOR NEW FINANCING OPTIONS IN THE CLEAN ENERGY BUSINESS

By
Alice Cowman



GREEN BONDS AND GREEN SUKUK

Battling the competition of subsidized fossil fuel and with faltering policy support, the clean energy industry worldwide is looking for new and innovative funding structures. Tapping the capital markets through green bonds is becoming increasingly popular and the green bond market has grown exponentially in recent years. Bloomberg New Energy Finance has reported that a record \$16.6 billion of green bonds were issued in the first quarter of 2014, already greater than the \$14 billion issued in all of 2013. If this continues, 2014 could see a green bond issuance at least three times higher than 2013.

Islamic finance markets are also booming and demand has far outstripped supply for Islamic finance products. Sukuks are a funding source for infrastructure projects that countries all over the world are now looking to take advantage of. Global Sukuk issuances passed the 100 billion mark in both 2012 and 2013 and are forecast to do so again in 2014.

Given that (i) Sukuk is a way of issuing permit bond financing in a way that is compliant with Shari'a law and (ii) there is a desperate need for innovation in clean energy financing, a Green Sukuk is a logical next step. Greater issuance of Sukuks locally would support Sheikh Mohammed's intention of Dubai becoming the center of the Islamic Finance Economy, and the issuance of the world's first Green Sukuk would underline that ambition. Briefly below, we look at how a Green Sukuk might work in the UAE context and the challenges that might arise with its issuance, as compared to a green bond.

UAE'S GREEN PROJECTS AND SUKUK STRUCTURES

Solar projects planned within the UAE and backed by long-term power purchase agreements would adapt well to a Sukuk structure. However these projects, as evidenced by the solar project rounds in Jordan, are likely to be easily financed under traditional project finance structures with a potentially lower cost of funds. Energy efficiency projects are less popular with commercial banks than infrastructure projects with a secure long-term power purchase agreement attached. Dubai's stated aim of reducing energy consumption by 30% by 2030 will require significant funding for both public and private sector. While building retrofits might be more suitable for a debt and equity structure in the short-term, there is definitely scope for investigating large public projects such as more-efficient street lighting to determine their suitability for Green Sukuk financing.

WHAT ARE SOME OF THE SUKUK LIMITATIONS WITH REGARDS TO THE UAE'S GREEN PROJECTS?

There are a few key structural limitations to a Sukuk. There needs to be an existing and well-defined asset, which means financing assets under construction is complicated, although not impossible. Also investors cannot be guaranteed the entire return on their investment. If performance of the assets is not as predicted, they will only be paid what is available. This risk to the investors is mitigated when income can be predicted with accuracy (i.e. under a long term power purchase agreement). With energy efficiency projects, energy management contracts would need to provide that certainty guaranteeing a level of efficiency savings. Investors would need to be made comfortable with the sponsor and security offered under such contracts.

On the technical side, investors would have to be sure that the chosen project would meet the payback period of a Sukuk. Over 70% of Sukuk issuances in 2013 were for a period of less than 5 years in order to get a cheaper cost of funds. Longer-term projects would potentially have more competitive interest rate offers from other forms of financing.



ALICE COWMAN
CLEAN ENERGY
BUSINESS COUNCIL

She is the CEO of the Clean Energy Business Council.

WHAT ABOUT GREEN BONDS?

Green bonds do not suffer from the structural limitations listed above and if an authority within the UAE were to issue a green bond for a number of renewable energy and energy efficiency projects, it would be the first government entity in the GCC region to do so. Ile de France - the governing authority of Paris and its environs - issued such a bond in April 2014, an \$829 million issue with proceeds earmarked for a broad array of projects including typical renewable energy and energy efficiency developments plus innovative initiatives like an ecological corridor development. This 12-year bond's coupon (its periodic interest rate) was set at 2.375%. On average, coupons and therefore the cost of funds for government entities have been reported to be higher under a Sukuk by about 0.86%¹. On the upside, a higher coupon is more attractive to investors.

THE NEED FOR BOTH GREEN BONDS AND GREEN SUKUKS

It would be easy to conclude that a green Sukuk seems too complicated to pursue right now. However, the IEA has stated that \$1 trillion of investment in clean energy a year is required to meet climate targets, creating a need for both these financial models. Developing the Sukuk model would entail a steep learning curve for bankers, lawyers and investors, but the market is developing rapidly. Green Sukuks require just a little push further up this learning curve. UAE entities issued bonds and sukuku worth \$116.7 billion in 2013². With this experience and a firm commitment to both developing Islamic financial markets and a low carbon future, the UAE is in a great position to kick-start both Green Bonds and Green Sukuks in the Middle East. *e.m.d.*

- 1 <http://www.adb.org/sites/default/files/pub/2014/asia-bond-monitor-march2014.pdf>
- 2 2013 Markaz, GCC Bonds & Sukuk Market Survey

PUTTING A PRICE ON CARBON

By Patrick Verkooijen and Tom Kerr

Climate change poses one of the greatest global challenges and threatens to roll back decades of development and prosperity. The latest Assessment Report from the United Nations Intergovernmental Panel on Climate Change makes clear the importance of putting a price on carbon to help limit the increase in global mean temperature to two degrees Celsius above pre-industrial levels.

Depending on each country's circumstances and priorities, various instruments can be used to price carbon efficiently and cost-effectively reduce emissions, such as domestic emissions-trading systems, carbon taxes, the use

of a social cost of carbon, and/or payments for emission reductions.

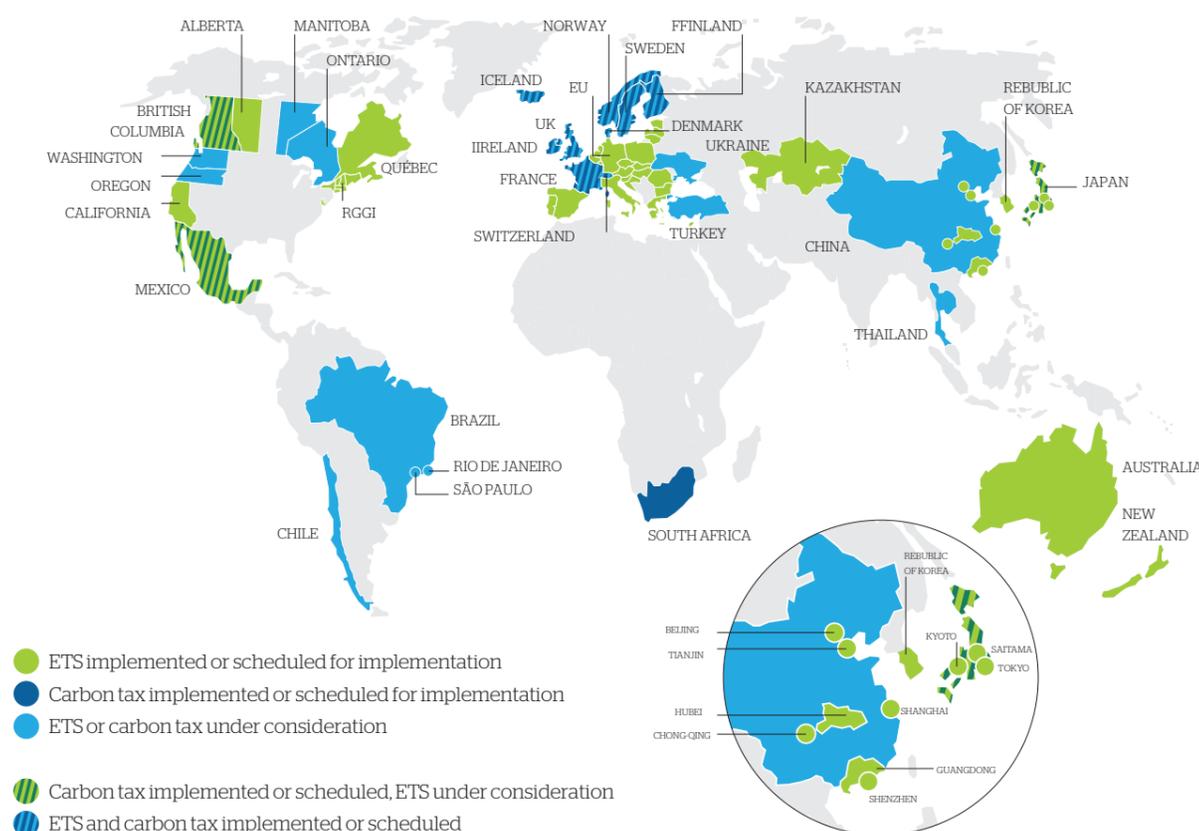
Governments are taking action. In 2014, about 40 national and over 20 sub-national jurisdictions have already implemented or scheduled emissions-trading schemes or carbon taxes. In total, these jurisdictions account for more than 22% of global emissions. Many more countries and jurisdictions are advancing preparation for pricing carbon. Together, these represent almost half of global GHG emissions.

Corporations are responding. A growing number of companies are already working within carbon-pricing systems and are developing expertise in managing their emissions. Others

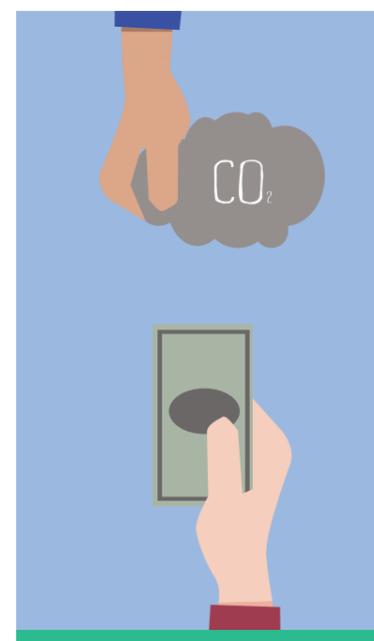
are incorporating greenhouse gas reduction targets into their business planning. In 2013, over 100 companies worldwide publicly disclosed to CDP (international, non-profit Carbon Disclosure Project) that they already use carbon pricing as a tool to manage the risks and opportunities to their current operations and future profitability. Businesses see that carbon pricing is the most efficient and cost-effective means of reducing emissions, leading them to voice support for carbon pricing.

The momentum is growing. Pricing carbon is inevitable if we are to produce a package of effective and cost-efficient policies to support scaled up climate change mitigation efforts.

SUMMARY MAP OF EXISTING, EMERGING, AND POTENTIAL REGIONAL, NATIONAL AND SUB-NATIONAL CARBON PRICING INSTRUMENTS (ETS AND TAX)



Source: <http://www.worldbank.org/en/news/feature/2014/05/28/state-trends-report-tracks-global-growth-carbon-pricing>



PATRICK VERKOOIJEN
WORLD BANK

He is the Special Representative for Climate Change at The World Bank

THOMAS KERR
IFC

He is the Principal Climate Policy Officer in the International Finance Corporation

COMMENTARY ON PRICING CARBON

By HE Eng. Waleed Salman, EVP, Dubai Electricity and Water Authority

The process of change is long and tedious. In my personal experience, and in line with the commitment to Enterprise Risk Management (ERM) which granted DEWA numerous awards and commendations, we learnt that change can be introduced gradually and in a participatory manner, when the opportunity arises.

Carbon emission reduction is today a soft commitment, but expected to grow to a financial liability before the end of the decade. With inaction, the global business environment will be in turmoil from trying to adopt stringent regimes in a short timeframe.

Putting a price on carbon is a small step for businesses to take to prevent this calamity. It allows entities to utilise their competencies and abilities in practical financial terms, thus looking at CO2 emissions as a benchmarked financial liability and as part of their sustainability-integrated balance sheets.

This exercise allows entities from both public and private sector to assess their liabilities when climate policy actions may be rolled out, and also develop and consolidate skills within their organisations.

By Ivano Iannelli, CEO, Dubai Carbon

Green investment and green economy are growing trends, combining business acumen with socio-environmental public liabilities and opportunities. The use of a pricing mechanism allows for the complexities in carbon-emission accounting to be reduced to a simple language businesses can understand.

While many entities invest considerable time and effort in sustainability reporting, often simpler things are overlooked. The exercise of pricing carbon and using it as a vehicle for environmental performance in a balance sheet would have a profound impact on the way businesses look at resources.

After all, many feel that the greatest success of the Kyoto Protocol has been its unexpected ability to tap the potential of the private sector to help solve our climate change problem. Having built a compendium of positive and some negative experiences, we need to strengthen a reinvigorated global ambition.

Greater international cooperation is essential. Governments need to pledge to work with each other and companies need to pledge to work with governments towards the long-term objective of a carbon price applied throughout the global economy by:

- strengthening carbon-pricing policies to redirect investment commensurate with the scale of the climate challenge;
- bringing forward and strengthening the implementation of existing carbon-pricing policies to better manage investment risks and opportunities;
- enhancing cooperation to share information, expertise and lessons learned on developing and implementing carbon pricing through various "readiness" platforms.

We invite all countries, companies and other stakeholders to join this growing coalition. *em.d*

<http://www.worldbank.org/en/programs/pricing-carbon>

THE CLEAN REVOLUTION: THE CASE FOR LEADERSHIP, INNOVATION AND COLLABORATION

By
Mark Kenber



TODAY THE GLOBAL ECONOMY SITS AT A CROSSROADS. WE LIVE IN AN ERA OF UNPRECEDENTED RISK. BUT WE ALSO LIVE IN A TIME OF EXTRAORDINARY OPPORTUNITY.

On the one hand, businesses, markets and whole economies are increasingly vulnerable to price instability and supply volatility caused by extreme weather and energy insecurity. On the other, is the emergence of a major new economic sector and a wealth of new business opportunities. And with it comes the chance to be smarter, more efficient and more resilient.

The Climate Group was launched a decade ago by business and government leaders from around the world, who were the first to spot this opportunity. Today, we work with over 100 major brands, governments and international institutions. Together with our partners, we have developed practical and transformational projects that show revolutionary potential for replication and scale-up. These new clean energy and technology solutions are cutting emissions and improving community livelihoods in every corner of the globe.

They are also helping businesses become more profitable, generating much-needed jobs and growth, outperforming their peers on stock exchanges, and prompting governments to rethink economic strategy.

History tells us there is a tipping point at which a new idea or technology moves from the margins into the mainstream. It also tells us that the emergence of this tipping point requires leadership, innovation, and collaboration. The time to lead this tipping point is here. We know our world's climate is changing. We also know that the demand on natural resources, infrastructure and energy is rapidly increasing: by 2050, our planet will be home to nine billion people, and by 2035 global energy demand could double. Yet we also know that greenhouse gas emissions must be reduced by 80% by mid-century, with a peak by 2020, if we are to avoid an unthinkable legacy for our children. This deadline is just six years away. ➡



MARK KENBER
THE CLIMATE GROUP

He is the Chief Executive Officer of The Climate Group. He previously advised former UK Prime Minister Tony Blair on climate policy, co-founded the successful Verified Carbon Standard, and was a leader of WWF's global Climate Change programme.



As we sit at this crossroads, it is clear that only one road leads to security and opportunity - the road of a clean industrial revolution. We've had an industrial revolution which changed our production methods, machinery and consumer lifestyles. We've had a digital revolution, in which the internet and mobile technology completely transformed the way we live, work and play in less than a generation. Now let us embrace the clean revolution, with its innovative new business models, financial mechanisms and policy frameworks that will rapidly scale-up the proven energy, technology and infrastructure solutions that are within our reach today - and usher in a new era of low-carbon prosperity.

A clean revolution will deliver vigorous economic returns, and is already doing so today. The average return on low-carbon investments is now 33%, equivalent to a payback period of three years. Over 60% of investments produce yields in excess of 30%. Surely the question is why are so many missing out on such clearly demonstrable financial returns?

Renewable energy is today a major player in the global economy. The industry accounts for 6.5 million jobs worldwide. Global renewable-energy capacity doubled between 2000 and 2012. One quarter of all global electricity now comes from renewable sources.

LED (light-emitting diode) lighting is an example of one of the technologically proven and commercially viable low-carbon solutions that are currently available. In our 2012 report produced in partnership with Philips - Lighting the Clean Revolution: The rise of LEDs and what it means for cities - we reported on our global city trials, which show how LED street lighting generates energy savings as high as 85%, making a significant impact on the 19% of global energy accounted for by lighting. As well as offering massive reductions in energy use, carbon emissions and costs, LED lighting was also proven to help create a better, safer environment for communities.

Renewable energy and LED lighting are firmly in the sights of Dubai's leadership. The Climate Group co-hosted an LED workshop in Dubai earlier this year with partners committed to promoting the use of energy-efficient street lighting in Dubai, the UAE and beyond. At the workshop, Dubai stakeholders set out the Emirate's ambitious strategy for energy efficiency and demand-side management, which includes the Mohammed bin Rashid Al Maktoum Solar Park, and bold targets for energy efficiency and diversification.

The cue for this ambition comes from the very top. The Vice-President, Prime Minister of UAE and Ruler of Dubai His Highness Sheikh Mohammed bin Rashid Al Maktoum has set out a powerful vision of building the green economy in the UAE. The UAE aims to become a global hub in the export and re-export of clean technologies, and an international model of low-carbon success. The programme includes a range of far-reaching initiatives and policies around energy, agriculture, investment and sustainable transport which will demonstrably raise the quality of life for its citizens. As an international finance centre, Dubai could create a global tipping point through the government's plans to encourage investment in the clean economy, become a global clean-tech hub, and facilitate the production, import, export and re-export of innovative products and technologies.

Speaking at Climate Week NYC 2012, the global summit of government and business leaders organised each year by The Climate Group, American entrepreneur and Twitter co-founder Evan Williams said: "America's long history of prosperity was built by entrepreneurial innovators in science and technology. These visionaries imagined and then created a new and better way of doing things which was the catalyst for a century of prosperity. We need powerful new thinking in that same vein in order to challenge and transcend the limits of our high-carbon economy with clean energy innovation."

Dubai's Green Economy report captures this vision and the new thinking that the world needs in order to effectively mitigate the clear and present risks ahead and build a strong, secure and prosperous economy for all. *em.d*



DUBAI FDI ENGAGING DUBAI WITH THE GLOBAL INVESTOR

By
HE Fahad Al Gergawi



The unprecedented changes we see among economies worldwide today have brought a significant emphasis on sustainable and innovative economic models. Governments, businesses and investors are looking at competitive environments that provide them with maximum flexibility, ease as well as room to grow and expand. ↻

Dubai has long been an attractive destination for traders, investors and entrepreneurs.

In recent years, especially, its successful economic diversification, world-class infrastructure, connectivity to high-growth markets and consistent emphasis on ease of doing business, have widened the scope for investment and uninterrupted business growth in and out of Dubai.

A key element of Dubai's economic success is its broad interface with the world, which the leadership has continued to reinforce - by creating the right institutions, policies, infrastructure and a highly reputed living environment.

Dubai Investment Development Agency (Dubai FDI) in the Department of Economic Development - Government of Dubai, has been established with the objective of promoting Dubai's reputation as an international business hub and creating a suitable environment to attract, grow and retain investments.

Dubai FDI assists investors and companies worldwide take advantage of doing business in Dubai through of guidance and support. As a non-profit partner, Dubai FDI works alongside new ventures and existing companies to ensure their smooth journey towards sustainable success. We assist and guide on all aspects of business decisions, from identifying opportunities across key sectors and determining the best legal structure to connecting investors to a vast network of government and private sector facilitators and clients.

Being part of the United Arab Emirates and located at a crossroads between the East and West as well as North and South are significant advantages for Dubai from the global investor's perspective. Most recently, the UAE was ranked the world's 12th most competitive economy by the World Economic Forum and earlier this year, the international compiler Morgan Stanley Capital International Inc. (MSCI) upgraded the UAE from a 'frontier market' to an 'emerging market', both significant developments that augur well in terms of increased capital inflows.

Great strides have been taken by Dubai on the economic diversification front - by opening up new sectors including the launch of the 'Green Economy Partnership' to be led by Dubai FDI as well as an initiative to make Dubai the capital of Islamic economy. Dubai FDI foresees more busy and fruitful years ahead with these developments and the growing interest in Dubai's economic direction by the global investor community. *e.m.d*

BETWEEN 2012 and 2015 retail sales in the UAE is estimated to grow 32.9% FROM AED 114 billion TO AED 151 billion according to the Dubai FDI report



HE FAHAD AL GERGAWI
DUBAI FDI

He is the Chief Executive Officer of Dubai FDI



HAND IN HAND

By **Edem Bakhshish**



REGIONAL STRATEGIC APPROACH TO ADDRESS EXISTING KNOWLEDGE, COMMUNICATION AND RESOURCE GAPS TO FURTHER ADVANCE SOUTH-SOUTH, EAST-EAST, AND TRIANGULAR COOPERATION FOR DEVELOPMENT IN THE ARAB STATES, EASTERN EUROPE AND CIS



EDEM BAKHSHISH
UNOSSC

He is the Chief, Division for Arab States, Europe and the CIS at United Nations Office for South-South Cooperation

Concerns are being raised about the future of humanity and the conditions of life for our future generations. Threats of regional conflicts, widespread competition for resources, and fears of food insecurity are rising. Given this perspective, and considering that political decisions are often informed by economic considerations, it becomes clear that economic activities need to be brought into harmony with the laws of nature, along with environmental and longer-term sustainability considerations.

South-South Cooperation constitutes an effective and cost-efficient model in fostering practical applications of green-economy

principles as reflected in the founding principles of South-South cooperation, such as non-conditionality, national ownership, and equality, growing volumes in South-South trade, increasing flows of South-South development cooperation, as well as building South-South institutional capacities.

The regional strategic approach is supported by the United Nations through the UN Office for South-South Cooperation. The agreed regional approach is closely integrated with the global three-in-one multilateral support architecture for South-South Cooperation that consists of the Global South-South Development Academy, Global South-South Development EXPO and the South-South Global Assets and Technologies Exchange (<http://ssc.undp.org>).

The three key elements of the regional approach in support of South-South cooperation for development in the Arab region, Eastern Europe and CIS are:

- 1 National-level coordination boards on South-South and triangular cooperation;
- 2 Online South-South cooperation portal for real time access to South-South-related information;
- 3 Arab regional facility and ECIS regional facility for scaled up exchange in South-South (East-East) solutions, technologies and expertise within the regions and beyond.

NATIONAL-LEVEL COORDINATION BOARD ON SOUTH-SOUTH AND TRIANGULAR COOPERATION (OR ITS EXISTING EQUIVALENT)

In each country it takes the shape of the forum that is most relevant to the national context, building on existing institutional arrangements and avoiding creation of a duplicate structure. Regular meetings of national-level Coordination Boards on South-South and Triangular Cooperation are co-hosted by the relevant National Coordination Authority and the respective UN RC Office. The Board is comprised of line ministries, UN country team members and other triangular cooperation partners, as well as relevant civil-society organisations and private-sector institutions. The national-level Coordination Board for South-South and Triangular Cooperation is a time-efficient and a cost-efficient clearing house with the following three functions:

- Coordination and synergies
- Facilitation and resource mobilisation
- Upstream policy advice and norm-setting on South-South cooperation

The board serves as a consultative body to assist the National Coordinating Authority in updating and reviewing national priorities and strategy, as well as in addressing any upcoming relevant policy and capacity development issues. The Board focuses on national policy, national-coordination mechanisms, and national-level resources (including packaged knowledge and expertise, clearly identified needs, and some funding to support exchanges in those with other countries).



ONLINE SOUTH-SOUTH COOPERATION PORTAL FOR REAL TIME ACCESS TO SOUTH-SOUTH-RELATED INFORMATION

The regional South-South cooperation portal serves as a one-stop shop for the most in-demand information on South-South cooperation such as:

- Documented home-grown solutions with the potential for transfer (replication/adaptation)
- Information on technologies
- Description of existing mechanisms in support of South-South cooperation
- Rosters of Arab and ECIS experts and centres of excellence
- Partnership proposals with confirmed partial commitments
- Relevant training opportunities and training materials
- Statistical and research data, as well as other data on a demand-driven basis.

This portal is facilitated by the UN Office for South-South Cooperation in cooperation with the Islamic Development Bank and UNDP Regional Support Centres for Arab States and Europe and CIS and is closely linked with the global South-South Development Academy as part of the three-in-one multilateral support architecture for South-South cooperation.



ARAB REGIONAL FACILITY AND ECIS REGIONAL FACILITY FOR SCALED-UP EXCHANGE IN SOUTH-SOUTH (EAST-EAST) SOLUTIONS, TECHNOLOGIES AND EXPERTISE WITHIN THE REGIONS AND BEYOND

The key objective of the regional funding facilities for South-South cooperation is to provide for an equitable approach in scaling-up exchanges in solutions, technologies and expertise in a number of agreed thematic areas. It is done by filling financial gaps in cases where resource gaps cannot be addressed bilaterally and locally, between solution providers and solution recipients.

The Arab Regional Funding Facility and the ECIS Regional Funding Facility are part of the three-in-one multilateral support architecture for South-South cooperation that finances up to 40% of the total budget of any given South-South cooperation initiative with the understanding that at least 60% of the total budget comes from solution providers and recipients.

Both a pooled-resources modality, where funds are actually contributed to a regional funding facility, and a parallel-funding modality are available. In the pooled-resources modality, the regional funding facility is housed by the United Nations fund for South-South Cooperation.

In the parallel-funding modality, the actual contribution of funds to the UN fund for SSC prior to financing concrete South-South cooperation initiatives is not required. Duly endorsed commitment on timely disbursement of funds in a given amount and for a given period of time is sufficient to participate in the facility. A minimum administration cost will apply. The priority objectives here are:

- To provide a visible, simplified and effective channel for financing, monitoring and evaluation of concrete South-South cooperation initiatives;
- To further expand a regional compact between various existing bilateral- and multilateral-funding facilities and instruments on the common principles in supporting intra-regional and cross-regional South-South (East-East) cooperation;
- To eventually harmonise and synchronise decision-making processes of various players who participate in the Regional Funding Facilities but prefer to commit resources directly.

Sustainability of the proposed approach is reflected in the fact that each of its three key elements are demand-driven and thus are self-sufficient in that each of the elements produces value-add in advancing South-South cooperation and practical implementation of green-economy principles. Once all three key elements are in place, they will further reinforce each other, to provide for economies of scale, and thus further increase their cumulative value-add to promoting South-South cooperation and greener economies in the two regions. *emd*

“ South-South Cooperation constitutes one of the effective and cost-efficient models in fostering practical applications of green economy principles. ”

BUILDING A PLATFORM FOR DUBAI'S GREEN ECONOMY

By
Marwan Abdulaziz

enpark
ENERGY & ENVIRONMENT

A member of **TECOM** INVESTMENTS



MARWAN ABDULAZIZ ENPARK

He is the Executive Director of EnPark, focusing on energy efficiency, green building, renewable energy and waste management.

INFO BOX

EnPark, a member of TECOM Investments, is a Free Zone Business Park dedicated to facilitating and fostering the growth of the alternative energy and environmental industries. EnPark is a home for organisations operating in energy efficiency, renewable energy, waste management and green building sectors. EnPark provides regulatory and legislative support to its licensees, offering a platform for sustainable business operations through the integration of eco-friendly policies, standards, education programmes and technologies, combining environmental, social and economic elements to reflect Dubai's benchmark for sustainable development.

As we progress with the strategy to develop a green economy for sustainable development in the UAE, we need to focus on critical priority areas. Ours is a unique city; few cities face the challenge of having to adapt their facilities and infrastructure to cyclical population changes.

The Dubai Abatement Strategy, part of the Dubai Integrated Energy Strategy 2030, is focused on implementing carbon-reduction plans. The model is based on past lessons learned and aims to provide the essential building blocks for the achievement of long-term goals through initiatives and programmes, coordination with government bodies, and the assignment of responsibilities.

The Supreme Energy Council is currently working on a number of measures to enhance energy efficiency, increase cost savings and reduce CO2 emissions. These measures are all focused on upgrading older systems and rationalising power and water consumption. Examples include green building regulations, and lighting, water and cooling retrofits. These measures have been adopted by the Dubai Supreme Council of Energy for government buildings and entities, and we are now moving into the commercial sector.

By 2020, it is imperative that Dubai has sufficiently committed itself to the green economy so it can be a showpiece at the world EXPO 2020. There is a huge opportunity for Dubai to make the green economy work. Economic growth, energy efficiency and sustainable development are the main pillars of this vision. Indeed, as the Executive Director for EnPark, on a daily basis I see progress being made as more and more renewable energy, sustainability or environmentally-focused organisations approach us to set up a base within our business park. We now have over 50 organisations licensed under EnPark and we are determined to grow this figure as we do our part in answering the economic strategy for developing a green economy.

I have travelled the world speaking to green-focused companies looking for a home in the Middle East, held discussions with Governments looking to forge greater trade relationships in this area and learnt from those who have set up dedicated green-economy communities across the world. We have brought these lessons back to Dubai and implemented the most relevant aspects in our own Free Zone Business Park. One of our main findings was that in order for a green economy to truly take shape, we have to be accountable. To be accountable, we must be transparent, and this is why this vital annual report has been published. By showcasing relevant projects and initiatives, we can track progress, mapping out each stage and the challenges and opportunities encountered, whilst benchmarking our progress with international projects.

We might not be living in the greenest economy in the world, but we aspire to improve our current statistics and inspire the next generation to follow suit. This is the only way we can build a long-term economic success model and a sustainable future for Dubai. *e.m.d.*

CATALYSING CHANGE TOWARDS A SUSTAINABLE FUTURE

By
Stefania Romano



STEFANIA ROMANIO
ITALIAN TRUST FUND

She is the Director of the Italian Trust Fund, and the Chief of Operations of the CEO Platform for Green Growth in MENA initiative.

THE CEO PLATFORM BRINGS TOGETHER GREEN ECONOMY PIONEERS

Visionary business leaders, an innovative private sector and senior executives open to dialogue and cooperation have long been important engines in economic and social development. In the Middle East and North Africa (MENA) region, these drivers are complemented by a unique cultural and economic potential that is giving rise to pioneering business solutions aimed at providing a response to environmental stresses and economic challenges at both the regional and global levels.

The CEO Platform for Green Growth in MENA (www.ceoplatform.rec.org) is a response to the challenge of creating a sustainable future. Green growth is a holistic approach that combines environmental conservation, economic development and social prosperity. A greener economy is better able to manage business risks, while at the same time offering new business opportunities.

Visionary, action-orientated champions of green growth are brought together through the business leadership forum to engage with regional and global policy makers and to support the introduction of policies to promote a sustainable future for the region.

The Platform is centred around various interconnected core areas of work, including green finance, innovation and technology transfer, green goods and services and climate resilience. It covers Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, the Palestinian Territories, Qatar, Saudi Arabia, Tunisia, Turkey and the United Arab Emirates.



The platform provides an opportunity to voice common ideas on the most pressing sustainability challenges affecting the region, including water scarcity, the need to balance energy demand and climate change mitigation, and resource security.

Current activities include a survey of CEOs to assess the strategic strengths of key stakeholders and stimulate debate on how green growth can contribute to a sustainable future in the MENA region; and a course organised by the Sustainable Development Academy in Venice, Italy, bringing together members of the CEO Platform and prestigious speakers from the MENA region, Europe and the USA to explore the latest approaches to green growth and the circular economy. A discussion paper on urgent cross-cutting challenges will also be shared with a wide group of stakeholders with the aim of translating dialogue into a tangible policy paper. A series of quarterly CEO interviews, known as "Green Talks", will be broadcast via local and regional media in order to increase understanding and raise awareness of green growth policies among the wider business community and to give prominence to game changers/risk takers and visionary business leaders.

With the ongoing support of major MENA partners, the Platform was initiated by the Italian Ministry for the Environment, Land and Sea (IMELS). It espouses regional ownership through its founders and works in partnership with renowned international and regional like-minded institutions and organisations that are committed to establishing a prosperous and green economy across the MENA region and beyond. www.emd.org

A ROLE MODEL FOR INVESTMENT IN GREEN INDUSTRIES

By
Ahmed Detta

Inferior waste management has become one of the most challenging environmental problems, raising serious concerns for both developed and developing nations. The total volume of solid waste generated around the globe is estimated to be 1.3 billion tons; the GCC region alone is estimated to generate 120 million tons of solid waste per year.



AHMED DETTA
DUCYCLE

He is the Chief Executive Officer and Founder of Ducycle.

Recycling is a core element of waste management, to enable us to manage waste effectively and protect the environment at the same time. Apart from other economic benefits, recycling helps to reduce pollution, conserve resources, save energy, reduce deforestation and reduce greenhouse gas emissions.

Ducycle, a Dubai-based plastics and bottle recycler, is establishing a world class sustainable plastic recycling plant in the UAE to divert polluting plastic waste away from landfill disposal. Ducycle has initiated the construction of a 38,000 ton per annum plastic recycling plant to recycle PET (Polyethylene terephthalate) bottles into flaked and pelletised plastic.

As an organisation, we pride ourselves on becoming a role model investment for the green industry through engaging every citizen in the UAE to recycle. Bespoke awareness and ease of implementing solutions formulate the core of our strategy, and we have aligned ourselves with the policies and ambitions of Dubai's green economy. We are working with key organisations to understand consumer behavior, lifestyle and choices. By doing so, we are able to devise accurate awareness messages that contribute directly to consumer behavior change. Change is best administered during a consumer's buying behavior journey.

Ducycle went through a stringent due-diligence process with a series of institutional investors and these introductions were made by Ducycle's Local Sponsor - Mr Hamad Al Abdooli. Mr Al Abdooli was instrumental in stressing the importance of this project across a series of Ministerial Departments and diligently attended and supported a series of meetings to raise our organisation's profile. With Mr Al Abdooli's support, we were recommended as a highly sought after investment by the Foreign Direct Investment Office to a series of global private equity firms.

Our ethos engaging the wider community for recycling and the transparency of our processes have allowed Ducycle to qualify and work towards being endorsed by the United Nations Clean Development Mechanism. Following a strict and stringent process, provides a framework to establish a truly sustainable recycling model that will be proactive and contribute to our society and local environment for generations to follow.

The end products we are creating are also major accolades for the investment we have received to date. "Significant numbers of manufacturing organisations are turning to recycled material" as part of their production process to drive down costs, reduce the reliance on raw materials and continue to appeal to ever growing 'green conscious' consumers with their products. In addition to this, a trend is growing for policies to be administered encouraging organisations to reduce their reliance on virgin material. The purity and flexibility of the products created by Ducycle allow a vast array of organisations to utilise these materials while also allowing them to adhere to Governmental policies. Ducycle will become a major exporter of 'food grade quality' plastic material, further contributing to the principles of Dubai's green economy.

Ducycle's initiative will yield concurrent environmental and economic benefits for the company while bringing Dubai to the forefront of a greener community. Creating improved relations with the community, gaining a better relationship in society and employing a large number of the local population are our key drivers. Ducycle will be the pioneering blue print for plastics recycling in Dubai. *e.m.d*

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06. GREEN INDUSTRY.



HE **ABDULNASSER IBRAHIM** **BIN KALBAN**

CHIEF EXECUTIVE OFFICER
AT DUBAL HOLDING LLC.

INTRODUCTION

Green industrial development is a major factor in securing resource-efficient low-carbon growth. Given its role in creating new jobs while protecting the environment and promoting sustainable patterns of production, green industrial development is a vital pillar when pursuing a green economic model.

According to the United Nations Industrial Development Organization (UNIDO), the term "green industry" refers to economies striving for a more sustainable path of growth by undertaking green public investments and implementing public-policy initiatives that encourage environmentally responsible private investments.

The UAE is doing just that. With an industrial sector centred on hydrocarbons, construction and aluminium production, it is natural to start by adapting these main players within a strategically phased long-term plan.

The following pages outline the many efficiencies that are generated through more environmentally friendly fuels, commercialised research with industrial applications, the promotion of engine and generator efficiency, and how a green investment and business park creates the right breeding ground for best practices in a green economy.

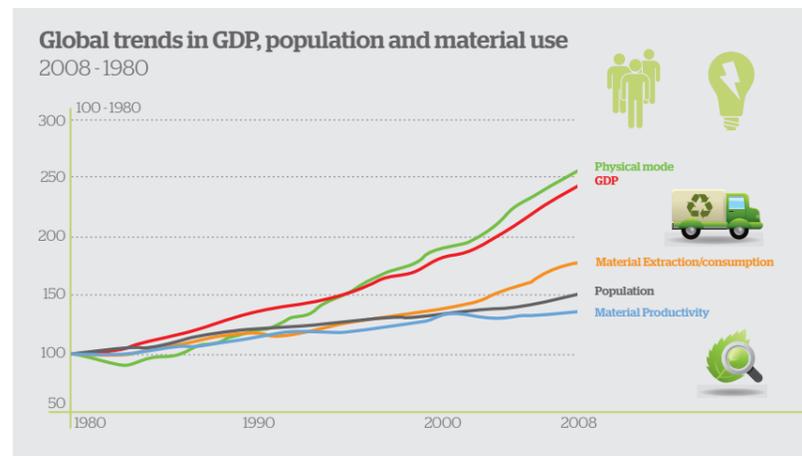


THE GREEN INDUSTRY INITIATIVE

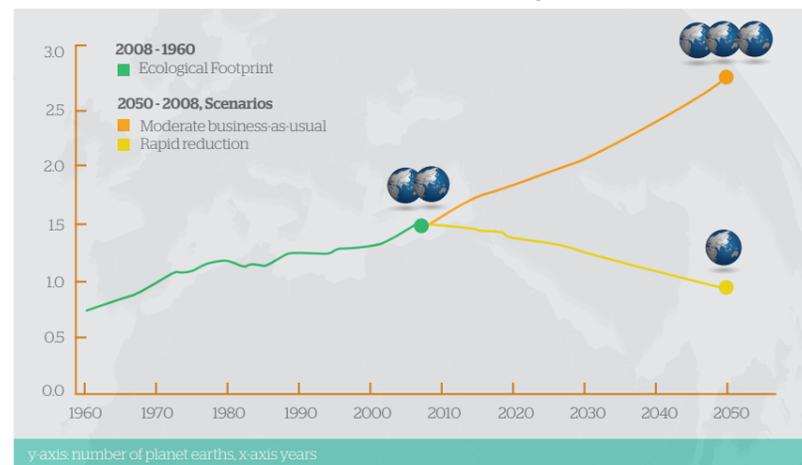
By **Heinz Leuenberger**

THE CHALLENGE OF “DECOUPLING” ECONOMIC GROWTH AND ENVIRONMENTAL IMPACT

It is widely recognised today that the existing model of economic growth is under unprecedented strain. As both population and income levels rise, damaging patterns of production and consumption are amplified and are threatening to test planetary boundaries. Based on current trends, this development will come at an unacceptably high cost both to nature and society. Increased extraction of, and competition for, ever-dwindling supplies of scarce raw materials and a further build-up of greenhouse gas emissions and other pollutants are heightening existing concerns and tensions among governments, the private sector and the world's population at large, all while degrading fragile ecosystems on which human development depends.



Source: Dittrich, M. et al. Green Economies Around the World, Sustainable Europe Research Institute (SERI), Vienna, 2012



Source: Global Footprint Network, 2012, World Footprint

It is therefore clear that 'business as usual' is no longer an option, and that any future economic growth must decisively be decoupled from increased resource use and negative environmental impacts.

Decoupling typically refers to the ability of an economy to grow without corresponding increases of pressures on the environment. This implies a shift away from labour- and resource-intensive production towards resource-efficient productivity and cleaner production methods. Less energy and raw materials would be used to deliver more goods and services, with fewer emissions and waste. This would in turn create new industries and jobs, while reducing risks to human health and the environment thereby also making economies more resilient to coming change.

The positive effects on natural resources, human health and global climate would be bolstered by the generation of employment through new business opportunities. However, decoupling will require significant changes in government policies, corporate behaviour, and consumption patterns by the public, as well as continuously pursued capacity building and radical innovation.



HEINZ LEUENBERGER
UNIDO

He is the Director of Environmental Management Branch of UNIDO. He heads UNIDO's Green Industry Initiative, overseeing the global Resource Efficient and Cleaner Production programme.

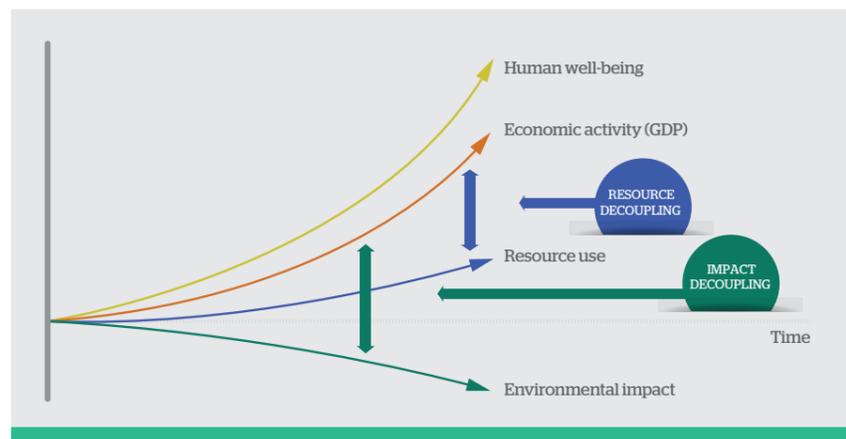


Green Industry (...) offers an effective point of entry and a driving force towards a Green Economy and provides a sectorial approach for a global transition to a Green Economy (...)



The steps required for an economy to decouple its production from increased resource use and negative impacts on the environment, can be broken down into four broad areas:

- 1. Greening Existing Industries:** Improving the environmental performance of existing industry by increasing resource efficiency, strengthening waste management, phasing out toxic substances, and using renewable energy sources.
- 2. Dematerialising the Economy:** Reducing the material footprint of processes and products, by instituting new business models, promoting the eco-design of products, and closing the material loop by promoting a circular economy.
- 3. Creating New Green Industries:** Supporting the creation of industries delivering environmental goods and services such as 3R service providers, pollution control equipment suppliers, and developers of renewable energy technology.
- 4. Shifting Emphasis from Labour to Resource Productivity:** Re-orienting the prevailing economic paradigm away from an emphasis on achieving labour productivity, towards maximising productivity gains from efficient resource management.



Source: International Resource Panel, Decoupling Natural Resource Use and Environmental Impacts from Economic Growth, United Nations Environment Programme (UNEP), Nairobi, 2011

THE GREEN INDUSTRY INITIATIVE

The importance of the manufacturing and related sectors to the process of decoupling cannot be emphasised strongly enough. While there is general agreement that industrial growth is needed in developing and emerging economies to alleviate poverty, deliver goods and services, create jobs, and raise living standards, industrial activity is also responsible for consuming material resources, water and energy at an unsustainable rate, and emitting toxins, pollutants and waste in levels greater than the earth's ecosystems can absorb. The manufacturing industries are therefore the primary site at which sustainability interventions must take place in a comprehensive, consistent and holistic form.

As a result, the United Nations Industrial Development Organisation (UNIDO) launched the Green Industry Initiative in the year 2009, following the Ministerial-level Manila Declaration on Green Industry in Asia. The Green Industry Initiative helps decouple economic growth from resource use and pollution by employing a two-pronged strategy aimed at:

- Improving the environmental performance of existing industries.
- Supporting the creation of new industries delivering environmental goods and services.

By providing a path towards industrial production and development that does not come at the expense of the health of natural systems or lead to adverse human health outcomes, Green industry is particularly relevant for developing and emerging economies which are transitioning their economies and which can either choose to go down a traditional resource-intensive

and polluting path, or choose a more sustainable route.

Through the Green Industry Initiative, UNIDO works to provide technical support and assistance to countries incorporating concepts, tools and methodologies of Green Industry; supporting bilateral, regional and international cooperation in the development and transfer of cleaner production technologies and practices; strengthening the economic and trade competitiveness of Green Industries; and actively forging partnerships, between and among governments, the private sector, research institutions, and civil society in pursuit of core Green Industry policies and practices.

Green Industry therefore offers an effective point of entry and a driving force towards a Green Economy and provides a sectorial approach for a global transition to a Green Economy in manufacturing and associated sectors. Furthermore, Green Industry approaches enable industries to decrease resource (energy, materials and water) use, while lowering their emissions and managing their toxic substances and wastes. It enables firms to take extended responsibility for their operations and products, and decrease environmental burdens, while at the same time, saving money, increasing revenues and gaining a competitive advantage. Green industry is also fundamental to improving protection of humans and the environment from harmful substances and fostering sound management of chemicals. In addition, it promotes the development of inherently safer chemical substitutes and non-chemical based alternative processes. Deep cuts in pollution, including GHG emissions, require comprehensive changes in how products and services are produced.

ECONOMIC, SOCIAL AND ENVIRONMENTAL BENEFITS

The implementation of Green Industry policies and practices in industrial manufacturing activities has the potential to bring about vast benefits along the traditionally promulgated axes of sustainable development: economic, social and environmental.

Economically, Green Industry brings about cost savings through resource productivity, as well as longer-term growth and resilience through a decreased reliance on raw materials and access to new markets through standards conformity, consumer demand responsiveness and innovation. Worldwide, the economic opportunities associated with resource savings are estimated to total USD 2.9 trillion, while the global market for green products and services is around USD 1.3 trillion in size.

Additional savings from Green Industry are effected through increased labour productivity and lower insurance, restitution and remediation costs brought about by improved working conditions as well as heightened ecosystem and community wellbeing, stemming from the upgrade of technology, infrastructure, equipment and waste and chemicals management processes.



ECONOMIC BENEFITS CASE STUDY

The UNIDO-UNEP global network of Resource Efficient and Cleaner Production (RECP) Centres has assisted thousands of companies in implementing sustainable production while saving costs and increasing revenues. In Kenya, a manufacturer of edible oils and soaps was able to expand production capacity and improve production efficiency by using RECP methods. Annual benefits include more than USD 623,000 in savings, which fuelled company expansion, including the creation of new jobs and new business ventures. In Sri Lanka, the local RECP Centre helped a coconut mill save over USD 200,000 per year for an investment of less than USD 5,000. Options identified by the Centre enabled the company to simultaneously decrease waste quantities and reduce the amount of GHG emissions to almost zero through the utilisation of waste for energy. The coconut mill has taken a leading role in greening the sector by helping other coconut mills to optimise processes and decrease waste.

The impacts of these enterprise-level achievements are the result of gains from immediate action and low-cost investments. While they might seem limited in a global context, they clearly illustrate the opportunities connected to systematically, continuously and holistically implementing Green Industry approaches.

In the social sphere, Green Industry can bring about more employment, rising incomes and the empowerment of marginalised groups. While the improvement of the well-being of workers and communities is an immediate and intrinsic benefit of Green Industry, the approach also helps assure long-term poverty alleviation through the conservation of natural capital, on which most economic growth is traditionally based.

Green Industry also offers employment opportunities for poor and marginalised groups. For instance, modernising and formalising the informal recycling and reuse industry - in which approximately 15 million people are employed worldwide - would ensure that valuable resources are not wasted. The outcome will be reducing poverty by creating new, formal, income-generating jobs with improved working conditions. Conservative estimates indicate that, globally, economic activities associated with reuse of the water stream alone (from collection to recycling) represent a market of USD 400 billion.

SOCIAL BENEFITS CASE STUDY

Through a project run by UNIDO together with UNEP and the Global Environment Facility in Zambia, three rural mini grids based on solar, biomass and small hydro power technologies have been set up to enhance national manufacturing capacity based on renewable energy technologies. Private partnerships have been stimulated through the involvement of communities, utilities, investors and businesses. At the same time, the project is contributing to the establishment of a legal, institutional and policy framework to promote further deployment of renewable energy.

Meanwhile, similar initiatives are enabling the spread and uptake of information communication technology in rural areas, thereby providing a green solution for bridging the digital divide and helping provide universal access to modern technologies.

Green Industry's contribution to environmental protection centres on the conservation of natural resources and the protection of ecosystems from harmful emissions and wastes. By promoting comprehensive and innovative approaches to the efficient use of resources by industry, Green Industry helps eliminate wasteful processes and alleviate the substantial pressure placed on natural resources by industrial activity.

In addition to the sound management of resources, Green Industry implies effective measures in the areas of pollution prevention and abatement such as waste reduction and management, phasing out of toxic substances, increasing use of renewable energy sources and feed stocks, and the eco-design of products and processes.



Green Industry (...) offers an effective point of entry and a driving force towards a Green Economy and provides a sectorial approach for a global transition to a Green Economy (...)



ENVIRONMENTAL BENEFITS CASE STUDY

Artisanal or small-scale gold mining in developing countries is a poverty-driven activity and the miners often suffer from social marginalisation. With increases in the global price of gold, the numbers of these miners are on the rise as is the environmental and health damage that their activities cause.

UNIDO's Mercury programme demonstrates ways to eliminate mercury emissions from artisanal and small-scale gold mining operations through the introduction of more efficient and cleaner gold recovery techniques including gravimetric concentration, amalgamation in close-circuit and burning of the amalgam in closed vessels, allowing recycling of mercury. Furthermore, a recent addition to the programme has been the promotion of fair-trade initiatives for the gold market. This programme provides guarantees of reduced environmental contamination and impact on health, increased earnings through recycling and more efficient techniques as well as a high selling price through the fair-trade concept. These latter aspects are important for the poor rural population involved in the activity and for the natural environment that their activities affect.

THE GREEN INDUSTRY PLATFORM

While the impact of enterprise-level achievements might seem limited in a global context, it clearly illustrates the opportunities connected to implementing Green Industry policies and practices. Taking into account the number of small- and medium-sized enterprises in operation in developing countries, the large number of enterprises that are being established every day, and the share of the global economy they constitute - if Green Industry were to be mainstreamed and extended in these enterprises, the cumulative benefits would be vast.

In order to therefore scale up and mainstream the Green Industry Initiative, UNIDO, together with the United Nations Environment Programme (UNEP), launched the Green Industry Platform - a global, high-level, multi-stakeholder partnership, to catalyse, mobilise and mainstream action on Green Industry around the world. The Green Industry Platform offers a framework bringing together government, business and civil society leaders to secure concrete commitments and mobilise action in order to:

- a) Improve the environmental performance of existing industry
- b) Support the creation of new industries delivering environmental goods and services.

At present, the Green Industry Platform counts nearly 200 members from all regions of the world and a variety of industrial sectors. Each member has signed the Platform's Statement of Support document, through which they engage to promote core Green Industry policies and practices.

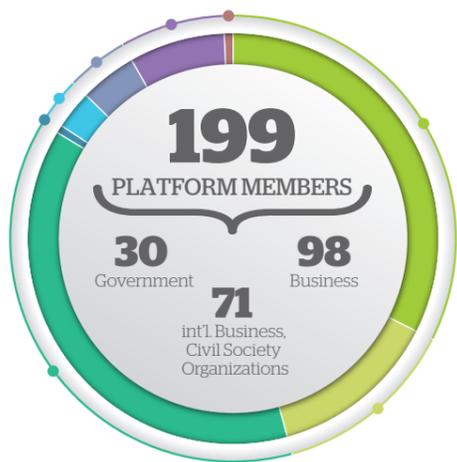
The Green Industry Platform is the first and largest purpose-built global initiative focused on promoting a more sustainable model of industrial production. As an action-oriented Platform, its aim is to infuse the emerging 'green industrial revolution' with coherence and focus, while catalysing measurable progress in the component areas of a Green Industry approach to manufacturing.

As such, the Green Industry Platform aims to provide a forum for all stakeholders to share and profile best practices, promote research, innovation and deployment of green technologies, while also raising awareness about the benefits of Green Industry. Above all, the Platform offers participants the opportunity to engage in transformative partnerships to attain mutually aligned objectives, and in the process, mainstream and scale up a Green Industry approach to manufacturing.

Through the engagements contained in the Statement of Support, the Platform helps achieve clean and competitive industrial development, reduced pollution levels and an end to the unsustainable use of natural resources. Specifically, the Statement of Support engages participants to:

- Improve Resource Efficiency
- Strengthen Waste Management
- Reduce and Eliminate Toxic Materials
- Pursue Energy Efficiency and Use Renewable Energy
- Adopt a Lifetime Approach to Product Manufacture
- Promote Technology Transfer and Share Best Practices
- Green Global Value Chains
- Support Green Industry Research and Innovation
- Foster Green Industries and Jobs
- Set Green Industry Targets
- Make Finance Available to Green Industry

The co-benefit to participating industries is an increase in competitiveness, stemming from improved efficiency, updated production processes, optimised waste management and adoption of environmental and efficiency standards. Consequently, pursuance of these engagements is expected to attract fresh investments and open new markets, as well as lead to growth in the 'green' jobs sector, ultimately facilitating the transition to a Green Economy. *emd*



SUSTAINABLE CONSTRUCTION

By **Hari Kishan Meka**

IMPLEMENTATION OF SUSTAINABILITY STRATEGY 2020 IN THE CONSTRUCTION SECTOR

The 2020 Sustainability Strategy, developed with support from Forum for the Future, is built around what Al-Futtaim Carillion's have described as our 'Six Positive Outcomes', which encompasses Carillion's economic, environmental, and social contributions and impacts.



HARI KISHAN MEKA
AL FUTTAIM
CARILLION

He is a Regional Sustainability Manager in Al Futtaim Carillion.

The chosen vehicle to deliver the outcomes is Al-Futtaim Carillion's Visual Impact Team in the MENA region, which overcomes language and literacy barriers by taking a practical approach towards health, safety and environmental training. The training resulted in increased commitment to Carillion as expressed by our operatives. The initiative contributed to us winning the Sustainable Project of the Year Award at the Qatar Construction Week Awards 2013.

Additionally, a sustainability week is celebrated every year, where each day has a separate theme based on the Positive Outcomes. Employees are encouraged to come up with initiatives to motivate and to induce a sense of ownership of the Sustainability Strategy. The best practices are recorded and continued, eventually shaping the direction taken to achieve our vision.

A Sustainable Leadership Plan (SLP) has been developed for continual improvement in sustainability performance of AFP. SLP is measured at both contract level and business level to reflect the fact that both of them are essential for the 2020 Strategy. To help and deliver the SLP, contractors develop plans for the Key Performance Indicators (KPI's) as Carbon Reduction Plan, Waste Reduction Plan, Water Reduction Plan, Biodiversity Reduction Plan, and Community Needs Plan.

Sustainability Talk and News (STN) is a Carillion PLC initiative that brings together a wealth of sustainability content generated by the building services and construction industry. STN is an online portal which hosts a range of opinion, comment, videos, presentations, and case studies, looking at key issues of sustainability. This further raises awareness on our strategy internally and also externally with our key stakeholders. *emd*

DID YOU KNOW?

The efforts were awarded:

- Construction Week Corporate Social Responsibility Award 2010 & 2011
- Construction Week 2012 Sustainability Initiative of the Year
- Arabia Corporate Social Responsibility Award 2011 & 2012 in large company category

The strategy is delivered through the implementation of the following six Positive Outcomes:



INTERVIEW: SAEED KHOORY



**Saeed
Abdullah
Khoory**
CEO, ENOC



The partner behind every successful journey, our strategy is aligned with the nation's development vision led by a focus on economic diversification and sustainable growth.



Q1. WHAT ARE ENOC'S STRATEGIC GOALS AND OBJECTIVES AND HOW DO THEY TIE IN WITH THE UAE'S DEVELOPMENT PLANS?

S.K.: WS.A.K: ENOC has always been a key player in supporting the UAE's social and economic growth. The partner behind every successful journey, our strategy is aligned with the nation's development vision led by a focus on economic diversification and sustainable growth.

As the UAE focuses on Vision 2020, placing it among the world's most sustainable nations, ENOC is working to achieve the visionary goals set by our leadership. A clear priority is to support the Green Economy for Sustainable Development initiative announced by His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai.

Today, the UAE is committed to diversifying its energy sources and utilising renewable energy sources to meet growing demand from a burgeoning population and to support the fast-paced infrastructure development. ENOC complements the nation's growth approach with our focus on accelerating our operational efficiency and maximising productivity.

Our goal is to be a leading regional integrated oil and gas group, highly profitable and socially responsible towards employees, community and the environment. Working to meet the goals of the Government, we continue to provide fuel at subsidised rates to drive all-round development. As a responsible government entity, we place the highest emphasis on optimising resource use and maximising productivity through strategic initiatives.

In fact, our strategic priority for 2014 is to explore new opportunities for growth, led by our expansion to new geographical regions, and developing initiatives to bolster all-round growth. We aim to leverage the positive macroeconomic conditions in Dubai and other key markets to aggressively grow our market share and increase product volumes.

We have accelerated our capital-investment programme to boost profitability by driving the fast and efficient execution of critical projects and building infrastructure to strengthen our market share and support the energy needs of Dubai.

Business processes will also be continuously enhanced by leveraging knowledge management and information systems to promote better customer understanding, deploying state-of-the-art IT systems to drive growth, and employing superior management-information systems for faster decision-making. This, in turn, is an ideal fit with the Smart Dubai initiative announced by His Highness Sheikh Mohammed bin Rashid Al Maktoum.

Q2. HOW DOES ENOC'S STRATEGY ALIGN WITH PLANS OF THE UAE, ESPECIALLY EMIRATES SUCH AS ABU DHABI AND DUBAI, TO DIVERSIFY THEIR ENERGY MIX?

S.K.: We are a member of the Dubai Supreme Council of Energy and are committed to achieving the goals set by the Dubai Integrated Energy Strategy which are to reduce energy demand by 30% and diversify energy sources with a focus on renewables by 2030. This is reflected in the number of green initiatives implemented by ENOC in the past few years. Most recently, ENOC introduced the ultra-low sulphur green diesel across all ENOC/EPPCO service stations.

Highlighting our commitment to sustainability, ENOC has signed a Technical Services Agreement (TSA) with Dubai Carbon Centre of Excellence (DCCE) to effectively manage the carbon footprint of ENOC's operations and to develop the competencies of ENOC's staff in promoting Clean Development Mechanism projects. The TSA will assist us in developing a carbon footprint calculator and an analysis strategy.

In another ground-breaking initiative, our wholly-owned subsidiary Emirates Gas (EMGAS) is currently driving a CNG project in Dubai to complement the UAE Government's strategy of safeguarding a healthy and clean environment and reducing pollution. CNG is set to become the UAE's preferred alternative fuel of choice for government vehicles and we at ENOC have been working with the Roads & Transport Authority to introduce CNG in public-transport vehicles to reduce environmental pollution.

One of ENOC's pioneering sustainability initiatives was the opening of the first green service station in the Middle East, here in Dubai. Among the innovative green initiatives at the station are technological devices to contain petrol fumes released at the pump and state-of-the-art systems such as solar-powered lighting, a waterless car-washing system, new waste-segregation systems and design upgrades to reduce noise pollution.

Q3. IN TERMS OF ENVIRONMENTAL PERFORMANCE, WHAT ARE THE KEY PRIORITIES FOR THE COMPANY? HOW DO YOU MONITOR WHETHER THESE PRIORITIES ARE BEING ACHIEVED?

S.K.: Our activities are aligned with the green economy vision of the UAE. We consider our focus on promoting environmental sustainability to be a key part of our corporate social responsibility (CSR). Our top priorities are to reduce our environmental footprint, strengthen operational efficiency across the fuel supply chain, and promote awareness among all stakeholders on the importance of safeguarding our environment.

In addition to the initiatives mentioned above, we have also integrated the culture of sustainability internally. Across ENOC, several green measures have been introduced such as replacing all ozone-depleting systems with ozone-friendly appliances and the usage of LED/solar lights. ENOC's headquarters achieved a saving of 48% in water use and 78% in energy use through these initiatives in 2012 compared to 2010. The ENOC staff accommodation has a waste-water treatment plant and this, as well as the use of smart devices for water and electricity conservation has ensured tangible savings annually.

Q4. HOW DOES THE COMPANY DEFINE SUSTAINABILITY?

S.K.: At ENOC, sustainability is a key component of our organisation's purpose and values and is integral to our corporate social responsibility commitment. We define sustainability as a tangible and achievable approach which covers all of our stakeholders, to conserve natural resources, enhance operational efficiency, reduce our ecological footprint and promote innovative practices to set a green legacy for future generations.

Q5. EARLIER THIS YEAR, ENOC MADE AVAILABLE FOR THE FIRST TIME IN THE UAE CLEANER DIESEL, MEETING THE ADVANCED EURO 5 SPECIFICATIONS. CAN YOU EXPLAIN THE RATIONALE FOR THIS DECISION, HOW LONG IT TOOK TO IMPLEMENT IT AND WHAT ARE THE INTENDED RESULTS?

S.K.: The introduction of the ultra-low-sulphur green diesel across all of our service stations follows the UAE Federal Cabinet decree aimed at raising the UAE's standards of diesel fuel from 500ppm to 10ppm, whereby all commercial diesel vehicles and equipment are to use the ultra-low-sulphur diesel that conforms to Euro 5 standards. The decree aims to promote the UAE's environmental sustainability by limiting pollution.

The environmentally-friendly fuel is distributed by ENOC in accordance with the regulation issued by the Emirates Authority for Standardisation and Metrology to reduce motor-vehicle pollution and greenhouse gas emissions and promote environmental sustainability. We have taken the extra step of absorbing the additional cost involved in distributing the low-emission diesel.

The response to the launch of green diesel at ENOC/EPPCO service stations has been extremely positive. As one of the first providers of ultra-low-sulphur diesel in the UAE, we will continue to work with all concerned stakeholders - including government departments and motorists - to further promote its use.



Our strategic priority for 2014 is to explore new opportunities for growth, led by our expansion to new geographical regions, and developing initiatives to bolster all-round growth.





Q6. THE COMPANY IS ALSO COLLABORATING WITH DUBAI MUNICIPALITY ON A PROJECT TO UTILISE LANDFILL METHANE GAS AS TRANSPORT FUEL. HOW IS THIS PLAN PROGRESSING?

S.K.: EMGAS had signed a Memorandum of Understanding with Dubai Municipality to convert land and sewage waste into CNG. EMGAS is now building an advanced facility to convert waste to bio-methane from what is currently being flared. This is then compressed into CNG, which will be used as an automotive green fuel.

The biogas and subsequently CNG will be generated at the planned EMGAS facility at Dubai Municipality's sewage and landfill sites in Al Aweer and Al Qusais, as per international CNG standards using the latest technologies from America and Europe. When the project is fully completed it will be able to provide CNG to approximately 15,000 passenger cars and light commercial vehicles per day.

EMGAS has already commenced commercial sales of CNG and has a CNG Mother Station located close to its facilities in Jebel Ali from where dedicated EMGAS CNG tankers receive and distribute CNG to its customers, including DP World, Dubai Police and Dubai Airports.

Three dedicated CNG Sub-Stations are being installed on the premises of EMGAS' customers for quick and efficient distribution of CNG. This seamless supply of CNG through the sub-stations is ensured through a fleet of dedicated trailers which will top up the clean fuel on a regular basis.

EMGAS also owns and operates a CNG mobile-filling unit which tours customer premises to distribute CNG as per their requirements. The advanced and fully-certified CNG mobile filling unit of EMGAS has 4,869 litres on-board along with a compressor and electronic dispenser. Several governmental entities and private businesses are in discussions with EMGAS for commencing use of CNG in their vehicles.

Q7. PLEASE OUTLINE OTHER PROJECTS THE COMPANY IS UNDERTAKING TO IMPROVE ITS ENVIRONMENTAL PERFORMANCE.

S.K.: Among other activities aimed at enhancing our environmental performance is Tadweer, a laptop recycling project in partnership with Dubai Municipality. The company also undertakes emergency-response workshops, conducts environmental competitions among school children to raise awareness among youths and takes part in the Clean Up the UAE campaign annually.

ENOC continues to promote Go Green, a waterless car-wash initiative which allows car owners to have their cars cleaned and shined without using a single drop of water, thereby helping to save water and preventing detergents from polluting the environment.

Upholding the belief that it must set an example, ENOC has introduced the waterless car-wash service for all employees at the ENOC Complex. The concept saves up to 200 litres of water and prevents detergents from polluting the environment with the new Bio Wash technique, an all-in-one eco-friendly car-wash liquid.

We have clear internal guidelines and benchmarks to evaluate the impact of our eco-friendly measures. Our Technical Service Agreement with Dubai Carbon will further enable us to reduce our ecological footprint and explore more CDM projects. *en.d*



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We define sustainability as a tangible and achievable approach which covers all of our stakeholders, to conserve natural resources, enhance operational efficiency, reduce our ecological footprint and promote innovative practices to set a green legacy for future generations



SCAN TO DOWNLOAD THE ENOC APP TODAY!



DRIVING A GREENER UAE

By **Saeed Abdullah Khoory**

EMGAS CHANGING THE AUTOMOTIVE INDUSTRY

The compressed natural-gas initiative by Emirates National Oil Company's (ENOC) wholly-owned subsidiary, Emirates Gas LLC (EMGAS), is set to become a game-changer for the automotive industry.

The compressed natural-gas initiative by Emirates National Oil Company's (ENOC) wholly-owned subsidiary, Emirates Gas LLC (EMGAS), is set to become a game-changer for the automotive industry.

Compressed Natural Gas (CNG) is reshaping the global-energy dialogue by bringing greater operational efficiency to the transport and logistics sector. In the UAE, the transformational impact of switching to CNG for automotive fuel is significant, as the country's transport sector accounts for nearly 90% of total diesel consumption, which is growing at an average of 4% per annum based on conservative estimates.

In addition to reducing the reliance on traditional fuels - which are provided at subsidised rates and are already a burden to both oil companies and the Government - CNG is a cleaner and greener fuel alternative with long-term environmental benefits. It is estimated that CNG fuel will save overall costs of between 33 and 50% and over 40% when compared to the use of petrol or diesel. With the UAE establishing its credentials as a transport and logistics hub, the benefit-cost ratio for logistics companies moving to CNG can be significant.



It is estimated that CNG fuel will save costs by between 33 and 50 per cent and over 40 per cent compared to the use of petrol or diesel



The country's transport sector accounts for nearly 90 per cent of total diesel consumption, which is growing at an average of 4 per cent per annum based on conservative estimates



Being non-toxic and non-corrosive, CNG leaves very little environmental impact which in turn contributes to reducing the UAE's carbon footprint. CNG is also reportedly safer - according to a study by the US Gas Research Institute of over 430 million vehicle-miles of use, CNG fuel caused no fatalities, burn accidents or serious injuries.

At the forefront in leading the sustainable development agenda of Dubai and in line with both the Dubai Integrated Energy Strategy and the Green Economy for Sustainable Development vision, ENOC is making concerted efforts to promote CNG as a preferred green automotive fuel in the UAE.

The Emirates Authority for Standardisation & Metrology (ESMA) has officially nominated EMGAS as executors of CNG activities in the UAE.

This is expected to further promote the usage of CNG as an alternative green automotive fuel in the UAE.

ENOC Chief Executive Officer Saeed Khoory observes: "The Green Economy for Sustainable Development vision announced by His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai, serves as our guiding principle in initiating and popularising sustainable-development initiatives. Through the launch of commercial sales of CNG and providing the requisite support infrastructure, we are focused on further promoting its use for preserving the environment and fostering energy efficiency."

With the UAE increasingly focusing on promoting alternative sources of energy and driving sustainable growth, CNG has a key role to play in supporting the country's green vision for the automotive sector. The announcement by ESMA has prompted a strong response from various governmental entities, highlighting the interest in the UAE to adopt green initiatives to fulfil the sustainable development vision of the Government.

Credited with launching CNG in Dubai through a pilot project with RTA in 2006, EMGAS is the largest

supplier of LPG in the UAE and the market leader in supplying a variety of LPG products and propane used in industrial and commercial establishments and residential areas. EMGAS marked a milestone on 27 November 2013, the day that the nation won the bid to host the World Expo 2020, with the commencement of commercial sales of CNG, a clean and green fuel of choice that supports the Green Economy for Sustainable Development vision of the UAE.

EMGAS has a CNG Mother Station located close to its facilities in Jebel Ali from where dedicated EMGAS CNG tankers receive and distribute CNG to customers including DP World, Dubai Police and Dubai Airports. Three dedicated CNG sub-stations are being installed on the premises of EMGAS' customers for quick and efficient distribution of CNG. The seamless supply of CNG through the sub-stations is ensured through a fleet of dedicated trailers which will top up the clean fuel on a regular basis.

EMGAS also owns and operates a CNG mobile filling unit which tours customer premises to distribute CNG. The advanced and fully-certified CNG unit can carry 4,869 litres and is equipped with a compressor and electronic dispenser. The unit enables the delivery of CNG to EMGAS' customers at their premises for refuelling CNG-powered vehicles which are fast gaining in popularity.

ENOC has been championing the need to promote energy efficiency through the CNG initiative, and also has plans to introduce a cost-effective and environmentally-friendly model of pipe-less natural-gas fuel stations.

EMGAS has also signed a Memorandum of Understanding with Dubai Municipality to treat land and sewage waste to generate CNG. An advanced facility is being set up to convert waste to bio-methane, which is compressed into CNG and used as an automotive green fuel. Once complete, the facility will provide CNG to approximately 15,000 passenger cars and light commercial vehicles a day. Further supporting the environment through clean fuels in the automotive sector, ENOC is supplying ultra-low-sulphur green diesel to all ENOC/EPPCO service stations.

As Dubai prepares for the World Expo 2020 under the theme "Connecting Minds, Creating the Future" ENOC is supporting development priorities by providing cleaner and greener fuels. This will contribute significantly to enhancing efficiency in the transport and energy sectors and will be a true game-changer for the UAE's transport sector. *em.d*



SAEED ABDULLAH KHOORY
ENOC

He is the CEO of ENOC.

INTERVIEW: MARWAN ABDULAZIZ

ENPARK: A UNIQUE HOME FOSTERING SUSTAINABLE BUSINESS OPERATIONS

Marwan
Abdulaziz
Executive Director,
EnPark



Q1. WHAT ARE THE MAIN ISSUES THE UAE IS FACING WHEN IT COMES TO SUSTAINABILITY?

MA: According to the National Communication, the UAE's carbon emissions reached 161.134 million tCO₂e in 2012, which makes the UAE the third most prolific carbon emissions generator per capita on earth. This statistic represents our rapidly expanding community and a growing economy. Whilst steps are being taken to reduce the level of carbon we use, we must also encourage conversation.

To make progress in developing a sustainable community in the UAE, we need robust legislative framework that encourages energy efficient behaviour, a clear business case and a sense of responsibility for our surroundings ingrained into each and every resident.

enpark
ENERGY & ENVIRONMENT

A member of **TECOM** INVESTMENTS

In 2013, the UAE Ministry of Economy estimated that the volume of investment opportunities for alternative energy projects by the private sector in the UAE will be around \$100 billion by 2020

Q2. WHAT ACTIONS ARE ENPARK AND THEIR BUSINESS PARTNERS TAKING TO COMBAT THESE ISSUES?

MA: We have designed EnPark's visions and objectives to be directly aligned with the UAE government's goals to improve energy efficiency and develop a green economy. Diversification of the world's power generation sources is absolutely vital but in order to bring this ideal into reality, we need to encourage R&D and innovation to identify new technologies that address our unique surroundings. This ambition is a core premise of EnPark's purpose. We have the ability to develop appropriate infrastructure and provide whatever facilities our business partners require. We have the ability to develop bespoke infrastructure and provide whatever facilities our business partners require.

For example, waste management is a huge issue as the UAE is ranked among the top ten worldwide in terms of per capita solid waste generation. This alarming statistic prompted Dubai Municipality to develop initiatives such as the "My City.. My Environment" drive. Indeed, based on the positive response from the community during a pilot project last year, EnPark has selected a waste management company to assist in rolling out the initiative across Dubai.

Q3. WHICH GOVERNMENT ENTITIES ARE INVOLVED IN THE INDUSTRY?

MA: EnPark has a strong relationship with all governmental organizations, working as a facilitator to drive conversation between the public and private sector. We work with DEWA, The Supreme Energy Council and the Executive Office to drive forward the sustainability agenda.

The Dubai Green Economy Partnership is the first multi-stakeholder collaboration in the emirate and we were proud to have been invited to be a founding member of the organisation. Since its inception, the partnership has hosted a number of events to promote the creation of a green, low-carbon economy in the Middle East through initiating programs that enable green trade and investment, and accelerate the adoption of green technologies, products and services across regional and global markets.

In June this year, EnPark hosted the second Green Leadership Series event in partnership with the Dubai Green Economy Partnership. An audience of 150 delegates listened as the panelists addressed the potential challenges that collaborative efforts of Public-Private Partnerships, suggesting practical solutions to overcome these issues through policies designed to inspire sustainable development.

Q4. DO YOU ACTIVELY SUPPORT THE DEVELOPMENT OF ALTERNATIVE ENERGY AND ENVIRONMENTAL INVESTMENTS IN YOUR OPERATIONS?

MA: The alternative energy and sustainability sectors in our region are still in their infancy. For them to truly take shape, we need to drive private investment to provide the necessary resources for the sector to thrive. EnPark supports the Dubai Government's drive to adopt a structure and necessary policies needed to attract private investment and works closely with the relevant Government departments to facilitate this investment.

EnPark is home to over 50 companies spanning the entire energy sector. We support their development by facilitating conversations about partnerships, investment trends, industry trends and ways of overcoming the challenges each organisation is facing. EnPark is unique in its ability to offer world-class infrastructure to organisations in the alternative energy and environmental industries and to give the choice of being located in any of the TECOM Business Parks across Dubai. Our omnipresence enables our business partners to choose the location that best suits their business. Our first-class technical and community infrastructure and important collaborations with other industry players, regulators and government, provides the perfect destination for businesses to further strengthen their impact in the Middle Eastern market. *em.d*

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DID YOU KNOW?

EnPark is a member of TECOM Investments and a free zone business park dedicated to facilitating and fostering the growth of alternative energy and environmental industries.

Launched in 2006, EnPark offers business partners bespoke infrastructure facilities across TECOM's portfolio of business parks for companies looking to identify, consolidate and capitalise on the significant opportunities that exist in the domestic and regional markets of the Middle East.



STRATEGIC RISK ASSESSMENT OF CLIMATE CHANGE

By
Ayman Halawa

CALCULATING GHG EMISSIONS FOR DEVELOPING MITIGATION AND ADAPTATION

Greenhouse gas (GHG) emissions and the associated environmental consequences represented in climate change have become one of the most significant issues for businesses and industries worldwide as increasing risks associated with changing climates could have adverse impacts on the development of economies and business trends globally.

Greenhouse gas (GHG) emissions and the associated environmental consequences represented in climate change have become one of the most significant issues for businesses and industries worldwide as increasing risks associated with changing climates could have adverse impacts on the development of economies and business trends globally.

Consequently, companies have now started including long-term climate change vulnerability assessment to their organisational risks. Such assessment can be further improved by using some international models such as UK DEFRA climate change risk assessment model and IPCC climate change vulnerability assessment model. Utilising regional climate data from the National Centres for Meteorology and Seismology has also proven to be helpful. During such environmental risk assessments of GHG emissions and climate change, all relevant risks are assessed, taking into consideration frequency and likelihood of the event and the potential impacts and consequences.



Assessment can be further improved by using (...) models such as UK DEFRA climate change risk assessment model and IPCC climate change vulnerability assessment model

In addition, successful environmental risk governance should include environmental risk management, communication and organisational arrangements to reduce GHG emissions in businesses. Good risk governance of GHG is concerned with building confidence with all stakeholders and organisations to consider environmental risks alongside other business risks they manage.

Most organisations have now realised the importance of integrating environmental risks with overall business risk. This integration helps organisations identify relevant threats and risks and prepare their mitigation and adaptation strategies according to the United Nation Environment Program (UNEP) climate change response identification. The mitigation actions state the amount of greenhouse gases reduced in the atmosphere and adaptation actions are outlined.

Illustrating the previous points in a practical example is the Climate Change Risk Assessment for the Energy Sector. Identifying the risks that could face this sector such as an increase in energy demand for cooling purposes due to rising temperatures, an increase in flood risks to energy infrastructure due to more intense rainfall and rising sea levels and the losses in electricity network capacity. These threats require energy companies to develop mitigation plans to set objectives and targets for GHG emission reduction and introduce smart grids for electricity usage management, and adaptation plans for infrastructure and demand side management.

The energy sector has a relatively high awareness level of the risks posed by climate change, and is exposed even further through interdependencies with other sectors (eg. potential disruption in infrastructure for the transportation sector could interrupt the movement of fuel supplies for the energy sector).

The business community discusses risk and potential actions in international multi-stakeholder events, one of them being the Road to Paris 2015 conference whose participants believe in the importance of incorporating business needs within international climate negotiations and in preparing an agenda that supports their beliefs, which include:

1 A clear roadmap with milestones:

Clarifying the building blocks of a new agreement, and clear milestones for the work plan between now and 2015.

2 Realistic and comprehensive targets:

More clarity by governments and negotiators on how agreed GHG emissions targets need to be implemented and achieved by businesses, regions, and cities and how business can and will contribute.

3 Climate financing:

New, innovative, and business-oriented approaches to financing the bottom up initiatives.

The process among business, finance, and government to facilitate a binding agreement in Paris 2015, will continue at the World Climate Regions Summit in October 2014 in Paris. *em.d*



AYMAN HALAWA

Ayman is an Environmental Specialist.

The energy sector has a relatively high awareness level of the risks posed by climate change

ENGINE AND GENERATOR EFFICIENCY

By
Pradeep Karunakaran



PRADEEP KARUNAKARAN
CUMMINS MIDDLE EAST

He leads Cummins Power Generation Business Unit for the Middle East and is responsible for Genset, G Drive and Alternator businesses, along with the engineering and segment organization.

HOW A MANUFACTURER OF ENGINES AND GENERATORS GROOMS ITS PRODUCTS FOR A GREEN ECONOMY

In 2014, for the seventh consecutive year, Cummins was named one of the world's most ethical companies by Ethisphere Institute. Driven by this success, and as the result of nearly two years of in-depth study, Cummins recently adopted a comprehensive plan to reduce the company's environmental footprint. The plan addresses everything from manufacturing operations to the operation of the engines and generators they produce, with a special focus on waste, water, and energy.

Cummins already manufactures some of the cleanest engines and generators in the industry. However, an overwhelming majority of Cummins' environmental footprint is created by the end user of its products. "With millions of engines and generators in service, and customers in 190 countries and territories, there's no question in my mind that Cummins has the global reach to make a positive impact on the environment," said Tom Linebarger, Chairman and Chief Executive Officer.

The work behind the Cummins Connect series of Generators is a great example of greater design efficiency and ultimately sustainability. Technical advances in engine speeds combined with the use of turbochargers and other developments has enabled engineers to use the same basic engine platform to design 12 different variations of the standby generators, producing 20 kilowatts (kW) to 60 kW of power.

The concept 'Super Truck' is another example. In February, the President of the United States praised the concept 'Super Truck' developed by Cummins and the Peterbilt Motors Company, which during testing, under real world conditions, achieved a 75 per cent increase in fuel efficiency as compared to a typical truck on the road today. In 2013, Cummins introduced more than 70 new products or product updates around the world, many improving emissions and fuel efficiency or both.



The concept 'Super Truck' (...), achieved a 75 per cent increase in fuel efficiency as compared to a typical truck on the road today



MEASURING SUCCESS

Cummins has set measurable targets for its key goals as follows:

Energy and GHGs: Reduce energy use and greenhouse gas emissions by 25 per cent and 27 per cent, respectively, compared to a 2005 baseline and adjusted to sales, by 2015.

Water: Reduce direct water use across Cummins by 33 per cent by 2020, adjusted by hours worked. Achieve 'water neutrality' at 15 Cummins manufacturing sites where water is in short supply, also by 2020.

Waste: Increase recycling rate from 89 per cent in 2013 to 95 per cent by 2020. Reach 'zero disposal' status at 30 sites by 2020 where 100 per cent of waste is recycled in a useful manner. *e.m.d*

Around the world, Cummins has been leading by example when it comes to emission standards by helping regulatory bodies to challenge the norms, standards, and art of the possible. Cummins helped develop the first greenhouse gas (GHG) emission regulations for commercial trucks in the United States and was the first company to have an engine certified to meet those regulations, which went into effect in 2014.

Cummins focuses its practices on three main areas - compliance, pollution prevention, and resource conservation.

DID YOU KNOW?

Environmental Challenge is a Cummins Corporate Responsibility initiative wherein more than 200 Community Involvement Teams from around the world compete to have their projects chosen as one of the 15 best environmental efforts of the year. In 2013, through hundreds of projects, more than 11,000 employees invested over 60,000 hours, to reduce 19,000 tonnes of Greenhouse Gas (GHGs), more than four times the reduction achieved in the previous year's effort.

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Every Application and Every Need, we have the Generator Set for You.



Our energy working for you.™

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ACKNOWLEDGEMENTS

MEET THE PEOPLE THAT BROUGHT THIS REPORT TO LIFE



HE SAIED AL TAYER,
Chairman of the World Green Economy Summit, Vice Chairman of the Dubai Supreme Council, MD&CEO of the Dubai Electricity and Water Authority (DEWA)



HE ENG. WALEED SALMAN,
Secretary General and Vice-Chairman of the World Green Economy Summit, Chairman of Dubai Carbon, Executive Vice President Strategy and Business Development of the Dubai Electricity and Water Authority



UNDP COUNTRY OFFICE: SAYED AQA, MANAR YAZBECK
UNDP ENERGY AND CLIMATE TEAM: KISHAN KHODAY, TIM SCOTT
UNDP TECHNICAL EDITOR: FRANK PINTO

As well as the International Air Transport Association (IATA), the International Bank for Reconstruction and Development (IBRD), the International Labour Organization (ILO), the International Renewable Energy Agency (IRENA), the United Nations Environment Programme (UNEP), The United Nations Industrial Development Organization (UNIDO), the United Nations Office for South-South Cooperation (UNOSSC), the United Nations Sustainable Development Solutions Network (UNSDSN).



OUR PARTNERS FROM THE WORLD GREEN ECONOMY SUMMIT TEAM

Alia Almansoori, Saeed Ghubash Humaid Almarri, Sophie Hansen, Femi Itiola, Julia Leny, Jens Nielsen, Andre Schneider

OUR EDITORS

Editor in Chief: Michaela Neukirch
Research and Editorial Assistant: Mariam Maani, Suraiya Tasnim
Head Technical Editor: Frank Pinto
Contributing Editors: Mercedes Duran, Ivano Iannelli, Maheen Iqbal, Mariam Maani, Praseeda Nair, Suraiya Tasnim, Vesela Toderova, Wolfgang Wetzer, Giselle Whiteaker
Peer Review and Quality Assurance: Kishan Khoday, Frank Pinto, Tim Scott
Technical Sub-editors: Rachel Bartz, Reshma Francy, Clemens Ploechl, Fazil Abdul Rahiman, Wolfgang Wetzer, Moamen MA Younis
Proofreading: Anoud Abusalim, Wisam Gangari, Aquin George, Marziah Rashed

OUR PRODUCTION

Creative Director: Josiane Sadaka, The Brand District
Design: Moses Antony, Hratch Derhagopian
Artwork: Johnson Addae, Neeraj Madnani
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Get in touch: T +971 50 2800643 | info@thebranddistrict.com | www.thebranddistrict.com
PowerPrint
Power Print LLC was established in 2004 and is now one of the leading print solutions specialists in the region.
Get in touch: +971 4340 4077 | info@powerprintae | www.powerprintae
Knowledge Partner
Frost & Sullivan | www.frost.com

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COMPANY PROFILES

DUBAI SILICON OASIS



سلطة فاحة دبي للسيليكون
Dubai Silicon Oasis Authority

Dubai Silicon Oasis Authority (DSOA), which is owned 100% by the Government of Dubai, is the region's leading technology hub. In addition to a state-of-the-art infrastructure, DSO offers first-class business support, technology incubation facility, growth equity financing as well as full free zone benefits, creating the perfect environment for technology companies to thrive. As a result, DSO has become the destination of choice for a wide range of cutting edge technology players such as: Fujitsu, SAP, Avaya, Porsche, Western Digital and many more.

DSO's community spans over 7.2 square kilometres of state-of-the-art office towers, R&D facilities, industrial zones, educational institutions, luxury apartments, villas, hotels, healthcare and a full range of lifestyle facilities which translate into a dynamic 'integrated' community where people can work, live and play.

DSO also offers an array of high-quality facilities to businesses operating within the technology park supported by advanced systems and latest technologies. Furthermore, DSO ensures an eco-friendly and clean environment with buildings being constructed in line with global energy saving standards, while carrying out daily maintenance to ensure an ideal business environment.

DSO facilities include:

- Plug and play office space;
- Multiple-Use Warehousing and light industrial units;
- Land for development

Become a member of DSO's hi-tech community and benefit from the one-stop-shop-business services right at your doorstep including:

- Business Registration and Licensing;
- Customs Clearance;
- Municipal Services and Building Certification;
- Immigration Services and Employee Visa Processing;
- Postal Services; and more.

Free Zone Benefits include and are not limited to the below:

- 100% foreign ownership
- 100% repatriation of capital
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- Zero corporate tax
- No import or export tax
- State of the art IT infrastructure
- Fast-track business set-up and licensing

Telephone: 045015555

Email: inquiry@dso.ae

Web: www.dso.ae



ENOC: BEHIND EVERY SUCCESSFUL JOURNEY

Emirates National Oil Company (ENOC), an entity wholly owned by the Dubai Government, is a leading force in the economic diversification and sustainable development of the UAE.

Established in 1993, ENOC's primary focus has been to develop downstream and upstream activities in the oil and gas sector. Over the years, ENOC has expanded into several high-growth business sectors to create long-term value to its stakeholders.

With over 30 active subsidiaries and international joint ventures, ENOC has five key business segments: Supply, Trading and Processing (STP); Terminals; Marketing; Retail and Other Ventures and Investments. ENOC's vision is to be a leading integrated oil and gas group that is highly profitable and socially responsible towards its employees, the communities it serves in and the environment.

The winner of several international awards for quality, environmental sustainability and service standards, ENOC operates a network of ENOC and EPPCO service stations and is also credited with launching the Middle East region's first 'green service station'. The retail network features branded convenience stores and car wash and quick oil change facilities.

The Group's business portfolio includes: refining, oil trade, terminalling and storage, bunkering, liquefied petroleum gas, aviation fuel marketing, lubricants blending and marketing, chemicals, informational technology, real estate and travel, with core operations in the Middle East, Asia, Europe and Africa.

Corporate Social Responsibility (CSR) is a fundamental purpose and value at ENOC. 'Human Fuel', which aims to raise funds for the United Nations World Food Programme (WFP) and Dubai Charity Association to address global hunger, is one of ENOC's key CSR initiatives.

ENOC is a strong participant in environmental protection, community development and health & safety awareness. Emirates Gas, a wholly-owned subsidiary, promotes Compressed Natural Gas (CNG) as a clean and green fuel of choice that supports the 'Green Economy for Sustainable Development' vision of the UAE.

An 'employer of choice' with a special focus on Nationalisation in all its key markets, ENOC has over 6,000 employees globally and continues to attract, develop and retain top talent. The Group also adopts the latest technologies and implements best practices to achieve all-round world-class performance.

Committed to the highest standards of business ethics and integrity, ENOC adheres to its 'Code of Business Conduct', based on the core values of Team Work, Integrity, Transparency, Respect and Customer Focus. Recognised as a 'Superbrand', ENOC is the 'power behind every successful journey'.



COMPANY PROFILES



PACIFIC CONTROLS

Pacific Control Systems (PCS) is a global provider of end-to-end managed services and Business Intelligence services to the government and private sector leveraging ICT, machine-to-machine (M2M) and Internet of Things applications. Pacific Controls' innovation lies at the intersection of three core capabilities:

- Machine and Device data enterprise platforms
- End-to-end managed service delivery and IT infrastructure integration
- Cloud Computing Infrastructure Services

PCS is at the forefront of platform, data infrastructure and service delivery innovation for enterprise and publically managed solutions, partnering with leading product OEMs, carriers, service providers, governments and diversified enterprises to help fully leverage smart connected devices, machines and the Internet of Things and People.

PCS has invested aggressively in foundation technologies for "smart systems", including network enablement, unified communications, virtualisation technologies, application service delivery and software infrastructure. These core technologies and platform capabilities revolve around real-time situational awareness and automated analysis for equipment assets, business processes and infrastructure.

PCS' Galaxy Platform is the world's first Enterprise Device Management Platform solution. Galaxy is an end-to-end platform for managed services that proactively monitors assets, providing transparency into how critical "real world" systems are performing, where critical faults lie, and where opportunities exist to significantly reduce operational expenses.

Pacific Controls has developed a strong relationship with clients in both the public and private sectors, who are loyal blue-chip clients in key countries around the world. It is also working with a broad spectrum of network operators, IT equipment players, professional services providers, software players and equipment OEMs to form partnerships to unlock the extended enterprise by simplifying the integration of sensors, machines, assets, people and systems to provide solutions for managing real time, real-world systems.

In 2007, Pacific Controls built its headquarters the first USBGC LEED certified platinum-rated green building in the Middle East and 16th in the world. It currently operates five state-of-the-art Command Control Centers in Dubai, and one in the USA, with 24x7x365 remote monitoring of customers assets and facilities, enabling clients to enhance security of their assets, optimize energy usage, and reduce set up and operational costs.

In 2011, Pacific Controls Cloud Services, a fully owned subsidiary of PCS was launched in a 128,000sqft Uptime, Tier Three-certified Data Centre Campus, ISO 27001 certified, running virtualised managed services, using the Galaxy platform on the Pacific Controls Cloud, for government and corporate customers.

For more information, please visit www.pacificcontrols.net.

DUBAI FDI



In concert with the strategy of the Emirate of Dubai and as decreed by H.H. Sheikh Mohammed Bin Rashid Al Maktoum, The Dubai Investment Development Agency (Dubai FDI) was founded to enhance the overall investment environment for the Emirate of Dubai. The Agency was founded to create a transparent environment and a single entity to attract international investment. Dubai FDI's global attraction, growth and retention strategies better enable businesses to set up and

leverage their strengths to target the entire region and globe from their base in Dubai. Central to the Agency's success is the development of key sector strategies where technology and knowledge transfer benefit the overall economic needs of Dubai, the Emirati people and all stakeholders.



ENPARK



A member of **TECOM INVESTMENTS**

About the Energy and Environment Park - EnPark

EnPark, a member of TECOM Investments, is a free zone dedicated to fostering the growth of the alternative energy and environmental industries in the Middle East. The business park offers bespoke real estate facilities and its central location provides access to the MENA region. Today, more than 50 companies, from cleantech startups to large energy multinationals, operate under EnPark's licenses.

EnPark provides a home for organisations within the Energy Efficiency, Renewable Energy, Green Building and Waste Management sectors. As an EnPark licensee, a business is provided with access to infrastructure facilities across TECOM Investment's portfolio of business parks.

In allowing the freedom to choose the location of their business, EnPark provides its partners with a forum to facilitate industry and regulatory collaboration, identify business opportunities and share their experience of regional operations, products and services with industry peers.

In establishing a platform for growth for these industries, EnPark acts as a bridge between business, industry bodies and Government as part of the drive to develop Dubai's knowledge-based economy.

As a founding member of the 'Dubai Green Economic Partnership', EnPark's vision is in line with Dubai's Economic Vision 2021, 'a green economy for sustainable development' launched by His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.



COMPANY PROFILES

FIRST SOLAR



First Solar is a leading global provider of comprehensive photovoltaic (PV) solar systems which use its advanced thin-film modules. With an installed capacity of over 9 gigawatts worldwide - from mega utility-scale solar plants to kilowatt-sized community off-grid systems - the company's integrated power plant solutions deliver an economically attractive alternative to fossil-fuel electricity generation today.

From raw material sourcing through end-of-life module recycling, First Solar's renewable energy systems protect and enhance the environment.

For more information about First Solar, please visit www.firstsolar.com

ALEMCO



The recent partnership between ALEMCO and Smart4Power will transform the way building refurbishing has been traditionally addressed. These companies together offer a unique service to customers who are interested in upgrading their buildings and reducing their energy bill. The companies' collaboration rests on three pillars: delivery of reliable and high quality MEP services, achieving optimal building energy efficiency and the provision of LEED/Estidama green building certification.

ALEMCO is a Mechanical, Electrical and Plumbing company that provides the skill, expertise, experience and resources essential to meet the demands of today's fast track projects, including some of the most iconic projects across the UAE.

Smart4Power addresses energy efficiency for all building types, providing energy audits and integration of solutions for air conditioning, lighting, motors, and controls.

CUMMINS INC.



Cummins Inc., a global leader in engine technology is headquartered in Columbus Indiana, USA. It serves customers in more than 190 countries through its network of more than 600 company-owned and independent distributor facilities and approximately 6,500 dealer locations.

Cummins produces Engines for On-Highway (e.g. Automotive), Off Highway (e.g. Construction) and Non-Automotive Application (e.g. Gensets) across a wide range of power nodes. The Company has four segments: Engines, Gensets, Components, and Distribution all designed to complement each other to deliver world class customer service.

Cummins's presence in the Middle East began in 1956. Some key achievements are: The High Horsepower Master Rebuild Centre, Genset Projects Business, Certified Training Centre, and LEED Gold certification for our facilities in addition to the ISO 9001:2008 certification.

SHELL (MENA)



Shell in the Middle East and North Africa (MENA)

Shell's relationship with the Middle East and North African countries dates back almost as long as the company's existence. Working hand in hand with governments and local partners, we at Shell are proud to support the countries that make up the MENA region in producing and delivering the upstream and downstream aspects of oil and gas production. We operate across the region in a series of joint ventures and partnerships. We supply the technical expertise and economies of scale that come with running a global portfolio of assets and interests.

Today, we are one of the largest oil and gas companies in the world, with over 4,000 employees in the Middle East and North Africa. Over 90% of our employees are regional talents. Our commitment to sustainable investment in human capital does not stop at the fence line of Shell operations. At Shell, we not only look to partner with host governments and national operations, but we also believe in supporting the local communities and environments in which we operate.

Shell has developed a number of social investment and development programmes to encourage growth, self-reliance and prosperity to people in the countries in which it operates. These programmes focus on providing training and learning opportunities for individuals as well as the wider community and are themed around human capital, environmental awareness and increasing road safety.

TOSHIBA Leading Innovation >>>

TOSHIBA GULF FZE



Toshiba Gulf FZE, based in Jebel Ali Free Zone, Dubai, is a wholly owned subsidiary of Toshiba Corporation and a world-leading diversified manufacturer, solutions provider and marketer of advanced electronic, electrical products and systems.

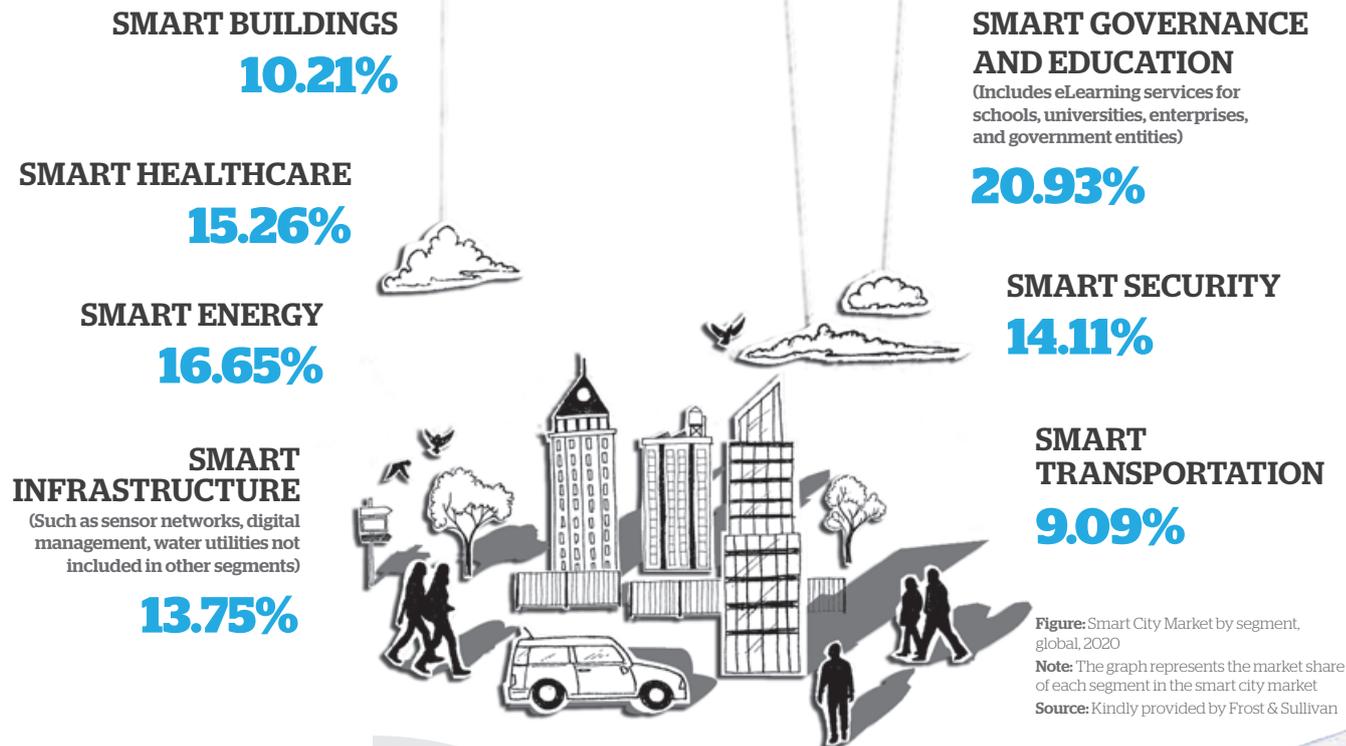
The Business Solutions division at Toshiba Gulf FZE offers a wide array of e-STUDIO Multifunction Printers (MFP) providing customers with a variety of document management solutions, while enhancing security, user-friendliness, efficiency and more.

Toshiba practices environmental management with the aim of realizing a society based on low-carbon, recycling and natural symbiosis by seeking a combination of business and environmental activities in order to hand down the health of global environment to our next generations as an irreplaceable asset. Toshiba e-STUDIO ensures all MFPs it produces are compliant to the latest environmental standards.

GREEN ECONOMIES ARE PROSPEROUS ECONOMIES

We will give you an example. Smart Cities will create huge business opportunities with a market value of \$ 1.5 trillion in 2020.

TOTAL OF \$ 1.5
TRILLION IN 2020



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WE HOPE TO SEE YOU AT
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