Bureau International des Expositions (ed.)

Connecter les Esprits, Construire de Futur

Connecting Minds, Creating the Future

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Preface

Mr Vicente González Loscertales,
Secretary General of the Bureau International des Expositions

Dubai has chosen as the focus of its upcoming World Expo in 2020 a timely and rich theme “Connecting Minds, Creating the Future” that opens the way for a wide discussion among the international community on how to contribute, solve, anticipate, innovate, through partnership and shared experiences, in three fundamental areas of global development: mobility, sustainability and opportunity.

The 21st century is one of greater interdependence and of shared responsibility. Expos are now acting as key instruments, which help unravel the complexities of our time by adopting a multifaceted approach to culture, to innovation, to society and all the challenges of humankind.

The theme “Connecting Minds, Creating the Future” translates the very essence of a World Expo by bringing together a variety of different identities and experiences. It will be the driving force in 2020 to help unveil the complexities of our interdependent world, to help us all understand our role and determine the best way in which we can all contribute positively.

The theme will be put into practice in the three very concrete domains that shape the priorities of each country: mobility, sustainability and opportunity. The aim is to create partnerships rather than links, which in turn will engineer sustainable, lasting solutions rather than provide temporary remedies to the world’s most defining challenges.
This year’s edition of our bulletin has benefitted from the excellent contributions of distinguished personalities, heads of prominent institutions and experts in the field of the theme.

His Highness Sheikh Ahmed bin Saeed Al Maktoum, President of the Dubai Civil Aviation Authority, Chairman and Chief Executive of Emirates Airline & Group, Chairman of the Expo 2020 Dubai Higher Preparatory Committee, takes us through the remarkable journey undertaken by the UAE, its readiness to host the Expo and welcome the world in Dubai in 2020. Mr. Sean Cleary, Chairman of the Strategic Concepts Ltd, Executive Vice-Chair of the Future World Foundation, Managing Director of the Centre for Advanced Governance, discusses the relevance of the theme and sub-themes in relation to the global challenges. Geoff Mulgan, Chief Executive of National Endowment for Science, Technology and the Arts, outlines the changing nature of innovation and the importance of identifying successful examples of inclusive innovation through connection.

Professor Jay Wang, Associate Professor at SUC Annenberg School for Communication and Journalism and Director of the USD Centre on Public Diplomacy at the Annenberg School presents Expo 2020 Dubai as an excellent opportunity for public diplomacy in a multilateral and globalised context with partnership as a key concept. His Excellency Abdullah Nasser Lootah, Secretary General of the Emirates Competitiveness Council, illustrates the sub-theme ‘Opportunity’ through the presentation of the UAE’s successful approach to national development. Dr. Abdulla Karam, Chairman of the Board of Directors and Director General of the Knowledge and Human Development Authority, reveals how collaboration transforms education and shares the positive practices adopted in private education in Dubai. Dr. Mohammed Nasser Al Ahbabi, Director General of the UAE
Space Agency, introduces the UAE Space Agency and its mandates explaining how it will be a long-term ‘engine of innovation’ together with Expo 2020 Dubai.

Ms. Reem Al Marzouqi, Architectural Engineer, relates her journey to becoming the first Emirati to obtain a US patent for a car driven without hands. Mr. Hans Tholstrup, President of the International Solar Car Federation, reminds us how solar power and other renewables are key to achieving a mobile and sustainable world. H. E. Razan Khalifa Al Mubarak, Secretary General of the Environment Agency-Abu Dhabi, refers to sustainability in the context of the UAE’s green growth strategy. Dr. Fred Moavenzadeh, President of the Masdar Institute of Science and Technology, tells us about the creation and work of the Masdar Institute of Science and Technology, as one of the projects aiming to develop UAE’s human and intellectual capital.

H. E. Helal Al Marri, Director General of Dubai’s Department of Tourism and Commerce Marketing and CEO of Dubai World Trade Centre, explains how the Master Plan of Expo 2020 Dubai has been designed to reflect faithfully the Expo theme and sub-themes. Dr. Hayat Shamsuddin, Director of Culture Expo 2020, underlines how human connectivity is a reflection of Dubai’s very essence. H. E. Mohammed Alabbar, Higher Committee Member for Expo 2020 Dubai and Founder and Chairman of Emaar Properties PJSC, recounts the story of Dubai’s rapid and inspiring growth to become a city of the future. Finally, H. E. Reem Al Hashimy, UAE Minister of State, Director General of the Bureau Expo 2020 Dubai, Board Representative of the Expo 2020 Dubai Higher Preparatory Committee, shows us how the values of the theme “Connecting Minds, Creating the Future” reflect the principles of the UAE vision and anticipates the
contributions that Expo 2020 Dubai will bring to the world.

The theme of a World Expo is the greatest link between visitors and participants for the exchange of knowledge and experience. It converges diversity of thought and innovation in the development and presentation of solutions to the main challenges facing contemporary society.

World Expos represent places, for governments and citizens, to project and to understand a changing world in a spirit of hope for the future of humankind. Expos are milestones that hold our concerns, hopes and vision for the future.

I am very grateful to all those who have contributed to this bulletin and who have demonstrated through their varied and insightful articles the complexity and interconnectivity of the questions raised by the Expo 2020 Dubai’s theme as well as their great relevance in addressing in an innovative way the major challenges we face.
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Connecting minds: a Journey Together to Tomorrow

His Highness Sheikh Ahmed bin Saeed Al Maktoum,
President of the Dubai Civil Aviation Authority, Chairman and Chief Executive of Emirates Airline & Group, and Chairman of the Expo 2020 Dubai Higher Preparatory Committee
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President of the Dubai Civil Aviation Authority, Chairman and Chief Executive of Emirates Airline & Group, and Chairman of the Expo 2020 Dubai Higher Preparatory Committee

In less than 50 years, the UAE has undergone a remarkable transformation from a series of humble desert and coastal outposts into one of the most modern countries in the world. His Highness Sheikh Ahmed bin Saeed Al Maktoum, President of the Dubai Civil Aviation Authority, Chairman and Chief Executive of Emirates Airline & Group, and Chairman of the Expo 2020 Dubai Higher Preparatory Committee, considers the UAE’s journey and his nation’s readiness to welcome the world to Expo 2020 Dubai.

Youth and ambition are the cornerstones of the UAE and Dubai. We are vigorous and vibrant, proud of our past and mindful of the future. A future that now includes the singular honour of being the first country in our region to host a World Expo. As we approach 2020 we intend to redouble our efforts to ensure a flawless global exposition that is welcoming to all and especially easy to navigate for our partners.

Though still a young nation, we are proud that in so short a time, we have achieved such remarkable development, modernisation and quality of life for our people. Our nation has become a global centre for connectivity and logistics, and we are driven by a vision of inclusion, unity and a desire to create a better world for all.

It is therefore a great privilege that, through Expo 2020 Dubai and our theme of Connecting Minds, Creating the Future, we can continue to escalate our visions, hopes and dreams into the global arena. In doing so, we hope to reconnect minds across our planet to build partnerships that will champion a
more inclusive and prosperous world.

**Making the Connection**

The UAE is a country that builds lasting relationships and draws on shared ideas to fuel progress and development. Early on in our journey, as pearl divers, fishermen and traders, our environment was the root of our communities and commerce. Merchants travelling along the Silk Road and spice routes were drawn to our shores seeking opportunities to trade goods, explore cultures and exchange ideas on how to thrive. Communities, such as Dubai, became bustling trade hubs, meeting points and melting pots of cultures. Everyone from Venetian pearl merchants, to Persian traders and Indian brokers congregated to bargain and barter, swap stories and share common values and philosophies. It is these same ideals of seeking common ground and shared benefits that will guide us as we prepare for Expo 2020 Dubai.

By 1971, neighbouring emirates, Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al Quwain, Ras Al Khaimah and Fujairah understood the benefit of uniting under one flag and formed one nation, the United Arab Emirates (UAE). Guided by the example of our forefathers, it was formed in a spirit of collaboration, shared values and deep rooted principles. The nation soon after embarked on an ambitious journey to transform its diverse communities into the forward-looking country it is today. A country that can compete with the best when it comes to education, culture, enterprise, technology and quality of life.

Our progress is testament to the power of connections and why hosting a World Expo in 2020 and focusing our theme on *Connecting Minds, Creating the Future* has such relevance for the UAE and the world as a whole. Today,
our cities are home to hundreds of nationalities, languages, and cultures; home also to thought leaders, educators and students; and home to the pursuit of excellence and the sharing of ideas; and in five short years, home to a truly global World Expo.

The themes and subthemes for Expo 2020 Dubai are a natural choice. They are interwoven throughout our story, have guided us to where we are today and will continue to shape our future. The UAE is one of the most vibrant examples of how Opportunity, Mobility and Sustainability interlink to influence the future, as they are implicit in the nation’s progressive model for economic development, its transport and logistics networks, and its visionary agenda to create a sustainable ecosystem with reduced reliance on traditional sources of energy.

Expo 2020 Dubai will project these powerful and persuasive themes onto a global stage and open possibilities, where before there seemed only impossibilities. As the global community faces increasingly more complex and interconnected challenges, there has never been a more important time to promote bonds between people, societies and ideas. By providing a platform for genuine partnerships and the coming together of minds and cultures, the global community can find the new solutions and pathways needed to build a thriving and sustainable future.

As the UAE prepares to welcome the world to participate in Expo 2020, we are reminded that Expo 2020 Dubai is more than simply a six-month exposition; it is a collaborative event with the potential to launch us all on a journey to a better future. As the UAE’s journey reaches its 50th year, its Golden Jubilee, we invite the world to join us on a far longer journey, an ambitious expedition that will touch every corner of the earth promoting
cultural exchange, identifying concerns, encouraging dialogue, and uncovering solutions that will lead to a more sustainable and prosperous world.

Dubai is honoured with the opportunity to be the meeting point and a catalyst for a better future.

**Creating a Global Meeting Point**

Positioned between east and west, Dubai is favourably located for a World Expo. Leveraging upon this geographic advantage has been key to our nation’s development and from an emirate with no airport in 1960; the UAE now has the busiest international hub.

By the time the nations of the world convene at the Expo 2020 Dubai site, Dubai World Central (DWC) as the world’s largest airport with an annual capacity of more than 160 million passengers and 12 million tonnes of airfreight, will become a symbol of the power of connection. The Expo 2020 Dubai site is physically located within DWC and the UAE’s much admired free zones and economic clusters, all ensuring swift and easy access for partnering nations, sponsors and visitors alike.

Connectivity is also about our commitment to prepare our people for the future. We are a nation with a welcoming philosophy and we are natural explorers and collaborators. Our cities are built on partnerships that are the foundation of our remarkable economic development. Meanwhile, our educational systems, institutions and universities are exemplary in the fields of learning and research and development, and consequently attract talent and inquisitive minds from diverse nationalities and disciplines. This invokes a global outlook ensuring that the next generation of UAE leaders
are trained in a country that is home to the highest concentration of international universities in the world. All these measures demonstrate our determination to develop a knowledge-based economy, underpinned by a large and thriving private sector that will benefit for generations to come.

Embedding Creativity and Culture

Our history is rich with examples of how our heritage proves a constant inspiration. One only has to look to the graceful dhow, a symbol of our trading legacy, to see it elegantly reflected in the beautiful sail-like design of the Burj Al Arab. Or look at our regional desert flower, the Hymenocallis and view it transposed into the magnificent shape and form of the Burj Khalifa, the tallest man-made structure on the planet.

The UAE has embraced landmark architecture as a symbol of its commitment to connect with world-class experts in pursuit of innovation and originality. From futuristic skyscrapers to award-winning bridges, from global museum and arts projects to iconic hotels, the nation has connected and collaborated with leading architects and artists of our time. We offer the creative freedom and employ industry excellence to complete almost unimaginable feats of engineering and construction whilst celebrating their aesthetic creativity. Creative freedom is something we encourage in all our partners and contributors to Expo 2020 Dubai.

Our thriving arts and culture scene also builds bridges connecting different and eclectic cultures. By seeking the unique and the extraordinary, we are able to explore, understand and appreciate the diversity of the world through meaningful connections. Building such bridges is very important to the UAE, and this is evident in the nation’s robust calendar of international events, including such notables as Art Dubai, Dubai International Film
Festival, Abu Dhabi Film Festival and the Emirates Airline Festival of Literature.

Our inclusive culture and our proud heritage are why millions of tourists feel welcome in our nation and have come to appreciate and understand our ability to connect with other cultures by promoting our own. Our commitment is reflected in current and developing initiatives throughout the emirates. Abu Dhabi’s cultural and educational projects continue to grow with examples, such as the Louvre and Guggenheim. Meanwhile, the northern emirates of Fujairah and Ras Al Khaimah are embedding more centres for heritage and cultural awareness, and Sharjah is celebrated as a religious and cultural destination.

Expo 2020 Dubai will extend this commitment, during the six-month event, by ensuring that the culture, heritage and the creativity of the nation will be woven into the experience of the 25 million visits expected at the Expo site. After that event our fully formed legacy structure will harness those millions of experiences to provide a lasting foundation for education, business, research, development and culture.

Opportunity - Opening the Doors to Prosperity
The UAE is a fertile ground for people and organisations from every continent. It offers both professional and personal opportunities for Emiratis and visitors from every corner of the globe and all walks of life.
As the UAE continues to pursue a policy of economic diversification, we also encourage global businesses to establish themselves and thrive. Our nation is considered a reliable and secure hub to establish and grow a business, a fact borne out by the large numbers of multinationals that have established deep roots in the country. Today, Dubai serves as a regional base
for over half the companies on the Fortune 500 list, including approximately 70 of the top 100 corporations. The UAE has also grown many multinational corporations of its own, such as Emirates Group, Etihad Airways, DP World, Aramex and RAK Ceramics.

Our advantageous position as a regional and international financial hub, with a notably entrepreneurial climate, also provides favourable growing conditions for small to medium sized enterprises (SMEs). Consequently, the SME sector has swiftly become a significant pillar of our national economy.

Our economic clusters offer strong incentives that instil confidence. As a result, the UAE is now home to a number of thriving free zones that, among others, include Jebel Ali Free Zone Authority (JAFZA), Dubai Internet City (DIC), Dubai Media City (DMC), Dubai International Finance Centre (DIFC), Dubai World Central (DWC), Khalifa Industrial Zone Abu Dhabi (KIZAD), and the Ras Al Khaimah Free Trade Zone. While each free zone concentrates on a specific cluster, all share a common purpose of drawing international human capital together in the pursuit of opportunity.

Innovation, a key value of Expo 2020 is also high on the agenda. Today, we live in a highly connected world witnessing rapid change and continuous developments, full of opportunities, discoveries and inventions. We must prepare and equip our future generations to fit into that world, ensure their position within it, and build a prosperous future for us all. Innovation is therefore at the forefront of our endeavours and we have designated 2015 as “The Year of Innovation”. This will be an auspicious start to a five year countdown to Expo 2020 and the launch of a strategy that will actively promote future developments in the sectors of renewable energy, transport, education, health, technology, water and space.
Mobility - The Lifeline of Opportunity

Mobility transports people, goods and ideas that are ultimately the building blocks to a strong diversified economy. Over five decades, we have worked long and hard and built a world-class infrastructure for air, sea and land. Today, few countries are as well connected physically, virtually and culturally as the UAE. With one-third of the world’s population within a four-hour flight and two-thirds within an eight-hour flight, the UAE is a critical link connecting east and west, north and south. This connectivity to the global economy not only serves the region, but also services the rest of the world.

Surprisingly, apart from a few streets, there were no tarmac roads in Dubai until 1965, and Abu Dhabi and Dubai were not linked by a paved road until after 1971. The development of highways was therefore, not only crucial to stimulate the economy, but also to forge a sense of unity and join together disparate emirates into one unified country. Today, modern highways link our emirates and Dubai’s Road and Transport Authority (RTA) continues to develop strategic plans that carefully consider the efficacy and sustainability of the various forms of transport that support the growing population and commerce.

Global air travel is equally key. In 1985, Emirates airline made its inaugural flight from Dubai with just two leased aircraft to three destinations. With patience and perseverance, the airline grew from a modest regional player to become the world’s largest international airline and industry innovator that has won awards for excellence across its operations. Today Emirates operates more than 230 ultra-modern aircraft, including the world’s largest fleets of the latest Airbus A380 and Boeing 777 aircraft, and serves some
140 destinations across six continents.

Mobility in the UAE takes many shapes and forms. Dubai inaugurated its metro rail system in September 2009, becoming the first of its kind in the Gulf’s Arab states and the longest unmanned in the world. Another recent innovation, that embraces sustainability, is the Dubai Tram that was inaugurated in November 2014. This 14.6km-long route sets new benchmarks in the Gulf region and is the first tramway outside Europe to be powered by ground-based electric supply systems.

Many more projects are planned in the next five years including Etihad Rail, an immense railway project. Etihad Rail will connect the country’s industrial cities and boost trade across the Gulf. This project will facilitate a new and alternative rail system to support the UAE’s growing ports and their ability to secure safe and environmentally friendly transportation. This 1,200 km double track network will be completed prior to Expo 2020 and, in keeping with the themes, will provide an innovative and sustainable network that will bring fresh opportunities by connecting goods and people across the Gulf Cooperation Council (GCC) countries.

**Sustainability - Preserving the Future**

Today, every inhabitant of the world has a duty to contemplate the day when the planet may no longer be habitable. Sustainability is an essential consideration to ensure that our children and our children’s children will be able to live fulfilling lives blessed with sufficient food, water, sanitation, clean air and access to the essential materials they need to build homes and livelihoods.

The drive to create a sustainable future has led the UAE to embrace
innovation and promote all sectors of the green economy, with the twin goals of simultaneously improving the nation’s competitiveness and reducing its ecological footprint. The UAE Vision 2021 National Agenda focuses on improving the quality of air, conserving and increasing water resources, enhancing the contribution of clean energy and implementing green growth plans.

Current initiatives include exploring alternative sources of clean and renewable energy, water conservation, salt-based agricultural research, expanding the framework for a reduced carbon economy, as well as a push to human capital development in many sectors of science and technology. Conservation and biodiversity are top priorities as we strive to protect natural eco systems and native fauna.

We are proud that Wadi Wurajah, together with a number of new gardens and reserves, has now established our tradition of national parks. Other key projects across the UAE include conservation of endangered or fragile ecosystems such as coral reefs and a focus on species in danger of extinction such as turtles and the Arabian Oryx. These are just a sample of the many innovative and regionally unique projects underway to protect the environment for future generations.

The UAE’s green ambitions extend beyond its frontiers and are proactive in connecting minds across our world to forge more sustainable futures for all. We have created Masdar City, a blend of architecture and ecology, and established ourselves as one of the world’s first and most important ‘arcology’ projects. This exciting project aims to create one of the planet’s lowest carbon and most eco-friendly urban developments. We are also proud to host the World Future Energy Summit (WFES), an annual event dedicated
to advancing future energy production, energy efficiency and clean technologies. This key international event brings together leading thinkers and practitioners to encourage international dialogue and stimulate real, on the ground, action.

Other major initiatives include the International Renewable Energy General Assembly (IRENA), which is a convening organisation that advances the agenda of the widespread adoption and use of renewable energy. Likewise, Abu Dhabi Sustainability Week (ADSW), is a pro-active global forum and the largest gathering on sustainability in the Middle East, which unites global experts, policy makers and investors to address the challenges of renewable energy and sustainable development.

The Zayed Future Energy Prize is an annual award that celebrates achievements that reflect innovation, impact and long-term vision and leadership in renewable energy and sustainability. These are but some of the major international initiatives that have found their home in the UAE, bringing together world thought leadership to address the coming challenges and opportunities for sustainability. Expo 2020 Dubai will provide a truly global platform to continue this vital work, while ‘Expo Live’ will generate wonderful opportunities for partnerships, innovations and solutions to directly promote sustainability and meet the growing challenges that affect us all.

**The Road to Expo 2020: A Journey Together**

We are inspired and excited that this historic event will reflect the journey of the UAE and we are honoured to invite the world to join us on this journey to transport our shared hopes and dreams to a higher level and genuinely make a difference.
We are confident that we can unite as a global community, leverage our resources, build new relationships, and create a brighter future... starting now.

Now is the time for every nation to stand up and be part of it, to open minds and exchange ideas.

As our Golden Jubilee approaches, we look forward to embarking on the next stage of our country’s journey by forging collaborations that will shape a more positive future for our global community.

With the help of the BIE, the participant nations and our contributing partners, the UAE renews its promise to astonish the world in 2020. It is a promise to deliver something momentous for the future, for the wellbeing of the world and for the prosperity of everybody, everywhere, for generations to come. We are awed and profoundly motivated by the immense potential of this Expo to offer an inspiring vision for all humanity by *Connecting Minds, Creating the Future*.

Join us.
Expo 2020 Dubai Higher Preparatory Committee
Connecting Minds, Creating the Future

Sean Cleary,
Chairman of Strategic Concepts Ltd, Executive Vice-Chair of the Future World Foundation, Managing Director of the Centre for Advanced Governance
Connecting Minds, Creating the Future

Sean Cleary,
Chairman of Strategic Concepts Ltd, Executive Vice-Chair of the Future World Foundation, Managing Director of the Centre for Advanced Governance

Connecting Minds, Creating the Future and the subthemes Opportunity, Mobility and Sustainability are pivotal starting points for bringing the world together to explore solutions for a better future. In this article Sean Cleary, noted strategic advisor and author, discusses some of the challenges that the global community faces today and highlights the relevance of the themes and subthemes.

What a wonderful theme for a World Expo! What an extraordinary opportunity for everyone involved! What a boon for humanity if we succeed!

What could be more important than creating a future that will allow all of us – 7.2 billion people and rising – to lead lives of sustainable prosperity, allowing those still mired in poverty and war to transcend these threats, and redirect their energies to improving their lives; while enabling everyone to live in harmony with the natural ecosystems – land, water and atmosphere – on which we depend for our survival.

Who would not want to contribute to achieving such an outcome?

‘Contribute’, I say, because no-one can define this future alone, or impose his preferences on all people. Interests often diverge, people in different societies prioritise values differently, and social norms vary across communities. No individual, no matter how intelligent, nor any nation, no matter how rich or powerful, has a monopoly of wisdom, or the ability to command so big a project. Only by connecting minds – inviting insights, sharing knowledge, listening carefully, and thinking deeply – can we create a
future that all will wish to share, and most will be willing to help create. That is the ambition, and the promise, of Expo 2020 Dubai.

The three directional themes for the Expo – *Opportunity, Mobility and Sustainability* – are focused, with precision, on creating a beneficial future for all.

**Opportunity** is the essence of human freedom, and what we need to unlock each individual’s potential. Aristotle’s distinction between potential (δύναμις) and actuality (ενέργεια) and (εντελέχεια) is the foundation of our understanding of education – the process of ‘leading out’, or unlocking, the potential of a young person to enable the actualisation of her innate talents. Within every acorn, there is the potential of an oak tree. But not all acorns achieve that mighty status; some are hoarded and eaten by squirrels, others by wild animals and human tribes; some, during the American Civil War, and in Europe after World War II, were ground to make ersatz coffee. Context and circumstance determine which acorns realise their potential.

So it is with people. Aristotle saw the first purpose of the state as the education of the people to render them virtuous. He identified virtue as the perfection of reason, the source of all abstract and practical knowledge. Education is a key component of opportunity.

Nobel Prize winner Amartya Sen sees individual agency, only possible where people are free, as lying at the heart of development. He argues that political freedoms, economic facilities, social opportunities, guarantees of transparency, and protective security, are necessary for development. Providing these five freedoms gives people the opportunity to be all that they can.
Creating conditions that allow each person to use his or her energy and talents to improve his or her life is what we seek in opportunity. We must enable each person to assert, confidently, the stirring words of the Victorian poet William Ernest Henley that Winston Churchill drew on in an address to the U.S. Congress in 1942, to summon courage and resolve, “I am the master of my fate; I am the captain of my soul.”

That mastery will not be certain however, not even for those in relatively privileged positions, in the next few decades. We are on the cusp of an era in which the fruits of research and development in information technology, biotechnology, nanotechnology and cognotechnology will unleash a flood of innovation, transforming the worlds of work and education, and disrupting familiar institutions, from electricity grids and systems of higher education, to representative government. The new technological revolution will bring extraordinary opportunities: established businesses and their emerging competitors will find avenues for optimisation of processes still constrained by their industrial heritage; substitution, with superior composites, of materials mined or manufactured with high inputs of human, mechanical and electrical energy; and virtualisation of many physical service offerings through digital marketing and delivery. But, as with the industrial revolution in the 19th century, not all will thrive: Individual opportunity will depend on insight, agility and resilience. Upskilling, cross-skilling and reskilling will be essential for almost all, throughout their professional lives. Societies will need to be flexible and supportive, drawing on deep reserves of social capital and cohesion.

Mobility enables opportunity. Except in the most privileged of circumstances, and often even there, young people migrate in search of
greener pastures, seeking a chance to craft their own destinies. Concentrations of knowledge and skill in places like Silicon Valley, Singapore, the UAE, and the north-eastern corridor in the United States, bring enormous benefits. Knowledge clusters encourage diffusion and cross-fertilisation of insights, driving creativity and innovation. As Bill Easterley has noted, this engenders virtuous circles and increasing returns to capital. Early adoption of maturing technologies leads to higher productivity, enabling sustained growth. Singapore, China and the UAE illustrate the success of policies designed to stimulate this.

Meanwhile, other less fortunate people are forced to flee their homes due to war or famine, in search of circumstances that permit their survival. This too reflects the link between mobility and opportunity, but it confronts us with important challenges. An exodus of skills from any environment drains opportunity from the system, as other smart, ambitious people soon see no advantage in remaining, and also abandon their homes. This engenders vicious circles in a global knowledge economy, triggering a downward spiral in the deprived location that is hard to correct, even when the crisis is resolved. Moreover, few countries are prepared for the influx of refugees triggered by political, economic or ecological crises, and many cannot contemplate absorbing tens of thousands of families from a neighbouring country, into their domestic economy and society. Even smaller numbers of refugees pose difficult challenges when their cultural origins, languages and social customs are very different to those of the new host country.

Finally, the meaning of mobility has changed in a digital era. Communication by email, sms, applications like WhatsApp, and social media, has sharply reduced letter writing and postal traffic. By the third quarter of 2014, 30 percent of all global book sales were digital, requiring no
printing, packing or shipping. In an age of multidimensional (3D and 4D) printing, and related forms of additive manufacturing, the transfer of digital intellectual property will replace much physical transport of manufactured goods. As virtual reality technologies evolve in combination with machine-to-mind technologies already in development, consumers will be able to immerse themselves in virtual experiences of distant locations, rather than travelling there physically. As concerns about environmental sustainability rise, this may become the preferred option of many. Companies anchored in transportation, travel and logistics will need to demonstrate foresight and strategic agility.

**Sustainability** – acting so that our best efforts to meet the needs of our generation do not compromise the needs of those to come – must complement mobility and opportunity in our plans for a viable future. It provides the only basis for more inclusive human prosperity in an age of continuing population growth, faster urbanisation and rising consumption. Our human population passed the seven billion mark in 2012, and ought to reach 9.2 billion (on the UN’s median projection) by 2050. We passed two billion only in 1924. Urbanisation is accelerating. In 2010, 56.5 percent of the global population of just under seven billion lived in urban areas, up from 37.2 percent in 1970. Over two-thirds of over nine billion people will live in urban environments by 2050. From 1970 to 2010, the percentage of persons living in towns and cities in Africa, Asia, Latin America, and Oceania rose from 25.5 percent to 51.8 percent. Most future urban growth will also be in low-income countries: Sub-Saharan Africa, only 35 percent urbanized (300 million residents) in 2011, may rise to 67 percent (1 billion residents) by 2050; China, about 40 percent urbanized today, may reach 73 percent by 2050; India, with under 30 percent of its population in urban environments today, could see that rise to 55 percent by 2050.
This will create extraordinary new opportunities for welfare, for investment, and for business, but one must also recognise the challenges. Sharply rising urban populations, higher vehicle use, greater energy generation, and the concentration of industries in and around cities, are key sources of greenhouse gas emissions. Although today’s cities occupy only about two percent of the earth’s landmass, they consume three-quarters of the world’s energy, and account for at least three-quarters of global pollution. Urbanisation drives up energy consumption: a one percent growth in urban population is reported to increase energy consumption by 2.2 percent. Cities also tend to be 1 - 6 °C warmer than surrounding landscapes, depending on their size, so the growing demands of urban production and consumption are dangerously accelerating the pace of climate change.

The burgeoning slums on the urban peripheries pose the greatest planning challenge. The largest agglomerations -- Mumbai (20.1m), Mexico City
(19.5 m), New Delhi (17 m), Shanghai (15.8 m), Calcutta (15.6 m), Karachi (13.1 m), Cairo (12.5 m), Manila (11.7 m), Lagos (10.6 m), and Jakarta (9.7 m) -- are in low-income countries. Many poor countries have several cities with more than 1 million residents: Pakistan has eight, Mexico twelve, China more than a hundred. Between 2010 and 2020, some 632 million economic migrants will swell the city surrounds of developing countries. Between 2000 and 2010, the number of slum dwellers in low-income countries rose from 767 million to 828 million. This might reach 889 million by 2020.

A rising global population, concentrated in urban environments, and with higher disposable incomes, will consume much more. The growing tension between a rising global population with expanding desires, and the falling stock of natural capital - groundwater, marine life, biodiversity, crop and grazing land, and a healthy atmosphere - is not sustainable. Even as business responds to the opportunities presented by rising demands for privileged lifestyles in emerging economies, we must recognise the risk of colliding with inflection points. Climate change - and its impact on the other parts of the ecosystem - may create a systemic feedback loop that threatens our survival. We must align insights, innovation, policy, and action to avert this, even as we advance our technological frontiers to seize the new opportunities.

We must de-link the economic growth we need to eradicate poverty, provide security and sustain welfare, from reliance on the incineration and emission of more carbon; and encourage humanity to distinguish human satisfaction from excessive production, accumulation, consumption and waste. The first is a significant and worthwhile technological and economic challenge; the second is more demanding.
There are reasons for optimism: China is addressing the need to reduce air and water pollution in and around its cities, and has commissioned international and national research programmes into these challenges, focused on an accelerating shift to renewable energy. Given the PRC’s ability to act swiftly once a policy has been agreed, significant breakthroughs in the deployment of renewables, carbon capture and storage (CCS), and urban planning ought to emerge rapidly. As the scale of deployment rises in China, prices are being driven downwards, making electricity from solar PV panels and wind turbines strongly competitive with grid pricing. Many new breakthroughs – in ICT (big data, ubiquitous sensors, smart grids, and mobile connectivity); and in energy and materials technologies (enabling shared, electric or fuel-cell powered, autonomous, lightweight vehicles – are creating new performance standards and important economic synergies.

Urban design and planning, premised on highways and widely distributed housing, serviced by privately-owned motor vehicles developed for individuals or nuclear families, are being radically rethought to capitalise on new approaches to more sustainable lifestyles, based on mobility as an integrated and shared system, available to each person when, and only when, it is needed. Sophisticated investors are developing new financial models, shifting capital flows behind innovative entrepreneurs and lowering the cost of capital for disruptive business models that create value and foster innovation. Large listed companies like Google, Apple, Siemens, Walmart, and the big automakers, are all racing to drive the ball downfield, and breaking the moulds that have defined their successes to date. Local governments from Asia to North America are starting to respond. But we must understand the context in which these changes are occurring. The complexity of the adaptive ecosystem in which humanity is embedded,
and of the economic and social systems that we have created, challenge our capacity to understand, model, and plan their workings. Human society is a complex adaptive system, incapable of collective control, and a core component of the bio-geosphere, a far larger and still more complex adaptive system, within whose interactions the potential for unintended consequences is enormous.

“We need to involve citizens around the world more directly in shaping our collective future.” -Sean Cleary

To meet the challenge of Creating the Future, we need to Connect Minds across the world to gain deeper insight into the challenges, and the opportunities, ahead of us; to agree how to address issues of the global commons that can only be resolved at a global level; and to align insights around how best to tackle those matters that can better be resolved differently in each locality.

But this is not enough. We also need to involve citizens around the world, more directly, in shaping our collective future. James Surowiecki has pointed out that crowds are more capable of making good decisions on many issues than experts are, if the crowds are characterised by diversity of opinion, independence and decentralisation, and if their views can be effectively aggregated, “to turn private judgments into a collective decision “. Through Expo Live, on the way to 2020, the Expo team will tap into the collective wisdom of hundreds of thousands of independent persons around the world, both to allow for the expression of their individual thoughts, and to permit effective aggregation of these insights to enable collective
decisions based on The Wisdom of Crowds.

It promises to be a remarkable journey, and I’m sure that all with a care for their lives, their children and their legacies, with wish to join Expo 2020 Dubai in undertaking it!
Three Revolutions in Innovation

Geoff Mulgan,
Chief Executive of National Endowment for Science, Technology and the Arts (Nesta)
Three Revolutions in Innovation

Geoff Mulgan,  
Chief Executive of National Endowment for Science, Technology and the Arts (Nesta)

Innovation is a key source of long-term growth. In this article, Geoff Mulgan (CBE), Chief Executive of National Endowment for Science, Technology and the Arts (Nesta), gives valuable insights into the concept of innovation and considers the merits of inclusive innovation and how events such as Expo 2020 Dubai can promote ‘innovation in innovation’.

The nature of innovation is constantly changing. Around the world new ways of generating ideas are being designed and implemented. Many firms, universities, start-ups or governments are thinking creatively about how to innovate. Another factor is the declining efficacy of the methods for innovation that worked well in previous decades.

Nesta is tracking these developments, which for shorthand we call ‘innovations in innovation’. Building on this work, in this paper we do three things: First, as context, we briefly outline the history of ‘innovations in innovation’; second, we focus in on the powerful movement towards inclusive innovation; and third we highlight examples of innovations in inclusive innovation taking place worldwide.

Twentieth Century Innovation Models

Much 20th century innovation, from transistors and integrated circuits to polycarbonate and neoprene, was driven by big laboratories and programmes funded by governments, or by big firms R&D capacities, like Bell Labs, DuPont, or Bayer. The key models of 20th century innovation policy came in particular from Germany in the late 19th century, and later from the USA. These were the models that nations all over the world tried to emulate. They
involved:
• A focus on big technologies and big science – aerospace, IT, chemicals, pharmaceuticals
• Orchestrating a science system with substantial public subsidy of upstream basic research
• Speeding up transfer from universities to business – including licensing, tech transfer, spin outs and mobilising venture capital to support these
• Publicly funded innovation agencies charged with improving the working of the innovation system – from direct subsidies for firm based innovation to support for SME adoption.
• Support through the tax system – primarily R&D tax credits and subsidy for investment

These policies continue to spread around the world as R&D spending as a share of GDP rises, and new countries adopt variants of the classic innovation model.

A growing body of evidence is now available to help governments seeking to support innovation for economic growth and social development. For instance the Nesta-Manchester University Compendium of Evidence for Innovation Policy synthesizes empirical evidence of policy effectiveness from over a thousand sources, relating to everything from R&D tax credits to innovation procurement. The newly launched OECD-World Bank Innovation Policy Platform is a practical resource collating rationales and models of innovation policy for a global audience. Nesta has also contributed to country specific knowledge, for example through its study on the Indian innovation system, and the recent study of innovation in China.

Yet the constantly changing contexts and opportunities for innovation mean these resources can only help us understand ‘what is working’; they can’t tell
us which tools are working now but are likely to stop working. And they aren’t helpful in mapping the menu of choices becoming available to innovation agencies and governments.

**Innovations in Innovation**

In every instance of national ‘catch up’ in global innovation we have seen not just an appropriation and absorption of previous technologies and models of R&D, but also new approaches to innovation. Take the striking example of Japan, whose post second world war catch up with Germany, the US and the UK did not just involve the adoption and absorption of previous models, but breakthrough organisational innovations like just-in-time manufacturing, and large-scale intra-firm innovation, which went on to revolutionise manufacturing around the world.

In recent decades, we have seen a range of other transformative innovations in innovation emerging from around the world. There is an established pattern of these developing as trends within the private sector’s leading edge, being articulated by academics and then pursued as part of growth strategy by both business consultants and policymakers. Most of these remain relatively marginal to national innovation strategies (in terms of spend and attention) but very significant in economic terms. They include:

- **Service innovation** – the recognition that rather than solely relating to technology and products, innovation also takes place in services. This can relate to innovations in designing and producing services, and organisational innovations in service firms such as those in the finance and retail.

- **Open innovation** – the growing importance, or necessity, of involving external firms as partners in a firm’s innovation process to reduce costs and drive competiveness. With recent origins in the IT industry (but a much longer history in other industries such as shipbuilding), there are now few
industries that do not use open innovation methods at some stage in the innovation process.

- **User-driven innovation** – the increasing role played by consumers and product/service users as sources of ideas and skills for the innovation process – particularly in the design, development and adaptation of new products, and now common in industries from extreme sports to fashion.
- **Design-led innovation** – the rise of companies like Apple which perform little R&D, but focus on bringing together technologies to new forms that are particularly appealing to customers.
- **Systems innovation** – where the value of an innovation can only be realised with the addition of complementary innovations, for instance the integration of manufacturing and services, or the development of technologies such as driverless cars or mobile healthcare. The transformation of waste management from landfill to recycling is a good example that has involved parallel changes in policy and regulation, business models, technology and public behaviour. This innovation method has emerged as particularly important in the areas of healthcare and energy.
- **Platform based innovation** – proprietary digital platforms associated with products, which provide an opportunity for third party commercial innovations, have revolutionised the mobile and digital services industry. For instance, while the direct contribution to profits of Apps sold in Apple’s App Store is not huge, the indirect contribution, through value added to iphone and ipad products is enormous. There are now over 300,000 Apps on Google’s competitor Android platform, which have been downloaded over ten billion times. This model is likely to spread beyond the mobile industry.
- **Frugal innovation** – ultra-low-cost, high impact innovations developed to reach underserved markets in scenarios of extreme resource constraint. These can provide the radical solutions required to address the challenges of inadequate healthcare, education, energy generation or finance for the
development of new ideas in any context. There is also growing interest in
innovations that achieve lean processes and economies of flow and frugal
innovations as part of the broader move to the circular economy in which
waste becomes fuel or a source of additional value.

**Inclusive Innovation**
One of the most striking trends globally is towards more inclusive
innovation. In many ways it is a reaction to both the ends and the means of
late 20th century innovation.

First, ends. A high proportion of public investment in innovation has been
devoted to the military (50% in most large countries) rather than to meet
public needs – to state interest rather than public interest. Meanwhile a high
proportion of private investment in innovation has been devoted more to the
needs of the rich than the poor – an inevitable result of market dynamics.
The alternative view is that innovation should be much more deliberately
directed to human needs and the needs of the relatively poor.

Second, means. Throughout much of the 20th Century, innovation was a
specialist activity, carried out in specialized locations, associated with ever-
increasing inputs designed to maximise the specifications of products and
services. In some key sectors, such as pharmaceuticals, these models have
experienced a sharp decline in the quantity and value of resulting
innovations. Yet many of the recent innovations in innovation have enabled
an ever greater range of participants in the innovation process, in an
increasingly diverse set of locations.
Inclusive innovation can be:

a) **Inclusive in process**

Innovations are inclusive in process when new technologies and methods permit a step-change in the number and type of people that can contribute to innovations that solve problems and drive productivity growth. They engage not only experts, but also tap into the brainpower of NGOs, social enterprises, startups, SMEs and citizens.

b) **Inclusive in outcome**

Innovations are inclusive in outcome when the target beneficiaries are currently underserved or disadvantaged by existing services and products, or their needs are completely unmet. This often means directing innovation much more to the needs of the poor and other disadvantaged groups.

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**A New Generation of Policies and Programmes to Support Innovation**

Many recent innovations in innovation exemplify these ideas:

- **Challenge prizes and innovation contests**

Rather than recognising past successes, this approach induces future innovation achievements. It involves defining a clear unsolved challenge or problem, and creating an infrastructure through which the widest possible range of participants can submit solutions and be judged according to a set of strict criteria. Firms have experimented with innovation contests for many
years (the $1m prize from online film company Netflix, for an algorithm to improve the accuracy of recommendations based on a user’s preferences, being one of the most studied by business strategists). Governments around the world have also been devoting increasing attention to the power of inducement prizes. Building on the success of programmes like the NASA’s Centennial challenges, the US government passed legislation to enable all departments to use prizes as a stimulus for innovation. Nesta’s Centre for Challenge Prizes is working with partners from UNDP to the European Commission to improve the effectiveness of challenge prizes as a means of supporting innovation. Our biggest prize last year was Longitude – reviving a 300 year old prize that had helped to find a way to discover a ship’s longitude at sea, a crucial step towards easing long distance travel and globalisation. A committee of top scientists identified 6 major challenges facing the world, and then with the BBC we encouraged the public to debate, and then vote on which of these should be the subject of a £10m prize. Last summer they voted for anti-microbial resistance and declining effectiveness of antibiotics as the most urgent problem, with the potential to cause millions of deaths, and the prize is now open.

Grand Challenges are also part of the innovation contests family. Funders of grand challenges identify major global problems and support the research in these areas that will have the most impact. Successful initiatives in this sphere are the Global Grand Challenges programme led by the Gates Foundation, USAID and Grand Challenges Canada, aimed at fostering innovation to solve key global health and development problems. The ‘Saving Brains’ led by Grand Challenges Canada aims at developing sustainable ways to promote and nurture healthy child and brain development in the first 1000 days at scale with lasting impact on human capital in low-resource settings. To date $33m has been invested in 76
projects and a platform to accelerate progress against this challenge.

- **Accelerators and bootcamps**
  There are thousands of different approaches around the world to supporting startups – from traditional business schools to co-working spaces and incubators. Each has their own merits, but one approach that has been proliferating in recent years, driven by entrepreneurs, and making startup support and practical entrepreneurship education widely available to excellent teams, is the bootcamp accelerator programme. Driven by the rapidly reducing cost and increasing speed with which it is possible to set up and scale a digital technology start up, these 3 month programmes combine intensive mentoring and skills development with access to a dense network of potential investors and customers. Along with the speed and intensity of the process, another key differentiator of this kind of method of innovation programme is the support of startups in batches or ‘cohorts’ – creating a valuable source of both peer pressure and peer support which many startups find crucial to the success of their venture. Techstars, the US-based programme that is one of the archetypes of this approach, has since its inception created 234 companies, which have raised an average of $1.5 million and employ over 1,536 people. Current estimates are that there are 172 programmes of this kind operating worldwide. The kind of challenge and support exhibited in these networks is also found in the thousands more ‘hack days’ and hack weekends held around the world each month.

- **Crowdsourcing and platforms for collaborative development**
  Crowdsourcing ideas & solutions (e.g. as in the Innocentive.com platform), resources (e.g. as in the Indian Government’s Open Source Drug Discovery Programme, which crowdsources effort by researchers to address the under-resourced challenge of curing TB) and funding (e.g. through crowdfunding
platforms like Kickstarter or the numerous programmes listed on Nesta’s ‘Crowding in’ directory) through online platforms is now a feature of many innovation programmes. Quality control of the solicited inputs is an ongoing challenge, but it is now possible to crowdsource not only ideas, but effort, expertise and funding, meaning the means of contributing to the innovation process is greater than ever before.

A more recent development that builds on experiences of crowdsourcing, is the emergence of new platforms for collaborative online development. Examples include Marblar, a collaborative platform for technology development that creates opportunities for people to turn patented science into new products and earn a cut of the royalties. These are still evolving fast – some early versions struggled to develop useable ideas, but more recent variants combining online and offline processes are working better.

• **Living Labs and social labs**
There are now hundreds of laboratories for social innovation around the world, using experimental methods. Some are oriented to technology, like the hundred or so Living Labs in Europe. Some focus on social challenges like the Social Labs across South America. We co-host a network of several hundred of these labs, including new ones springing up all over the world, from New Zealand and Chile to Canada and South Africa.

• **I teams**: governments around the world at national and city level are creating innovation teams within their structures – some are national (e.g. Denmark’s Mindlab, the UK’s Behavioural Insights Team, or Colombia’s Center for Social Innovation/ANSPE), and some are in cities (e.g. Seoul’s Innovation Bureau and New York’s Center for Economic Opportunity). Nesta is currently completing a study of these teams with Bloomberg
Philanthropy.

- **Open data**: the open data movement is gaining ground rapidly, with the recent Open Government Partnership, over a million public data sets, and a growing list of effective innovations, from transport and education to public budgets (and specialist teams in cities such as Mexico City and Buenos Aires). Data all sorts of uses – from transport systems to crime, and only just beginning to see how much.

- **Social innovation investment funds and incubators**: Social innovation is now receiving strong policy backing with significant public funds (US, France, Australia, UK, EU, Hong Kong); major new wholesale banks (e.g. UK Big Society Capital); several hundred social incubators; and urban programmes (e.g. Seoul, Bilbao) and an increasingly sophisticated global impact investment community. A related push is driving digital social innovation through open data and civic web platforms.

> “Connecting minds is key to the future of innovation.” -Geoff Mulgan

**Scaling Successful Examples of Inclusive Innovation**

There are many good examples of scale which include renowned ones like BRAC schools, Aravind hospital model of eye care, M-Pesa, Cola, Awaaz, Khan Academy, Nuevas Escolas and Pratham. Designed for social inclusion, many of these offer simple effective, affordable services that reach tens of millions.

To move forward, it is important to identify, replicate or scale successful examples of inclusive innovation that have the power to drive economic
growth and address social challenges. As innovation continues to grow we need to look out for new examples from across the globe and to monitor progress. We need to examine what is effective and find ways of scaling up and supporting good approaches from many different national and organisational sources. This can be supported through creating a ‘living map’ which can be a valuable resource of information and case study of inclusive innovation across the planet, or by connecting minds through a global hub and peer network which stimulates and supports innovation.

Connecting minds is key to the future of innovation. What is still unclear is which places in the world will be content to just copy the successes of the past, and which will be the true pioneers that shape tomorrow.
The Dubai World Expo: Connecting the World through Public Diplomacy

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Public diplomacy is a key mechanism through which nations foster mutual understanding and productive relationships. Expo 2020 Dubai, the first in the Middle East, Africa and South Asia (MEASA), will prove significant both domestically and internationally. In this article Professor Jay Wang, Associate Professor at USC Annenberg School for Communication and Journalism and Director of the USD Centre on Public Diplomacy at the Annenberg School, considers how through the theme of Connecting Minds, Creating the Future, public diplomacy at the Dubai Expo will take place in a multilateral and globalised context. This will leave a transformative legacy for generations to come.

The World Expo is a grand stage where countries gather together to showcase technological innovations and national cultures to the broader society. The event can be traced back to 1851, when London hosted the “Great Exhibition of the Works of Industry of All Nations.” Over the years, the Expo has undergone many changes, but its enduring relevance and significance is in evidence as emerging countries are making great strides in the expanding the Expo movement in recent times. The 2010 Shanghai Expo, the largest in Expo history, and the 2020 Dubai Expo, expected to be the most international ever, offer prime examples of the convergence of soft power and the mega-event, and why this historical institution still matters.

Soft Power and the Mega-Event
For most participant countries the World Expo remains the single largest promotional event of a nation outside of its own borders. As a nation’s
image is increasingly viewed as a strategic asset in the conduct of international relations, nations are eager to raise and maximise their profile on the world stage. The World Expo provides a mega platform of such soft-power cultivation and projection.

While the Expo is multifaceted, with a widening array of players and stakeholders from cities and trans-national organisations to businesses and non-government entities, nations and their pavilions remain its central feature and the participation of the general public a core mission. The event facilitates cultural transfer and transformation as countries bring their cultures into direct contact with foreign publics. This aspect of the Expo is particularly poignant in light of the rising global middle class. The Shanghai Expo attracted 190 participant countries with a record-setting 73 million visitors. The 2015 Milan Expo is featuring exhibitions by more than 140 countries and is already attracting millions of visitors.

The Expo also constitutes a unique global communal moment. Unlike other mega-events such as the Olympics or the FIFA World Cup, the Expo is not a “media event,” an event primarily experienced through media broadcasts. The spectacle of the Expo is to be sensed and experienced by “being there” as a pedestrian on the park grounds and by being immersed inside the pavilion spaces. It embodies an elemental form of human communication through physical movement. As we increasingly live in a digital universe, such physical presence and multi-sensory experience seem to have become more compelling and sought after.

Moreover, the Expo is not only to be experienced, but also remembered. As it is a concentrated temporal social occurrence, the outsized event rivets visitors’ attention and fascination. Brief as the Expo experience is, one’s
impression of it can be long-lasting.

**The World Expo as Public Diplomacy**

A global mass cultural phenomenon notwithstanding, the World Expo is a venue for public diplomacy. This point requires some elaboration. First, public diplomacy broadly refers to a nation’s engagement with its foreign publics for better communication and desired relationship. It expands beyond traditional diplomacy which is based on “government-to-government” and “diplomat-to-diplomat” interactions. It moves international relations from the corridors of power onto Main Street, so to speak. In this context “public” encompasses three aspects: communication addressed toward the public in other countries; the process of communication conducted openly; and multitude publics partaking in the process. In short, public diplomacy is a key mechanism through which nations foster mutual understanding and productive relationships.

Like other mega-events, the World Expo helps to cast a spotlight on the host nation. It is one of the few global platforms where the host nation can assert itself on the world stage. Besides the prestige associated with hosting the event, it also provides opportunities for participant countries to project their image and identities to a wider global audience through national pavilions. Spearheaded by national governments, the efforts of participant countries at the World Expo are meant to engage and impress visitors. While the Expo experience is by and large leisurely, national pavilions are normative spaces, for they engage a foreign public in the country’s ideas and ideals.

“**Expo 2020 Dubai will represent a global communal moment.**” -Professor Jay Wang
The World Expo represents a locale of “low politics” in the arena of global relations. The event is by design more celebratory than reflective, cooperative rather than oppositional. Nations engage with a mass foreign audience through the spaces of national pavilions, not to communicate about their nations’ policies per se but to build awareness and understanding. Such national promotion also takes place in the context of cosmopolitanism. The Expo ground is a competitive zone, with every nation trying to present the best of itself to the world. But it is a “conflict-free” space, without any country asserting national and cultural superiority.

Furthermore, the World Expo embodies trends and developments in the evolving field of public diplomacy. Indeed the event reflects the underlying landscape of global political economy. The shifting dynamics in international relations belies the Expo’s history, from the days of Western colonialism and imperial outreach, to the bipolar world of the Cold War, to a more distributed world order in contemporary times.

The general goals of public diplomacy encompass the broad, inter-related objectives of promoting a nation’s policies and priorities, communicating about its ideas and values, and building common understanding. While these basic goals remain unchanged over the years, the practice of public diplomacy has evolved and expanded. There are at least six notable developments. First, public diplomacy not only takes the forms of monologue and dialogue, for it now also includes collaborative efforts and partnership models between nations to build understanding and trust. Public diplomacy is increasingly viewed as a reciprocal process as opposed to merely a unidirectional endeavor. Another important development in public diplomacy is the growing need to situate the effort in a multilateral context
rather than a bi-national one, reflecting a more fluid, distributed contemporary international system. In addition, there has been the diversification of actors in a nation’s public diplomacy process, including non-government institutions and the private sector. Their involvement in turn brings new sets of practices to public diplomacy. The communication task which underlies public diplomacy work is getting far more challenging, given the crowded, fractured and transparent information environment we now live in. Contemporary public diplomacy therefore demands strategic, integrated communication approaches that are compelling in content, style and placement. Last but not least, there is a stronger emphasis on accountability in public diplomacy efforts; that is defining and assessing the effectiveness and efficiency of public diplomacy programmes. We see all these trends germane to the field of public diplomacy unfold in the context of the World Expo, and more specifically, the Dubai Expo.

**Expo 2020 Dubai and the Future of Public Diplomacy**

The United Arab Emirates has rapidly transformed itself over the past decades into a regional business hub and emerged as a regional soft-power state. It has witnessed breakneck growth as a stable, wealthy state in a volatile region. Dubai’s hosting of the 2020 World Expo, the first in the Middle East, Africa and South Asia (MEASA), will prove significant both domestically and internationally.

The city-state exemplifies the dramatic rise of a modern, global metropolis. The World Expo will undoubtedly deliver a “feel good” moment to the people of Dubai and, more important, provide a unifying identity, given its very diverse and international population. The Expo 2020 Dubai is also set to be the most global event not only in terms of participant countries but also visitors, with 70% of them projected to be international. To give some
comparative perspective: The vast majority of the visitors at the Shanghai Expo were mainland Chinese; and for the upcoming Milan World Expo, more than half of the visitors will be domestic. In this regard, the Dubai Expo will represent a global communal moment, unprecedented in Expo history.

Such visitor composition owes much to Dubai’s location at a global crossroads and the emergence of an ever more mobile global middle class. As a world city, Dubai embodies the idea of connectedness as expressed in the Expo theme, *Connecting Minds, Creating the Future*. Public diplomacy at Expo 2020 Dubai will take place in a multilateral and globalised context.

Expo 2020 Dubai highlights partnership and public diplomacy

The Expo 2020 Dubai also broadens the Expo paradigm by highlighting partnership as a crucial engagement model. As noted above, public diplomacy takes a variety of forms, with the projection of one’s national image as the most familiar one. The Dubai Expo, through its Expo Live project, embraces the practices of collaboration and partnership. Such an approach will enable the creation of a shared space and a shared experience between peoples and cultures.
Research and anecdotal evidence have shown that the experiences created by Expo pavilions are meaningful and memorable for visitors when done well, and can even be transformational. This is especially important for the young people who visit the Expo. Their Expo experience takes place at the height of their cognitive and memory capacity. So the potential of the Expo in shaping the younger generation’s global imagination cannot be underestimated. The demographic trends in the MEASA region suggest a younger population in the coming decades. How to engage our younger generation through the World Expo as well as broader public diplomacy efforts is vitally important for the region and beyond.
An Eye for Opportunities

His Excellency Abdullah Nasser Lootah,
Secretary General of the Emirates Competitiveness Council (ECC)
An Eye for Opportunities

*His Excellency Abdullah Nasser Lootah,*
Secretary General of the Emirates Competitiveness Council (ECC)

HE Abdullah Nasser Lootah is Secretary General of the Emirates Competitiveness Council (ECC). In this article he shares insights into how the UAE is seeking opportunities in new realms, and ensuring that the country’s collective ambitions and dreams have the opportunity to prosper for generations to come.

In 2020, Dubai will host the first World Expo in the Gulf region. The Expo represents a tremendous opportunity, not just for the United Arab Emirates (UAE), but indeed for the greater Middle East African and South Asian (MEASA) region. It is expected that the Expo will draw 25 million visits and generate over 277,000 jobs in the UAE while serving as a catalyst for longer-term national development. It is befitting therefore, that one of the event’s subthemes is *Opportunity.*

Beyond this unique mega event, the UAE’s approach to national development epitomises the ‘Opportunity’ subtheme and addresses in a very original manner the question that policy leaders face: “In our rapidly changing world how are we unlocking new possibilities for people and communities to become successful?” Through the lens of national competitiveness, we explore how the UAE has put in place a framework of national development characterised by boldly creating opportunities where none existed before. In so doing, the UAE has clearly demonstrated that opportunities lie in the eye of the beholder, and that these can be realised through an enabling policy framework.
Port Rashid — A Watershed Moment

His Highness Sheikh Rashid bin Saeed Al Maktoum, founder and then-ruler of Dubai, in 1972 - just a year after the UAE was established - opened a man-made, commercial port, Port Rashid. Sheikh Rashid had envisioned that a commercial port could transform Dubai from a small pearl diving and fishing outpost into an important trade hub.

There were significant challenges to developing a port as a natural deep harbour was required for the safe passage of ships, but one did not exist. It would have to be created at substantial cost, by dredging the Shindaga Shoreline. Several advisors warned against the project which they believed would land the emirate into deep debt. Some consultants even sought to be hired to conduct a feasibility study to prove that it wouldn’t be viable. Despite their skepticism, Sheikh Rashid held firm to his convictions that a port, through the increased flow of people, goods, and ideas, would yeild numerous social and economic opportunities for the young country. So, confident that Dubai’s strategic position had enormous potential, he assumed the risk, secured financing for the project and forged ahead with his plans to build a port.

Ocean going ships were immediately attracted to the new port and its unrivalled diligence and quality of service in the region, with its globally strategic position at the crossroads of Asia, Africa and Europe. In time, it established as an important hub for travel and trade.

Port Rashid soon outgrew its capacity and given its success, the Sheikh sought to supplement it with another port—Jebel Ali Port. This second, much larger port still stands as the world’s largest man-made harbour and the biggest container port in the Middle East. Its size and technical capacity
to handle large containers and vessels made it a model port for the industry and the region.

The port has assumed a vital role in serving global trade as the world’s ninth largest container port. The port is located in the Jebel Ali free zone which currently houses more than 7,000 companies in a variety of sectors. Today the UAE ranks 8 out of 183 countries for ‘Ease of Trading Across Borders’ in the World Bank Doing Business Report. Additionally, it provides market access to over 2 billion people and plays a vital role in the UAE economy.

True to Sheikh Rashid’s vision, the ports paved the way to strengthen the country’s strategic geographic location, and allowed for major developments ultimately leading to the modern metropolis of Dubai. The city is a gateway to the UAE - a country in which 200 nationalities live, work and seek opportunities.

**Opportunity — A Modus Operandi**

The construction of Port Rashid and Jebel Ali Port exemplifies the modus operandi of the way UAE has developed over the past four decades. The country’s leadership has demonstrated an eye for creating socio-economic opportunities where none existed. Typically this is accompanied by swift decision-making and implementation of visionary and inspiring projects, as well as long-term considerations for the country’s development.

One project that demonstrates these traits is Burj Khalifa, the world’s tallest man-made structure. The Burj is centerpiece of a large-scale, mixed-use development initiative that includes several thousand homes, hotels and leisure spaces, and has drawn international attention, and attracted FDI (Foreign Direct Investment) Burj Khalifa has established itself as one of
Dubai’s main tourist attractions - in the same league as the Eiffel Tower, the Statue of Liberty and the Sydney Opera House and helped surrounding hotels boost business in the downtown district. The filming of the scenes for the movie Mission Impossible IV only increased the building’s cachet. Similarly, the captivating Palm Jumeirah Island development was formed by reclaiming land on the coast of Dubai creating one of the world’s largest artificial archipelagos. The palm tree shaped development complex hosts residential, leisure and entertainment centers and several hundred kilometres of beaches.

The Palm Jumeirah

Iconic projects are but a small, if dramatic part of a much larger drive to create long-term opportunity in the UAE. Over the past four decades the UAE has achieved remarkable political stability led by a government with a bold vision for the country’s leveraging of opportunities for its future economic development and prosperity. The UAE has emerged as one of the most economically prosperous nations in the world with a GDP per capital of USD 44,770 in 2014 and high living standards, earning a place among the world’s most competitive countries. The UAE Ranked 12th out of 144
countries for overall competitiveness by the Global Competitiveness Report 2014-2015 of the World Economic Forum and 8th in the World Competitiveness Yearbook 2014 of the IMD. It has continued to grow to become one of the largest economies in the Middle East, thanks to a bold diversification strategy to reduce independence on hydrocarbons.

In its quest for fostering opportunities, the UAE’s leadership has carved out a model of a modern and progressive nation underpinned by an indomitable spirit. Today, H.H. Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE, and H.H Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai, perpetuate the forward-thinking vision of the founding fathers of the UAE. They, along with the rulers of the other emirates, Sharjah, Ajman, Umm al Quwain, Ras Al Khaimah and Fujairah have actively endeavoured to ensure that a proper framework of institutions and policies is established to unlock the greatest potential is from the nation’s resources.

The leadership’s efforts led to the UAE being recognised globally for its iconic projects, forward-leaning cities and emirates, enabling business environment, high value-added businesses and industries, and dynamic culture that values openness, diversity and social cohesion, in lieu of what would have been otherwise a barren desert. The population acknowledges the government efforts to provide a safe and stable environment, conducive to better economic performance and higher prosperity. In 2015 the UAE topped the world with 85% trust index, in the Edelman Trust Barometer. With regards to well-being and happiness, the country ranked the 14th happiest nation in the 2013 World Happiness Report, published by the Earth Institute, Columbia University.
Ecosystems for Opportunities and the Role of Government

The way societies leverage opportunities and resources is determined by a variety of factors. Along with values, they include the history, culture, socioeconomic development, policies and government institutions, of those societies. These complex elements come together as the core components of an “ecosystem for opportunities.” In such ecosystems government plays an indispensable role in providing the regulatory framework, institutions and policies that create the powerful catalysts for people and businesses to succeed. When such ecosystems function well, people and productive resources are capable of sustaining economic growth and prosperity. In this regard, the UAE government has provided a common framework to support the nation’s development as a destination of opportunity.

The drive for creating opportunities is closely linked to the idea of competitiveness. The Emirates Competitiveness Council (ECC) is a UAE federal government entity acting as an advisory body mandated to drive the country’s competitiveness agenda. This mandate is closely linked to ensuring opportunities for resources to be used in the most productive way and should translate into policies for better living standards for a sense of well-being, happiness and prosperity of the people. The organisation coordinates government efforts at the federal and local levels with that of the private sector, towards establishing the UAE among the most competitive nations in the world.

As such, the ECC views the role of government in general, and competitiveness stakeholders in particular, as being key to creating an environment that is conducive to enabling individuals and corporations to reaching their full potential. This includes the spheres of education; the business environment, enabling the movement of goods and services; and
providing a fertile context in which creativity and innovation can thrive to propel the nation forward.

**Vision-Driven Policy**

A fundamental component of the ecosystem for opportunity is the policy framework which sets the tone to guide policymakers in their endeavours. Sheikh Mohammed bin Rashid Al Maktoum has articulated the UAE Vision 2021—an ambitious blueprint for the country to unleash its potential, to become “among the best countries in the world” by 2021—the nation’s Golden Jubilee Year. The vision lays a clear path for the next stage of UAE’s economic and social development as a knowledge-based, higher value-added economy that seeks to create opportunities for the future. It seeks to do so as a cohesive, resilient economy, bounded by its identity, with the highest standards of living in a nurturing and sustainable environment. The framework underscores the fact that the people of the UAE are at the core of development. At the emirate-level the documents cascade into the Abu Dhabi Vision 2030 and Dubai Plan 2021.

Towards achieving the UAE Vision 2021, the leadership has launched a seven year UAE National Agenda with specific performance targets. Performance indicators are specified in the sectors of national priority—education, healthcare, economy, police and security, housing, infrastructure and government services. This agenda is coupled with an initiative for federal ministries and government entities to achieve the top international ranking in an indicator within their remit. Together these policy instruments ensure that the entire country is moving in lockstep to meet the ambitious national goals. The clearly defined, goal-oriented support for specific outcomes is expected to yield even greater opportunities for development within the UAE.
**Unleashing Economic Opportunities through Openness**

One of the early priorities of the country’s leadership was to create an environment conducive to operating businesses, promoting trade and attracting investment and talent. This has been supported through investments in world class infrastructure—roads, sea and air and modern communications networks. Additionally the country has sought to diversify its economy beyond oil and gas and create the conditions necessary for a robust private sector to thrive from trade and support growth. By focusing on service sectors such as service industry, including logistics, tourism, and financial services to diversify its economy, the UAE has created a system where each of these sectors reinforces the others, cementing the country’s competitive advantages in these industries. The policy direction has led to the development of an enabling financial, technological, legislative infrastructure. In so doing, it has created among the world’s leading places to do business.

Making it easier to do business provides a tremendous boost to individual initiative and is being seen as an important vehicle for youth entrepreneurship, and the growing number of women’s businesses. This is significant in a country where small and medium-size enterprises employ 90% of the workforce.

One of the most attractive features of the UAE’s business environment include a transparent and efficient regulatory process which has been vital for increased business activity and growth across the country. Businesses in the UAE are not subject to direct taxes on corporate profits or personal income and foreign investors can avail of 100% repatriation of capital and profits. There are no foreign exchange controls, trade quotas or barriers. There are over 20 free zones in the UAE which offer tax free and customs
duty free benefits to expatriate investors. Liberal visa policies and flexible immigration rules permit easy import of expatriate talent of various skill levels from almost anywhere in the world.

Between 2009 to 2015 business environment reforms have led to significant improvements in performance in the World Bank’s Doing Business Report. The country jumped from 47th in 2009 to 22nd in 2015. Additionally the county has been ranked among the world’s top 10 Business Environment Reformers, in 2010 and in 2015.

UAE’s Performance in World Bank’s Doing Business Report

Unleashing the Power of Human Capital
Another key feature in UAE’s ecosystem for opportunities is its focus on developing the country’s human capital. The UAE’s vision is to ensure the younger generation is given every opportunity to advance its knowledge-based economy. Education remains a key component of the government’s policy, with continued investments towards fortifying its position as a leading knowledge-based economy of the 21st century, and has put in place several policies, procedures and institutions towards this goal.
In its quest to provide an unparalleled education for its citizens, and to attract the brightest minds, the UAE has developed tertiary educational institutions to cultivate the expertise needed to catalyse its progress. The system provides universal, free access to higher education for all citizens. Students have access to courses across the educational spectrum—in the arts, the sciences, humanities and business studies, from vocational training to graduate degrees focused on developing critical thinkers and positive change agents. The post secondary system has made enormous strides since its inception in 1976, keeping pace with trends in global education, best-practices, and international standards, while establishing strong collaborations with leading institutions of higher learning from around the world.

The 2014 Asda’a Burson-Marsteller Arab Youth Survey which polls Arab Youth from across the region showed that UAE nationals ranked the highest out of all 16 countries in terms of optimism about the future of their country. Young Emiratis are also most confident about their future prospects with half (50%) believing they have more opportunities now than they did a year ago.

There are a plethora of academic institutions which have recently attracted international attention and include: International campuses of New York University and Sorbonne in Abu Dhabi; Dubai Knowledge Village; Dubai International Academic City; Healthcare City; and Dubai International Financial Center, University City in Sharjah; and Academy Zone in Ras al Khaimah. Through these partnerships with leading institutions the UAE is building a critical mass of national and international actors—including students, institutions, companies, knowledge industries, science and technology centers—who engage in education, training, knowledge production, and innovation.
Today, the UAE is among the largest hosts of transnational education in the world with more than 37 international institutions of higher learning within its borders. At a time when global knowledge and talent is at a premium, being a centre of trans-national education provides the UAE with the significant opportunities and competitiveness potential for attracting the brightest minds— faculty and students—from within the country and from overseas, to participate in shaping an innovation-driven economy.

The country’s educational strategy has yielded unprecedented opportunities, attracting youth from around the UAE and the region who build their capacities as intellectuals, entrepreneurs, biologists, doctors, lawyers, chemists, engineers, sustainability specialists. These institutions are providing the next generation of students with skills to generate value in the economy. They are also being equipped with tools towards addressing regional and global challenges. Perhaps one of the most remarkable achievements of tertiary education in the country is the higher education attainment by women, which is among the highest in the world.

Finally, as a cornerstone for building the capacity of its brightest minds, every year the UAE government offers generous scholarships for students to study at the world’s leading universities and research institutions. These scholarships enable high achieving students from diverse academic backgrounds to tap into the world’s lead thinkers, create dynamic research projects, and identifying solutions to pressing regional and global challenges. In 2012 the Ministry of Higher Education and Scientific Research provided scholarships to 366 UAE national students to study in 20 countries, at a budget of several million dollars.
Reaching for the Stars

The UAE’s leadership has demonstrated its success in creating opportunities where common wisdom might have dictated a different course of action. This vision driven leadership has become a hallmark of the country’s development policy approach, ultimately becoming part of soul of the country. The pursuit of opportunities has helped attract entrepreneurs and talent from within the country and around the world, who are cognizant of the miracles possible through pursuing opportunities within an enabling policy framework. With a penchant for the big picture, the UAE leadership continues to seek opportunities well into the future. By articulating a national innovation strategy, naming 2015 the Year of Innovation, and investing heavily in it, the country is charting a course for on-going intensive growth. The innovation strategy will focus on seven sectors - renewable energy, transport, education, health, technology, water and space. Powered by innovation and the discovery of ever better ways to leverage its human capital and productive resources, the country envisions that such growth will allow for continuous improvement in incomes and social well-being, helping to shape the future of the nation’s opportunities. In 2014, the government launched the Mohammed bin Rashid Centre for Government Innovation at the Emirates Towers, Dubai, to spur creativity, and put in place the structure and procedures to spur innovation across the national workforce.

The county’s large-scale investment in innovation, science and technology, also intends to find solutions for the betterment of people’s lives globally. For instance the Zayed Future Energy Prize, is awarded for innovative solutions towards meeting challenges of global climate change, energy security and the environment. At US$4 million, it is the largest such prize of
its kind.

More recently launched International Council on Artificial Intelligence and Robotics (iCAIR) seeks the best way to use robotics and artificial intelligence to improve people’s lives, including the creation of educational materials and a global action plan. The first initiative of the Council will be the UAE “Robots for Good” Award. The goal of the award is to encourage research and application of innovative solutions to challenges in three areas: health, education, and social services. This award follows in the heels of the successful UAE “Drones for Good” Award, US$1 million award for best use of civilian drones for improving people’s lives.

As part of the larger drive to promote scientific innovation, the country also launched the Emirates Institution for Advanced Science and Technology (EIAST), with an emphasis on space technology and promoting sustainable development. By pushing the boundaries of science and technology UAE’s space programme, and its R&D agenda, the country’s economy seeks to be further diversified into future-oriented fields. A mission to Mars, for instance, would promote a focus on making breakthroughs in the development of new technologies. It could usher in a new era of a generation of Emirati students pursuing courses in space science, aerospace engineering and the sciences, including the energy industry, medical research and technological entrepreneurs. This in turn would open the door for a space industry, new research bodies and entrepreneur ship. The initiative could potentially lead to the development of new clusters and spawn intellectual property in a host of areas related to space sciences and position the UAE as a key actor in strategically important areas of science, technology and sustainability.
By reaching for the stars the UAE is seeking opportunities in new realms, and ensuring that the country’s collective ambitions and dreams have the opportunity to prosper for generations to come.

“Expo 2020 Dubai represents a tremendous opportunity not just for the UAE, but indeed for the greater MEASA region.” - Abdullah Nasser Lootah

About the ECC
The Emirates Competitiveness Council (ECC) is a UAE federal government organisation mandated to further the UAE’s global competitiveness in line with UAE’s Vision 2021 to make the UAE a leading country in the world. The ECC serves as a center of excellence for policy research and analysis. It also serves as a conduit between the public and private sectors to advocate for policies with federal and local government to enhance the nation’s productivity and well-being. ECC’s partnership with the public and private sectors is vital to the UAE’s globally competitive position and to sustaining the future prosperity of the nation.
Knowledge and Human (Happiness) Development

Authority: learning, connecting, taking notice, being active, giving

Dr Abdulla Karam,
Chairman of the Board of Directors and Director General of the Knowledge and Human Development Authority (KHDA)
Knowledge and Human (Happiness) Development

Authority: learning, connecting, taking notice, being active, giving

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Education is a key enabler and opens the doors of opportunity both socially and economically. In this article Dr Abdulla Karam, Chairman of the Board of Directors and Director General of the Knowledge and Human Development Authority (KHDA), shares a positive approach in connecting minds across the education community in Dubai.

“Good governance is about nothing more or less than creating happiness. It really is that simple.”

- Sheikh Mohammed bin Rashid Al Maktoum, Flashes of Thought

The residents of Dubai are as diverse as their breadth of experience is rich. The city’s location as a gateway to the world cultivates a multi-cultural environment that both attracts and creates innovative global citizens. Responsible for private education in Dubai, the ethos of the Knowledge and Human Development Authority (KHDA) is in total harmony with the Expo2020 theme of Connecting Minds, Creating the Future. As a government authority, we connect the minds of the education community - educators, parents, students, investors and community partners - to come together for a common goal, convening them to engage in conversation that will create the future of Dubai.

You’re Happy, We’re Happy, Everybody’s Happy

Paying tribute to Sheikh Khalifa bin Zayed Al Nahyan’s 10-year anniversary as President of the UAE, Ruler of Dubai Sheikh Mohammed bin Rashid Al
Maktoum said “...his influence cannot be measured by statistics, but by the amount of happiness he has infused into people’s hearts.”

Inspired by this, we at KHDA measure our success not just by statistics, but by the happiness we share and create with Dubai’s education community.

Happiness is a subject we take seriously. Research has shown that happy people are more creative and innovative, they are more willing to take risks and are more likely to learn positive lessons from failure. Happy people also make others around them happier, they are more resilient, productive and work better in teams. When it comes to education, we know that happy teachers teach better, happy students learn and retain information more effectively, and happy parents engage more with their children.

In short, we want to be happy, we want our partners in the education community to be happy, and we want Dubai to be happy. A mother once visited KHDA with her young son. She had driven down Sheikh Zayed Road in heavy traffic and arrived frazzled. Her son, however, seemed exuberant. “He loves driving down Sheikh Zayed Road,” she explained. “When I’m stressing about the traffic, he’s craning his head trying to spot Spiderman in between the buildings.” Our aim, perhaps, is to create a community that looks for Spiderman a little more often.

In June 2014, KHDA took part in its first ‘Happiness Survey’, replacing the Employee Engagement and Employee Satisfaction surveys. A series of evidence-based questions assessed team members’ happiness according to how empowered they felt to make change, their home environment, their work environment and their resilience. After completing the survey, KHDA colleagues were given their personal happiness score, as well as results from
individual departments and the organisation as a whole.

Following the Happiness Survey, ‘Happiness Jams’ for individuals, teams and line managers were conducted. The Jams took the form of design-thinking sessions that helped colleagues to plan a happiness strategy ‘from the outside in,’ with the goal of empowering them to take responsibility for their own happiness.

Motivated by the work of the New Economics Foundation in the UK, KHDA adopted the ‘5 Ways to Wellbeing’ – evidence-based practices for increasing happiness. Centred on learning, connecting with each other, being active, taking notice of the world around us and giving, these 5 Ways have transformed the internal culture at KHDA and directed how we interact with our communities.

The 5 Ways of Wellbeing have given us the framework and language to talk about happiness. The last time KHDA colleague Majed last read a book, for
example, was at school 10 years ago. Inspired to ‘keep learning,’ he vowed to read one novel a month. Nine months and nine novels later, he says he feels calmer and happier in general, even when he’s not reading.

Rather than surf the Internet to catch up on gossip when she needs a break, KHDA team member Maryam now walks around the office and stops to chat at colleagues’ desks. These quick, informal catch-ups allow her to ‘connect’ with team members she doesn’t often speak to, and make her feel a greater sense of belonging.

Following the internal launch of 5 Ways to Wellbeing and its related activities, a second Happiness Survey was conducted in December 2014, showing significantly improved results on both an individual and organisational level.

Supported by our experiences and the stories of our colleagues, we know that happiness works. Using our authority to convene, our responsibility becomes to contribute to yet more happiness – in our education community, in Dubai, and around the world.

**Happy to Have Choices**
Last August, Kalthoom’s daughter Aisha turned five, and it was time for Kalthoom to decide on a school.

Like her mother before her, Kalthoom went to the local neighbourhood school. Unlike her mother, Kalthoom had to think much more carefully about which school to send her daughter. Would Aisha benefit more from an English-language or Arabic-language school? Would British or American education better suit her? Would she enjoy going to school with students
from many different nationalities, or one with a more homogenous student body? Did Kalthoom want her daughter to attend a co-educational school? What was more important – the quality of pastoral care at the school, or its academic performance, or both?

Now, more than ever in Dubai’s history, parents have choice when deciding on a school for their children. Since KHDA was first established in 2007, the number of private schools has risen from 136 to 169. Between them, these schools offer 16 different curricula, including the Indian, US, International Baccalaureate, UAE Ministry of Education, French, German, Iranian, Canadian, and Japanese, just to name a few. Their 255,000 students are from 186 different nationalities, making Dubai’s education sector one of the most diverse in the world. Today, 90% of all education in Dubai takes place in the private sector, and 57% of Emiratis like Kalthoom, choose private education.

In 2007, there was little detailed information available about private schools in Dubai. To find out how many schools there were at that time, KHDA referred to the power and water bills sent out to businesses which classified themselves as schools.

When she is asked about the experience of choosing her daughter’s school, Kalthoom recalls the main challenge was deciding what she wanted for her daughter, not in accessing the information she needed. In 2007, Kalthoom would have found not data, but darkness.

Today, KHDA has ‘switched on the lights’. It reports annually on key data on Dubai’s private schools and universities - student enrolment growth rates, curricula, students, teachers, parents, principals and school capacity rates, for example. This data is crucial for connecting researchers, policy-makers, investors, journalists and parents, and allowing them to participate in the
conversation around Dubai’s growing private education sector.

Beyond the school curriculum or its language of instruction, there was one crucial question Kalthoom needed to answer before choosing a school for Aisha: how good is the quality of education at this school?

In 2008, KHDA established the Dubai Schools Inspections Bureau (DSIB). From its very first year, DSIB shone a light on the quality of education in Dubai by inspecting schools, and making the results public. In doing so, it provided an essential tool to help parents choose a school for their children, made schools accountable to parents, and created a shared language that enabled the education community to talk about quality.

By September, Kalthoom had chosen a US-curriculum girls’ school with a ‘good’ rating for her daughter; a school with a diverse but mainly Arabic-speaking student body. This, she learned, was not an unusual choice.

In 2009, KHDA published the first of its ‘In Search of Good Education’ research reports, examining the reasons Emirati parents choose private education for their children. KHDA has published 12 research reports and studies since 2008, on topics such as early childhood education, making higher education choices in Dubai, how children and teachers use technology in the classroom, and the evolving relationship between government and the private sector.
Higher Education in Dubai

KHDA sees research as an integral part of its work – forming the basis of knowledge-sharing and policy-making, and helping to connect a community of policy-makers and educators around topics of importance to Dubai.

A World of Opportunity
Khalid is a business development manager working in Dubai. He graduated from university in his home country of Jordan more than ten years ago, and has recently started a part-time MBA at a British business school in Dubai.
He attends evening classes, so is able to continue his career while building his prospects. He plans to study at his university’s home campus for six weeks during his annual leave.

Raj was born in Dubai and completed his schooling there. In September, he’ll be starting his tertiary studies at an Indian university in Dubai. Unlike some of his friends who have chosen to study in India, he does not feel ready to leave the city he calls home, and is confident about the quality of education he will receive.

Catherine began her business degree at Heriot-Watt University, in her home town of Edinburgh. After her second year, she opted to complete her studies at Heriot-Watt’s Dubai campus. Five years later, she has graduated and is now working at a multinational company in Dubai.

The story of Dubai’s higher education sector is the story of Raj, of Khalid, of Catherine, and thousands more like them—students of all nationalities living in Dubai, or coming to Dubai especially to study. Dubai’s strategic location, in the heart of the Middle East and close to the Indian subcontinent and Africa, makes it an attractive destination for students who want a world-class higher education near their home countries, and for students from further afield enticed by a new experience. Its growing economy, offering graduates a variety of career opportunities, is a further pull.

Since the 2013/14 academic year, student private university enrolment in Dubai has grown by 19%. Today, 24,000 students are enrolled in 26 international branch campuses offering internationally accredited education from 10 countries, including the UK, the US, Australia, France, India, Russia and Lebanon. These campuses offer hundreds of programmes from Bachelor
to Doctorate level in a variety of specialisations, including business, law, media and engineering.

International branch campuses in Dubai’s free zones are licensed and quality assured by KHDA. Its mandate for this sector is simple: allow only accredited universities with recognised programmes to open a campus in Dubai; and make sure that all higher education students receive a high quality education.

To achieve this goal, KHDA set up the University Quality Assurance International Board (UQAIB) in 2008. Comprising a group of quality assurance and higher education experts from around the world, the Board meets regularly to vet applications from institutions wishing to offer degrees in Dubai, and to ensure that the programmes on offer by existing institutions are of the same high quality as those taught in the home campuses.

As a result of UQAIB’s work in improving quality in higher education, the Government of Dubai passed Law 21 in 2012, allowing students like Khalid, Raj and Catherine to have their degrees attested by KHDA, and guaranteeing that this degree will be recognised by the public and private sectors in Dubai.

As Dubai’s economy continues to grow and diversify, KHDA will continue to look for higher education providers able to produce the graduates which can meet its needs.

**Let’s Share What Works, and Make More of It**

“I’m so happy to come here and meet so many teachers and talk about what’s going well. I picked up so many good ideas that I can take back and use and share.” – teacher attending What Works.
At the KHDA office in April 2012, two school principals bumped into each other – one coming in for a meeting, the other leaving. What was a quick stop to say hello turned into a 20-minute conversation that ended with a plan to visit each other’s schools. From that simple encounter, What Works – a movement of positive practice that has transformed education in Dubai - was born.

The two principals could clearly see what four years of inspections data had proved - that to find examples of world-class education, educators in Dubai didn’t have to look far. Every day, in classrooms across the city, exceptional teaching and learning was taking place. All that was left to do was share it.

The first event of the What Works movement took place at the beginning of the 2012/13 academic year. Five hundred teachers attended workshops delivered by their colleagues at other Dubai schools, sharing what they do best. Students from different schools showcased their latest projects, while inspirational Emirati speakers shared their uplifting stories.

Three years later, more than 8,000 teachers have attended 18 What Works events focusing on topics such as Maths, Science, Literacy, Creativity and Entrepreneurship, to name a few. No matter how many times teachers attend What Works, they are still delighted at the energy and colour that welcome them when they walk into the venue. As they take note of their surroundings, they recognise and greet teachers from other schools and stop to talk to students about the projects they’re displaying. Many teachers will go and speak to a What Works exhibitor – a community organisation with specific initiatives for schools – and come away with new ideas to put into practice the next day.
What Works has proven that it is collaboration, not competition, which has the power to transform education. By sharing positive practice already happening in Dubai, What Works ensures that quality improvement of all schools is sustainable and enjoyable.

It’s a laughing matter. Teachers at What Works

The Road we are Travelling

In 2008, the World Bank issued the ground breaking ‘Road Not Travelled’ report, signifying a new approach for governments in the Middle East to improve quality of education. The recommendations of this report centred on the tenets of incentivisation (motivating all stakeholders in the education process to perform better) and accountability (holding stakeholders to account for their actions).

Throughout the Middle East, education reform has generally not delivered its intended results. Across the region, international assessment results have shown that students are performing below the international average. KHDA fully embraced the recommendations of the ‘Road Not Travelled’ report and integrated them into strategic policymaking across the organisation.
While it continued to improve on the ‘accountability’ component of the report’s recommendations – ensuring quality assurance through published inspections, as well as strategic partnerships with international accreditation and quality assurance bodies, the What Works movement of collaboration and strengths-sharing proved an effective tool for incentivising teachers, leaders and students in Dubai’s private schools and universities.

In 2014, the World Bank published a follow-up report entitled The Road Travelled, examining how KHDA had been influenced by the recommendations of the 2008 report, and their impact on the private education sector.

The report showed that in Dubai, the international assessment scores of students in private schools had increased, with a number of students in specific curricula performing well above the international average. The majority of students, 51%, were receiving a good or outstanding quality of education in 2014, up from 30% in 2009. The report concluded that KHDA’s approach showed “all the hallmarks of good governance – transparency, accountability and strong stakeholder participation.”

As well as launching a public discussion about the importance of school quality, the report continued, KHDA also created higher expectations among parents and school operators. The What Works movement, further, has shown it can be a sustainable tool for school improvement in Dubai.

**Putting Parents in their Children’s Shoes**

“We were overwhelmed by the response of parents this morning – a few were a little nervous at the start but they all enjoyed it. I believe they are going home with a renewed sense of empathy for what our kids go through.
They will hug their kids harder when they get home today, that’s for sure!” – teacher watching parents sit Test4Good at a Dubai school.

In February 2015, KHDA launched an initiative designed to connect parents and their children through reading, improve Dubai’s international assessment scores in line with the 2021 UAE National Agenda targets, and raise funds for the Dubai Autism Center.

Called Test4Good, the project saw thousands of parents across Dubai sit an adapted version of international assessments TIMSS and PISA, invigilated and marked by students.

Maths and science test questions highlighted to parents the importance of reading and literacy – quite often, it was comprehension skills rather than maths and science knowledge which determined a correct answer – and the need to develop a love of reading with their children.

By sitting the test under exam conditions and knowing they were to be judged (lightly) on their result, parents were able to feel the stress their children felt at school and help their children to better prepare for tests.

Together with targets for international assessments, the UAE National Agenda identifies happiness as one of the key indicators of a prosperous nation. By working with its team members, local and international partners, and all those passionate about education in Dubai, KHDA is working to make happiness not just an end, but also a means to an end.
Connecting Minds + Creating the Future = Enabling Happiness

The work of KHDA is guided by the collaboration and learning opportunities we can create and enable in our community, and the happiness these connections can promote. It is truly exciting to consider how Expo 2020 will carry these values forward on a larger, global stage. Echoing the words of our leader Sheikh Mohammed bin Rashid, the lasting impact and influence of Expo 2020 may not be measured by statistics alone, but by the amount of happiness it has infused into people’s hearts. Expo 2020 Dubai is a great milestone in the journey of the UAE, just as it is in the journey of KHDA. As we travel towards this milestone together, we continue to look to the future, while never losing sight of how far we’ve come.

Director General of the UAE Space Agency
The UAE Agency and Innovation in the Space Sector

Dr Mohammed Nasser Al Ahbabi,
Director General of the UAE Space Agency
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Innovation and Mobility lie at the heart of the Expo 2020 Dubai. In this article, Dr Mohammed Nasser Al Ahbabi, Director General of the UAE Space Agency shares how the UAE is reaching for the stars.

In 2010, the UAE introduced an extraordinary plan for the future growth and wellbeing of the nation. The government was seeking to establish its vision and goals ahead of the Golden Jubilee celebrations of the founding of the UAE and this culminated in the Vision 2021 document. This established a framework for a diverse, sustainable and successful future UAE economy that would preserve the cultural and social values and identity of our forefathers.

The vision charts the next stage of the UAE’s development by identifying key sectors, benchmarks and areas of development to guarantee the long-term sustainable prosperity of the UAE. Setting up of the UAE Space Agency and announcing the intention of the UAE to send their own probe to Mars are just two among the many UAE mega projects that fall within the Vision 2021 objectives. Hosting the World Expo 2020 Dubai in the UAE, will clearly be a great opportunity to showcase the achievements of this vision.

The World Expo has, since its inception as the Great Fair of 1851, been intended to be of “universal concern to all of humanity” by prompting the peaceful application of science and technology to the betterment of humanity through innovation. With this being its guiding principle, the World Expo
have continued to inspire generations of people to innovate thus ensuring the progress of humanity with the aim of building an even more aspiring and prosperous future. The UAE has been charged to champion this guiding principle by hosting Expo 2020 in Dubai. For that, UAE has declared *Connecting minds, Creating the future* as the main theme for its event, thus sending a clear message to the world that the UAE has earned its right to be acknowledged as a leading modern peaceful nation with modernisation and innovation for the betterment of humanity being one of its key and primary objectives. At Expo 2020 Dubai, the entire UAE nation will have a unique stage to demonstrate its success, vision and values to the world. The UAE is determined that all sectors of society should benefit from the peaceful application of locally driven and generated innovation to all its national infrastructure and services, including those relating to the peaceful uses of “Outer Space”.

The peaceful use of outer Space, through the deployment and usage of Space assets, such as Earth orbiting satellites, together with their associated services, data, and applications, play an important role in the world economic growth and sustainability which applies to all nations around the globe. So much so that the United Nations (UN) have recognised this importance by setting up the UN Office for Outer Space Affairs (UNOOSA), which is a UN entity dedicated to looking after, regulating and harmonising the peaceful uses of outer Space for the benefit of all humankind. Historically, Space has been an extraordinary place for humanity to cooperate to achieve its loftiest goals, even in the depths of conflict. While mankind’s ventures into Space started with a Cold War Space race between the United States and the USSR yet even as these superpowers continued to compete, they were able to partner successfully and peacefully for joint missions to explore Space that have consequently fostered 40 years of
peaceful cooperation.

In recognition of the importance of the peaceful uses of outer Space and the socio-economic benefits that the UAE Space sector has generated over the past three decades, a decree was announced in July 2014 by the UAE President His Highness Sheikh Khalifa bin Zayed Al Nahyan to set up a United Arab Emirates Space Agency (UAE Space Agency) as a federal entity that will report directly to the Cabinet and enjoy financial and administrative independence. The UAE Space Agency primary mandates being:

- Develop, organise, support, guide and coordinate the UAE’s growing Space sector that contributes to a diversified UAE national economy and which supports sustainable development;
- The development and use of Space science and technology within the UAE and provide support and advice in these areas;
- Raise awareness of the importance of the Space sector and the development of the qualified human resources in the Space field;
- Develop the necessary Space policy and regulation, and support their enforcement;
- Enhancing the UAE’s position as a global player in aerospace;
- Establish international partnerships in the Space sector, and help support knowledge transfer.

In that same year His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, launched a National Innovation Strategy with a seven year plan which aims to make UAE among the most innovative nations in the world. Innovation, simply put, describes the path from ideas to social and or monetary benefit – in effect it
encompasses all what is involved in taking the “idea” from being just an idea to a good idea and developing it into a business – not necessarily commercial. This National Innovation Strategy aims to stimulate innovation in seven sectors where innovation is an essential and integral part of achieving their key strategic objectives. The seven sectors are:

1- renewable energy
2- transport
3- education
4- health
5- technology
6- water
7- Space.

Once again indicating the importance of Space as a key element in building an advanced high-tech based future for the UAE.

It is important to note here that the need for Space assets and Space applications touches in one way or another all the other six sectors. It was therefore not surprising that the UAE had earlier that year announced the ambitious directive to catapult Space innovation by sending a UAE probe to Mars by the 50th anniversary of the setting up of the UAE.

The UAE is sending a clear message to the world affirming its status as a Space-faring nation in which the Space sector is playing a major role in the country’s sustainable economic development and growth. To get from the Earth to Mars, the UAE will have to exert itself to the utmost and beyond in education, training, infrastructure, manufacturing and other sectors of economic and social development in order to meet our goals. That’s why the
UAE Space Agency’s mandate is extensive and far reaching in not only developing specific Space projects but in expanding and promoting new industries and native Emirati capacity in the Space sector.

It is clear from the above that the UAE seeks to develop a long-term strategic plan for a solid and sustainable foundation for science and knowledge based society that will lead to advanced Space innovation and exploration and stimulate sustainable high-tech based economy. The UAE investments in Space technologies already exceed US$5 billion, a significant percentage when compared to a global investment of US$300 billion in commercial Space assets and support. National investment in Space technology is continuing to grow, as a result of healthy commercial demand for more Space services, such as satellite based telecommunications, Satellite based navigation and Earth observations from Space, in addition to growth generated through government lead initiatives and funding, such as the UAE Mars Mission. It is therefore the responsibility of the UAE Space Agency to facilitate what is necessary for these and future investment in the Space sector to playing their role in achieving its UAE national economic growth targets.

The UAE Space Agency will be responsible for facilitating, supporting as well as supervising UAE national Space programmes, such as the UAE Mission to Mars. The UAE Space Agency is also tasked with encouraging, promoting, harmonising and regulating the UAE based Space enterprises which include Thuraya Satellites; originally setup as an operator in 1997 that providing mobile satellite communications, YahSat; setup in 2006 to provide satellite data communications and television broadcast, and EIAST, set up in 2005, which has been responsible for developing the Dubai-Sat series of Earth mapping and observation systems.
The UAE Space Agency Innovation Strategy is intended to be in line with the UAE National Innovation Strategy which states that it shall be implemented along four parallel tracks:

**First Track**

The setting up of the UAE Space Agency and its mandates clearly falls within the First Track which intends to set up a stimulating environment for innovation in the form of supportive institutions and laws. The UAE Space Agency intends to push forward along this track by encouraging and supporting Space technology and applications’ innovation incubators as well as technological infrastructure to fuel innovation in the Space sector. It will also encourage innovative research and development through supporting and harmonising Space related activities, directly and indirectly, within the various UAE universities and R&D institutions.

As was stated earlier, innovation is the path of developing an idea into a business. Innovation is triggered by challenges to improve on current conditions and is therefore driven by the need to find solutions to these challenges. To give an example. Within the Space industry, the need to improve and find ways of successful, reliable, cost-efficient and most importantly safe operations have been the main drivers to innovation. Innovation will be the core of everything that the UAE Space Agency will be involved in. The UAE Space Agency is tasked with developing an ecosystem that will help drive innovation into its Space programmes by filtering and brainstorming ideas, encouraging collaboration between our partners within the Space and non-Space industries to taking part in the research and development and funding of the development of Space applications. The Space sector has a remarkable track record of turning government-developed
technologies and infrastructure into extraordinarily innovative commercial enterprises. From foam to phones, technologies that originated in the exploration of Space play a remarkable role in our daily lives. The kind of advances that are attained through investment in Space sector development promote not just economic growth but economic sustainability. Estimates from NASA show that for every single US dollar NASA has devoted to research and development, it has produced US$7 to US$14 in return. For the UAE, this innovative field could provide even greater benefits. An economic and developmental orientation towards Space means training engineers, physicists, mathematicians, computer programmers, scientists, and other knowledge-economy experts into the fields that are already starting to dominate the world economy in the 21st century.

That’s why the UAE Space Agency seeks to play a crucial role in promoting and nurturing innovation through public and private sector partnerships, pro-innovation policy creation, and industry-wide collaborative efforts both within the UAE and abroad in order to ensure that we are taking the fullest possible advantage of the latest advances in Space and technology for the benefit of the entire UAE economy.

**Second Track**

Having a highly focussed lean UAE Space Agency is very much in line with the Second Track that aims to develop government innovation by institutionalising innovative practices with the support of an integrated system of modern tools to reduce running costs. The intention is to focus more funding on innovation.
Third Track

The UAE Space Agency aims to encourage the private sector to be more innovative, thus supporting the Third Track by stimulating companies working in the Space sector to grow and nurture their innovation and scientific research centres, to adopt new technologies, and to develop innovative products and services. It is the mandate of the UAE Space Agency to encourage the creation of new Space based enterprise as well as to facilitate and pave the way for international cooperation that includes UAE based companies and organisations. Today, that international cooperation, between governments and companies is an indispensable feature of the Space sector. Multinational projects like the International Space station, planetary missions, and launcher development, as well as deep Space and Earth orbiting object tracking networks all rely on international collaboration with heavy involvement from the private sector in providing the expertise, technologies as well as services to implement these mega projects. But what is clear is that almost all of these projects are built using public funding directly by governments or indirectly through international organisations such as UN and European Space Agency (ESA), or interagency agreements. It is clear that it is such international collaboration and commitment from governments that had allowed mankind to build a future far brighter than what any one nation could have accomplished by itself. The UAE wants to join and play a leading role in this community of nations at the forefront of Space exploration, by partnering up with other nations, agencies, corporations and organisations with experience and technological know-how in the Space sector as we seek to develop parity with their capabilities. Our goal is not just to lead in the Space sector, but ultimately to give back and contribute our own expertise to mankind’s development of outer Space.
**Fourth Track**

The UAE Space Agency will work hand in hand with educational establishments, the media and non-Space based enterprise to encourage the creation of a generation of highly skilled and motivated individuals. These individuals will have a solid science, technology, engineering and maths (STEM) background key to implementing the Fourth Track which among other objectives, aims at creating Space related educational material for schools and universities.

The future success of the UAE’s economy will require not just technical knowledge, but a new generation of Emirati leaders in science, technology, engineering and mathematics. We believe that the UAE Space Agency and programmes can offer a vital path for students as we develop these future scientists and engineers. The UAE Space Agency aims to both set an example for students to emulate and to directly promote those students as they seek to fulfill their dreams and the dreams of the nation.
To this end the UAE Space Agency is looking to partner with international partners and educational institutions, as well as launching its own initiatives with an aim to expand the science, technology, engineering and mathematics (STEM) capabilities of future generations of Emiratis. The modern global economy has proven time and again that it’s the best educated and the most innovative nations that will achieve the greatest and most lasting success. So while the foundations of the UAE’s growth may have historically relied on the Earth’s physical resources, our future growth and success will be dependent upon our ability to develop intellectual resources.

The UAE Space Agency is directed, as is the case with other UAE government establishments to define and includes in its strategic performance objectives the sixteen indicators set out by the National Innovation Strategy in order to measure progress of the innovation plan. These innovation performance indicators are intended to measure among other things the percentage of innovative ideas and the proportion of budget allocated to innovation and R&D investment, a measure comparing the UAE innovation capabilities with other comparable countries, as well as indicators for the protection of intellectual property, including the creation of patents. Just as Expo 2020 Dubai aims to be an ‘Engine of Innovation,’ the UAE Space Agency seeks to do the same on a longer-term scale. Where Expo 2020 Dubai will run for six months, the task at the UAE Space Agency is to use the next six years to put together the best minds from around the UAE and the world to reach our immediate goals for Space, while developing long term capacity for future generations to lead the Space sector.

It is clear that what the American President John F. Kennedy said in 1962 to set the ball rolling for the US to become a leading Space faring nation, is now also still true for the UAE today: He said: “We choose to explore Space
and to push the bounds of our capabilities and knowledge, not because they are easy, but because they are hard, because that goal will serve to organise and measure the best of our energies and skills, because that challenge is one that we are willing to accept, [and] one we are unwilling to postpone.”

The Space industry will be an engine for that human capital development in the 21st century both in the UAE and around the world. The centrality of the Space sector to our daily lives will only grow as technology becomes increasingly reliant on Space to function. Now is the time to prepare the UAE to assume a leadership role in this vital sector, or risk falling behind permanently to other nations that take advantage of these extraordinary opportunities before us.

To announce to the world that, as a nation, will send a mission to the far reaches of outer Space, or to build an exposition facility of unprecedented scale where the UAE will challenge the best minds to address some of the greatest global issues, or to educate an entire generation of youth to look to the stars takes not just ambition, but the courage of conviction. This requires courage to accomplish the task that has been set, and courage to declare that failure is not an option. Recognising that the UAE will stand to this challenge His Highness Sheikh Mohammed bin Rashid Al Maktoum, said “We chose the epic challenge of reaching Mars because epic challenges inspire us and motivate us. The moment we stop taking on such challenges is the moment we stop moving forward,” and in undertaking these challenges we enrich the lives and experience not just of ourselves, but of all mankind and for all generations to come.
On the road to innovation

Reem Al Marzouqi, Architectural Engineer
On the road to innovation

Reem Al Marzouqi, Architectural Engineer

Reem Al Marzouqi, an architectural engineer, is the first Emirati inventor to win a US patent for her car that can be driven without hands. In this article she shares her journey and encourages others to follow her path.

Mobility is something that we all take for granted. The world is so highly connected these days and we think nothing of jumping on planes, metros, buses and trams. And our cars are something that we cannot live without. I’d like to tell you the story of how I became the first Emirati inventor.

I was a first year student UAE University in Al Ain and one day I was watching a TV show when I was fascinated by the story of a remarkable lady called Jessica Cox. Jessica is a pilot from the United States who, despite not having arms, has overcome her disabilities to become an accomplished pilot. However, although Jessica could take to the skies, she couldn’t do what you and I do every day - drive a car. This made me think.

I emailed Jessica and found out that she was having a lot of difficulty driving a car using her feet and I discovered how much she would like to have a car that would overcome her disabilities. She was able to fly a plane but couldn’t drive a car. She was sad because complaints had been filed against her for trying to drive a normal car, which actually was very painful for her. The result was that her licence had been suspended.

This made me really think about how I could make a difference to the lives of people just like Jessica and what I could do to help. And this was the start of it all. Most of all for me it was about making a positive contribution that could make life better.
At the time, I was doing a introductory ethics course at University and we had an assignment to get a product in the market and evaluate it according to our course material. When it came to the assessment I decided to start developing my car idea but when the assessment day came I was shocked when I realised that everybody else on my course was evaluating products already on the market. I panicked - out of misunderstanding, I had thought I had to get a product and add new ideas to it. So by then it was too late so I went ahead and submitted my idea of designing a car fully controlled by feet without the need of using our hands. I’ll be honest with you, I didn’t get a good grade on my assignment because I simply hadn’t followed the assignment’s criteria. However, the positive outcome was that my professor was incredibly supportive and loved the idea and encouraged me to carry on with my idea.

Something had really clicked for me and I wanted to pursue my ideas so I started to contact companies. The issue was that they all seemed to need a prototype, something that I certainly didn’t have. All I had was an idea. It was frustrating and it would have been easy to give up. However, I had the wonderful and kind support from my mother who really believed in my idea and decided to give me some money to start working on the model. The way ahead was not always smooth, in fact it was very bumpy – some people doubted me, there were lots of frustrating hitches and obstacles along the way... and I had to keep raising more funds. This was my very first experience with registering ideas and I encountered initial difficulties like not knowing where to go or who to ask. It took a lot of energy and patience and I had to keep reminding myself that my idea was worth it, and that I should persist and see it through to the end.
After a lot of effort and help I finally obtained a US patent for my invention. A patent was filed at the US Patent and Trademark office (USPTO) in February 2012 (issued in November 2013). It had taken me years and I was shocked and very excited because I never thought I would achieve this. Now when people remind me that I am the first Emirati to obtain a US patent I feel immensely proud of my achievement. I was delighted when my prototype was showcased in March 2013 at Takamul’s UAE Innovations (Takamul is a national innovation support programme created by Abu Dhabi’s Technology Development Committee). In addition, it appeared in “A History of the World in 100 Objects” which was held at Zayed National Museum in collaboration with the British Museum. This exhibition exhibited 100 significant objects for 100 days, and allowed visitors to travel back in time and across the globe to see how humans have shaped the world, and been shaped by it.

My idea started out targeted to a very specific market and a major driving force for me was its social value, to help those with disabilities. However, since then I have been pleased to discover how innovations can be surprisingly adapted to quite different situations. A potential market that we are focusing on could be military applications such as tanks and vehicles where drivers will have their both hands free while they drive. It could also be used in peace-keeping operations and industrial situations.

Reem and her US patented car
Some people believe that only geniuses can create inventions, but that is not true at all. I’m certainly not an A Grade student and if I can do it, others can do it. Everybody has the potential to expand their mind. Everybody has the ability to experiment with new ideas that make the world a better place. You just have to go for it, you have to be brave and have the courage to sometimes fail but get up again, brush yourself off, and see it to the end.

My advice to others is don’t ever give up on ideas that some say are crazy or impossible. Everything is possible, you just have to know where to start from. Thomas Edison was one of the greatest innovators ever. His teachers said he was “too stupid to learn anything” and he was fired from his first two jobs for being “non-productive.” As an inventor, Edison made 1,000 unsuccessful attempts at inventing the light bulb. When a reporter asked, “How did it feel to fail 1,000 times?” Edison replied, “I didn’t fail 1,000 times. It took 1,000 steps to success.” So the light bulb was an invention with 1,000 steps, but he got there in the end and made a better world for all of us.

Alexander Bell also had a tricky time initially convincing people that his telephone invention was valuable. When he first tried to sell his patent the reaction was that it was “just a toy” He didn’t give up, he believed in himself and rallied to get his work recognised. A short time later, his demonstration of an early telephone prototype at the 1876 Exposition in Philadelphia brought the telephone to international attention, and the rest is history. So let us hope and be excited that Expo 2020 Dubai will also be a platform that helps the ideas of innovators and inventors across the world take flight!
Winning the US patent also made me feel proud as an Emirati woman because lots of people think that cars and engines are stereotypically part of the male domain. This isn’t true. In the UAE lots of women are working very hard to get into these fields and this is great as the UAE is still developing at such a fast rate that there is going to be a need for their talent and skills. We need to expect more UAE women entering the field of engineering and from personal experience I can tell you that at my University a lot of women were pursuing engineering related courses. The great thing is that there will be jobs for them when they finish their studies and they will get the support they need, What was of enormous importance for me was this support I received along the way. My university has a really positive attitude to research and encourages the students to be innovative and creative. Also I received wonderful support from the Technology Development Committee’s Takamul programme. This programme gives individuals a helping hand to make their dreams become reality through financial and legal backing and helps young inventors pursue their dreams. It has become the main support system for patents in the UAE, but its advice and guidance goes beyond filing patents to include marketing support, licensing and negotiating to transform ideas into commercially viable and applicable ventures. It essentially bridges the gap from the research and development (R&D) phase to the commercial. It has already given support to lots of innovations in diverse fields which encompass everything from ICT through to clean technology.

This ‘can do’ attitude is part of my nation’s philosophy and innovation has become top of the agenda in shaping the future. Actually innovation is becoming the trend here in the UAE and in 2014 His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai, launched a seven- year national innovation
strategy to propel the UAE to become one of most innovative nations by 2021.

Reem and her US patented car

This is especially relevant to our youth and young people just like me. Our leaders are making concerted efforts to fire up innovation in Emirati youth and to encourage young people to be pioneers of knowledge and innovation. This year, 2015, is the Year of Innovation and our government is encouraging schools and universities to develop skills in research and discovery and to embrace innovation. Just recently a seven-point scheme to nurture innovation was announced. This is very exciting and will introduce innovator incubators for young people and university students. Emergent talent is also going to be discovered with teachers looking out for young potential innovators as young as five or six years of age. To support this across education innovation-driven curricula will be introduced and innovation will be a key assessment criteria for schools. I am also very excited about the prospect of an annual national exhibition dedicated to innovation so that students of all ages can participate and there will be training camps dedicated to innovators using the help of experts who will be able to help develop potential. In addition to this there are going to be Chief Innovation Officers in all government organisations and it will be their job to nurture, encourage, advise and provide all the tools for innovation. This is so
wonderful for the future of our country. It’s going to really define the next generation. And for me it means that I am going to be up against some very tough competition in the future, which is good.

With Expo 2020 Dubai on the horizon we will have the chance to bring mobility and innovation to the foreground. Events such as Expo Live will allow people from all over the world to come together to develop exciting new ideas and innovations. The Expo Live Partnership Fund will support new research and development projects in the areas of Opportunity, Mobility and Sustainability that champion innovation in commercial and social development in communities across the globe. We have such an exciting time ahead, there is so much scope for enterprise and innovation across the Middle East Africa South Asia (MEASA) region and Expo 2020 Dubai will help nurture this in collaboration with the world. The Arab world was once renowned for the work of its scholars and inventors in the past so I hope that the inspiration of Expo 2020 Dubai will allow the UAE to become a hub of innovation that truly inspires the region and the world.
Empowered though Solar Power

Hans Tholstrup, President of the International Solar Car Federation (ISF)
Empowered though Solar Power

Hans Tholstrup, President of the International Solar Car Federation (ISF)

Mobility is important, but the challenge that faces us today is how to innovate and bring clean energy to life. The Abu Dhabi Solar Challenge, a first of its kind in the Middle East, sought to do this by encouraging students to innovate and convert their knowledge into real world solutions that promote sustainable transport. In this article Hans Tholstrup, President of the International Solar Car Federation (ISF) and the organiser of the first World Solar Challenge in Australia in 1987, shares his belief in the power of solar energy.

“We are reaching the end of cycles - the end of oil, the greenhouse effect, printing of money, the end of ocean fish, and the end of the easy growing of food. One could use the phrase ‘the perfect storm’, so we need a challenge to the philosophers of the world, to try to save as many of these cycles as possible.” - Hans Tholstrup

The sun is the real engine of all life. Today, we enjoy life partly through the opportunity of finite fossil fuel - I call it “fossilised sunshine”, as it comes from plant and animal material from more than 400 million years ago.

The Middle East really created the road for the wonderful opportunity of my life. My solar journey started due to the energy crises in the late seventies, which resulted in a 10% drop in oil supply - yes just 10% caused the oil crises! As a result, I was asked to drive in an “economy” challenge, a far cry from the normal motor racing I enjoyed at the time.

I soon got to experience how far I could go on a litre of fuel, rather than how fast. I won the event, so it was suddenly fun. I continued winning these
events, but it was soon over as supplies returned to normal. Oil was cheaper and no one was interested in saving it any more.

However, it made me think: as oil is a finite fossil fuel it will run out - and what then?

So I felt I needed to highlight that and what could be more futuristic than a drive across a continent on just sunshine? Everybody said you cannot do that - “it’s impossible” was often the doubters’ mantra. Innovation though often requires an “impossible” problem to become “possible”.

BP - my oil sponsor at the time - was on the back foot as environmentalists were stopping people driving in to some of these their service stations, as they were a major shareholder in the biggest Uranium mine in Australia. So they kindly decided - even though they thought I would not even get out of Perth - to give me the 30,000 dollars I needed in sponsorship.

That money built the car and executed the journey across Australia on solar panels. The panels had an output of 11%. Today we now have over 20% from solar panels at a quarter the cost.

The sun and my team proved that a human being could be carried over 4000km across Australia by converting the sunshine to electric power, which then drove what was essentially an electric car. Mind you it was only at an average speed of 23 km/h!

The fastest car to drive across Australia today in the World Solar Challenge has done it at 101 km/h.
My life has proven that we can and we must devote more time to solar power and other renewables, as we will sadly run out of oil. The human race likes mobility, it likes the car, it needs a personal transport capsule for our future to make life better and more sustainable. This is the big opportunity of the next generation.

The UAE recently hosted its first Solar Car event with The Abu Dhabi Solar Challenge in January. Only a couple of time penalties stopped the Petroleum Institute of Abu Dhabi beating the University of Michigan - the 2015 winners. It was PI’s first challenge and it illustrates perfectly the UAE’s commitment to both education and energy. There were nearly 300 students from 15 universities in the challenge - which we call a Brain Sport.

I have no doubt that these students and all those who have participated in International Solar Car Federation events in the last 20 years will see Dubai Expo as a unique opportunity to showcase potential innovation in energy. Given the UAE’s sunshine, I hope that this will be the focus.

We have a long way to go to achieve a mobile and sustainable world. The opportunity is about solving the “impossible”, which means investing in innovation and some good old fashioned hard, but smart, work from the Expo 2020 Dubai generation!
Sustainability, the Way Forward for Future Generations

Her Excellency Razan Khalifa Al Mubarak
Secretary General of the Environment Agency-Abu Dhabi (EAD)
Sustainability, the Way Forward for Future Generations

Her Excellency Razan Khalifa Al Mubarak

Secretary General of the Environment Agency- Abu Dhabi (EAD)

Sustainability is a subtheme of Expo 2020 Dubai and is key to ensuring a better tomorrow for generations to come. Her Excellency Razan Khalifa Al Mubarak, Secretary-General of the Environment Agency Abu Dhabi (EAD), shares insights into how this is being achieved in the UAE and underscores the need to connect across the planet to address growing and shared challenges.

Globally as the human population grows we consume more resources, generate more waste and emit more pollution into the earth’s atmosphere, on land and into water bodies. If these trends continue we will have a significant impact on the environment and compromise our long term sustainability, so it is essential that we decouple growth from these negative impacts. A number of countries, including the UAE, are now planning to shift economic growth patterns to “green growth”, with a priority focus on decoupling energy production from greenhouse gas emissions as an important contribution to climate change mitigation. Mankind is also putting more and more pressure of natural habitats and species as we clear more land for development and to produce food and as we over exploit biological resources such as wild fish stocks. In our rapidly changing world, it is essential that we find an approach to growth that is sustainable and that we protect natural resources such as water, biodiversity and the natural systems that keep our planet in balance.

Following a Green Growth Path

In January 2015 the UAE adopted a green growth strategy which aims to achieve Gross Domestic Product (GDP) growth above the Business As Usual (BAU) projections whilst creating a create knowledge based, high
Green Growth has the unique ability to bring diversified growth while enhancing the economy’s competitiveness, as well as its resilience against international market shocks through growth in non-oil GDP. Projections from the UAE Green Growth Strategy suggest optimistic GDP figures of up to 3.8% above BAU by 2021 and by 4.5% by 2030. In monetary terms the anticipated trade boost from green growth has been estimated at more than 18 billion AED by 2021 and 25-45 billion AED by 2030. This will in turn lead to increased local production for export through R&D investment and in doing so support the emergence of Small and Medium-Sized Enterprises (SMEs) that will be beneficial to complementing and supporting the Green Economy.

The ripples of this change will lead to positive job creation in sectors such as renewables and nuclear power, advanced manufacturing and environmental goods and services (for example energy, water or waste management companies). Figures are encouraging – 20% of green job creation would occur in power and water generation that will bring an estimated 17,000 new jobs by 2021 and more than 31,000 by 2030. Many of these jobs will be high value-added, professional jobs complemented by a large number of low-to-mid-skilled jobs in sectors such as construction. Increased job creation will also significant benefits for UAE nationals as well as continuing to draw international talent to the UAE.

**Finding Alternative Energy Sources**

Today the UAE depends on natural gas for more than 98% of our energy needs but we recognise that diversifying the energy mix will yield significant economic, social, and environmental opportunities. According to the UAE
Green Growth Strategy, achieving a 15% reduction in consumption of domestic natural gas will, for example save 42 million tonnes of oil which equates to a staggering 40-90 billion UAE Dirhams (AED). If by 2030 we continue to reduce by 30%, this would equate to 220 – 510 billion AED.

Another key advantage of energy diversification is that it can help ensure energy security and stability by reducing dependence on natural gas alleviating the nation’s potential of being exposed to price shocks in the international market. As population rates rise and power demand escalates this will be a critical consideration in ensuring stability.

The quest for diversified energy sources is therefore not only essential in terms of sustainability but brings with it economic stability and energy security. The use of diversified sources will have the unique result of freeing up valuable natural gas whilst reducing dependence on international markets and the volatility with which markets are often associated.

In response the UAE has adopted a policy of energy diversification, setting targets that aim for 24% of energy being less carbon intensive (nuclear or renewables) by 2021.

**Building Sustainable Cities for Tomorrow**

As the world’s population gravitates more and more to cities there is a need to minimise our individual footprints and as a result there is a need for cities to be designed, maintained and managed with sustainability in mind. Urbanisation is growing at a fast rate. According the United Nations (UN) 54% of the world’s population currently live in cities and this is expected to rise to 66% by 2050. Cities currently account for 60-80 percent of energy consumption and 75 percent of carbon emissions. It is clear that if we are to
live more sustainably, then cities will be at the heart of the solution.

The high density of cities provides opportunities for efficiency and makes technological innovation viable, helping to reduce resource and energy consumption. Cities also need to be liveable places with access to open spaces and nature, and where culture and heritage are protected and celebrated. Cities must work for the people living within them and must facilitate future trends. According to the UN, by 2030, as many as 60% of all urban dwellers will be under the age of 18, so cities should be designed to provide the right environment for young people to thrive. This trend of population growth, increase in the number of young people, and the significant growth of cities will be acutely felt in this region, and the repercussions must be anticipated managed and indeed seized.

So how do we make our cities more sustainable, liveable and fit for the future?

In the UAE, driven by economic growth, our populations have been growing rapidly and this is predicted to continue. To provide a focus for this rapid growth we have a number of interrelated visions and strategies to ensure future growth is sustainable. At the Federal level we have developed the UAE Vision 2021 and the Green Growth Strategy which sets a range of economic, social and environmental targets. These visions inform city planning and are implemented through policies aimed to ensure our cities are clean and healthy places to live, resource efficient, have effective transport networks and grow in harmony with the natural environment.

Many of our cities are situated on the coast, which reflects our cultural heritage and traditional relationship with the sea. But the coastal zone is also
home to some of our most diverse habitats, where islands, mangrove forest and sea grasses provide nesting sites for birds and sea turtles. These habitats also provide economic benefits by helping to clean coastal waters, providing breeding grounds for fish and protection against rising sea levels; they also provide people with access to nature and tranquillity within easy reach of the city. To conserve these rich natural habitats and our cultural heritage, these areas have been identified by the Environment Agency – Abu Dhabi (EAD) as conservation areas and are protected through the development process.

We have been focusing, and continue to focus on the efficient use of resources. In the UAE we are high users of electricity and water, in part driven by our climate and the need to cool buildings all year round, and to irrigate our landscaping and parks to make our cities more liveable. To reduce this impact we are improving the efficiency of our buildings by implementing locally adapted building codes and our building rating system called Estidama, meaning ‘sustainability’ in Arabic. Outdoors we are adopting landscaping techniques that demand less water and we are building the infrastructure to enable the reuse of all recycled water to replace groundwater and desalinated water for the irrigation of forests and farms.

We are also focusing on mobility and transport to enable people, goods and materials can move efficiency both around and between our cities. The first phase of the Etihad Rail network for freight transport is now operational on a testing basis and the plan is to expand this network to cover not only the UAE but also the region. Shifting freight transport from roads to rail will result in a reduction of around 60% in carbon emissions. In terms of passenger transport, Dubai’s metro system is reducing emissions and taking cars off the roads along major commuting routes and plans to expand mass transit in Abu Dhabi are well developed. Cycling is also a key form of
sustainable transport and as a healthy form of recreation.

In all areas of the city we are embracing innovation, thinking beyond today’s best practice to create the best practice of the future. This is why we have embarked on the vision of Masdar, a world leading Ecocity, the aim: to use smart design, which combines regional architectural techniques with technology to dramatically reduce energy, water and waste.

Towards Greater Water Efficiency
Globally, the general trend is that as populations grow more water is consumed and this is compounded by the fact that as individuals become more prosperous, per capita consume increases, either directly or indirectly through water intensive food and goods. In alarming contrast, the natural fresh water reserves (groundwater) of the UAE are declining rapidly, in fact if we continue to use water the way we do now our usable groundwater will be exhausted in two to three generations. Throughout the region we are seeing groundwater aquifers declining at unsustainable rates and even at these elevated rates of extraction, groundwater does not meet the full needs.

To fill the gap, the UAE and nations bordering the Arabian Gulf have turned to the widespread desalination of sea water, with Arabian Gulf nations accounting for over 60% of all global desalination capacity, a staggering sum. Unfortunately, the desalination of seawater is the most energy intensive water treatment technology, using around 10 times more energy per unit water produced than the treatment of fresh water, and double the energy of waste water treatment. This large and growing dependence on desalination and its associated impacts is leading us to search for new and innovative desalination techniques. In 2013 the UAE launched the Renewable Energy Water Desalination Programme which aims to refine innovative desalination
technologies to significantly reduce the energy demand, making them viable to be combined with renewable energy sources.

Water scarcity in the Arab Region is an unfortunate fact and will only be further exacerbated by growing populations and dwindling ground water supplies. Given the costs associated with the status quo, including expensive and environmentally damaging reliance on desalinated water, business as usual is not a satisfactory response. We need to do something different – we need to adopt a philosophy of ‘Business as Unusual’.

Masdar City, an arcology project in Abu Dhabi

This is why at the Environment Agency - Abu Dhabi (EAD) we are developing the concept of the sustainable water budget. At the heart of this concept is the principle that we must determine and define a fixed volume of water that we can supply sustainably over the long term, and we must then develop ways to live within this pre-determined “budget.” Unlike in the past, we must not continue to meet increasing demand, driven by economic and
population growth, simply by increasing supply, either through greater use of groundwater or yet more desalination.

This does not mean that economies and populations cannot grow. Rather it means that we have to be more efficient, more productive and more competitive in the ways in which we use water. We have to think carefully about how we allocate water, developing sophisticated systems to recognise its scarcity. These new systems would recognize that by allocating more water to one sector of our society, we may have to reduce the allocation to another sector, in the same way as decision making models account for limited resources in other aspects of our governance, such as in the development and allocation of financial budgets.

In short, it would help make our economies more competitive, especially as we compete in an increasingly resource constrained world.

“Expo 2020 Dubai offers an inspiring platform to bring the world together to share and collaborate.” -Her Excellency Razan Al Mubarak

Conserving Biodiversity for Tomorrow
In today’s modern and changing world, the natural balance of biodiversity is increasingly under pressure. Our coastal zones are some of the most bio diverse areas we have, yet they are also some of the most desirable areas for development. As urbanisation increases and population surges there is a need to safeguard biodiversity.

Despite its relatively small size, the UAE supports 678 species of plants, 54 mammals, 72 reptiles and amphibians, and 450 species of birds. Abu
Dhabi’s marine habitats are home to the second largest population of
dugongs in the world and the UAE waters are also home to the endangered
Hawksbill and Green turtles, four globally-threatened species of shark, three
threatened species of ray and around 240 species of fish. However, many of
the species that were once relatively common in the UAE are now
considered to be endangered or threatened due to habitat loss either directly
or through fragmentation.

To support habitat and species protection, a project was launched to use
satellite imagery to map the impact of human development on natural
habitats in the emirate. Launched in January 2013, this ambitious project
covers 59,640 sq km of land and 28,220 sq km of marine environments and
will be extended to cover the whole of the UAE over the next few years. The
use of maps is invaluable in supporting the EAD in conducting
environmental impact assessments for major infrastructure and industrial
projects and when designating protected areas.

The EAD actively assesses, monitors and protects biodiversity in order to
safeguard the nation’s natural habitats and biodiversity for tomorrow.
Programmes include efforts to monitor and protect dugong populations,
which involves monitoring local sea grass habitats where dugong feed and
working with local fishing communities to prevent accidental capture, a
main cause of death. Efforts to date have been successful and the population
is currently stable with figures of around 2,900 in winter and 2,291 in
summer. Bird monitoring programmes covering coastal areas and offshore
islands collect valuable information on the distribution, habitats and
breeding patterns of selected species of birds which include Egyptian
vultures, which are native to the Jebel Hafeet region of Al Ain and
flamingos.
Ex situ conservation efforts have helped to preserve the flora and fauna of the UAE. The Delaika Conservation and Breeding Facility, established by the EAD in 2010, focuses on four main species which include mountain gazelles, sand gazelles, the Arabian oryx and the African/Scimitar-horned oryx. The site which is 3.5 million square metres is currently being upgraded to provide the facilities required to breed the most genetically diverse herds, of each species, in the world. A broad genetic diversity is important to ensure the long term health of the animals which will be reintroduced into the wild.

Arabian Oryx have been introduced in Qasr Al Sarab

The scimitar-horned oryx has been extinct in the wild since 2000. In 2014, EAD announce plans to gradually reintroduce about 500 of these oryx into
the Ouadi Rime-Ouadi Achim game reserve in Chad. This species cannot be release in the UAE as it is not native to the area. Other projects include the release of 100 Nubian ibex into a protected nature reserve in Jordan with plans to eventually release them into the wild once they have adapted to the new environment.

Eco-reserves play a significant role in the EAD’s efforts and with a number already actively in operation there are plans to open several more, including visitor facilities. The Al Wathba Reserve consists of a manmade lake about 40 km south-east of Abu Dhabi City. With a significant population of 4,000 flamingos and a rich biodiversity of 250 other species of birds, 11 species of mammals, 10 species of reptiles and 237 types of invertebrates in 2013 it has been recognised as a “Wetlands of International Importance” under the Ramsar convention. Another example is the Mangrove National Park which is a 19-sq-km mangrove forest located on the eastern coast of Abu Dhabi City that can be visited by organised kayak tours. The mangrove is listed as “vulnerable” in terms of extinction risk on the International Union for Conservation of Nature’s Red List of threatened plant species and represents an important marine and bird habitat.

Plans are also afoot to open another eco-reserve to the public at Qasr Al Sarab protected area where around 400 of the nearly extinct Arabian oryx have been reintroduced. In addition, Arabian oryx have been reintroduced into two more national parks within the UAE. Wadi Wurayah National Park in Fujairah is truly a treasure to the region and one of the few areas in the UAE that is bursting with both flora and fauna, as well as having intact freshwater resources. It is home to many delicate ecosystems and endangered species and concerted efforts are in place to protect the rich biodiversity of the area. Local, regional and international experts will
contribute their knowledge to restore and sustainably manage this freshwater ecosystem and its precious resources, and in doing so we will be able to expand our knowledge through research in order to better understand the area and the species that reside within it.

Collaborating for a Better Future
Striving to create a sustainable growth and a sustainable environment for generations to come is therefore high on the agenda in the UAE and through the collaborative efforts of government entities and other stakeholders, concerted efforts are being made in many key areas to ensure a better tomorrow. In an era defined by burgeoning population growth, rapid urbanisation and rising consumption we have a duty to mitigate growing tensions by careful planning. To meet the challenge of Creating the Future it is essential that we become collective stakeholders and that we Connect Minds across our planet to address growing and shared challenges such as sustainability. Expo 2020 Dubai offers an inspiring platform and starting point to bring the world together to share, collaborate and innovate, and in doing so offer compelling solutions that will shape the future in the field of sustainability.
UAE’s Continuing March towards Innovation with Expo 2020 Dubai and Masdar Institute

Dr Fred Moavenzadeh,
President of the Masdar Institute of Science and Technology
UAE’s Continuing March towards Innovation with Expo 2020 Dubai and Masdar Institute

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Dr Fred Moavenzadeh is President of Masdar Institute of Science and Technology Abu Dhabi, United Arab Emirates. In this article he shares insights into exciting research and innovation in advanced energy and sustainable technologies which is underway at Masdar Institute.

The awarding of the rights to hold the Expo 2020 in Dubai is just one of a list of honours by the UAE. Indeed, the UAE has been on an unprecedented journey of national transformation and progress for decades. Since the country’s formation in 1971, it has developed and matured at an incredible rate, achieving what many would have considered impossible in such a short amount of time.

This unique growth curve is due in large part to the farsighted vision of the UAE’s founding father, the late Sheikh Zayed bin Sultan al Nahyan. In his 33 years as President, Sheikh Zayed provided the UAE with the roadmap and wisdom that inspire the country’s rulers even today. Some of his words that continue to help guide the UAE’s progress are below:

“No matter how many buildings, foundations, schools and hospitals we build, or how many bridges we raise, all these are material entities. The real spirit behind the progress is the human spirit, the able man with his intellect and capabilities.”

“We must not rely on oil alone as the main source of our national income. We have to diversify the sources of our revenue and construct economic
projects that will ensure a free, stable and dignified life for the people.”

“The real asset in any advanced nation is in its people, especially the educated ones, and the prosperity and success of the people are measured by the standard of their education.”

“Nothing could delight me more than to see [a] woman taking up her distinctive position in society ... Nothing should hinder her progress ... Like men, women deserve the right to occupy high positions according to their capabilities and qualifications.”

Sheikh Zayed thus believed that the UAE needed to use the wealth afforded from its vast natural resources to develop itself, diversify its economy, educate its men and women, and preserve the environment. He wanted to see the UAE’s people become its true high-value asset – far surpassing that of any natural resource – to use their talents and opportunities to bring pride, satisfaction, security and enrichment to themselves and their country.

The current UAE leadership have kept true to Sheikh Zayed’s ideals and integrated them in its modern strategies. The Abu Dhabi Vision 2030 was announced with a focus on building a value-added knowledge economy that is well integrated in the global economy and provides accessible and higher-value opportunities for all UAE citizens and residents of the Emirate. It gives particular emphasis on diversification of the economy towards advanced and technology-intensive industries that can compete in global markets and that are capital intensive and require highly educated professionals who are prepared for the challenges of research and development (R&D) and entrepreneurship.
By focusing on technology-intensive economic sectors, the UAE leadership intends to use the country’s strengths to neutralise its challenges. The country’s most obvious strengths have been its young and ambitious population, vast hydrocarbon resources, significant national wealth and strong, agile and unified government, which together result in the UAE’s unique ability to take on difficult and costly projects and adapt to resulting changes quickly. The country’s challenges have been its scarce natural freshwater resources, small indigenous population, small domestic market, dependence on food imports, underdeveloped academic infrastructure, and high expectations of increasing quality of life for residents. Thus the ideal solution would leverage the UAE’s national wealth and strong government to diversify its economy beyond the finite hydrocarbon sector, into industries that can continually and exponentially produce wealth and prosperity for the country, while also addressing its need for water, food and energy security.

Masdar Institute of Science and Technology
The solution hit upon was to develop the UAE’s human and intellectual capital through development of a robust education and R&D infrastructure,
with a focus on facilitating innovation in key advanced industries. Providing the UAE’s talented young men and women with the right education, training and support, they could then be leveraged to become the country’s new asset, producing the intellectual property, innovations, services and technical expertise that would provide a continuous and growing source of revenue and security for the country.

It is with this rationale in mind that the Abu Dhabi government established the Masdar Institute of Science and Technology in 2007. Created in collaboration with the Massachusetts Institute of Technology (MIT), Masdar Institute is a research-focused university that offers word-class Masters and Doctorate degrees in dynamic engineering fields of value and relevance to the critical sectors of advanced energy and sustainable technology.

Its vision is to be recognised as a regional and global model for research intensive universities of the 21st century while underpinning the growth of Abu Dhabi’s rapidly developing economy across the key sectors identified in the Abu Dhabi Vision 2030. With its focus on the specialized sectors of advanced technology and sustainable energy, Masdar Institute also responds to the growing global need for products, services and solutions relating to renewable energy, global climate change, environmental impact, freshwater production, and food security. Its graduates become highly sought after specialists in engineering and science, providing the UAE with a high-value cadre of professionals to power its knowledge economy, while the research its students and faculty pursue would produce intellectual capital in the form of patents, breakthroughs, startup companies, and services of relevance to the competitive global economy.
Masdar Institute’s Academic Strategy

An Intellectual Platform

To help it achieve this, Masdar Institute is built on an intellectual platform that focuses on Technology, Policy and Systems. These three areas are at the core of scientific innovation, particularly the sectors targeted by Abu Dhabi in its Vision 2030. It focuses its academics and research on Technology, Policy and Systems also because these areas lie at the heart of advanced sustainable technology trends of the future. For example, the extensive and diverse energy demands of residential, commercial and utility consumers have made solar energy the most rapidly growing clean energy sector in 2010 and 2011.

This growth has been enabled by Technology, Systems and Policy innovations such as feed-in tariffs, new solar materials and devices and utility-scale concentrating solar systems. Similarly, the need for coordinated efforts in the domains of technology, policy and systems is demonstrated by multi-disciplinary clean energy trends such as electric vehicles, sustainable
cities, and sustainable transportation. By focusing on Technology, Policy and Systems, Masdar Institute aims to establish cutting-edge technologies that translate into larger networks of systems and policies.

**Research Focus**

In order to achieve Masdar Institute’s overarching mission and vision of innovation and transformation for the UAE, the Institute has a core objective of creating and sharing innovative technology and knowledge in a holistic way that includes both academic and commercially relevant activities. This objective is met through publication of scholarly papers, generation of new intellectual property (IP), and attraction of industry research funding.

Masdar Institute’s research agenda – which is at the core of its very vision and mission – is contained within five research domains. These are:

- **Water, Environment and Health:** Focusing on how to provide sufficient, cost effective and equitable access to water, while maintaining the integrity of natural water supplies and minimizing any environmental impact.
- **Future Energy Systems:** Focusing on developing and deploying technologies, systems and polices for efficient and cost-effective production, delivery, use and storage of energy, with minimal impact on the environment.
- **Microsystems and Advanced Materials:** Focusing on the exploration and development of microelectronic devices and circuits that are the fundamental building blocks for the current and future transformation of energy, embedded systems, medical electronics and large-scale systems.
- **Smart Systems:** Focused on the development of smart control systems for developing an efficient infrastructure system such as tramp power, water, telecommunications.
**Innovation & Entrepreneurship**: Focused on encouraging innovation and entrepreneurship and facilitating the development of start-ups and venture capital.

To better consolidate and align these domains and the projects taking place within them Masdar Institute launched its five Institute Research Centers (iCenters) in 2014. They are: the Institute Center for Smart and Sustainable Systems (iSmart), the Institute Center for Microsystems (iMicro), Institute Center for Water and Environment (iWater), the Institute Center for Energy (iEnergy) and the Institute Center for Innovation and Entrepreneurship (iInnovation).

The new structure provides increased visibility of the Institute’s areas of research strengths, which is expected to increase stakeholder engagement and attract further collaboration and funding.

Additionally, through iInnovation’s interaction with the other iCenters, the Institute’s core research activities are linked with translational research and innovation ecosystem development, to better enhance the reach and impact of Masdar Institute’s research activities on the UAE and its economic ambitions. The iCenters work closely with Masdar Institute’s Sponsored Research Centers, supporting their efforts and helping them to build additional funding and visibility.
Masdar Institute’s iCenters and Sponsored Research Centers

Achievements
This focus on Technology, Policy and Systems with an eye to achieving real-world results is already beginning to pay off. In only six years since Masdar Institute began its academic operations, we have managed to put Masdar Institute on the world academic map and seen our achievements grow each year. To date, 307 students have graduated from Masdar Institute. The class of 2014 was the largest graduating class to date, and had the highest percentage of graduating UAE nationals - at 40%. In fact, we have achieved an increasing UAE national student enrolment target year on year, with total enrolment of Emiratis growing from 11% in 2009 to 44% in fall 2014. Our overall student enrolment currently stands at close to 500 students as of fall 2014 (348 MSc students, 143 PhD students) – with all students meeting MIT standards for admissions. Of this total, women represent 44% of the general student body and 61% of the UAE national student body. Our faculty, who currently number 95 from 30 countries and leading international universities including MIT, Stanford University, University of California – Berkeley, Cambridge University, Harvard University, etc.
Since inception eight years ago, our faculty, students and researchers have published over 550 papers in peer reviewed journals, 380 conference proceedings, four book chapters and two full books. It comes as no surprise then that Masdar Institute was the number one ranked university in research citation impact in the Arab region as per 2015 US News and World Report. Our faculty, students and researchers have also had six patents issued, and applied for another 52 patent applications and 82 invention disclosures. Following the establishment of iInnovation – one of the first technology commercialisation platforms in the UAE that is working to translate ideas into proof of concept that will be the stepping stone towards incubating technology start-ups – we also have the formation of four startup companies by members of the Masdar Institute community.

“Masdar Institute of Science and Technology is dedicated to providing real-world solutions to the issue of sustainability.” - Dr Fred Moavenzadeh

Innovations and Milestones
Of the hundreds of research projects ongoing and completed at Masdar Institute, many exciting outcomes and milestones have been recorded.

This year Masdar Institute signed a contract to construct the world’s first bioenergy pilot project to use desert land – irrigated by seawater – to produce both bioenergy and food. Part of the Sustainable Bioenergy Research Consortium (SBRC), the project is based on an integrated, closed-loop system. The technology uses coastal seawater to raise fish and shrimp for food, whose nutrient-rich wastewater then fertilizes plants rich in oils that can be harvested for aviation biofuel production. The plants thrive in arid, desert conditions and don’t require fresh water or arable land to grow.
Lastly, the effluent is diverted into cultivated mangroves being discharged back into the sea, further removing nutrients and providing valuable carbon storage. The goal of this pilot project is to demonstrate the integrated bioenergy process as a commercially viable and sustainable system with respect to essential food and fuel production, suitable land use, reduced carbon emissions and wastewater clean-up.

Another exciting first, a UAE national student was among a team of Masdar Institute researchers who fabricated the very first bulk-hetero-junction solar cell in the country. Mejd Alsari, a UAE national student, and Dr. Samuele Lilliu, a post-doctoral fellow working at the Nano-Optics and Optoelectronics Research (NOOR) Laboratory under Dr. Marcus Dahlem, Assistant Professor, Microsystems Engineering, fabricated the first polymer-based organic photovoltaic solar cell (OPV), which can also be conveniently printed on flexible substrates in Masdar Institute’s ATIC-sponsored cleanroom facilities internally without any assistance from external fabrication facilities or expertise. OPVs can be customised with colour and design for unique Building Integrated Photovoltaic (BIPV) applications and further research in large area organic photo-detectors based on the same technology has potential applications in the medical, security and entertainment industry.
Ahmed Al Harethi, another promising UAE national student at Masdar Institute, won the Medal of Top Emiratis on the UAE’s 43rd National Day in 2014 for being “the first Emirati to invent a mechanism for generation of biofuels with industrial quantities using genetically-modified algae”, which relates to his ongoing doctorate research at Masdar Institute. He was one of over 137,000 applicants for the Medal of Top Emirati, of which only 43 were issued. Al Harethi has also filed a US patent application for a methodology he has developed to produce high salinity tolerant microalgae strains, which have the potential to be cultivated on the UAE’s coastal deserts for useful chemicals and other byproducts.

**Conclusion**

This is just a snapshot of the exciting research and innovation in advanced energy and sustainable technologies underway at Masdar Institute. With the continuing support of the UAE government and the greater collaboration with industry, academia and government organizations, Masdar Institute hopes to bring real breakthroughs to the UAE and world at large. We are confident government and industry support and investment in related technical industries will ensure the new generation of Emirati technicians and scientists Masdar Institute helps to produce channel their talent, commitment and passion into the UAE’s economy rather than being drawn to established knowledge-economies overseas.

As the UAE gears up to host Expo 2020 Dubai, we all need to increase our efforts to support the country’s transformation from an economy fuelled by a finite and volatile natural resource, to one with a stream of diverse knowledge-based industries that give back to the country, rather than just extract from it. Knowledge-based industries are the main producers of high technology goods, high and medium-high technology manufacturing and the
main users of technology, and account for more than half of GDP in the OECD. They continue to grow rapidly. Knowledge intensive economies are also capital intensive, limiting the number of countries who can effectively make this transition, and thus providing the UAE with a unique and advantageous opportunity. As ‘high value human capital’, going forward, the UAE citizenry will produce the valuable and useful products and services that contribute to the UAE’s prosperity and its place of pride in the global community.
Bringing the Theme to Life; Connecting Minds, Creating the Future through the Expo 2020 Dubai Master Plan

His Excellency Helal Al Marri,
Director General of Dubai’s Department of Tourism and Commerce Marketing (DTCM) and CEO of Dubai World Trade Centre (DWTC)
Bringing the Theme to Life; Connecting Minds, Creating the Future through the Expo 2020 Dubai Master Plan

His Excellency Helal Al Marri,
Director General of Dubai’s Department of Tourism and Commerce Marketing (DTCM) and CEO of Dubai World Trade Centre (DWTC)

The theme Connecting Minds, Creating the Future and the subthemes of Opportunity, Mobility and Sustainability lie at the core of Expo 2020 Dubai. In this article, His Excellency Helal Al Marri, Director General, Department of Tourism & Commerce Marketing and CEO of Dubai World Trade Centre, shares how Expo 2020 Dubai’s master plan has been carefully designed to reflect the theme and subthemes.

The UAE was given the honour of hosting World Expo 2020 in Dubai under the theme Connecting Minds, Creating the Future, a powerful echo of the spirit of partnership and collaboration that have been instrumental in the city’s undeniable stewardship in innovation and its sustained progress.

Much like the unrivalled convening power of World Expos, connectivity and partnerships lie at the heart of the genesis of Dubai as a modern-day hub linking the East with the West. Before its evolution into the current state-of-the-art form, Dubai was a trading post facilitating the meeting of people and movement of goods, and was commonly known as Al Wasl – meaning ‘the connection’.

Opportunities stem from connections and connecting people has often catalysed the birth of societies and civilisations. Dubai finds its roots in such a coming together of people and minds.

It is this very essence that is enveloped throughout the concept for the Expo 2020 Dubai master plan. Its design and execution is driven by a clear vision
for its legacy, integrating sustainable urban development with opportunities to foster economic and social development for the Emirate, for the country and for our region.

The spirit of the master plan is to facilitate this global dialogue on-ground during Expo 2020 Dubai, bringing to life the theme Connecting Minds, Creating the Future and seamlessly integrating the three sub-themes Opportunity, Mobility and Sustainability. The spatial organisation of the site embodies these concepts, drawing deep inspiration from local urban design, architecture and the natural environment.

At the core of the Expo 2020 Dubai master plan for the gated Expo area, are three distinct zones, each dedicated to one of the sub-themes, which will converge at the central Al Wasl Plaza, the figurative and literal heart of Expo 2020 Dubai, and a tribute to the city’s age-old namesake.

**A Home For The Future: Expo 2020 Dubai Master Plan**

With the objective of maximising the potential legacy use of the structures and infrastructure built for the Expo period, the Expo 2020 Dubai site has evolved since the bid stage, increasing significantly the number of permanent structures and transforming into a highly integrated plan, designed for sustainable and long-term commercial viability. It has undergone substantial review and feasibility, from optimum land usage and sustainability targets to infrastructure planning, transport forecast modelling, and the seamless incorporation of Dubai Smart City’s principles for a completely integrated participant and visitor experience.
The journey for Expo 2020 Dubai begins long before entering the site, for tourists, residents and participants alike.

Visitors entering Dubai or the UAE via airports - or already in the city en-route to the site on the metro or via the low-emission Expo Rider buses - will be provided with up-to-the-minute information about the day’s programme of events by way of video, either through a mobile application and/or interactive displays.

For participants, they will be accommodated in the serviced apartments and residential units located immediately adjacent to the Expo in the Expo Village, providing unmatched security and convenience. Being located within walking distance to the Gated Area, participants have the option to walk or to make use of a dedicated low-emission vehicle that will take them to the relevant entrance for accreditation scanning and security screening.

Once inside, they will be immersed in a site design that encourages collaboration and, consequently, inclusive partnerships among participants to
be the basis for innovation. To this end, the master plan employs a totally integrated approach to the spatial distribution of all participant and host country pavilions.

Al Wasl Plaza is the heart of the Expo site in geographical location, orientation, stage of the journey, and visitor experience. Clever integration of smart-cities technologies, along with a sophisticated way finding strategy, brings the three thematic zones together at this nexus point, symbolically crowned by the peaking of the shade structure – all coming together as the landmark focus of the Expo 2020 Dubai site.

This key open public space of Expo 2020 Dubai, serves as the main orientation space for visitors, as the central stage for events, performances, concerts and the very ‘heart’ of the night entertainment programme.

All the key components of Expo 2020 Dubai are then found in each of the three subtheme zones, such as participant pavilions, organiser pavilions, event spaces, public spaces, food and beverage outlets, and other supporting facilities.

At the centre of each theme zone are clusters of small pavilions, displacing the more common-place ‘joint pavilions’ from historic World Expos. Housing the smaller pavilions at the centre of activity in the Souk areas – inspired by the ancient Middle Eastern urban planning fundamentals meaning they are the physical epitome of convergence – gets them as much exposure to visitors as the larger anchor pavilions. These larger pavilions, including those pavilions that usually drive the highest number of visitors, surround each of the clusters in such a way as to entice visitors on a journey of discovery.
The Souk areas are designed to evoke the harmony, beauty, functionality, and vibrancy of the traditional souk, where all kinds of interactions and human encounters may take place. All participant pavilions will derive benefit from the close interaction between participants and visitors - one of the key elements to foster partnerships and provide the spark for new ideas and innovation.

Composed of narrow meandering pathways and niches that connect all the pavilions, the Souk areas will each have its own landscape identity based on the corresponding sub-theme. The main pedestrian pathway will be lined with trees and informal rest areas in order to help with way finding within the narrow streets, and also to create additional opportunities for people to experience, explore, and connect with Expo 2020 Dubai.

For visitors, the Souks will be an immersive experience into the Middle Eastern traditional architecture as well as a unique journey, with large international organisations and Best Practice Areas serving as bookends situated at the beginning and the end of typical visitor paths along the Souk areas; with pavilions for small international organisations and countries forming the journey in between.

Further to this, are the Theme Pavilions - the focal point of the subtheme zones. Each has a direct relationship with one of the souk petals and its associated Best Practice Area – a collaborative space for non-official participants such as corporations, small and medium enterprises (SME), academic and non-governmental organisations (NGOs).
The Theme Pavilions will each contain a permanent exhibition of interactive and educational content related to its theme. In addition to serving as flexible exhibition spaces, these pavilions will be among the Expo Site’s largest buildings and will be landmark attractions at the ends of the souks, acting as anchors and natural destinations.

The Theme Pavilions will create a sphere of influence with other components of the master plan, embracing the theme of *Connecting Minds, Creating the Future* and inspiring best practice and collaborative thought-leadership amongst all participating countries in the Souks that are situated adjacent to them.

Further fostering collaboration and the sharing of ideas, will be the Innovation Pavilion. This will capture the pioneering essence of Expo 2020 Dubai, providing visitors and participants with a place to connect and engage. Consistent with the importance of innovation as a key topic in Expo 2020 Dubai, it will serve as one of the key anchors of the Expo site, and will be situated in a central and highly visible location near Al Wasl Plaza.
The zone will house an auditorium with a capacity of 1,000 people and will host a series of talks, events and showcases focused on innovation throughout the duration of the Expo. Adjacent to it, as an integral part of the Innovation District, will be an area dedicated to displays of pioneering, future technologies and initiatives created in collaboration with top research and academic institutions - an immersive experience, ground-breaking in its own right.

The Innovation Pavilion will be linked with the satellite Innovation Pods, two of which are located in each of the Souk areas. The Innovation Pods will be mini ‘hubs’ of innovation, encouraging participants and visitors to connect, collaborate and share ideas and concepts. The pods will house meeting rooms, collaboration areas and display areas as well as small gathering spaces with AV and technology enabling them to connect live with events, showcases and talks being hosted in the main Innovation Pavilion.

All of these respective site features are being underpinned with a state-of-the-art user journey, which strives to ensure Expo 2020 Dubai will welcome
the world to an authentic, collaborative and astonishing experience that educates, entertains and inspires, whilst creating lasting connections, fostering purposeful innovation and delivering value for everyone. To this end, we are implementing cutting edge ICT innovations that allow us to extend the experience of an Expo beyond the insides of any single pavilion, across the entire site, delivering unique educational and entertainment experiences built around the core sub-themes.

A Sustainable Destination
We have also set out clear sustainability targets for the Expo 2020 Dubai master plan design, linking back to our subtheme. Detailed targets and overarching strategies have been developed to ensure that sustainability is achieved in the design of Expo 2020 Dubai pavilions and related buildings and infrastructure, focusing on demand reduction, use of alternative sources, re-use and recycling across energy, water, waste, materials and supply.

A key ambition of Expo 2020 Dubai is to generate at least 50% of the Expo Site’s operational energy needs over its six-month duration from renewable sources. Emphasis will be placed on integrating solar energy technologies, linked to plants being developed as part of the future city infrastructure requirements, into the Expo site master plan.

Furthermore reduction in consumption of water across the pavilions and buildings on-site is being targeted to be achieved at Expo 2020 Dubai whilst a Resource and Waste Management Strategy (RWMS) outlines the approach to managing waste that would arise during the construction, operation and legacy transition phases of the Expo and reusing materials with the intention of maximising the opportunity of recycling waste material. As one of the underpinning philosophies that has guided our thinking and provided the
thread that weaves together many aspects of our Expo, sustainability has been a core facet throughout - from the content and operations of the event to the physical design and implementation of the site and all of its activities.

Both through the tangible manifestation of this Expo 2020 Dubai subtheme to its role in the shaping of dialogue and discussion in the build up to, during and in the event’s legacy, we hope to make Expo 2020 Dubai an effective and inspiring springboard for the green global economy.

The next five years will be the start of our legacy commitment to make our venue a living green laboratory for the world.

**Our Legacy**

Expo 2020 Dubai is committed to creating a sustainable and lasting legacy beyond the six-month duration of the event that intrinsically ties back to the Expo 2020 theme *Connecting Minds, Creating the Future*. Our legacy aims to create a destination that is a catalyst - boosting Dubai from a technological point of view into a prototype future Smart City, inspiring to deliver an inspirational environment for youth of UAE and the GCC region, and be the global benchmark for purposeful innovation.

Legacy strategy was a core facet of our bid and continues to be a foundation for all planning activities, delivering a strong platform for Dubai and the UAE to launch the next 50 years when commemorating our Golden Jubilee. We are equally committed to engaging with the Al Wasl Plaza is the heart of the Expo 2020 Dubai site participating countries through programmes that allow for inclusive representation in the context of the theme, for each of them to leverage Expo 2020 Dubai to energise research and innovation in the thematic areas, and to serve future organisers of World Expos with
experience-based learnings on the management and delivery of the event itself.

Indeed, every stage of the Expo, from preparation to delivery and transition, has hence been assessed as an opportunity to capture, maximise and achieve lasting benefits for Dubai, the BIE, the UAE and its surrounding region, and for the global community as a whole.

At the very heart of all innovation lies creativity and inspiration. With culture, art and heritage laying the foundation of this core, the Expo 2020 Dubai site will have a range of event and entertainment options in specialised venues. Most significantly, delivering an engaging, vibrant and interactive experience that continually triggers passion and inspiration is a core part of the fabric that defines the identity of the legacy development.

Starting from the site, we expect to leverage our strong underlying legacy vision for the development to serve as a live showcase for purposeful innovation. The signature assets that the UAE will build for the Expo, like the UAE Host Pavilion and Children’s Pavilion will be future museums with rich, engaging content that is culturally educational and inspirational. The three subtheme pavilions are planned to be transformed into anchors for educational institutions that serve as future centres of excellence, which help build strong intellectual property, enrich human capital and lay the foundation of the region’s knowledge economy.

With the Souks being the ideal fabric to foster development of an active and informal entrepreneurial ecosystem, the site will serve as the engine to fuel growth of SMEs from across the MEASA region. The trade fair hosting exhibition centre and conference facilities along the front end of the
development bring the innovation cycle full circle to fruition – from ideations in the academic institutions, to prototyping and product development in the start-up environment, potential scalability in the larger commercial offices encompassing the Souks and completing the life-cycle through trade and business facilitated at trade shows.

Being acutely aware that investment from countries and corporations in their Expo participation is often significant, it is critical that we work closely with them from the early preparatory stages to explore possible avenues for future retention of their assets where practical.

We are working hard on ensuring that our Expo articulates the themes in practical terms so that participants can immediately relate to the content that will be showcased or developed, and consequently see themselves as active contributors and direct beneficiaries of the event. Further to this we are creating the right ecosystem for participants to connect with other participants and audiences across the entire event cycle through to the legacy – ensuring that we provide a concrete path that extends participation value beyond the six month period.

**Conclusion**

Certainly, Expo 2020 Dubai seeks to offer the international community an opportunity to share perspectives and practices to develop solutions for an inclusive future. Collaboration and innovation – the cornerstones of this platform – are mainstay pillars of the master plan as well. Layering the Expo’s key requirements on this base, and building on sound design principles rooted in a clear longer term legacy, is the modus operandi of a viable Expo master plan that will ensure Expo 2020 Dubai sets a new standard for global mega events.
For more than 160 years, World Expos have been one of the largest and oldest global mega events, bringing together people from around the world, to visit pavilions of other nations, corporates and institutions, learn about the various exhibits and the themes, and experience other cultures... all in a single location.

Dubai will help write a new chapter in the inspiring annals of World Expo history, one that will be collaboratively shaped by all. As the late Sheikh Zayed, the founding father of our country, once said: “Future generations will be living in a world that is very different from that to which we are accustomed. It is essential that we prepare ourselves and our children for that new world.”

I truly believe that Expo 2020 Dubai will be a defining platform to propel the fulfilment of this promise.
Expo 2020 Dubai: Waxing of the Arab Crescent

Dr Hayat Shamsuddin,
Director of Culture Expo 2020
In this article Dr Hayat Shamssudin, Director of Culture Expo 2020 Dubai, considers the nature of culture and reflects on how the theme of Expo 2020 Dubai, Connecting Minds, Creating the Future, reflects the essence of Dubai, a cultural crossroads. Expo 2020 Dubai, will therefore allow Dubai to realise its potential as a nexus of human connectivity which brings the theme alive while offering the perfect venue for the first World Expo in the Middle East Africa South Asian (MEASA) region.

Culture: how can something so fundamental so wholly elude simple definition? The answer lies in the fact that culture is not an ends in itself, but a means to an end; it is not a fixed, quantifiable phenomenon but a term we derive to describe the coruscating, ever-changing idiosyncrasies of a society expressing its growth and development, simultaneously prompting further evolution. Culture is ergo synonymous with the opportunity, mobility and sustainability a society expresses – it is how each of us in our many walks of life interact with others, as both individuals and collectives, with people, nations and ideologies. This extends across timeframes: culture is the expression of societies of the past in that of the present, and of the today in the tomorrow.

Then what is culture? If society were a building, with each individual person and organisation representing the cables, beams and girders of the building’s components and the economy representing the building’s function – be this corporate, residential or commercial – culture is the building’s architecture, the particular aesthetic that arises only when every other factor works in tandem and gives the building its distinctive character. Such a metaphor is perhaps most apt in Dubai, where the colossal Burj Khalifa towers over the
rest of the emirate: its cutting-edge design renders it one of the most structurally impressive feats of construction, its multitude of facilities renders the functional possibilities of the building endless, but its exclusively ambitious architecture is what renders its 4,000 daily visitors so awestruck by an icon of the global tourism industry and a testament to the power of human ambition.

But the Burj Khalifa is a footnote to the boundless cultural wealth and diversity of the emirate it inhabits – Dubai. At Expo 2020 Dubai, we believe in planting the seeds for a syncretism of ideas and perspectives that shall catalyse cultural expression on an unprecedented scale – as the ruler of Dubai, His Highness Sheikh Mohammad bin Rashid Al Maktoum, has emphasised, “the ethos of Dubai was, and is, all about building bridges to the outside world; it was, and is, about creating connections with different cultures.” Such fluidity of cultural dialogue – the hallmark of Dubai’s paragon of unparalleled economic growth in the 21st Century – shall characterise a World Expo sculpted by the uniquely kaleidoscopic influence of its host city and provide the stimulus by which human connectivity shall transform the way we communicate, collaborate and innovate.
Figure 1 - Expo 2020 Dubai’s global impact revolves around the chemistry of cultural exchange on both micro and macro scales. Individuals, organisations and nations will share their distinctive cultural dynamics to reimagine socio-economic norms on the world stage, as embodied by Dubai’s globalised and cosmopolitan community.

Expo 2020 Dubai’s theme – *Connecting Minds, Creating the Future* - is therefore simply a reflection of the city that has borne them; human connectivity is both the cause and product of Dubai’s limitless vitality, a symbiosis that has allowed the emirate to develop a social vibrancy and vigour that reverberates across the region. The UAE has long been a focal point of regional commerce, be it as the Bronze-Age Umm an-Nar culture connecting ancient Mesopotamia with the Indus-Valley Civilisation of modern-day Pakistan, the trading city of Julfar (modern day emirate of Ras Al Khaimah) connecting Europe with India and China along the maritime Silk Road of the medieval era or the Trucial States offering a crucial link between Britain and its overseas territories of India and Burma. Today, Dubai continues this proud tradition as a beacon of stability and prosperity in the MEASA (Middle Eastern, African and South Asian) region: its world-renowned airline, Emirates, oversees 3,500 flights per week, providing the
region’s 2.9 billion people with transport to Dubai in 4 hours or fewer, whilst Dubai’s rich demography represents a microcosm of the region’s peoples and cultures. As the MEASA region’s first World Expo, Expo 2020 Dubai is primed to act as a gateway for the rest of the world into a burgeoning emergent civilisation.

Equally, Dubai’s truly international society is emblematic of the interconnected, globalised future World Expos have spearheaded since 1851. The emirate’s labour market is comprised of 202 different nationalities of the world’s 206, and is universally recognised as a hub of international investment and trade - its total international trade has grown by an average of over 11% per annum since 1988, and its 85 airline links to over 130 global destinations are augmented by over 120 shipping lines. However, Dubai’s eminent human connectivity reaches far beyond mere business: the emirate’s education sector exemplifies the depth and permanence of the internationally holistic qualities of Dubai’s society, with 15 different curricula on offer to more than 243,000 students from over 140 different countries in the emirate’s private schools.

The emirate’s future generations are thus preserving the cultural legacy of their past. The Arab world’s history as a global centre of collaborative learning finds echoes throughout the ages, from the origins of modern medicine in Bukhara under the Samanid Empire through Ibn Sina, to the 16th-Century Ottoman observatory of Taqi Al Din, which revolutionised the study of planetary motion, to the Bait Al Hikmah of the Abbasid Caliphate – known in the West as the House of Wisdom and frequented by such legendary figures as Al Khwarizmi, father of algebra, and Ibn Al Haytham, father of modern optics. In dissolving these cultural strata, Expo 2020 Dubai shall bring its ethos of collaboration – that is and always has been a mainstay
of Middle Eastern culture – to the centre of the world stage.

This human connectivity forms the foundation of Expo 2020 Dubai’s vision for the future; a vision shared by the emirate itself and on the cusp of whose realisation Dubai stands. Its amalgamation of cultures fuels the engine of its progress: Dubai’s tourism sector encompassed 11 million annual visitors in 2013 - this figure is expected to rise to 20 million by 2020, at which point 160,000 hotel rooms shall be required to welcome the world to Expo 2020 Dubai. Similarly, the past 20 years have witnessed over 60 art galleries open in the emirate, showcasing artistic movements spanning the entirety of the globe’s human geography; the Dubai Metro Art Museum Project, launched as recently as 2014, seeks to install art museums at Dubai’s metro stations and establish the emirate as one vast open-air gallery alongside campaigns such as Dubai Canvas and Dubai Speaks to You, a megaphone for cultural expression whose pioneering thinking reflects this new paradigm of societal development in which each individual voice is integral to a fruitful whole.

Expo 2020 Dubai shall exercise its potential as a nexus of human connectivity, a confluence of business, science and culture. Nevertheless, far
beyond simply kindling the sparks of untapped ideas to spur growth and development in these spheres, human connectivity shall propagate itself, setting the creative economy ablaze in its descent into complete lucidity of shared thought, a vicious cycle of daring innovation, unbridled competition and wide-reaching improvement, creating a future whose prospects are as incandescent as its fiery interplay of ideas. The vanguard of this shall be Expo 2020 Dubai’s groundbreaking digital ecosystem, comprised of Expo Live and Augmented Expo: in breaking through the financial, technological and communicative barriers taken for granted in today’s business environment, initiatives such as these shall foster an innovative synergy that shall set a blueprint for future World Expos and, by extension, redefine the frontiers of creative thinking in the 21st century.

Conversely, the future Expo 2020 Dubai envisages is as grounded in the lessons of Dubai’s past as it is in its trailblazing present. The emirate shall represent a crossroads where tradition meets progression, old values meet new ideas and our heritage realises our ambition. Dubai’s proud Bedouin past offers a model for this revolution of human connectivity that resonates to this day – in the immortal words of His Highness Sheikh Mohammad bin Rashid Al Maktoum, “what we want is the continuation of a journey that began with [our] forebears”. Its characteristically intimate way of doing business teaches to harness the power of human capital, a legacy inherited by
the modern UAE as the happiest nation in the Middle East, facilitating efficiency and longevity through personal bonds.

Furthermore, the pioneering spirit inherent to the Bedouin people as wandering nomads alongside the frugality and inventiveness of their harsh desert culture – the literally groundbreaking falaj irrigation systems and myriad uses of the nakheel palms’ fibres, fruit and fronds typify this – offer inspiration for today’s Dubai as a society in which creating the future was simply a way of life. Expo 2020 Dubai’s themes therefore represent a marriage of the emirate’s past and future, a coalescence of cultural ideas whose holistic message is the perfect expression of its host city’s uniquely variegated whole, and finds the perfect mouthpiece in the global challenge of a World Expo.

At Expo 2020 Dubai, the heritage of Expo as the acme of the game-changing and cutting-edge, shall meet a venue whose finger is on the pulse of the emerging world, catapulting the event into a new era in which innovation is not the exception but the rule, a global perspective not an advantage but a necessity, and the line on the horizon is just another hurdle to overcome. We want Expo 2020 Dubai to connect the transformative voice of World Expos with the emerging new audience of the MEASA region, creating a future in which the impossible is just the beginning.
Building the cities of the Future

His Excellency Mohammed Alabbar,
Higher Committee Member for Expo 2020 Dubai and Founder and Chairman of Emaar Properties PJSC
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As Dubai prepares to host Expo 2020 Dubai the city is leading the quest for co-creating solutions for a part of the world that will have the largest density of mega cities and urban centres. In this article, His Excellency Mohamed Alabbar shares insights into how Dubai’s journey moves to becoming a city of the future and will ultimately leave a legacy for future generations.

Four decades ago, Dubai was a desert land, inhabited by Bedouin tribes, fishing villages and date farms. As a young Emirati studying abroad, almost no one had heard of the emirate. Today, it is home to 200 nationalities and is a thriving global city. Over the next six years, the International Monetary Fund predicts it will continue to grow, averaging a healthy 5.6 percent as big real estate projects rise and preparations to host the Expo 2020 Dubai begin.

All of the signs are that the world will judge Dubai not just as a smart city but also as a future city. But what is a city of the future and how do we define the legacy of a city for our future generations? Dubai is not alone in its rapid growth. Just as new manufacturing techniques sparked the mass migration from villages and towns to cities during the West’s Industrial Revolution, today’s shift towards industry, technology and service is driving more and more people to urban areas and creating modern cities and in some cases mega-cities.

We are currently two-thirds of the way through a century-long cycle of rapid urbanisation, at the end of which more than 70 percent of people will live in
cities, according to the World Health Organisation. Today, for the first time in history, the majority of the world’s population is living in urban areas. To put that into context, 100 years ago just two in ten people in the world were living in urban areas and by 2050, that figure will triple to six in every ten, according to research by the United Nations.

Aerial view of Downtown Dubai

Technology coupled with a rapidly growing population means urbanisation is happening quickly. While it took London around 130 years to grow from a population of one million to eight million, it took Bangkok 45 years and Seoul just 25 years. By the middle of the 21st century, the urban population will almost double, from roughly 3.4 billion in 2009 to 6.4 billion in 2050.

While these numbers seem unprecedented, it is important to note that the speed at which it is happening is not. Globally, urban growth peaked in the 1950s after World War II, particularly in Europe and North America, but there have been and are dramatic differences in the scale and pace of urbanisation across the world. Tokyo, for example, grew by more than half a
million inhabitants each year between 1950 and 1990 while Mumbai grew by around 240,000 annually. While cities in China and Sub-Saharan Africa experienced only modest growth during this period, urbanisation took off from the 1990s onwards. Delhi added 622,000 new inhabitants per year between 1990 and 2010 while China’s South Guangdong metropolitan area saw its 5.5 million inhabitants grow to almost 32 million in just two decades. Looking ahead, it will be developing region’s turn to expand. The United Nations predicts that cities in India, China and Nigeria will account for 37 percent of the projected growth of the world’s urban population between 2014 and 2050.

The challenges these cities will face as they continue to grow will be vast. Many will be familiar with the image of dozens of migrant workers utilising old shipping containers on the outskirts of Shanghai as a solution to the city’s growing housing shortage following its rapid urbanisation. As demands for housing, infrastructure, transportation, healthcare and education increase so too does the pressure to meet these demands.

Challenges aside, this urban transformation offers no end of opportunities economically, demographically, socially and environmentally. Megacities and cities of the future create jobs, offer access to education and healthcare, develop diverse social communicates and in the case of the developing world, provide citizens with basic human needs such as access to clean water.

A recent report on the Millennium Development Goals (MDGs) by the World Bank and the International Monetary Fund says future cities could significantly progress the development of MDGs. “Virtually no country has graduated to a high-income status without urbanising and urbanisation rates
above 70 percent are typically found in high-income countries,” notes the report. The price of water in Niger exemplifies the impact cities can have on sanitation and health. While the average price for piped water from a network costs around CFAF182 ($0.30) per cubic metre, it rises to CFAF534 from a public fountain and nearly doubles to CFAF926 from a vendor in the rural areas.

The wider economic impact of these new cities is boundless. China’s Pearl River Delta region, for example, has been one of the most economically dynamic regions in China’s mainland since the launch of its reform programme in 1979. Characterised by mass urbanisation, foreign direct investment, the region comprises Guangzhou, Shenzhen, Dongguan, Foshan, Zhongshan, Zhuhai, Jiangmen, and parts of Huizhou and Zhaoqing, and has a per capita GDP in excess of 50,000 yuan (approximately $7,300) and an economy comparable in size to that of Taiwan.

Providing jobs and opportunity here in the Middle East and North Africa is one of the biggest challenges we face as the region’s population continues to grow. With a population of over 370 million, more than 60 percent of which is under the age of 25, the MEASA region is one of the most youthful in the world. As we saw during the Arab Spring and continue to see in many of our neighbouring countries, youth want – and need – access to jobs, good homes and quality lifestyles. As such every new city development is an investment in our future and in our youth. These cities create new jobs. Once complete, King Abdullah Economic City in Saudi Arabia, for example, has the potential to create one million new jobs and promote a culture of youth entrepreneurship. In a country where 1.9 million youth are expected to enter the workforce over the next decade, the ability to create jobs is a vital component to economic development.
Urban areas are also able to offer more diverse social communities, which in turn promotes and encourages no end of cultural opportunities. City dwellers form globally-connected, fast paced societies where new cultures are able to meet and converge.

In just a few decades, Dubai has created what I believe to be a city of the future. Its inspiring growth has earned it several epithets. Writers on one-off visits to the city have jumped at eye-catching adjectives, sometimes laced with cynicism, while the more informed have researched the city’s growth to describe it with profound insight and deep clarity.

Professor Jeffrey Sachs, the US economist and director of the Earth Institute at Columbia University, referred to Dubai as a phenomenal city and a miracle built in a short span of time. He sees Dubai as the new trading hub in the Indian Ocean and a centre of creativity and ideas. Thomas Friedman, The New York Times columnist, describes the city as “a model that we should want the Arab world to follow.” Highlighting its ability to build a future based on “private property not caprice, services more than oil and globally competitive economies,” he praises its safe haven status and its ability to encourage young Arabs to live up to their full potential across a broad spectrum of industries from technology start-ups to the arts and finance, in a culture they are familiar with.

The Dubai story is about building the city’s fundamentals and getting them right. As emerging markets strive to create urban centres for its people, Dubai offers a template that stands tried and tested. What Dubai did and continues to do is simple. It is building on its strengths – its geographic location, multiculturalism and openness to the global economy – and in
doing so effectively addresses structural challenges that are inbuilt in any economy.

The transformation of Dubai is the result of farsighted initiatives that were rolled out decades ago. The leadership invested where it mattered. Realising that trade is the prime driver of the city’s growth, Sheikh Rashid bin Saeed Al Maktoum, regarded by many as the Father of Dubai, commissioned the extensive dredging of Dubai Creek and set the blueprint for the Jebel Ali Port, now a regional logistics and exports hub that connects global markets. At a time when high-rises were beyond imagination for the Arab world, Dubai built the World Trade Centre as a modern hub for international businesses to expand to the region.

With eyes set on economic diversification to ensure the city’s sustainable growth, HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, took the city to the next level by focusing on strengthening its economic competitiveness, and attracting capital and talent through an uncharacteristic opening up of the economy. He extended the ‘free business zone’ mindset with 100 percent ownership and total income repatriation to the information technology, media, education, healthcare and biotechnology sectors, which are today the pillars of the knowledge economy.

The sense of ownership in business that such policies ushered in was supported by a game changing initiative in the city’s property sector. The freehold era, where expatriates and non-residents could own and build property brought a true sense of belonging to the 200 nationalities who today call Dubai their home. It is a model that is now emulated in several markets across the region.
Dubai’s business-oriented policy frameworks were backed by the leadership’s focus on creating opportunities for the people and fulfilling their lifestyle aspirations. This is amply demonstrated by Downtown Dubai, a 500-acre mega-development by Emaar Properties – one of the first companies to seize the many opportunities that the introduction of the freehold era bought.

Downtown Dubai is located on what once served as an army barracks. The abandoned land has today been transformed to the ‘most prestigious square kilometre on earth’ and is the most-visited retail, entertainment and lifestyle destination in the world having welcomed over 80 million visitors in 2014. Downtown Dubai created a ‘city within a city’ and carved a new ‘Downtown’ model in urban development that is being replicated in countries as far as Serbia, Nigeria, Egypt, Saudi Arabia, Pakistan and Turkey.

There are several takeaways for policy makers from Downtown Dubai. It marks one of the ‘New Deals’ in the economic transformation of the city. With an investment of $20bn, Downtown Dubai is a prime example of a successful public private partnership. By investing in building new infrastructure, the city energised its core economic sectors – retail, tourism, hospitality and leisure – while driving the growth of the property sector through world-class residential and commercial projects.
The various components of Downtown Dubai – Burj Khalifa, the world’s tallest building; The Dubai Mall, the world’s largest and most-visited retail and entertainment destination; six world-class hotels with occupancy levels that are higher than industry average; a bustling boulevard that brings a new lifestyle - are all designed as economic catalysts. Today, tenant sales across the 1,200 retail outlets in The Dubai Mall alone contributes nearly five percent to the city’s gross domestic product, while iconic attractions such as Burj Khalifa, which hosts the globally acclaimed New Year’s Eve fireworks, the hotels and leisure attractions make recurring and sustainable contributions to the economy.

With thousands of new jobs created, Downtown Dubai also exemplifies the spirit of global collaboration that drives Dubai. Creating niche growth hubs is central to the sustained growth of a future city. Downtown Dubai is that smart city hub that not only drives GDP growth but also takes the city up on the Gross Happiness Index scale.
Putting people first, creating micro-growth engines within the economy and building on one’s strengths – these have helped Dubai define its credentials today. The city achieved speed and scale. Both matter in creating the cities of the future.

As Dubai prepares to host the World Expo 2020, the city is reiterating its ability to address the fundamental needs of future cities that, it hopes, will inspire a new development narrative not only for the region but for the world.

The theme of Expo 2020 Dubai – *Connecting Minds, Creating the Future* – reflects the DNA of the city – its past success and its future aspirations. *Connecting Minds, Creating the Future* is about building essential, smart partnerships across three critical priorities, to inspire and shape the future of all countries and communities. These are: mobility, sustainability, and opportunity – the three sub-themes for Expo 2020 Dubai. It establishes the idea that mobility of people, goods and ideas, as well as access to intellectual and financial capital, job creation, and energy and water resources, serves as a critical basis for our individual and shared future.

The realities of tomorrow are far removed from the needs or aspirations of the people that inhabit today’s cities of the world. In most cases, today’s megacities evolved unplanned, attracting hundreds of thousands of people seeking new job opportunities offered by urban centres with no real supporting infrastructure. This in turn has created urban development challenges that policy makers are now struggling to address.

Unplanned growth and the inability to look into the future have created major concerns for several of today’s megacities. While the World Bank and
the International Monetary Fund report recognises that urbanisation can be a force for good, it also warns of the pitfalls of careless planning: “If the forces of urbanisation are not managed speedily and efficiently, slum growth can overwhelm city growth, exacerbate urban poverty, derail MDG achievements and reduce, if not eliminate, cities’ comparative advantage regarding attainment of the MDGs.”

With the number of megacities set to grow to 37 by 2025, more than two-thirds of them in the developing world, these challenges, when addressed, also hold the key to human happiness – the foremost value and objective that Dubai promotes.

Not surprisingly, these three development challenges are related to ensuring Opportunity, Mobility and Sustainability – the very sub-themes of Dubai Expo 2020. People need food, water, power and a clean environment. They need to be connected with mass transport infrastructure that is non-polluting, efficient and smart. Above all, they need the opportunity for a better life – good education, fair jobs, homes and a healthy lifestyle. This is all the more important for a future generation dominated by the youth.

Dubai has been addressing the fundamental big city challenges for more than four decades. We have been creating and consistently rebuilding a ‘city of the future’ and attracting talent and capital by creating the right environment for growth.

The world-class infrastructure that we have invested in and built, such as the well-knit roads, telecom connectivity, airports, ports and homes, welcome multicultural talents to a smart urban hub that offers them a quality lifestyle. And that is what has earned us the reputation as a global city. Today, 95
percent of Dubai’s GDP comes from non-oil sectors including trade, logistics, financial services, aviation, tourism, hospitality, real estate and construction. Dubai Airports welcomed a record 70.4 million passengers in 2014 while the city welcomed 11.6 million tourists, an increase of 5.6 percent year-on-year. Dubai’s 2014 numbers are 13.2 million tourists up 8.2 percent compared to previous year.

As we move to the next stage in our city’s evolution, we are reimagining our approach – as we have always done. The world tomorrow belongs to a tech-savvy generation unencumbered by the prejudices or geographical boundaries that have constrained those who walked before them. Broadband and smartphone penetration have led to new ways of thinking, and innovative approaches to doing things. By the turn of the decade, we will be part of what Google’s Executive Chairman Eric Schmidt describes as a fully connected world. We will also be living in a world of connected devices, in the era of ‘The Internet of Things.’

Preparing for the Expo 2020 Dubai presents a fantastic and unique opportunity to rethink, reconfigure, reinvigorate and re-explore how we can build future cities and communities tailored for a smarter, connected world.

Dubai is exploring how we can strengthen mobility by enhancing the physical flow of people and goods through smart, safe and robust systems for logistics and transport. We are seeking new ways to become more sustainable with better access to energy and water for all and we are challenging conventional models in opportunity creation by collectively harnessing new models for the flow of financial and intellectual capital.
As the first World Expo to take place in the Middle East, Africa and South Asia, serving an area with a collective population of nearly 2.9 billion people, Expo 2020 Dubai is leading the quest for co-creating solutions for a part of the world that will have the largest density of mega cities and urban centres.

Taking action on global problems, mobilising global resources and talent, and harnessing global creativity and innovation, Dubai Expo engages communities and talent from around the world in the common pursuit of a better future.

Such an ambitious mission requires a truly global, accessible domicile of convergence. This is what Dubai is, and what it has always done best.
Harnessing the Power of Dubai, its People and Connections

*Her Excellency Reem Al Hashimy,*

*UAE Minister of State, Director General of the Bureau Expo 2020 Dubai and Board Representative of the Expo 2020 Dubai Higher Preparatory Committee*
Harnessing the Power of Dubai, its People and Connections

_Her Excellency Reem Al Hashimy,_
_UAE Minister of State, Director General of the Bureau Expo 2020 Dubai and Board Representative of the Expo 2020 Dubai Higher Preparatory Committee_

Expo 2020 Dubai is designed around the theme: Connecting Minds, Creating the Future. Her Excellency Reem Al Hashimy, UAE Minister of State, Director General of the Bureau Expo 2020 Dubai and Board Representative of the Expo 2020 Dubai Higher Preparatory Committee, explains the genesis of this theme and its relevance to many of the urgent challenges faced by the world today.

Her Excellency Reem Al Hashimy

_A Shared Vision for a Better World_

For over 40 years, Dubai and the United Arab Emirates (UAE) have been a living testament to the spirit and values that shape World Expos. They have attracted and welcomed people and ideas from all around the world and leveraged best global practices. They have created government policies, procedures and operations that support economic growth, enhancing the quality of life for its residents. They have developed world-class infrastructure and attracted and educated the best and brightest in the region.
But, this is only part of the story, for none of this has been done in isolation. Rather, we have built our country on cooperation and partnership with other nations from every part of the globe. Therefore, even if we provide the meeting ground, the infrastructure and the opportunity, we will only be truly successful if we share our vision and design our strategy alongside the contributing nations of the world.

Crafting a prosperous future requires a powerful vision that serves as a guiding beacon. The UAE journey has been shaped by the wise vision of our forefathers, who worked together to create a better world for our people. The concepts of unity, collaboration, and partnership have been catalysts for progress and this is why we are so convinced that our theme, Connecting Minds, Creating the Future, is worthy and relevant. It is a powerful call to action for our global community to connect, to take collective responsibility and to forge a common future united in destiny, responsibility, knowledge and prosperity.

The values that shape Connecting Minds, Creating the Future echo the strategic principles of our UAE Vision 2021, which strives for an ambitious future, a confident nation grounded in its heritage; excellent education and healthcare; a competitive economy driven by knowledgeable people; and a nurturing and sustainable environment that enhances the quality of life. These simple, yet fundamental aspirations share much with the vision and spirit of every World Expo. Consequently, the pursuit of these goals will shape the destiny of Expo 2020 Dubai and offer a mighty springboard to impel both our nation and the world onto the next stage of the journey of mankind.

As the world convenes in Dubai for Expo 2020, this historic event has the
extraordinary potential to inspire us all by providing a model for a truly connected world in the 21st century. It has the unique and compelling value proposition of being able to bring the world together to share values, share ideas, and share a vision for a better world.

**A Crossroads for Collaboration**

Guided by a clear vision, we are proud that the UAE has been given the honour of hosting the 2020 World Expo in Dubai. We are inspired that for the first time in history, a World Expo will be held in the Middle East, Africa and South Asia region (MEASA). We are also delighted that the UAE, a historic crossroads, will bring so many nations together to create powerful and timely connections.

Connections are part of our societal DNA. Indeed Dubai’s traditional name in Arabic, Al Wasl, means ‘connection point’. The country was born from local settlements based around historic trading posts and fertile oases that for centuries formed meeting places for people, goods and ideas. These settlements were important for collaboration and information sharing, benefitting from the mobility of travellers and leading to business growth and opportunity. Then, as now, tradesmen brought news from far off lands, shared the latest knowledge, traded goods and experience, debated the future, showed each other new materials and demonstrated the latest inventions and discoveries. The parallels with a World Expo are unmistakable. In the modern era, the UAE has continued to thrive by removing barriers, building links and pioneering new routes for development, diversification and advancement.

To meet the challenges every part of our world faces today; to mobilise global resources and talent; and to harness global creativity and innovation,
requires a truly global destination where hearts and minds can congregate. We are honoured that Dubai, where connecting and collaborating is customary and uniquely welcomed, has been chosen. With over 200 nationalities living and working in Dubai, the city is a nexus for people, nations, goods, institutions, ideas and partnerships. With a world-class infrastructure, advanced technology, efficiency, innovation, as well as our inherent ability to collaborate and partner, Dubai is fully mobilised and intent on creating a truly exceptional World Expo that will bring value to participants and visitors alike.

**Partnerships that meet Global Challenges**

As the 21st century unfolds we are, as never before in history, facing a time of profound change bringing complex and interdependent challenges that can, and do, affect us all.

The coming decades will see critical tipping points emerge in the size and distribution of the global population, and as our planet swells our resources will decrease.

As human density multiplies at more than 200,000 a day, urbanisation will take precedence as people move to cities to seek the chance of a better life. Already more than half of humanity lives in cities and by 2030, it is estimated that 80 percent of people in developed countries and 55 percent in developing nations will live in urban centres. These growing global demands are in sharp contrast to the relentless decrease in natural capital leading to depletion in biodiversity and reduction in resources, all with profound effects on our biosphere.

At the same time, technology continues to accelerate at an exponential rate.
Between now and 2020, more advances in science and technology are expected than in the entire 20th century. This will revolutionise the way we produce and consume, while at the same time threatening disruption to our environment.

Together, we have to respond to these challenges, and together we have the power to identify solutions. This is why Connecting Minds, Creating the Future is much more than a theme, but actually defines a manifesto. Connection and collaboration underpin a framework for addressing the challenges faced by the entire global community. The theme underscores our commitment to partnerships that will foster widespread cooperation and far reaching solutions.

At the dawn of a new century, it is time for us to reconfigure and re-develop connections. In our increasingly interdependent world, no single entity or nation can hope to overcome the multiple challenges we face. Collaboration provides our single best route to building a better tomorrow, tackling together what cannot be done alone. Through robust partnerships that stretch across demographic, institutional and national borders, we have a unique opportunity to redefine the geography of global progress.

The subthemes of Expo 2020 Dubai, Opportunity, Mobility and Sustainability, are the enablers of such development and progress. Opportunity is the lifeblood of development helping us to shape priorities and find ways of fulfilling our social and economic potential. Mobility is the bridge to opportunity and facilitates connections between people, goods and ideas. Sustainability is the ethos that allows us to pursue our dreams of progress, while minimising how much we borrow from tomorrow. Collectively, these subthemes shape and reshape how we connect to one
another, forming a prism through which we can shed light on our challenges. We can only fully unlock that potential, however, if we work together to understand the links between our thirst for opportunity, our need for mobility, and the requirement to act sustainably, and this is what Expo 2020 Dubai will do.

**Delivering on the Promise of Expo 2020 Dubai**

Expo 2020 Dubai promises to provide the world with a chance to come together to listen, learn and formulate how we can respond to the challenges that face us. Through its theme and subthemes, it will catalyse our thinking and crystallise our hopes. The UAE is committed and we are already at work harnessing our assets, expertise and enthusiasm to create a transformative event. In the journey to Expo 2020 Dubai and beyond, collaboration will prove invaluable in ensuring a fruitful legacy for generations to come.

The Expo 2020 Dubai site will be a physical manifestation of *Connecting Minds, Creating the Future* and its subthemes of Opportunity, Mobility and Sustainability. It will bring to life the theme and subthemes through the environment and experiences delivered throughout the Expo period. It will seamlessly demonstrate the interdependencies between the subthemes. It will generate meaningful platforms offering the chance for each nation to be seen and heard, while fostering new relationships, encouraging dialogue and ensuring interaction between all participants and visitors.

Exploratory platforms, such as Expo Live, will, for the first time in Expo history, call upon countries, companies, universities, entrepreneurs, citizens, organisations and individuals to develop solutions to the world challenges that limit our progress towards more sustainable, prosperous and inclusive communities. Expo Live will define concrete challenges, support projects
with demonstrated benefits for communities and reward outstanding achievements and innovations. Through seminars and working groups; challenges and grants, countries and Expo Live partners will be inspired to take an active role in creating the Expo 2020 Dubai Opportunity, Mobility and Sustainability programming, and in doing so shape the future.

Expo 2020 Dubai will leverage the convening power of a World Expo to bring opportunities for stakeholders, both international and local, to work together for a greater good.

**Constructing a Legacy for Future Generations**

We are committed to giving the world an Expo that is genuinely meaningful and memorable, bearing a legacy that is far-reaching and beneficial in its impacts. To this end, we have readied ourselves to meet contributing countries with a broad welcome and a seamlessly complete event. Every area of our Government is involved to ensure the smoothest possible experience for national contributors, business sponsors and visitors alike.

While Expo 2020 Dubai will achieve lasting benefits for the UAE and its regional neighbours and for the Bureau International des Expositions (BIE) with the cooperation of participating nations, we must also offer those benefits to the global community as a whole.

Our founding father and first President, His Highness Sheikh Zayed Bin Sultan Al Nahyan, clearly understood the need for the UAE to play a proactive role in embracing the future and creating legacies when he said: “Future generations will be living in a world that is very different from that to which we are accustomed. It is essential that we prepare ourselves and our children for that new world”. As we welcome the world to Expo 2020 Dubai,
these words remind us that we have a responsibility to future generations.

Legacy planning is essential and every stage from preparation to delivery and beyond will explore long-term ways of promoting a positive difference in the areas of Opportunity, Mobility and Sustainability, while creating a more connected and responsible world.

Legacy will come in many forms – physical, social, economic, and reputational legacies are just a few. As we all endeavour to leave a powerful imprint on our world, we will systematically build our legacy on five key principles. These principles include identifying national and global agendas in line with key priorities; enhancing knowledge creation and awareness related to each of the subthemes; maximising and sharing the social and economic benefits of hosting the event; reinforcing the subthemes through the master plan and operations plan delivery, and bringing honour to the reputation of the UAE and the region.

The legacy of Expo 2020 Dubai will capitalise on the transformative event and continue the journey to promote positive change through new ideas, new
jobs, new ideas together with universities and research centres and a better understanding on how to harness the power of our connections.

Pathways to a Brighter Future
Expo 2020 Dubai will pave the way towards a brighter future. As the UAE approaches its 50th anniversary, we are thankful to have this important milestone in our nation’s history and to remind us of the values that have brought prosperity to the UAE. As the first Expo to be hosted in the Middle East, Africa and South Asia, we are encouraged that it will be a wonderful source of pride, not only for the people of UAE, but for the entire region.

Expo 2020 Dubai will allow the whole global community to collectively reflect, collaborate and create an inspired and shared roadmap that offers a progressive and sustainable path to a collective future, one that is happier, more productive and less stressful than the current trail.

No one can change the past, but through dialogue, exchange of ideas, listening, understanding and collaborating we can forge the future. Through our united efforts we can achieve almost anything we choose. As citizens of humanity, each government, nation, community, organisation and individual has the responsibility to protect our fragile ecosystems and precious resources, find solutions to our shared challenges and in doing so create opportunities that empower every segment of world society.

We unreservedly welcome the World Expo to Dubai, and the world to Expo 2020 Dubai. The UAE and the surrounding region is proud to open its doors to the vast potential that lies within Expo 2020 and beyond. We are confident that the UAE and the city of Dubai will rise to the honour and, with the help and support of contributing nations, be worthy of our selection.
Expo 2020 Dubai will be a momentous landmark for the global community and we extend an invitation across our planet to come together, to work in harmony, to build enduring partnerships, and to generate ideas and solutions that will last long into the future.