

Pioneering the Future of Sustainability





## Pioneering the Future of Sustainability

Based in Abu Dhabi, Masdar is a pioneering international renewable energy and sustainability company that is advancing commercially viable solutions in energy, water, urban development and clean technologies in the UAE and across the world.





Shams CSP Plant, United Arab Emirates



London Array Offshore Wind Farm, United Kingdom

## Who we are

Masdar is the regional leader and a major international player in renewable energy and sustainable urban development. We are a UAE-headquartered company that has been advancing the development, commercialisation and deployment of cutting-edge solutions in the industry for more than a decade.

We are developers of clean energy power projects; we are sustainable urban planners and developers; we are partners in high-impact innovation; and we are facilitators of world-class industry and knowledge platforms that are accelerating the adoption of clean-tech solutions.

Masdar operates in some of the world's most exciting, cutting-edge industries, creating a vibrant corporate culture and partnership model that is constantly pushing the limits of science, engineering and design.

Wholly owned by the Abu Dhabi Government's Mubadala Investment Company, we are partners in the UAE's transition towards a knowledge-based economy and are passionate champions of sustainable development. We seek to be a model of sustainability for other companies, while helping the UAE to be a model of sustainability for the wider Middle East.

## Our ownership

Masdar is wholly owned by the Mubadala Investment Company, a pioneering global investor that deploys capital with integrity and ingenuity to accelerate economic growth for the long-term benefit of Abu Dhabi. As Abu Dhabi's leading strategic investment company, Mubadala is active in 13 sectors and more than 30 countries around the world, creating lasting value for its shareholder, the Government of Abu Dhabi.

In addition to investing in industries such as conventional energy, healthcare, and real estate, Mubadala works to

develop global industrial champions in sectors such as aerospace, ICT, semiconductors, metals & mining, and renewable energy. Mubadala's investment approach prioritises partnership with best-in-class organisations and a commitment to the highest standards of governance.



MUBADALA





Abu Dhabi Skyline, United Arab Emirates

## What we do

Masdar brings technical expertise, innovation and experience to help solve some of the most difficult challenges in renewable energy and sustainable urban development. We identify and develop commercially viable solutions to address key global issues such as energy access, water scarcity, climate change, and the need for a more diverse energy mix.

Promoting the UAE's economic development vision, we build local talent and R&D capabilities, catalyse new industries and contribute to the country's economic diversification. We help solidify the UAE's position as a hub for renewable energy and clean-tech industries.

Our work includes renewable energy power projects of all sizes; sustainable urban development through Masdar City and its clean-tech cluster; collaborative sustainability innovation, research and development projects; and knowledge platforms that bring together different audiences – from thought leaders and policymakers to SMEs, young professionals and high school students – to drive progress in these fields.

Cooperation and partnership are pillars of our business model, whether through strategic co-investments or joint research and development projects with peer organisations based in the UAE, the wider Middle East and across the globe.

## Why establish Masdar?

Masdar was founded by Abu Dhabi's leadership as a powerful mechanism to foster home-grown innovation and the development of cutting-edge technologies, as part of the UAE's ongoing economic diversification agenda, while also serving the vital cause of climate change mitigation.

Working in these future-focused industries helps drive the strategic Abu Dhabi and UAE-wide ambitions – as outlined in Abu Dhabi Vision 2030 and UAE Vision 2021 – to diversify the scope of economic activity and drive growth in high-value, knowledge-intensive sectors.

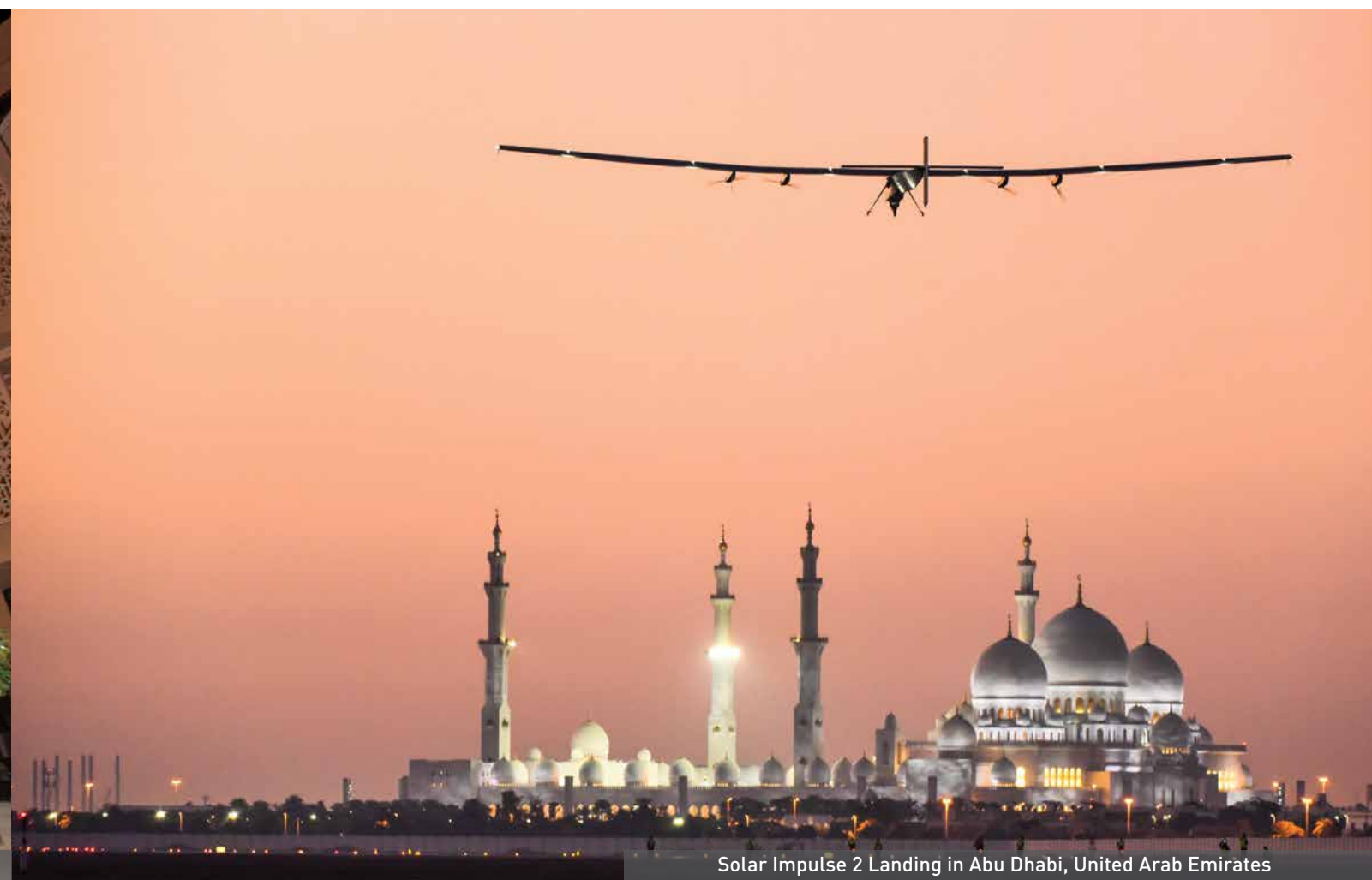
Given the UAE's familiarity with extreme-climate environments and the energy intensity required to live in such conditions, the significant benefits which can be gained from clean energy and sustainable development are very clear. The nation is therefore well positioned to build on its international leadership in conventional energy in order to champion future energy solutions and systems.

Masdar's work also supports the United Nations' Sustainable Development Goals, which include sustainable access to energy and water for all, and other multilateral pacts, such as the 2015 Paris Agreement.





Masdar City's Wind Tower, United Arab Emirates



Solar Impulse 2 Landing in Abu Dhabi, United Arab Emirates

## Achievements So Far

Masdar's dramatic growth since its launch in 2006 has come at a time of enormous transformation in the renewable energy and sustainability sectors. In its first decade, Masdar has contributed to this changing landscape while at the same time evolving in response to the sector's ongoing development.

Masdar developed what was then the region's largest solar photovoltaic (PV) power plant, as well as the region's first and at the time the world's largest concentrated solar power (CSP) plant.

Masdar is part of different international consortia and joint ventures that, among other accomplishments, have

delivered the world's largest offshore wind farm and the world's first solar thermal plant to deliver grid power 24 hours a day.

Perhaps the most tangible symbol of Masdar's progress is Masdar City, the Middle East's first sustainable urban development which is today home to one of the largest concentrations of energy efficient buildings in the world.

Masdar City is anchored by the Masdar Institute of Science and Technology (now part of Khalifa University of Science and Technology), the region's first graduate-level university focused on advanced energy and sustainable technologies.

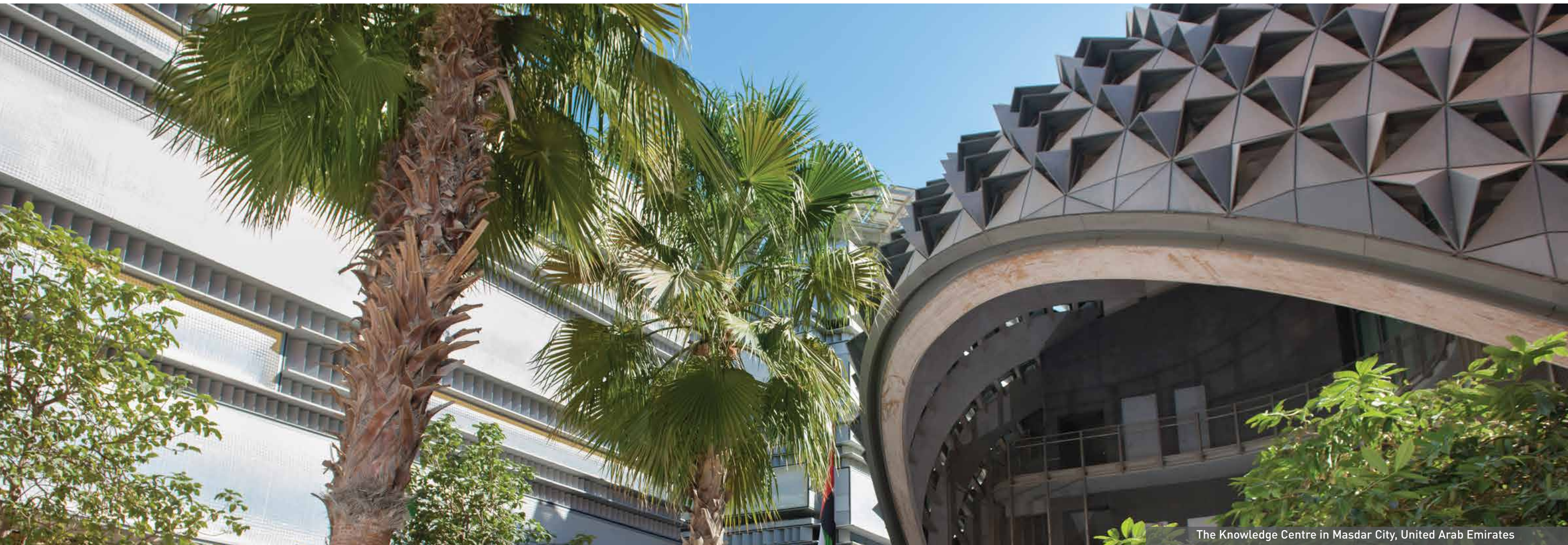
This vibrant city also provided the ideal base for the International Renewable Energy Agency (IRENA) – which became the first intergovernmental organisation to be headquartered in the Middle East.

In addition, Masdar has played a significant role in raising awareness across the world of the potential of renewable energy and clean technologies. The Masdar-backed Solar Impulse 2, the world's first aeroplane to fly around the world without using a drop of fuel, attracted international attention; while knowledge platforms such as Abu Dhabi Sustainability Week have driven industry growth by bringing

together governments and business leaders to create partnerships and to agree on action.

The Zayed Future Energy Prize was created to honour the legacy of the late Founding Father of the United Arab Emirates, Sheikh Zayed bin Sultan Al Nahyan, by inspiring the next generation of global energy innovators. It has received nominations from more than 100 countries since 2008, while its winners have positively impacted the lives of more than 289 million people.





The Knowledge Centre in Masdar City, United Arab Emirates

## Guiding Principles

### Vision

To make Abu Dhabi the world's reference for knowledge and collaboration on the advancement of renewable energy, clean technologies and sustainable development.

### Purpose

To forge a link between the fossil fuel economy of today and the clean energy economy of tomorrow -helping to build a resilient knowledge-based economy as the most effective strategy to secure the long-term prosperity of the UAE.

### Mission

To advance the development and adoption of commercially viable solutions in renewable energy and sustainable real estate that address the sustainability challenges of the UAE, the Middle East and international markets.

### Our Values

**Agile:** We believe that success in today's energy marketplace requires the ability to move swiftly and in sync with changes in technology. We believe that we can make decisions quickly and decisively and with an agility that keeps us at the forefront of the industry.

**Commercial:** We believe that the best way to increase the use of clean technologies is to demonstrate that they are commercially viable – to prove that their adaptation will not only benefit the health and sustainability of our planet, but will also return profits to shareholders.

**Sustainable:** We believe that sustainability is a key criterion that we must use in making decisions. We think about the degree to which the actions we take can be repeated in the future without any significant loss in quality, resources or efficacy.

**Grounded:** We believe that because our business is so forward-thinking – pioneering new concepts and technologies – that our decision-making process must be firmly rooted in reality. Everything we do is grounded in what is feasible, given financial and technical constraints. This will result in better technology, healthier returns and greater adoption.





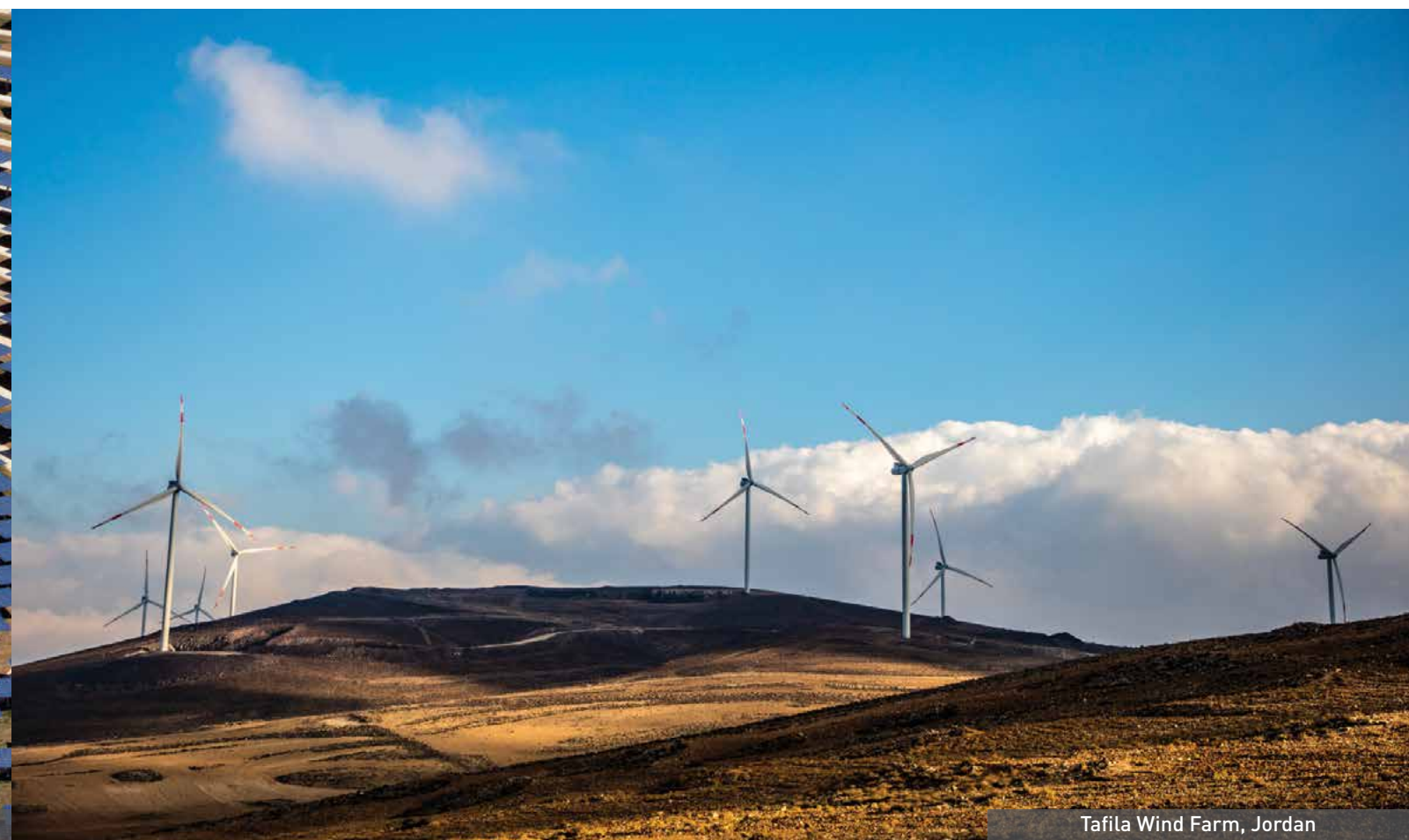
## A Comprehensive Approach to Sustainability

Masdar is active across the fields of renewable energy and sustainability, working with partners to address challenges on both sides of the energy and water supply-demand equation. Masdar Clean Energy focuses on supply-side challenges, while Masdar City's work in sustainable urban development tackles the demand side. In addition, Masdar supports knowledge platforms fostering crucial global dialogue and consensus building to address both supply- and demand-side challenges.





Gemasolar Solar Power Plant, Spain



Tafila Wind Farm, Jordan

## Clean Energy



From the world's largest and first-of-a-kind renewable energy projects, to small-scale solar home systems, and from Europe and Africa to the Middle East, Asia and South Pacific, Masdar Clean Energy has been transforming communities and markets for more than a decade.

The total value of renewable energy projects in which Masdar is a partner is more than US\$8.5 billion, with Masdar's investment stake worth US\$2.7 billion. Leveraging technologies in wind, solar PV and concentrated solar power (CSP), the total generating capacity of these projects exceeds 2,700 megawatts (MW).

Some of the most significant projects include the 630MW London Array offshore wind farm – the world's largest in

operation. It is providing clean energy to more than half a million UK homes from 175 turbines, displacing more than 925,000 million tonnes of CO<sub>2</sub> emissions per year. Building on the London Array's success, off England's Norfolk coast, is the 402MW Dudgeon Offshore Wind Farm.

The UK is also home to another of Masdar's "world firsts": The 30MW Hywind Scotland Offshore Wind Farm representing the world's first commercial-scale floating offshore wind farm. The project is significant not only because this technology has lower costs and shorter construction timelines than conventional fixed-pylon based offshore wind farms, but also because its success will pave the way for other offshore wind projects in deep water.

Another landmark Masdar project is the Gemasolar Concentrated Solar Power (CSP) plant in Spain. Using molten salt as a heat storage technology, the plant became the world's first utility-scale facility to deliver electricity to the grid 24 hours a day. Also in Spain, Masdar partnered to develop the 100MW-combined Valle 1 and 2 parabolic trough plants, which again incorporate molten salt storage technology.

In the MENA region, pioneering projects include the 100MW Shams CSP plant in Abu Dhabi, one of the largest CSP plants in the world and the first of its kind in the Middle East and North Africa. The 117MW onshore Tafila Wind Farm in Jordan was the first commercial utility-scale wind power project in the Middle East.

Also under development in Jordan is the 200MW Baynouna Solar Energy Project, the country's largest solar power plant.

In the UAE, Masdar is leading a consortium to develop the 800MW Phase 3 of the Mohammed bin Rashid Al Maktoum Solar Park in Dubai, after setting what was a record-low price for solar power generation of US cents 2.99 per kWh.

Across all its projects, both large and small, Masdar Clean Energy works to push the frontiers of technology, systems integration, performance and commercial viability. Most projects achieve breakthrough results thanks to partnerships with organisations in government, industry, academia and the non-profit sector.





7000 Solar Home Systems, Egypt



Samoa "Cyclone-Proof" Wind Farm, Pacific Islands

Worldwide energy security cannot, however, be delivered solely via utility-scale projects. Masdar Clean Energy's Special Projects team delivers small, distributed and localised projects and installations in challenging and remote locations, often far from the grid. The team brings the technology, project management and partnership expertise gained from Masdar Clean Energy's large-scale projects to bring clean energy to rural locations.

Benefitting hard-to-serve communities, these projects range from micro-grids in the Pacific Islands and rural solar home systems in Afghanistan and Morocco, to onshore wind power installations in the Republic of Seychelles and off-grid community solar PV projects in Egypt. The size of the projects ranges from 1.7 kilowatt (kW) rooftop solar home projects to community solar PV and wind generation facilities with capacities from 100kW to 10MW, although most are less than 1MW.

In Egypt, 62,000 homes, schools, mosques, health clinics and government buildings across more than 140 communities have benefitted from the Special Projects team's activities. Altogether they have added more than 30MW of solar power displacing CO<sub>2</sub> emissions of 42,700 tonnes. Projects across 11 island nations in the Pacific region have added more than 6MW of clean power, helping these communities save 3.2 million tonnes of fuel every year.

The contribution of every project to extending energy access further enhances their perceived value. They also bring significant socioeconomic benefits such as training for local utility engineers, improved water security, and educational and business opportunities.





## Where Sustainability is a Way of Life

Masdar is working to realise a template – or ‘green print’ – for sustainable urban communities through the design and development of Masdar City, a vibrant mixed-use technology cluster, free zone, and popular civic space that is home to a research-driven graduate university and a growing residential district.

One of the world’s most sustainable urban communities, Masdar City is fostering an ‘innovation ecosystem’ – a hub connecting education, research and development, business and investment.





## Sustainable Inside and Out

With more energy-efficient buildings in a single district than any other development in the region, Masdar City features both passive and active energy and water saving features that ensure all buildings are certified to at least 3 Pearls (equivalent to LEED Gold) under the Estidama programme, Abu Dhabi's sustainable building, villa and community rating system designed for the specific needs of the UAE climate. In fact, Estidama was incubated in Masdar City.

## Master Plan

The city's master plan integrates office, residential, educational, leisure and retail in a way that maximises walkability and facilitates the use of public transportation, including personal rapid transit and group rapid transit systems. Ultimately, up to 50,000 people will live in Masdar City, while up to 40,000 will work and study there.

The master plan's orientation of the city and its high-density design help to optimise shading and capture prevailing winds, producing naturally cooler outdoor public spaces, while also reducing indoor cooling requirements.

Buildings are constructed using low-carbon cement, recycled aluminium and sustainably sourced wood, while energy-efficient buildings mean Masdar City consumes 40% less energy and water than other developments in the UAE of a comparable size.

In addition, the city is powered in part by clean energy generated from an on-site 10MW solar power plant and a 1MW solar rooftop system.

With such a commitment to urban sustainability, Masdar City represents a unique living laboratory for industry and academia to study how cities use, conserve and share resources, and for product developers to evaluate technologies in a real-world setting.

The city also offers a range of investment opportunities to purchase or lease land plots to develop projects designed to enhance mixed-use community living. Some of these investment opportunities include apartments, office buildings, schools, retail outlets, light industrial facilities, research and development initiatives, and hotels.





IRENA Headquarters Building in Masdar City, United Arab Emirates

## Major Tenants

Masdar City is home to major local and international tenants, including the headquarters of the International Renewable Energy Agency (IRENA) and the 800-strong regional head office of Europe's largest manufacturing and electronics company, Siemens.

US multinational GE has established the GE Ecomagination Center in Masdar City's Incubator Building, where it conducts research with regional partners and provides training and education programmes. Energy management firm Schneider Electric also is a major tenant, as is aerospace company Lockheed Martin, which operates its Center for Innovation and Security Solutions (CISS), the first facility of its kind for the company outside the United States.

## Eco-Villa

Expanding its pioneering innovation in sustainable living, Masdar City has designed and built its first low-carbon single-family home. The Masdar City Eco-Villa offers two levels of sustainability: the standard Eco-Villa, which consumes around 75% less energy than conventional villas of a comparable size in Abu Dhabi, and the Net Zero Energy Eco-Villa, which uses solar PV to generate renewable energy and achieve a net-zero energy footprint.

The four-bedroom Eco-Villas feature optimised natural lighting, a high-performance envelope, low-energy LED lighting and multiple other sustainability features. Crucially, the construction cost is similar to that of a standard villa.



## The Future Build

To support a green construction supply chain, Masdar has developed The Future Build web portal ([www.thefuturebuild.com](http://www.thefuturebuild.com)). The first portal of its kind in the Arab world, The Future Build assists architects, engineers and contractors in identifying and sourcing green building products and materials that have been independently assessed to ensure they deliver the environmental benefits claimed. At the same time, it helps suppliers of green building products reach the construction industry, particularly in the United Arab Emirates and wider Arab world.



# Masdar City Free Zone



Masdar City is a free zone, incorporating a rapidly growing community of over 500 companies. The city is the ideal location to start and operate a business, with a diverse mix of start-up, SME and multinational companies working side by side.

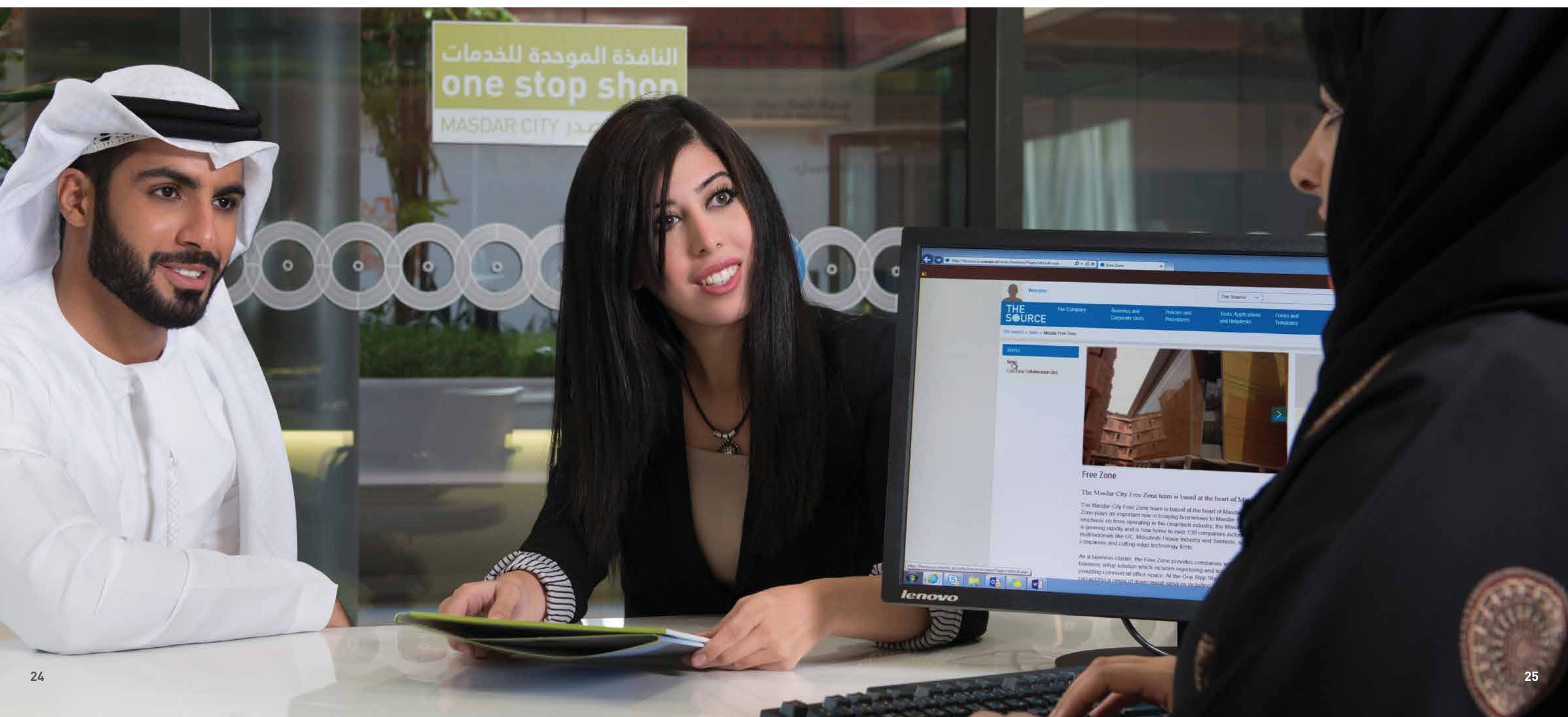
Partners and tenants benefit from a range of comprehensive business support services, such as quick

and efficient licensing and visa processing, incentives that include 100% company ownership, exemption from corporate and personal income taxes, unlimited repatriation of capital and profits, and cost-effective leasing opportunities. The nearby Masdar Institute of Science and Technology, now part of Khalifa University of Science and Technology, also provides a unique

opportunity for companies to partner on R&D projects and to access the Institute's talent pool.

These benefits, along with the extensive selection of restaurants, cafés and retail outlets, combine to create a vibrant and convenient location to conduct business.

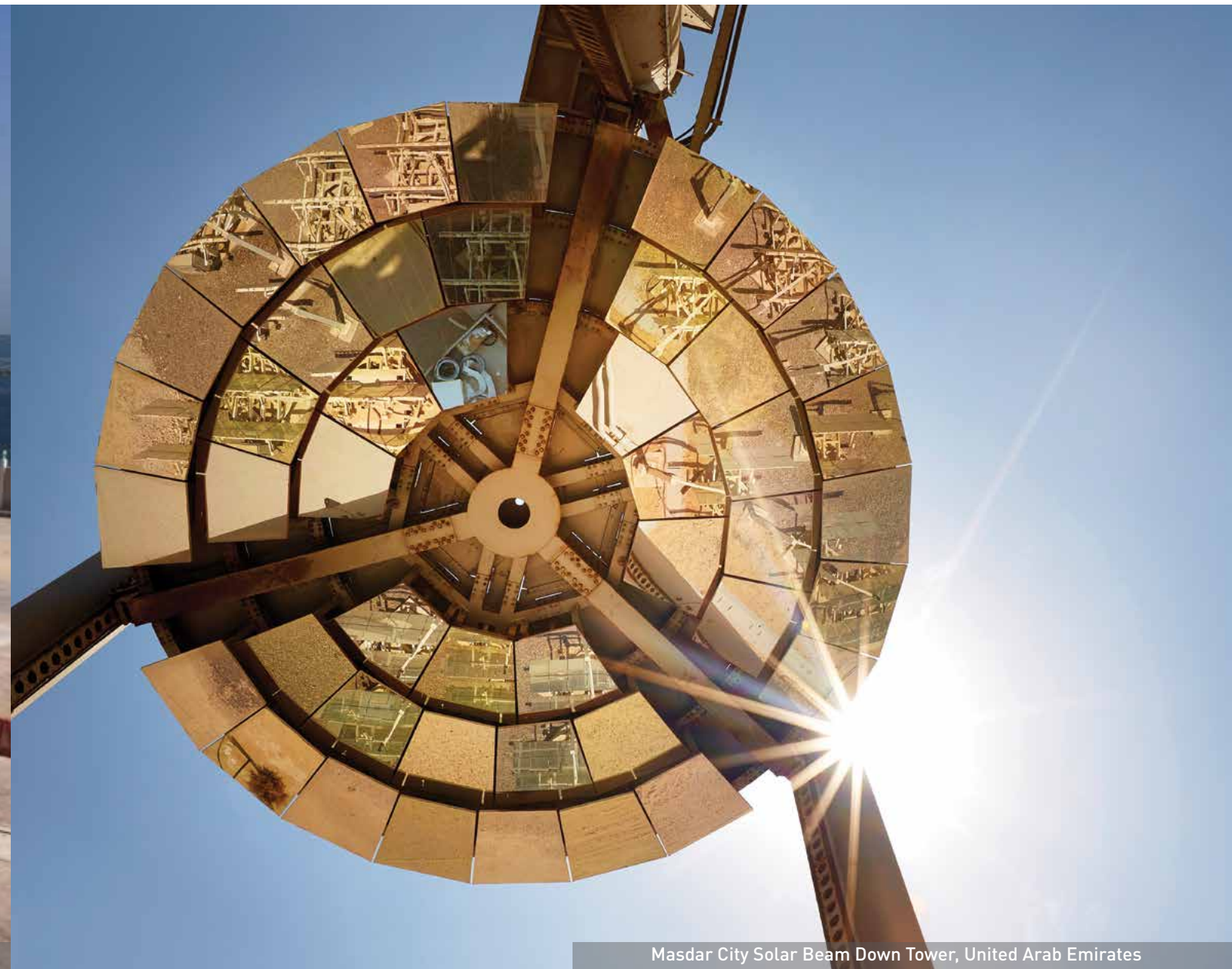
Abu Dhabi is an exciting, vibrant, multi-cultural city and a truly international capital. Located at the crossroads of Asia, Africa and the Middle East, Abu Dhabi is the capital of the United Arab Emirates, a business-friendly country with a heritage of tolerance and openness and a reputation for welcoming citizens from more than 200 countries.







Masdar Renewable Energy Water Desalination Pilot Plant, United Arab Emirates



Masdar City Solar Beam Down Tower, United Arab Emirates

## Clean-tech Innovation

With its operations touching on some of the most exciting areas of engineering and scientific inquiry, Masdar thrives on innovation, taking technologies, and the region, to new frontiers. Masdar was the first company in the Middle East and North Africa to build a utility-scale concentrated solar power plant, the first to develop a commercial-scale carbon capture usage and storage (CCUS) project at a steel facility, with the Abu Dhabi National Oil Company

(ADNOC), and the first to develop a commercial-scale wind farm in the GCC region.

Masdar is also leading the region's first sustainable seawater desalination pilot programme running five different pilot projects at one time. Working with Abengoa, Suez, Veolia, Trevi Systems and Mascara NT, the programme aims to achieve electric energy consumption of less than

3.6 kilowatt-hours per cubic metre of produced water using membrane-based desalination technologies. This is a particularly difficult challenge because conventional seawater desalination is energy intensive.

Further expanding the real-world testing environment, the Masdar Solar Hub offers a state-of-the-art solar testing and R&D platform for PV and solar thermal technology. This provides a valuable resource for equipment

manufacturers, system integrators and installers, project developers, utilities, investors and research organisations.

The Masdar City Free Zone itself supports innovation, creating a business-friendly industry cluster. Companies of all sizes can find inspiration throughout the city, while forging valuable partnerships with like-minded organisations.





Abu Dhabi Sustainability Week Opening Ceremony



## Knowledge Platforms

Masdar believes that the advancement of our industry depends on co-operation, partnership and knowledge transfer embracing multiple stakeholder groups.

With this in mind, Masdar has created a number of powerful knowledge platforms for the global sustainability community. These include Abu Dhabi Sustainability Week (ADSW); the Zayed Future Energy Prize; and initiatives such as Women in Sustainability, Environment and Renewable Energy (WiSER) and the Student Exclusive.



### Abu Dhabi Sustainability Week

Comprised of several distinct but related events, Abu Dhabi Sustainability Week was established to further our collective understanding of the major energy, economic and technological trends shaping the world's sustainable development, and to empowering the global community to respond.





# Key components of ADSW include:



The annual IRENA General Assembly is the International Renewable Energy Agency's ultimate decision-making authority and brings together high-level delegates from more than 150 IRENA member states, as well as other stakeholders.



The World Future Energy Summit (WFES) engages more than 30,000 people, including political, business, finance and academic leaders to stimulate dialogue, innovation, and commercial and investment opportunities.



The International Water Summit (IWS) is a global platform for promoting water sustainability in arid regions, and where the world's water and energy experts come together.



EcoWASTE is a leading international platform for advancing sustainable waste management and recycling across the Middle East, North Africa and beyond.



WISER is an initiative co-founded by Masdar and the Zayed Future Energy Prize to mentor, empower and inspire women to be catalysts of innovation, industry leaders and drivers of commercial solutions. It promotes the role women play in industries related to science, technology, engineering and mathematics (STEM).

In addition to the WISER Initiative Conference during ADSW, WISER holds additional events in other countries, and works with academic and research institutions, women's networking groups and corporate interests to create education and training opportunities to prepare them to contribute to these industries.

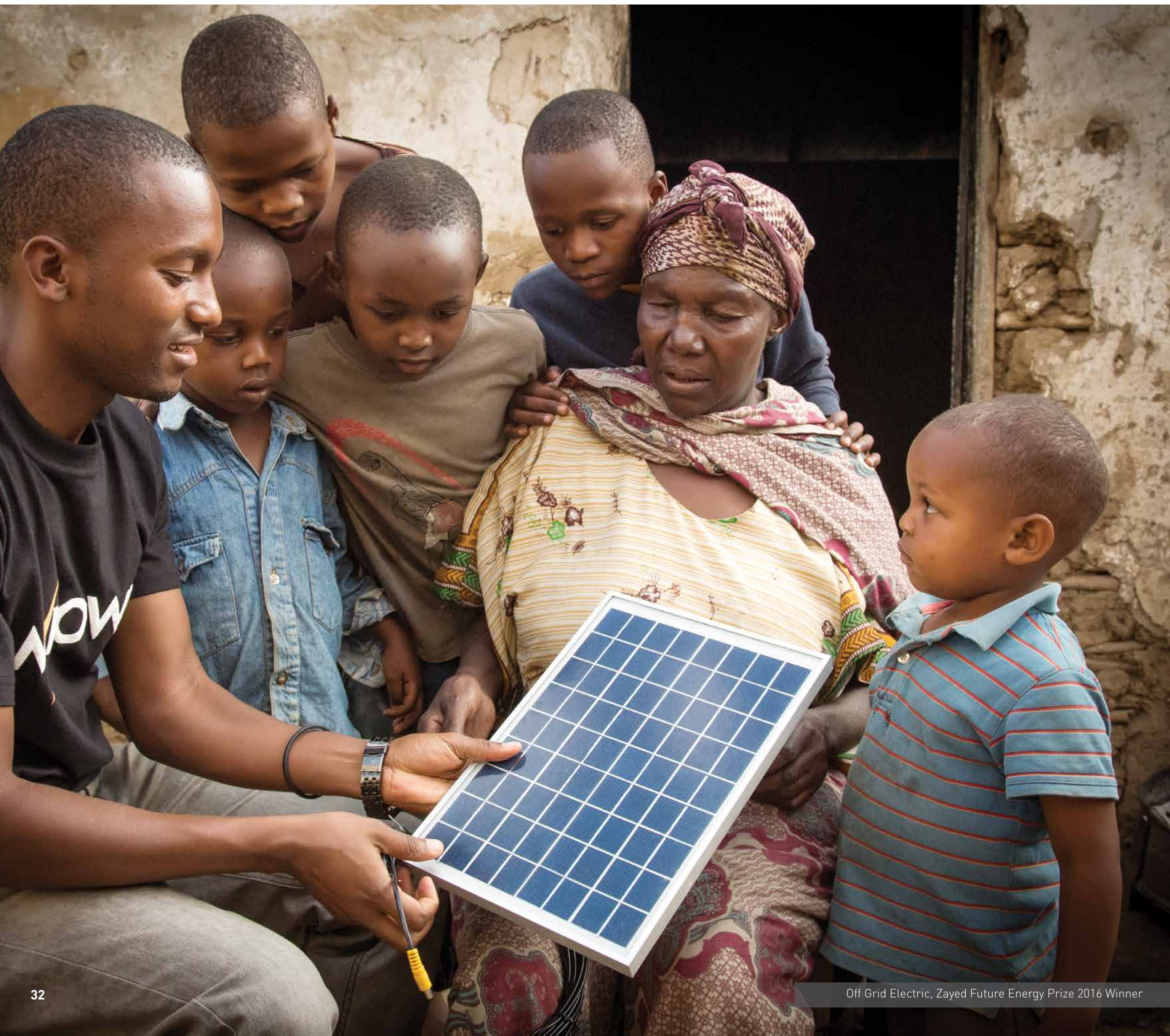


The Student Exclusive provides an exciting and engaging programme of activities designed to leverage the incredible resources of ADSW to inspire student involvement in advancing renewable energy and sustainable development. The Student Exclusive gives UAE youth an unmatched platform to participate in the largest sustainability gathering in the Middle East.



The community-focused Festival @ Masdar City extends the spirit of ADSW to the general public. Hosted in Masdar City, the event seeks to inspire UAE residents to adopt more sustainable practices through a collection of different events and activities.





## Zayed Future Energy Prize

The Zayed Future Energy Prize is an annual award established by the United Arab Emirates leadership to recognise excellence in renewable energy and sustainability. Launched in 2008, the Prize represents the vision of the late founding father of the UAE, Sheikh Zayed bin Sultan Al Nahyan, who championed social, economic and environmental sustainability.

The Zayed Future Energy Prize rewards and recognises organisations, schools and individuals that are furthering the advancement of sustainability and renewable energy. Entries are accepted across five categories: Large Corporations, Small and Medium Enterprises, Non-Profit Organisations, Lifetime Achievement, and Global High Schools.

For more information, please visit:  
[www.ZayedFutureEnergyPrize.com](http://www.ZayedFutureEnergyPrize.com)





## Looking Ahead

For more than ten years, Masdar has been a pioneer in the fields of renewable energy and sustainable urban development.

As we help to transform cities and communities locally, regionally and across the globe, we are raising awareness of the UAE's commitment to innovation, economic diversification and ambitious partnerships.





Through Masdar, Abu Dhabi and the UAE are embracing the commercial potential of renewable energy and clean technologies while advancing practical solutions to global sustainability challenges.

To learn more about Masdar or to partner with us across our broad scope of operations, visit our website: [www.masdar.ae](http://www.masdar.ae).



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