Project Name

City, Country

Lorem ipsum, or lipsum as it is sometimes known, is dummy text used in laying out print, graphic or web designs. The passage is attributed to an unknown typesetter in the 15th century who is thought to have scrambled parts of Cicero's De Finibus Bonorum et Malorum for use in a type specimen book. It usually begins with:

"Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua."

The purpose of lorem ipsum is to create a natural looking block of text (sentence, paragraph, page, etc.) that doesn't distract from the layout. A practice not without controversy, laying out pages with meaningless filler text can be very useful when the focus is meant to be on design, not content.

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QUICK FACTS

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Hywind Scotland

Peterhead, Scotland

Hywind Scotland is the world's first commercial-scale floating offshore wind farm, located off the coast of Peterhead in Scotland, where the average wind speed is 10 metres per second.

The 30 megawatt (MW) Hywind Scotland consists of a wind turbine placed on top of a ballasted cylinder. It combines known technologies in a completely new setting and opens up the possibility for capturing wind energy in deep-water environments.

Masdar has a 25 per cent stake in the project, along with lead operator Equinor, which owns 75 per cent.

The facility consists of five 6MW floating Siemens wind turbines that are anchored to the seabed. The technology can be used in water varying between 95 and 129 metres deep.

The project was inaugurated in October 2017 and provides approximately 22,000 UK homes with electricity, displacing 63,000 tonnes of carbon emissions each year.

QUICK FACTS

- Located off the coast of Peterhead, Scotland, covering an area of 4 square kilometres
- Installed capacity of 30MW
- 5 floating Siemens wind turbines anchored to the seabed with a capacity of 6MW each
- Displaces 63,600 tonnes of CO_2 annually
- Powers approximately 22,000 homes
- First floating offshore wind farm to integrate energy storage

Mohammed Bin Rashid Al Maktoum Solar Park Phase 3

Shuaa Energy 2

Dubai, UAE

Shuaa Energy 2 Company, a joint venture between Dubai Electricity and Water Authority (60%), Masdar (24%) and EDF Renewables (16%), developed the third phase of the Mohammed bin Rashid Al Maktoum Solar Park, an 800 megawatt (MW) solar photovoltaic (PV) plant, which was inaugurated in March 2020. Phase 3 is part of what will be the largest single-site solar park in the world, with a planned capacity of 5,000MW by 2030.

The plant is being developed on a 18 square kilometre area in Seih Al Dahal, located on the outskirts of Dubai.

In July 2016, the consortium won the project after offering the lowest recorded bid for a solar plant at the time, valued at 2.99 US cents per kilowatt hour (kW/h). Construction started on the project in December 2016, with financial close achieved in June 2017.

The project utilises PV modules with solar tracking technology increasing the power production from the PV plant compared with fixed structures.

Phase 3 was constructed in three stages: the first 200MW was completed in April 2018; the second 300MW was completed in 2019; and the final 300MW was completed in February 2020, one month ahead of schedule.

QUICK FACTS

- One of the largest solar PV plants in the world with a capacity of 800MW
- Developed by Shuaa Energy 2 company (DEWA 60%, Masdar 24%, EDF 16%)
- Construction occured over three phases: The 200MW first stage was completed in April 2018, the 300MW Stage 2 was completed in 2019 and the final 300MW Stage 3 was completed in February 2020
- Phase 3 will displace over 1 million tonnes of CO_2 emissions each year and power 240,000 homes
- Largest solar power plant in the world to use single-axis tracker technology to follow the path of the sun
- The first stage of Phase 3 utilises custom-made robots that clean the panels without the need for water

The 800MW facility has the capacity to power 240,000 homes in Dubai and will offset over 1 million tonnes of CO_2 emissions per year.

Čibuk 1 Wind Farm

Vojvodina, Serbia

The Čibuk 1 wind farm in Serbia is the largest utility-scale commercial wind project in Serbia and the Western Balkans. The wind farm has a capacity of 158 megawatts and was inaugurated in October 2019.

Led by Masdar, Abu Dhabi's renewable energy company, the project capitalises on Masdar's international renewable industry expertise in order to support Serbia's ongoing socio-economic development.

Covering an area of 37 square kilometres, Čibuk 1 is located approximately 50 kilometres outside Belgrade in the autonomous province of Vojvodina. Comprising of 57 wind turbines supplied by GE Renewable Energy, the project provides electricity to 113,000 homes and displaces more than 370,000 tonnes of carbon dioxide per year.

Besides helping to minimise the environmental impacts of Serbia's power sector, Čibuk 1 created approximately 400 local jobs during construction while also delivering 50 kilometres of new roads.

By 2020, Serbia has pledged to produce 27 per cent of its domestic power needs from renewable energy sources, reducing the country's dependence on coal-fired power generation in line with European Union regulations. Čibuk 1 is Masdar's fifth wind farm in Europe after the 630MW London Array, one of the world's largest offshore wind farms in operation, the 402MW Dudgeon Offshore Wind Farm in England, and the 30MW Hywind Scotland offshore wind farm, the world's first commercial-scale floating wind farm situated off the coast of Peterhead, Scotland. Masdar is also a partner in the 72MW Krnovo wind energy project in Montenegro.

QUICK FACTS

- Inaugurated in October 2019
- Installed capacity of 158MW
- The largest utility-scale commercial wind project
- in Serbia and the Western Balkans
- Powers 113,000 homes
- Displaces more than 370,000 tonnes of CO_2 per year

Renewable Energy Water Desalination Programme, Abu Dhabi, UAE

In 2013, Masdar launched a renewable energy desalination pilot programme to research and develop energy-efficient, cost-competitive desalination technologies powered by renewable energy. The project was officially inaugurated during UAE Innovation Week in November 2015.

Commercial partners – Abengoa, Suez, Veolia and Trevi Systems – each developed and operated a next-generation pilot seawater desalination plant in Ghantoot, Abu Dhabi. The four plants tested a range of innovative approaches to boost operational efficiency of reverse osmosis, a technique where salt water is purified through membranes. A fifth pilot was installed in October 2016 by Mascara Renewable Water, a unique off-grid solar powered solution without batteries, ideally suited for remote locations. The commercial partners operated the pilot plants for periods of between 12-15 months.

The Masdar Institute of Science and Technology, now a part of Khalifa University, also conducted five research projects on the pilot projects in collaboration with the commercial partners.

A Masdar report published at Abu Dhabi Sustainability Week 2018 on the results of the programme found that the solutions are up to 75 per cent more energy efficient than the thermal desalination technologies currently used in the UAE, delivering annual energy savings of as much as US$550 million.

The desalination project was sponsored by the Abu Dhabi Government, with co-funding provided by the industry partners. Masdar was leading the project management and coordinated the programme with key Abu Dhabi stakeholders.

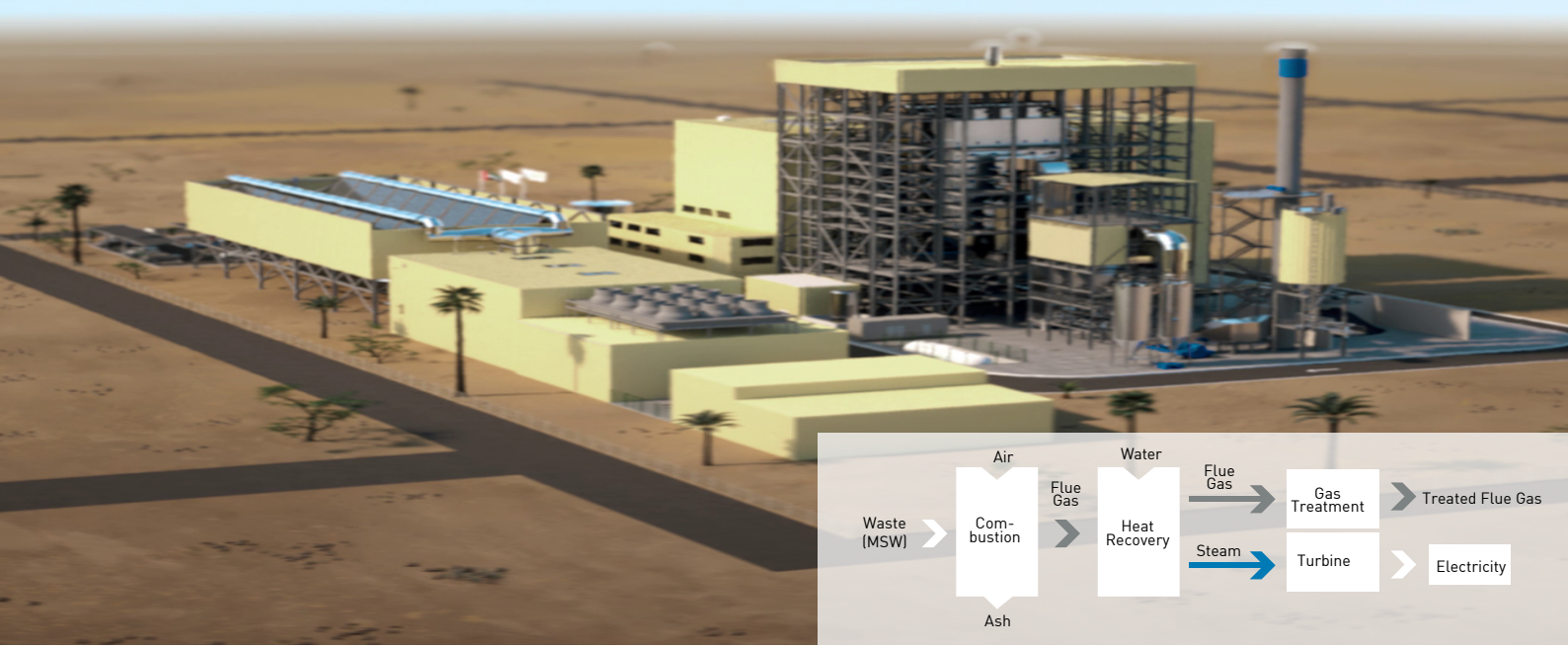
QUICK FACTS

- Pilot project test facility located in Ghantoot, 90 kilometres northwest of Abu Dhabi
- Five leading commercial partners developed and operated pilot desalination plants
- Achieved electric energy consumption of less than 3.6 kilowatt-hours per cubic metre of produced water (through membrane-based seawater desalination)
- Test plants produced 1,500 cubic meters of potable water per day
- Five R&D projects were delivered in collaboration with the Masdar Institute of Science and Technology, now part of Khalifa University
- The Gulf region accounts for around 40% of the world's desalinated water production
- Abu Dhabi sources 40% of its water and virtually all of its drinking water through desalination
- There are 25 operational desalination plants in the UAE

Masdar is currently preparing for the development of several commercial desalination projects, which will use the piloted technologies.

Key benefits for the UAE include:

- Diversification and strengthening of energy and water security
- Enhanced energy efficiency of water desalination
- Reduced cost of water desalination
- A reduction of the environmental impact of desalination



Sharjah Waste-to-Energy Project

Sharjah, UAE

The Sharjah Waste to Energy Company (SWTE) a joint venture between Bee'ah, the Middle East's leading and award winning environmental management company, and Masdar, is developing a cutting-edge waste-to-energy plant in Sharjah, UAE.

Diverting around 300,000 tonnes of solid waste from landfills each year, the Sharjah Waste-to-Energy Plant will contribute to Sharjah's efforts to reach its zero waste-to-landfill target, and help the UAE achieve its 2021 goal of diverting 75 percent of solid waste from landfills.

The facility will incinerate around 37.5 tonnes of municipal solid waste per hour to generate energy and will be located in Bee'ah's existing Waste Management Facility in Sharjah, where the emirate's waste is collected, sorted, recycled and, where necessary, sent to landfills.

The incineration process converts waste into heat, which is then used to drive a steam turbine. The net electrical power produced will be up to 30 megawatts (MW), which will be supplied to the Sharjah electricity grid. The flue gas treatment plant will be designed to meet European Union (EU) environmental standards.

The partnership between Bee'ah and Masdar was signed and announced at Abu Dhabi Sustainability Week (ADSW) 2016, with the joint development agreement signed and announced during ADSW 2017. Financing agreements were signed in Q3 2018 with the lending banks and financial institutions. The project is expected to become operational by Q3 2021.

QUICK FACTS

- Processing more than 300,000 tonnes of Municipal Solid Waste per year
- Net power: Up to 30MW (energising 28,000 homes in Sharjah)
- First Commercial Waste to Energy Facility in Middle East
- Project displaces almost 450,000 tonnes of CO_2 emissions per year
- Project saves 45 million m3 natural gas per year Shareholders: Masdar 50% & Bee'ah 50%
- Commercial operation date set for Q3 2021
- Won the 2018 Thomson Reuters Project Finance International (PFI) Award for Clean Deal of the Year in Middle East and Africa
- Won the 2018 Structured Loan Deal of the Year Award at the Bonds, Loans and Sukuk Middle East Awards
- Won the IJ Global Awards 2018: Waste Deal of the Year, Middle East and North Africa
- Won the Middle East Energy Awards 2019, Clean Energy Initiative of the year

Valle 1 and 2

Cadiz, Spain

Valle 1 and 2 are adjacent concentrated solar power (CSP) plants located in Cadiz, Spain that feature parabolic trough solar technology combined with thermal storage system.

The construction of the plants started in late 2009 and became operational in 2011. The plants have a combined power capacity of 100 megawatts (MW). The footprint of the solar field covers 510,000 square metres. The molten salt storage system allows for seven to eight hours of power generation after sunset, becoming one of the pioneering CSP power plants to provide disptachable and reliable baseload supply.

Valle 1 and 2 are the two first thermo-solar plants in the province of Cadiz. The plants produce approximately 300 gigawatt-hours (GWh) per year, which is equivalent to an average consumption of 45,000 households a year, or the entire city of Cadiz, and displaces more than 96,000 tonnes of carbon dioxide a year.

Both plants utilise the latest parabolic trough technology developed by Torresol Energy, a joint venture between Spanish engineering firm Sener (60%) and Masdar (40%).

This technology has unique mechanical characteristics, including a collector design that has a significantly lower steel weight and fewer assembly hours compared to similar collectors.

QUICK FACTS

- Operational since 2011
- The first CSP plants in the province of Cadiz, Spain
- Produce approximately 300GWh/year, equal to an average consumption of 45,000 households, or the entire city of Cadiz
- Displace more than 96,000 tonnes of CO_2 each year
- Provides the entire province with reliable baseload supply that extends up to eight hours after sunset
- Combined installed capacity of 100MW

Masdar Solar Hub

Abu Dhabi, UAE

The Masdar Solar Hub is a state-of-the art solar testing and demonstration hub for solar photovoltaic (PV) and solar thermal technologies. The hub consists of two facilities located in Masdar City and is jointly managed by Masdar and the Khalifa University of Science and Technology. Launched in January 2015, the Masdar Solar Hub aims to become a globally recognized centre of excellence in the areas of PV and solar thermal energy.

The Masdar Solar Hub spans a wide range of activities, including solar energy and thermal storage equipment testing, prototype evaluation and solar irradiance monitoring. It fulfils a crucial need in the technological development and demonstration of novel, commercially-viable solar energy systems.

Key features:
There are two main facilities that form the Masdar Solar Hub.

1. Photovoltaic Test Centre
The photovoltaic test centre provides independent and accurate measurement of the performance, reliability and durability of PV modules, different PV module coatings and automated cleaning systems for PV modules. It allows users to perform experiments under the harsh environmental conditions present in Abu Dhabi, such as high temperatures, high humidity and salinity.

2. Masdar Institute Solar Platform
The Masdar Institute Solar Platform (MISP) is where researchers, universities, and industrial partners carry out R&D activities in order to drive research, development and demonstration of solar thermal technologies such as concentrated solar power (CSP) and thermal energy storage (TES). The platform is built around a set of unique facilities such as the Beam Down Concentrating Tower and its solar field, the hot-oil loop and TES system, and the Solar Irradiometer Platform.

The Masdar Solar Hub is a valuable resource to equipment manufacturers, system integrators and installers, project developers, utilities, investors, private end users, research organizations, and the public. The hub increases the available solar equipment testing capacity in the UAE, and by doing so, accelerates the development of solar energy solutions in the UAE and throughout the Middle East.

QUICK FACTS

- The Masdar Solar Hub integrates infrastructure and expertise available at Masdar and Khalifa University of Science and Technology in the area of solar testing and demonstration.
- Focuses on the following technologies:
  - Photovoltaic (PV) module testing
  - Concentrated solar power (CSP)
  - Thermal energy storage (TES)
- Allows Masdar, Khalifa University of Science and Technology and the solar industry to collaborate on equipment testing and demonstration
- Activities of the hub include:
  - Long-term outdoor exposure testing of PV modules and CSP components
  - Testing of solar thermal equipment and solar receivers
  - Indoor testing of PV modules
  - Testing of thermal energy storage systems

London Array

London, England

London Array, the world's second largest wind farm currently in operation, is a joint venture between RWE (30%), Orsted (25%), Caisse de dépôt et placement du Québec (CDPQ) (25%) and Masdar (20%). Located at the main feed of the Thames Estuary in the United Kingdom, the project was inaugurated on July 4, 2013.

London Array has a capacity of 630 megawatts (MW), which powers more than half a million homes and reduces more than 925,000 tonnes of carbon dioxide emissions every year.

Construction began in July 2009 with the building of a new onshore substation on the north Kent coast. This enabled electricity generated by the project to be transferred straight into the national grid. The first offshore foundation was laid in March 2011; the last of the 175 Siemens 3.6MW turbines was installed in December 2012.

More than 75 organisations and 6,700 workers helped in constructing London Array.

QUICK FACTS

- Inaugurated on July 4, 2013
- Covers an area of 100km^2
- Installed capacity of 630MW
- Powers over half a million homes
- Displaces 925,000 tonnes of CO_2 emissions per year
- Utilises 175 Siemens turbines with 3.6MW capacity each
- Two offshore substations and one onshore substation
- Over 400km of cables (array and export)
- A dedicated operations and maintenance base at the port of Ramsgate
- Onshore construction started in July 2009, full-scale offshore construction began in 2011
- First power was delivered in October 2012
- Final turbine was installed in December 2012

The Afghanistan Project

Helmand Province, Afghanistan

The Afghanistan Project is a Masdar initiative that has installed 600 solar home systems in 27 villages within the Helmand Province of southern Afghanistan. The project is enhancing the lives of more than 3,000 people without access to electricity.

The installations include 545 houses and 55 public buildings, including schools, mosques and clinics. Each system includes rooftop solar photovoltaic (PV) panels and battery storage.

Masdar installed the solar systems in partnership with the local community, and provided training on how to operate and maintain them.

The project was financed by a grant from the Government of Abu Dhabi aimed at raising living standards in developing countries. Masdar Energy Services, a specialised renewable energy solutions provider, developed and delivered the project.

QUICK FACTS

- Completed in September 2013
- Delivers power to 600 homes and public facilities in 27 villages of southern Afghanistan
- Extends energy access to 3,000 people
- Each solar home system includes PV panels, energy-efficient lighting, two fans, a TV and a refrigerator
- System batteries can store a two-day supply of energy

Morocco Solar Home Systems

Morocco

The Morocco Solar Home Systems (SHS) project is a Masdar-led initiative in partnership with Morocco's Office National de l'Electricité et de l'Eau Potable (ONEE). It provides 19,438 solar home systems in over 1,000 rural villages in the Kingdom of Morocco.

The solar home systems, along with broader electrification initiatives, will provide 99 per cent of rural Morocco with access to energy, enhancing the lives of more than 95,000 people that did not previously have access to electricity.

Each of the installed systems consists of two solar panels with a total capacity of 290 watts and two batteries with sufficient storage capacity for up to three days, thus ensuring uninterrupted power supply. In addition, the system includes eight LED light bulbs and light switches, three electric sockets and a 165-litre refrigerator.

Due to the different housing construction methods, several mounting structures were developed to suit each type of housing unit, including roof-mounted, ground-mounted, pole-mounted, tower-mounted and wall-mounted.

Masdar, through its EPC contractors, will provide maintenance support for the first two years after installation. ONEE will take over this role for the subsequent eight year period with Masdar contributing to the cost of operation & maintenance.

QUICK FACTS

- Provided 19,438 solar systems in over 1,000 rural Moroccan villages
- Extends energy access to 99% of rural Morocco, or 116,000 people
- Each house received:
  1. Two solar panels of 290-watt total capacity
  2. Two batteries with a total capacity of 300Ah (up to 3 days supply of energy)
  3. One charge controller
  4. 8 LED light bulbs and light switches
  5. One 165 liters capacity refrigerator
  6. 3 electric sockets

The home owners will also make a monthly payment contribution to the cost of the maintenance support.

The project was funded through a grant by the Abu Dhabi government, reflecting the United Arab Emirates' strong bond and historic relationship with the Kingdom of Morocco.

The Port Victoria Wind Power Project

Republic of Seychelles

The Port Victoria Wind Power Project, Masdar's 6 megawatt (MW) wind farm in the Republic of Seychelles, is the country's first large-scale renewable energy project. It accounts for more than 8 per cent of the grid capacity on the archipelago's main island of Mahe, where 90 per cent of the country's residents live.

The plant consists of eight wind turbines spread over two small islands off the coast of Mahe, five turbines located on the islands of Romainville and three at Ile du Port. The 750 kilowatt (kW) wind turbines were supplied by Unison Company, a South Korean turbine manufacturer and contractor.

Before the wind farm began operations, Seychelles was entirely dependent on imported fossil fuels to supply its electricity needs. The integration of clean, sustainable energy is helping the island nation decrease its power outages, address its long-term energy security and reduce its carbon footprint. The project produces nearly 7 gigawatt-hours (GWh) of clean energy each year, displacing approximately 5,500 tonnes of carbon dioxide annually and powering more than 2,100 homes.

The Port Victoria Wind Power Project is a major step towards meeting the Seychelles' energy policy, which aims to produce 15 per cent of its energy from renewable sources by 2030.

QUICK FACTS

- First large-scale renewable energy project in the Seychelles
- Wind farm has capacity of 6MW
- Consists of eight 750kW wind turbines
- Supplies more than 8% of Mahe Island's grid capacity
- Produces nearly 7GWh per year
- Farm covers a land area of 272,000 square metres
- Displaces about 5,500 tonnes of CO_2 per year
- Powers about 2,100 homes annually
- Saves 1.6 million litres of imported fuel each year
- The US$28 million (AED 102.8 million) project was financed through a grant from ADFD

The project was financed through a US$28 million grant provided by the Abu Dhabi Fund for Development (ADFD) – the national entity for development aid. Masdar developed and delivered the project, which is owned and operated by the Government of Seychelles.

15MW Sheikh Zayed Solar Power Plant

Nouakchott, Mauritania

Masdar's 15 megawatt (MW) solar photovoltaic (PV) power plant in Nouakchott was the largest solar power installation in Africa at the time of its completion in 2013. It was the first utility-scale solar power installation in the Islamic Republic of Mauritania, accounting for 10 per cent of Mauritania's grid capacity.

The Sheikh Zayed Solar Power Plant produces 25,409 megawatt-hours (MWh) of electricity annually and displaces approximately 21,225 tonnes of carbon dioxide per year. The plant consists of 29,826 micromorph thin-film panels and supplies electricity to over 10,000 homes in Nouakchott.

Innovative sustainable building practices were used in the construction of the plant. The use of screw piles, instead of concrete, for the foundations in the sandy terrain, reduced the project's cost, construction time and carbon footprint.

The shading offered by the solar array resulted in increased vegetation, limiting sand movement and helped the solar field blend in with the environment.

Funded by a UAE grant, Masdar developed the project on behalf of the Abu Dhabi Government. The solar

power plant is owned and operated by Société Mauritanienne de l'électricité (SOMELEC), the government-owned electricity utility in Mauritania.

The project was initiated by Masdar and Mauritania's Ministry of Petroleum, Energy & Mines in March 2012, and began operations a year later.

QUICK FACTS

- Located in Nouakchott, the capital of the Islamic Republic of Mauritania
- Largest solar PV plant in Africa when connected to the grid in March 2013
- Installed capacity of 15MW
- Accounts for 10% of Mauritania's grid capacity
- Consists of 29,826 micromorph thin-film panels
- Plant covers a land area of 300,000 square metres
- Displaces approximately 21,225 tonnes of CO_2 per year
- Powers nearly 10,000 homes in Nouakchott

Wood from the project's construction was donated to a local NGO called AIDE to support its operations within Mauritania.

16.6MW Mauritania Rural Electrification Programme

Mauritania

After the successful deployment of the 15 megawatt (MW) Sheikh Zayed Solar Power Plant in Nouakchott in 2013, Masdar installed an additional 16.6MW photovoltaic (PV) projects across eight remote communities in the Islamic Republic of Mauritania. Masdar's footprint in the country now includes a 31.6MW portfolio of renewable energy projects.

Inaugurated in November 2016, the 16.6MW PV rural electrification programme was funded by the governments of Mauritania and Abu Dhabi. Following the installation of these PV plants by Masdar, the facilities are being operated by Mauritania's national electricity provider, Société Mauritanienne d'Electricité (SOMELEC).

The plants supply up to 30 per cent of the electricity demand to the remote communities of Boutilim-it, Aleg, Aioune, Akjoujt, Atar, El Chami, Boulenour and Bani Chab, increasing local energy security by providing reliable, secure and clean electricity. In locations not currently connected to the national grid, the projects power around 39,000 homes, and also save up to approximately 10 million litres of diesel annually. The solar power plants produce 31,173 megawatt hours (MWh) of clean electricity annually and displace approximately 27,000 tonnes of carbon dioxide (CO_2) emissions each year.

QUICK FACTS

- Made up of 52,600 solar PV modules
- Installed capacity of 16.6MW megawatts
- Supplies 30% of the electricity demand for eight rural communities
- Diesel fuel savings of 10 million litres annually
- Reduces CO_2 emissions by 27,000 tonnes per year
- Powers more than 39,000 homes

Baynouna Solar Energy Project

Amman, Jordan

Located east of Amman, Masdar's 200MW Baynouna Solar Energy Project is the largest single solar energy project currently under development in Jordan. Expected to be complete in the first quarter of 2020, the plant will supply the annual power needs of approximately 160,000 homes and displace an estimated 360,000 tonnes of carbon dioxide each year.

Developed as a Power Purchase Agreement (PPA) between Masdar and National Electric Power Company, Jordan's state electricity provider, this US$240 million project will generate 563.3 gigawatt hours (GWh) of electricity each year, equivalent to 4 per cent of the annual energy consumption of Jordan.

The 200MW solar power plant and Masdar's 117MW Tafila wind farm will contribute to Jordan's goal of producing 10 per cent of its domestic electricity needs from renewable sources. Combined, the two projects will account for nearly 18 per cent of the 1.8 gigawatts (GW) of renewable energy Jordan plans to install by 2020.

QUICK FACTS

- 200MW of solar energy capacity
- Annual generation of 563.3 GWh
- Will power 160,000 homes
- Will displace 360,000 tonnes of CO_2 emissions each year
- Developed as a PPA between Masdar and National Electric Power Company, Jordan's state electricity provider

Tafila Wind Farm

Tafila, Jordan

The Tafila Wind Farm is the first commercial utility-scale wind power project in the Middle East. Located in the Hashemite Kingdom of Jordan, the 117 megawatt (MW) wind farm has increased the country's total power capacity by 3 per cent. The US$287 million project became operational in September 2015. It was officially inaugurated in December of the same year by His Majesty King Abdullah II Ibn Al-Hussein of Jordan.

The project was developed by the Jordan Wind Project Company, which is now owned by Masdar (50%) and Al Blagha Group (50%).

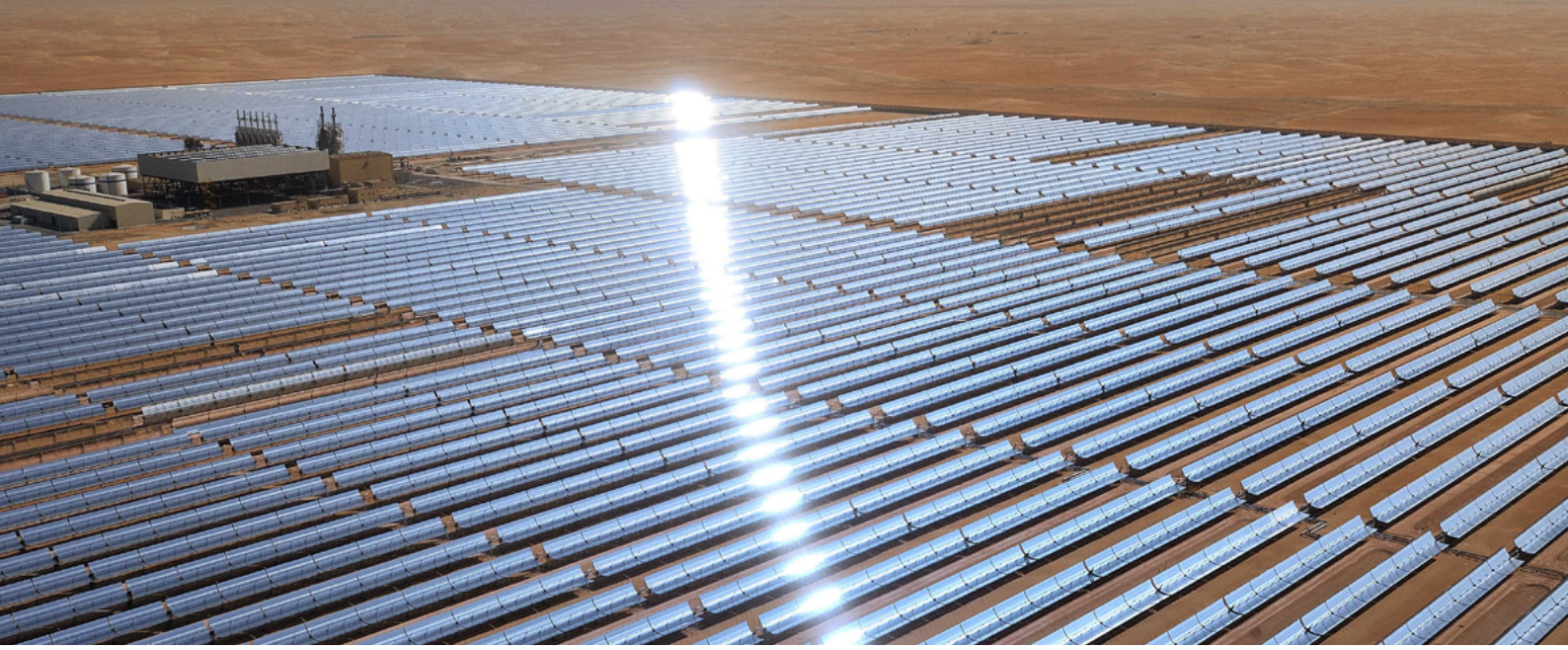
With Jordan's electricity demand estimated to grow by at least 4.5 per cent annually until 2020, the country must rapidly develop new sources of energy generation to cope with future growth.

Tafila was the first wind power project to be developed under Jordan's Renewable and Energy Efficiency Law passed in 2010. The law calls for the country to generate 7 per cent of its electricity from renewable energy sources by 2015, and 10 per cent by 2020.

Project financing was provided by International Finance Corporation, European Investment Bank, Eksport Kredit Fonden, and OPEC Fund for International Development.

QUICK FACTS

- Located in the Tafila region, 180km south of Amman, Jordan's capital and largest city
- Installed capacity of 117MW
- Powers 83,000 homes
- Produces approximately 390GWh of electricity annually
- Displaces nearly 235,000 tonnes of CO_2 emissions per year
- Accounts for almost 10% of Jordan's 1,800MW renewable energy target for 2020 and 3% of the Kingdom's total energy needs
- 38 turbines with 3MW capacity each, designed and built by Vestas



Shams

Abu Dhabi, UAE

In March 2013, Masdar inaugurated Shams - one of the world's largest concentrated solar power (CSP) plants in operation and the first of its kind in the MENA region. Masdar partnered with Total and Abengoa to deliver the 100 megawatt (MW) solar-thermal project.

The US$600 million project took three years to be developed. In January 2016, Masdar purchased Abengoa's stake in the project. In October 2018, Abu Dhabi Retirement Pensions and Benefits Fund (ADRPBF) purchased a 29 per cent stake in Shams. Masdar remains the majority shareholder with a 51 per cent stake.

Covering an area of 2.5 square kilometres, equivalent to 285 football fields, Shams generates enough electricity to power 20,000 homes in the UAE. Shams contributes to the diversification of the UAE's energy mix and reduces the country's carbon footprint. The plant displaces approximately 175,000 tonnes of carbon dioxide per year, equivalent to planting 1.5 million trees or removing 15,000 cars from the roads of Abu Dhabi.

Incorporating the latest in parabolic trough technology, Shams features more than 258,000 mirrors mounted on 768 tracking parabolic trough collectors. By concentrating heat from direct sunlight onto oil-filled pipes, Shams produces steam, which drives a turbine and generates electricity.

QUICK FACTS

- One of the largest CSP plants in the world
- A joint venture between Masdar (51%), ADRPF (29%) and Total (20%)
- Located 120 kilometres from Abu Dhabi in the Al Dhafra Region
- Powers more than 20,000 UAE homes and displaces 175,000 tonnes of CO2 per year
- Covers an area of 2.5 km², equivalent to 285 football fields.
- Installed capacity of 100MW
- Made up of 768 parabolic trough collectors
- Inaugurated in March 2013

In addition, the solar project uses a booster to heat steam as it enters the turbine to dramatically increase the cycle's efficiency. The plant also includes a dry-cooling system that significantly reduces water consumption – a critical advantage, particularly in the arid environment of Abu Dhabi.

Gemasolar, Central Tower Technology

Seville, Spain

Gemasolar is the world's first utility-scale solar power plant to combine a central tower receiver system and molten salt storage technology enabling electricity supply 24 hours a day. The plant has an installed capacity of 20 megawatts (MW).

The plant was built by Torresol Energy, a strategic alliance between Masdar (40%) and Spanish engineering group Sener (60%). The plant is located in Fuentes de Andalucia in the province of Seville in Spain. Construction began in 2008, was completed in May 2011, and the plant was officially inaugurated in October 2011. Gemasolar's design is a promising alternative generation technology to complement the more widespread parabolic trough technology.

Gemasolar has a high-temperature heat storage system (→550°C), which allows the plant to operate longer than most conventional solar concentrated solar power (CSP) plants. Sodium and potassium nitrate salts are kept in a molten state by the sun's thermal energy. These salts store excess heat accumulated during sunlight hours so that electricity can be generated at night. As a result, Gemasolar can generate electricity for 15 hours without solar irradiation.

The high temperature at which solar energy is captured by the salts receiver helps to produce steam at high pressure. This considerably increases the performance of the steam turbine.

The plant's solar field covers 195 hectares and the facility is able to generate approximately 80GWh/year, enough to supply 25,000 homes. The plant offsets carbon emissions of more than 27,000 tonnes a year.

QUICK FACTS

- World's first commercial-scale plant that applies the technology of a central tower receiver and thermal storage
- Installed capacity of 20MW
- Operational since 2011
- Generates approximately 80GWh/year
- Powers 25,000 homes.
- Offsets carbon emissions of more than 27,000 tonnes a year
- Generates electricity for 15 hours without solar irradiation

Krnovo Wind Farm

Krnovo, Montenegro

The Krnovo wind farm is Masdar's first investment in Montenegro's renewable energy sector.

The 72 megawatt (MW) onshore wind farm is Montenegro's first wind farm and one of the largest in the region. In December 2018, Masdar acquired 49 per cent of Krnovo Green Energy, the owner and developer of the Krnovo Wind Farm, which was established as a subsidiary of Akuo Energy.

The Krnovo Wind Farm comprises 26 GE wind turbines, which are set at an altitude of about 1,500 metres, where the average wind speed varies between 5.5 and 6.5 meters per second.

On stream since November 2017, the Krnovo wind farm is now supplying approximately 45,000 households with electricity and displacing an estimated 80,000 tonnes of carbon emissions annually. It is estimated to produce 200 gigawatts (GW) of electricity annually.

The electricity generated by the Krnovo project is expected to help Montenegro achieve its renewable energy target of generating one-third of the country's total energy consumption from renewable energy sources by 2020.

The Krnovo wind farm brings Masdar's presence in the Balkans' renewable energy sector to over 200MW.

QUICK FACTS

- Installed capacity: 72MW
- Wind energy penetration: 8% of total installed electricity capacity in Montenegro
- Carbon dioxide savings: 80,000 tonnes annually
- Homes powered: 45,000

Dhofar Wind Power Project

Dhofar, Oman

Masdar has delivered the first large-scale wind farm in the Gulf Cooperation Council (GCC) region. The 50 megawatt (MW) project is being constructed in the Dhofar Governorate, in the Sultanate of Oman. The project is a direct result of strong, bilateral ties between the United Arab Emirates and Oman. Funding for the wind farm is provided by the Abu Dhabi Fund for Development (ADFD), the UAE's leading national entity for development aid.

A feasibility study confirmed the suitability of a wind energy project in Dhofar. The Thumrait plateau, where the project is currently constructed, provides ideal conditions for the wind farm, with average wind speeds of 7-8 metres per second.

The project comprises 13 wind turbines developed by GE, each with an electricity generation capacity of 3.8MW. The turbines represent the latest development in GE's wind turbine platform, increasing both annual energy production and flexibility in operation.

The electricity generated by the Dhofar project will support Oman's increasing energy demand and economic growth. The wind farm will reduce domestic reliance on gas for electricity generation, which can be redirected toward more valuable industrial uses and preserve natural gas resources.

Construction began in the first quarter of 2018 and commercial operation was achieved in November 2019.

QUICK FACTS

- Installed capacity of 50MW
- Accounts for 7% of electricity in the Dhofar Governorate
- Displaces 110,000 tonnes of CO2 emissions per year
- Powers 16,000 homes

Batwind Energy Storage

Peterhead, Scotland

Batwind is the first energy storage system to be connected to an offshore floating wind farm.

The 1.3 megawatt-hours (MWh) battery stores excess electricity generated from the world's first commercial floating windfarm, the 30MW Hywind Scotland.

Both Batwind and Hywind Scotland are owned by Masdar and Equinor (formerly Statoil). Batwind was officially launched on June 27, 2018.

Using sophisticated data-analysis algorithms, Batwind will determine when to store and release electricity with the aim of increasing the economic value of the battery. The algorithm, which will rely on multiple data sources (weather & performance forecasts, market prices, maintenance schedules, consumption patterns and grid services) will "teach" the battery how to best stack different operational modes together so the utility and revenue is maximised.

The smart energy system is located at an onshore substation in Peterhead, Scotland. Batwind will rely on electricity produced by the Hywind floating offshore wind farm.

Energy storage is key to unlocking the full potential of renewable energy by addressing the variability of solar and wind. Electricity grids are real-time systems and have to continuously match supply and demand to ensure smooth operation. Therefore, the variation of energy from the sun and the wind can be a challenge. Storage solutions address this challenge by allowing operators to obtain electricity from solar and wind on demand.

Batwind is helping us to understand how storage technologies can improve the operational and cost efficiency of renewable energy power plants.

QUICK FACTS

- Storage capacity of 1.3MWh, equivalent to about 100,000 iPhones
- Battery operation and analysis expected to last till autumn 2020
- The energy storage system is provided by German specialist company Younicos, and augmented with smart functionality under development by Masdar and Equinor

Masdar's Solar Programme in Egypt

Masdar has delivered 30 megawatts (MW) of utility-scale clean energy projects and 7,000 solar home systems in remote and strategically important areas across Egypt. The four projects, customised specifically to the needs of local communities, provide energy to homes, schools, mosques, clinics, and government offices in areas that were lacking reliable electricity or were not connected to the national grid. The projects were part of a UAE-funded grant programme for rural electrification in Egypt, executed in partnership with Egypt's New and Renewable Energy Authority. Masdar's Energy Services Unit, a provider of specialised renewable energy solutions provider, executed the project on behalf of the Abu Dhabi Government

QUICK FACTS

- Four projects, completed between March 2015 and April 2016
- Displaces 42,700 tonnes of CO2 per year
- 70 villages and 141 communities gained reliable access to electricity
- Project financed by a grant from Abu Dhabi Fund for Development

Siwa Solar PV Plant, Egypt

Masdar's 10 megawatt (MW) solar photovoltaic (PV) power plant in Siwa, Egypt, was the first utility-scale solar power installation in Egypt and accounts for 30 per cent of the grid capacity of Siwa City.

QUICK FACTS

- Produces 17,500MWh of energy per year
- Eliminates 14,000 tonnes of CO2 per year
- Powers 6,000 homes
- Consists of 74,640 micromorph thin-film panels
- Covers a land area of 175,000 m2
- Operated by Al Behira Electrical Distribution Company, owned by Egyptian Electricity Holding Company

Red Sea Solar Power Plants

The four solar PV plants in Egypt's Red Sea Governorate have a total capacity of 14MW and provide reliable energy supply to support the area's vital tourism sector.

QUICK FACTS

- Built in the Red Sea cities of Marsa Alam (6MW), Shalateen (5MW), Abu Ramad (2MW), and Halayeb (1MW)
- Saves 40% of the fuel required by local diesel power plants
- Supplies electricity to nearly 8,000 homes
- Displaces approximately 20,000 tonnes of CO_2 annually

Al Wadi Al Jadeed Solar PV Plants

Masdar built three solar power plants in the Governorate of Al Wadi Al Jadeed, the largest and most sparsely inhabited region in Egypt. These new sources of electricity will support efforts to improve the Governorate's local infrastructure, enable cultivation of local land and aid access to underground water supplies, thereby providing a major boost to the growth of an under-developed region. The plants were developed in Al Farafra, Abu Minqar, and Darb Al Arbaeen. They provide electricity for over 4,800 homes and displace over 8,700 tonnes of CO_2 emissions, and reduce the diesel consumption of existing power plants by over 40 per cent.

QUICK FACTS

- Located in the cities of Al Farafra (5MW), Abu Minqar (0.5MW) and Darb Al Arbaeen (0.5MW)
- Saves 40% of the fuel required by local diesel power plants
- Supplies electricity to over 4,800 homes
- Eliminates 8,700 tonnes of CO2 per year

7000 Solar Home Systems

Masdar has provided 7,000 standalone solar home systems (SHS) to homes and public or community buildings in remote areas in six governorates without access to the national electricity grid. Each SHS consists of two solar panels, two batteries, charge controllers, energy saving light bulbs, cables, switches, and a mounting structure.

QUICK FACTS

- Located in Sohag, Matrouh, Qina, Aswan, Luxor, and Al Wadi Al Jadeed Governorates
- Nearly 7,000 homes benefit from the systems

UAE-Pacific Partnership Fund

The UAE-Pacific Partnership Fund (UAE-PPF) is a US$50 million initiative that delivered grant-funded renewable energy projects across 11 Pacific Island nations. All projects were delivered by Masdar in cooperation with each nation's government, with grant funding provided by the Abu Dhabi Fund for Development (ADFD). The solar and wind projects were developed and delivered in two cycles.

CYCLE 1:

Kiribati: 500kW Solar PV & Water Protection

The project is helping to meet the needs of 17 per cent of Kiribati's population who live off-grid. The 500kW solar PV plant is also protecting an endangered freshwater aquifer by restricting access and limiting contamination. The project also features a state-of-the-art control system.

Fiji: LaKaRo 525kW Solar PV

Three solar PV micro-grid implemented in conjunction with Fiji official now enebal ethe provision of 24hour electricity to citizens on three Fijian islands that previously averaged only 16hrs of electricity a day. The projects included 150kW LakeBA Island, 225kw plant on Kadavu Island and 150kW plant on Rotuma Island

Samoa: 550kW Cyclone-Proof Wind Farm

Samoa depends on imported diesel to meet 70 per cent of its energy demand. The 550kW Cyclone-Proof Wind Farm is the first wind power project in the country and is designed as a cyclone-proof facility with two 55 metre-tall turbines that pivot at the base, enabling them to be lowered and locked in place in less than one hour.

Tonga: Vava'u 512kW Solar PV

Masdar has helped reduce fuel consumption on the Tongan island of Vava'u by installing a 512kW solar PV plant along with advanced control systems. These systems ensure a maximum of 70 per cent of the solar energy is efficiently fed into the grid at peak hours, with any surplus stored in a battery bank for later use.

Tuvalu: 500kW Rooftop Solar PV

A series of rooftop solar PV installations has delivered a combined generating capacity of approximately 755MWh per year. The rooftop deployments included 270kW on two steel structures built one storey above ground to create 1,840sqm of shaded space; 150kW of solar panels on the roof of the islands hospital and nearby wharf buildings and 80kW on the workshop and storage facility for the local utility company.

Vanuatu: Port Vila 767kW Solar PV

Port Vila, the capital city of the island state of Vanuatu, has a population of 44,000, of which only 27 per cent have access to electricity. While the island already has some local renewable generation capacity – including PV, wind, and hydro – the majority of energy demand is still met by diesel generators. Masdar installed three solar PV plants to help increase the share of renewable energy in the energy mix in addition to providing shading for 112 parking spaces at the country's key civic areas (Parliament House and Meteorology and Geo-Hazard Department Building).

CYCLE 2

Solomon Islands – Solar PV Plant in Honiara

The Republic of the Solomon Islands consists of over 1,000 islands inhabited by a total population of 609,883. Approximately 90 per cent of the electricity produced is diesel generated. The 1MW plant, which was expanded from 600kW following a grant from the New Zealand Ministry of Foreign Affairs and Trade, bolsters energy resilience and reduces costs associated with diesel imports.

Marshall Islands – Solar Water Collection in Majuro

The Republic of the Marshall Islands is made up of 29 low-lying atolls and five elevated islands inhabited by 71,000 citizens. The nation is dependent on diesel for more than 90 per cent of its electricity. A 600kW PV Plant in Majuro was built on an existing water reservoir. The plant provides power to the existing grid and increases the rain water yield of the reservoir through increased run-off.

The Republic of Nauru – Nauru Solar

The Republic of Nauru is an island of just 21 square kilometres with more than 9,500 citizens that is highly dependent on imported fossil fuels for transport and power generation. The 500kW solar PV plant bolsters energy resilience by contributing electricity to the national grid.

Palau – Solar Penetration and Water Access

The Republic of Palau consists of over 250 islands inhabited by a total population of 21,186 citizens, the majority located on four main islands including Peleliu and Anguar. The three projects in Palau consist of a 100kW PV / 150kW low-load diesel hybrid generation plant on Peleliu; a 100kW PV / 100kW diesel hybrid plant on Angaur, which powers a water treatment facility capable of supplying 50 cubic metres of clean water per day; and 100 1.7kW solar home systems on the island of Koror provided through a subsidy loan programme by the National Development Bank of Palau.

Federated States of Micronesia (FSM) – Solar in Pohnpei

The Pohnpei Island State is one of the four main groups of islands in FSM. The 600kW solar plant, the largest PV project in FSM, supplies up to 10 per cent of the peak demand of Pohnpei's 34,000 residents.

UAE-Caribbean Renewable Energy Fund

The UAE-Caribbean Renewable Energy Fund (UAE-CREF) is a US$50 million initiative that aims to deliver renewable energy projects across 16 Caribbean Island nations to help reduce reliance on fossil-fuel imports, increase energy access, and enhance climate change resilience. The UAE-CREF is the largest renewable energy initiative of its kind in the Caribbean region. It is fully financed by the Abu Dhabi Fund for Development (ADFD), the UAE's leading national entity for international development aid. The fund is a partnership between the Ministry of Foreign Affairs and Cooperation (MoFAIC), ADFD, and Masdar, who is leading the design and implementation of the projects. The renewable energy projects are being developed and delivered in three cycles. In March 2019, the first three renewable energy projects from Cycle 1 were inaugurated. They include:

Bahamas: Thomas A. Robinson National Stadium 925kW Solar PV Carport Power Plant

The 925 kilowatt (kW) solar photovoltaic (PV) plant at the national stadium, which also serves as a carport with 342 parking spaces including 4 spots for families and 2 spots with fast charging electric vehicle (EV) charging stations, is the country's first large-scale solar energy project. Developed in partnership with the Bahamas Ministry of Environment and Housing, it sets a regulatory precedent for new renewable energy plants to feed into the grid.

Barbados: Bridgetown 350kW Solar PV Carport Power Plant & Bowmanston 500kW Solar PV Power Plant

This project has two elements: a 350kW solar PV carport with 124 parking spaces, which include six level 2 EV charging stations, and a 500kW ground-mounted PV plant. Both projects were developed in partnership with the Barbados Water Authority and are built on sites operated by the authority. The project supports BWA operations at their water treatment plant and the water pumping station.

Saint Vincent & the Grenadines: Union Island 600kW Solar PV Battery Hybrid Power Plant

Developed in partnership with St Vincent Electricity Services Limited (VINLEC), the project sets a strong precedent for using renewable energy to drive down energy costs on outer islands. Located on Union Island, the 600kW solar PV plant and 637 kilowatt-hour (kWh) lithium-ion battery project supplies all of the island's daytime power needs, and represents Masdar's first fully implemented grid-connected battery energy storage system.

Rocksprings Wind Farm in Texas and Sterling Wind Farm in New Mexico

United States of America

The Abu Dhabi Future Energy Company (Masdar), acquired John Laing Group plc's (John Laing) interest in two wind farms in the United States in 2019, marking the first time the company has invested in renewable energy projects in North America.

The 149MW Rocksprings project was commissioned in 2017, and comprises 53 GE 2.3MW wind turbines and 16 GE 1.72MW turbines at a site in Val Verde County, taking advantage of the exceptional wind conditions characteristic of the Texas region.

The wind farm generates enough power for 69,750 homes per year, displacing 285,624 tonnes of CO_2 emissions per year.

The 29.9MW Sterling project in Lea County, New Mexico, was also commissioned in 2017, and comprises 13 GE 2.3MW turbines.

Masdar and Akuo Energy are partners in both wind farms, in addition to their other ongoing partnership the 72 MW Krnovo Wind Farm, Montenegro's first wind energy project.

Rocksprings Wind Farm

- Located in Val Verde County, Texas
- Installed capacity of 149MW
- CO_2 emissions reduction per year: 285,624 tonnes
- Homes powered: equivalent to 69,750 households
- 69 GE turbines
- Operational since Q3, 2017

Sterling Wind Farm

- Located in Lea County, New Mexico
- Installed capacity of 29.9MW
- CO_2 emissions reduction per year: 66,204 tonnes
- Homes powered: equivalent to 16,167 households13 GE turbines
- Operational since Q3, 2017

Dumat Al Jandal Wind Farm

Al Jouf region, Saudi Arabia

In 2019, a consortium of Masdar and EDF Renewables announced that it had won the tender for the Dumat Al Jandal wind farm in Saudi Arabia. With an installed capacity of 400 megawatts (MW), it will be Saudi Arabia's first wind farm and the largest in the Middle East.

Expected to be completed in 2022, the project will displace approximately one million tonnes of carbon dioxide each year.

The wind farm will benefit from a 20-year power purchase agreement (PPA) with the Saudi Power Procurement Company, a subsidiary of SEC (Saudi Electricity Company), the Saudi power generation and distribution company.

Vestas is the contracted wind-turbine technology provider and responsible for the engineering, procurement and construction (EPC) contract. TSK will be responsible for the balance of plant (BOP).

The wind farm will be located 900 kilometres north of Riyadh, in the Al Jouf region of north-western Saudi Arabia. The project is 51 per cent owned by EDF Renewables and 49 per cent owned by Masdar.

QUICK FACTS

- 400MW capacity wind farm
- Will be the largest wind farm in the Middle East
- Commercial operation expected in 2022
- Will displace approximately 1,000,000 tonnes of CO2 per year

Noor Midelt Phase 1

Kingdom of Morocco

In 2019, the Moroccan Agency for Sustainable Energy (MASEN) announced that the consortium of EDF Renewables, Masdar, and Green of Africa had been awarded the tender for the design, financing, construction, operation and maintenance of the Noor Midelt Phase 1 multi-technologies solar power plant.

The project, which will have a total installed capacity of 800 megawatts (MW), is the world's first advanced hybridisation of concentrated solar power (CSP) and photovoltaic (PV) technologies.

On completion, it will provide dispatchable solar energy during the day and until five hours after sunset for a record-low tariff at peak hours of 0.68 Moroccan dirhams per kilowatt-hour.

Construction of the Noor Midelt Phase 1 plant, located 20km north of the town of Midelt in central Morocco, is expected to start towards the end of 2019, while delivery of the first electricity to the grid is planned from 2022.

Noor Midelt Phase 1 is the third project that EDF Renewables and Masdar will be working on together. EDF Renewables is a partner in Shua'a Energy 2, the joint venture led by Dubai Electricity Water Authority (DEWA) developing the 800MW third phase of the Mohammed bin Rashid Al Maktoum Solar Park in Dubai.

QUICK FACTS

- The world's first advanced hybridisation of CSP and PV technologies
- 800MW total installed capacity
- Located 20km north of Midelt in central Morocco
- Will displace 350,000 tonnes of CO2 annually
- Will power over 215,000 homes

The two companies are also partnering in the Dumat Al Jandal wind farm, which, at 400MW, will be Saudi Arabia's first and the MENA region's largest wind energy project.

The Ile de Romainville Solar Park

Republic of Seychelles

The Ile de Romainville Solar Park is a 5 megawatt (MW) solar photovoltaic (PV) power plant with battery storage in the Republic of Seychelles.

The project includes an energy storage system with a capacity of 5MW and 3.3 megawatt-hours (MWh), allowing for the safe and stable supply of electricity from the PV power plant to the main island of Mahé and further increasing the resilience of the national grid of the Seychelles.

The project is financed by Abu Dhabi Fund for Development (ADFD), and is being developed by Masdar and the Seychelles' Public Utilities Corporation (PUC).

The PV array is specifically designed to maximise the use of available land, while allowing for the maintenance of the wind turbines and minimising any shading losses resulting from them.

The new solar PV project is being constructed on the same island hosting five of the eight wind turbines of Masdar's first project in the Seychelles, the Port Victoria Wind Farm, which has been operational since 2013.

Seychelles currently relies on fossil fuels to meet its electricity demand, with fossil fuels accounting for around 20 per cent of the country's imports. It is estimated that the Ile de Romainville solar project will save approximately 2 million litres of fuel annually.

QUICK FACTS

- PV plant has a capacity of 5MW
- Expected completion in Q1 2020
- Will save approximately 2 million litres of fuel annually
- Will displace approximately 6,000 tonnes of CO2 emissions annually
- Installed battery storage capacity of 5MW and 3.3MWh

Masdar City 10MW – Solar PV Plant

Abu Dhabi, UAE

Masdar's 10 megawatt (MW) solar photovoltaic (PV) power plant is located on the north side of Masdar City and was connected to the Abu Dhabi grid in April 2009. This iconic facility was the first and largest utility-scale solar PV plant in the Middle East when it was connected to the grid back in 2009. The plant continues to provide electricity to projects under construction in Masdar City, and the Mohamed Bin Zayed University for Artificial Intelligence, while excess power creates a clean energy source for Abu Dhabi.

The facility produces approximately 17,500 megawatt-hours (MWh) of clean electricity annually and displaces approximately 15,000 tonnes of carbon emissions per year – equivalent to removing 3,300 cars from Abu Dhabi's roads. The plant consists of 87,780 multi-crystalline and thin film modules supplied by Suntech and First Solar.

In line with its strategy to build in-house operations and management capabilities, Masdar's Clean Energy division took over operations and maintenance of the plant in September 2019 through its newly established company Masdar Specialized Technical Services (MSTSC), with the support of MASE Contractors, a reputable operator in the Middle East.

QUICK FACTS

- First utility-scale solar PV power plant in the region
- Land area: 210,000 square metres
- Installed capacity: 10MW peak capacity
- Displaces approximately 15,000 tonnes of carbon dioxide annually
- 87,780 PV modules (18,228 supplied by Suntech, 69,552 supplied by First Solar)
- Energy production: approximately 17,500 MWh annually

Hero Future Energies

India

In November 2019, Masdar made a US$150 million strategic investment in Hero Future Energies (HFE) – India's leading clean-tech company – to help fund the expansion of its renewable energy portfolio in India and select international geographies.

The acquisition of the stake in HFE marks Masdar's first investment to the clean energy sector in India and adds to its growing international portfolio.

Masdar's investment in Hero Future Energies supports India's goal to achieve a renewable energy power generating capacity of 175 gigawatts (GW) by 2022, including 100GW of solar energy.

Hero Future Energies (HFE), founded in 2012, is currently active in 10 Indian states and has ambitious expansion plans. The company's operations encompass wind and solar power, including rooftop solar plants. HFE has already delivered 1.5 gigawatts (GW) of operational wind and solar energy, has another 1GW under construction and development. The company aims to have 3.5GW of solar power installed by 2022.

QUICK FACTS

- Masdar's first investment to the Indian clean energy sector
- Supports India's goal to achieve a renewable energy power generating capacity of 175 gigawatts by 2022

East Rockingham Waste to Energy

Perth, Australia

In January 2020, Masdar made its first investment in Australia after acquiring a stake in the country's second utility-scale waste-to-energy (WTE) facility, the East Rockingham Waste to Energy.

Under the terms of the investment, Masdar and leading Abu Dhabi advisory and development firm Tribe Infrastructure Group invested in the waste-to-energy project via their Abu Dhabi Global Market-based joint venture holding company, Masdar Tribe Energy Holdings Limited, which has acquired a 40 per cent stake in the WTE facility.

Financial close on the A$511 million greenfield East Rockingham Waste to Energy, which will be located in the Rockingham Industry Zone, 40km south of Perth in Western Australia, was achieved on December 23, 2019, and construction has already started.

When completed, East Rockingham Waste to Energy will process 300,000 tonnes per year of non-recyclable municipal, commercial and industrial waste and up to 30,000 tonnes of biosolids per year.

The facility will also recover approximately 70,000 tonnes per annum (TPA) of bottom ash, which will be processed for use in road bases and other construction materials. The WTE facility will generate 29 megawatts (MW) of baseload renewable energy, enough to power more than 36,000 homes, and displace more than 300,000 tonnes of CO2 emissions per year.

QUICK FACTS

- Located 40km south of Perth in Western Australia
- 300,000 tonnes of non-recyclable municipal, commercial and industrial waste and up to 30,000 tonnes of biosolids will be processed per year
- Facility to generate 29MW of baseload renewable energy
- Will power more than 36,000 homes
- Will displace more than 300,000 tonnes of CO2 emissions per year
- Facility to recover 70,000 TPA of bottom ash

Equity investors in the project also include UK company John Laing Investments, alongside Acciona Concesiones and Hitachi Zosen INOVA (HZI).

Financing of the project was supported by an A$18 million grant from the Australian Renewable Energy Agency (ARENA) and A$57.5 million in subordinated debt from the Australian government's Clean Energy Finance Corporation (CEFC).

Charging Infrastructure Investment Fund (CIIF), United Kingdom

In October 2019, Masdar became the first commercial investor in a UK government fund for EV charging stations. The UK Treasury launched the £400 million CIIF to bolster Britain's electric vehicle charging infrastructure, with the first £35 million provided by Masdar, which has been matched by the UK government.

The first investment in the fund will be allocated to expand the country's electric vehicle charging infrastructure with 3,000 new rapid charge points by 2024 as part of its ambition to end the sale of petrol and diesel vehicles by 2040.

The fund is managed by Zouk Capital.

Masdar's investment in the CIIF has been made through a special purpose vehicle (SPV) hosted by Abu Dhabi Global Market (ADGM), Abu Dhabi's International Financial Centre. The move further recognises the supportive business and transparent regulatory environment provided by ADGM, as well as its initiatives and ongoing commitment to sustainable and green finance.

Masdar's involvement in the fund builds on the company's track record of successful partnerships in the UK, where it also has investments in the 630MW London Array, one of the world's largest offshore wind farms in operation, the 402MW Dudgeon offshore wind farm, and Hywind Scotland, a 30MW floating wind power development situated near the coast of Aberdeenshire, which is connected to the 1.3MWh Batwind battery storage system, as well as ongoing research and development into next-generation clean technologies at the University of Manchester.

QUICK FACTS

- Rapid charge points can recharge a family car in as little as 30 minutes, compared with non-rapid charger technology, which can take anywhere from 60 minutes to several hours
- The UK is home to one of the largest electric vehicle networks in Europe

Graphene Engineering Innovation Centre (GEIC)

University of Manchester, England

Masdar is the principal funder of the Graphene Engineering Innovation Centre (GEIC) at the University of Manchester.

The Centre, which is housed in the Masdar Building, is a purpose-built facility that supports the business strategy of Masdar to participate in advanced clean technologies as soon as they show commercial potential.

The University's world-class, multimillion-pound centre will see industry-led development in graphene applications in partnership with academics. The Graphene Engineering Innovation Centre (GEIC) specialises in the rapid development and scale up of graphene and other 2D materials applications.

QUICK FACTS

The GEIC will focus on six application areas to rapidly accelerate the development and commercialisation of new graphene technologies.

- Composites
- Energy
- Membranes
- Inks, Formulations and Coatings
- Graphene production
- Measurements and characterisation

100MW Nur Navoi Solar Project

Navoi region, Uzbekistan

In November 2019, Masdar signed a Power Purchase Agreement (PPA) and Government Support Agreement (GSA) with the Government of the Republic of Uzbekistan to design, finance, build and operate the country's first public-private partnership (PPP) solar power plant.

Uzbekistan's Ministry of Investments and Foreign Trade awarded the project to Masdar after it tendered the lowest tariff of 2.679 US cents per kilowatt hour in a competitive auction to develop the 100-megawatt (MW) utility-scale PV solar plant, which will be located in the Navoi region.

As transaction adviser, the International Finance Corporation assisted the Ministry of Investments and Foreign Trade and the Ministry of Energy to design and tender the PPP, which attracted more than 40 bidders, under its Scaling Solar programme.

Uzbekistan aims to develop 5 gigawatts (GW) of renewable energy by 2030. Under the IFC's Scaling Solar programme, Uzbekistan plans to install 1GW of solar PV power.

Masdar established Nur Navoi FE LLC as the local project company to deliver and operate the PV plant. Construction is planned to commence in the third quarter of 2020 and the PV plant start-up is scheduled for the third quarter of 2021. The project company will also operate and maintain the plant for 25 years.

QUICK FACTS

- Masdar was awarded the tender after submitting the lowest tariff of 2.679 US cents per kilowatt hour
- Facility to generate 100MW of renewable energy
- Masdar to design, finance, build and operate the PV power plant for 25 years