


Advancing the Clean Energy Future



The background of the slide is an abstract composition of vibrant blue and white. On the left side, a large, semi-transparent sphere is visible, its surface reflecting light and showing internal patterns. From the right side, a bright, hazy light source emits numerous thin, white rays that fan out across the upper half of the image. Scattered throughout the scene are small, white, star-like points of light, some of which appear to be connected by faint, thin lines, suggesting a network or a digital space. The overall effect is one of high-tech, futuristic energy and innovation.

We are at the dawn of a global energy revolution that will transform the way we think about power generation, distribution and consumption. The scale and complexity of these changes is almost without precedent, and companies that seek not only to survive but also to thrive in this new environment must have the agility, expertise and long-term vision to respond to this new and uncertain landscape.

Masdar is a new kind of global energy company that takes a holistic approach to the changing realities of power generation and consumption around the world.

We operate across the full spectrum of renewable energy and sustainable technologies– from education and research to commercialization and deployment – to advance the clean energy industry.

# Masdar: Advancing the Clean Energy Future

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Established in 2006, Masdar is a commercially driven renewable energy company based in Abu Dhabi, United Arab Emirates. As a strategic government initiative—and a subsidiary of the Mubadala Development Company—Masdar has a mission to invest, incubate and advance the establishment of a clean energy industry in Abu Dhabi and around the world.

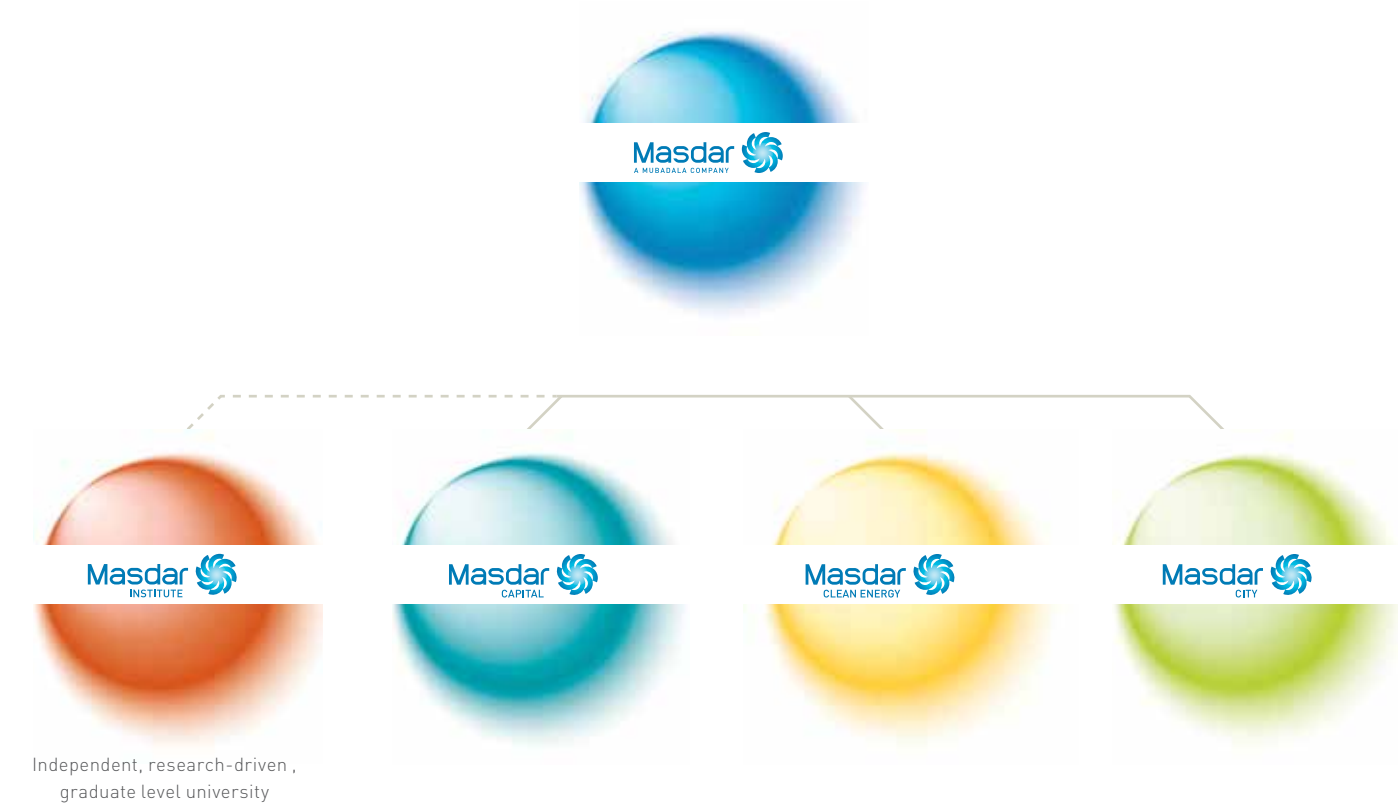
Masdar operates through three integrated business units, complemented by an independent, research-driven, graduate-level university. Our holistic approach—of merging higher education, R&D, investment and sustainable living—enables us to meet the changing needs of the evolving clean energy industry.

With an initial commitment of US\$15 billion from the Abu Dhabi government, Masdar today is a university, a renewable energy developer, an investor and a cleantech cluster in one of the world’s most sustainable urban developments. Through these platforms, Masdar is contributing to the Abu Dhabi Economic Vision 2030, which is focused on transitioning the emirate to a knowledge-led economy.

Gemasolar CSP plant, Spain



Masdar Organisational Structure





# What we stand for:

## Vision

To make Abu Dhabi the preeminent source of renewable energy knowledge, development and implementation, as well as the world's benchmark for sustainable development.

## Mission

To advance renewable energy and sustainable technologies through education; research and development; investment; commercialisation and adaptation.

## 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 adoption 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 it's vital our decision-making process 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 uses.

Night view of the Knowledge  
Centre at Masdar Institute



Abu Dhabi is home to the world's fifth largest proven oil reserves and the sixth largest natural gas reserves.

The Emirate has enough hydrocarbon reserves to last beyond 100 years. So why has the leadership of this Emirate – the capital of the United Arab Emirates – committed billions of dollars to developing Masdar and establishing Abu Dhabi as a global centre of excellence in renewable energy and clean technologies?

## Leadership in Future Energy





## Our Commitment to the Future:

### Extending Abu Dhabi's Energy Leadership

Abu Dhabi has traditionally played a leading role in global energy markets as a significant hydrocarbon producer. Through Masdar, Abu Dhabi seeks to leverage its substantial resources and experience in the energy sector to maintain its leadership position in an evolving global market that is increasingly looking to renewable alternatives.

This leadership is expressed in other ways as well. While Abu Dhabi has always been known as a global energy player, through Masdar, it is demonstrating what a responsible oil producer can do to help create a balance between hydrocarbons and renewable energy in addressing both climate change and energy security.



## Abu Dhabi's 2030 Vision

Abu Dhabi has embarked on a two-decade programme to transform its economy from one based on natural resources to one led by knowledge, innovation and the export of cutting-edge technologies. This transformation is guided by the Abu Dhabi Economic Vision 2030, which provides a comprehensive plan including steps to materialize the transformation over the next two decades.

Key goals include increasing the non-oil share of the economy from about 40 per cent to more than 60 per cent, and significantly diversifying the scope of economic activity. Among the priority sectors of this new economy will be education, banking and finance, tourism, pharmaceuticals, media, aviation and aerospace, transportation and logistics, and manufacturing in areas such as aluminium and petrochemicals. The plan also places a strong emphasis on value-added, knowledge-based industries, such as renewable energy and sustainable technologies.

Masdar is contributing significantly to this diversification by:

- Investing in human capital development
- Conducting research and stimulating innovation
- Expanding the energy and technology export base
- Diversifying domestic supply of energy
- Attracting inward investment
- Encouraging private-sector entrepreneurship



## Addressing Climate Change

With a heritage tied to life in the harsh and unforgiving desert, Abu Dhabi's leadership well understands the lessons of traditional desert living, where sustainable practices and resource conservation are essential to survival in such surroundings. That's why the Emirate's leadership understands the tremendous challenges posed by climate change, environmental degradation and the need to find sustainable energy sources.

### **But what of climate change? What is it and why does it need to be addressed?**

The term refers to the phenomenon of a planet-wide increase in surface temperatures that is being caused by human activity. Climate change is happening because of the greenhouse effect, which on its own is important in making the earth warm enough to support life. The problem is that emissions from cars, power plants and industrial livestock farming, as well as deforestation, among many other human activities, are resulting in too much greenhouse gas accumulation in the atmosphere. As a result, sunlight enters our atmosphere, but the gas buildup means not enough can escape into space, resulting in a hotter atmosphere. This, in turn, causes increasingly significant problems such as extreme weather and rising sea levels.

Concerted efforts must be taken to reduce the volume of greenhouse gases released into the atmosphere. This principally means finding ways to reduce energy consumption and develop clean sources of energy.

This is where Masdar comes in. By pursuing investments, partnerships, activities and operations across the entire renewable energy and clean technology value chain, Masdar supports the development, commercialisation and adoption of these technologies, both locally and internationally. As a result, Masdar is contributing to global efforts to combat climate change and find a more sustainable future for both the Emirate and the global community as a whole.



The background of the slide is an abstract, high-speed photograph of water swirling in a circular motion, creating a sense of dynamic energy. The colors range from deep blue to light blue and white, with a horizontal blue band across the middle where the text is located.

## An Integrated Approach to Future Energy



# An Integrated Approach to Future Energy

To advance the establishment of the clean energy industry in Abu Dhabi and around the world, a new and fundamentally holistic approach is required. Masdar takes such an approach through its three integrated business units and research-driven, graduate-level university. Together, they address the entire value chain of the renewable energy industry.

The **Masdar Institute of Science and Technology** is a source of innovation and human capital, while **Masdar Capital** pursues investments across the full spectrum of clean technology companies. **Masdar Clean Energy** focuses on developing large-scale renewable energy and carbon abatement projects. **Masdar City**, as a special economic zone and a test-bed for innovation, addresses the challenges of sustainable urban planning and development, while testing and implementing demand-reduction technologies and systems.

The result is an organisation greater than the sum of its parts, where the synergies of shared knowledge and technological advancement provide a competitive advantage. This advantage enables the company to move with agility and intelligence in an important, global industry that is evolving at great speed. This holistic approach keeps Masdar at the forefront of the industry, while also ensuring that the company remains grounded in the pursuit of feasible, pioneering technologies. As a result, Masdar delivers innovation to the market while also bringing profits to shareholders.

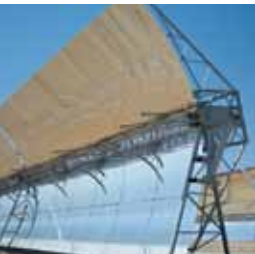
Masdar Institute



Masdar Capital



Masdar Clean Energy



Masdar City



The London Array  
offshore wind farm







## Masdar Institute

Masdar Institute of Science and Technology (Masdar Institute) was established as a not-for-profit, private graduate university to develop homegrown R&D capacity in Abu Dhabi addressing issues of importance to the region.

Established as an on-going collaboration with the Massachusetts Institute of Technology (MIT), Masdar Institute integrates theory and practice to incubate a culture of innovation and entrepreneurship, working to develop the critical thinkers and leaders of tomorrow. With its world-class faculty and students, the Institute is committed to finding solutions to the challenges of clean energy and climate change through education and research.

An important characteristic of Masdar Institute is its focus on complex real-world problems that require a multidisciplinary approach for the development of solutions from an integrated technology, systems and policy perspective. This multi-interdisciplinary and integrated approach is supported by the structure of its academic programs and by the emphasis placed on engaging external partners from industry, government, and other academic institutions in collaborative activities.

Serving as a key pillar of innovation and human capital, Masdar Institute remains fundamental to Masdar’s core objectives of developing Abu Dhabi’s knowledge economy and finding solutions to humanity’s toughest challenges such as climate change.



## Masdar Capital

Masdar Capital is building a portfolio of the world’s most promising renewable energy and clean technology companies. The unit also has achieved a “first” in the UAE of attracting 3rd party capital into the UAE from abroad and managing the funds out of Masdar City.

The unit helps its portfolio companies grow and scale up by providing capital and management expertise. Masdar Capital targets investments that have the greatest potential globally as well as to the UAE, and is particularly focused on the following sectors:

- Clean energy: including power generation and storage technologies, transportation technologies, cleantech/clean energy innovation, and sustainable biofuels.
- Environmental resources: including water and waste management, and sustainable agriculture technologies.
- Energy and material efficiency: including developments in advanced materials, building and power-grid efficiency, and the enabling technologies.
- Environmental services: including environmental protection and business services. Investment in these markets is made via two funds: the Masdar Clean Technology Fund (MCTF/Fund 1), launched in 2006, and the DB Masdar Clean Tech Fund (Fund 2), launched in 2009. MCTF, a fully deployed \$250 million fund, invested \$45 million in three cleantech funds and the remaining \$205 million in nine direct investments in companies, as lead or co-lead investor. It was launched in conjunction with partners Credit Suisse and Siemens AG.

The DB Masdar Clean Tech Fund is jointly managed with Deutsche Bank and raised US\$290 million by its final close. Its investor group includes Siemens, Japan Bank for International Cooperation (JBIC), Inpex Corp. / Japan Oil Development Co. Ltd., JX Nippon Oil & Energy Corporation, Development Bank of Japan (DBJ), Mitsubishi Heavy Industries (MHI) and GE. Both funds follow an active management investment strategy. The targeted investment amount is between US\$15-35 million and seeks to realise strong, risk-adjusted returns.

Through these funds, Masdar Capital also seeks to demonstrate, commercialise, and promote renewable technologies in the UAE, and to identify synergies between its investments and other Masdar activities, as well as the long-term energy and development programme of the UAE.





Shams 1 CSP Plant,  
UAE

## Masdar Clean Energy

Masdar Clean Energy develops large scale renewable power generation and carbon abatement projects.

In building a portfolio of strategic, utility-scale projects in the UAE and internationally, Masdar Clean Energy has invested over \$1.7bn of equity across projects with a total value over \$6.4bn, delivering nearly 1 GW of renewable energy.

Masdar is playing a key role in contributing to Abu Dhabi's 7% renewable energy capacity target by 2020. In meeting this target the company is developing numerous large-scale solar and wind energy projects across the emirate. Most notably, through a joint venture with Abengoa Solar and Total, Masdar is developing the 100MW Shams 1 concentrated solar power (CSP) plant in the Western Region of Abu Dhabi, set to be the largest, single-unit CSP plant in the world.



The London Array offshore  
wind farm, UK



Gemasolar CSP plant,  
Spain

Internationally, Masdar has played a key role in delivering the world's most innovative and large-scale renewable energy projects. Through the joint venture company Torresol with partners SENER Grupo de Ingeniería, Masdar aims to build and operate CSP plants globally. Today, Masdar is supplying 120MW of solar energy to Spain. Among the projects is the cutting-edge 20MW Gemasolar project which supplies uninterrupted electricity to the grid through its molten salt energy storage technology. The Valle 1 and Valle 2 CSP plants use similar technology and provide a combined 100MW of power.

Masdar Clean Energy's other notable project is the 870 MW London Array offshore wind farm, the largest offshore wind farm in the world. Situated in the United Kingdom, the London Array is made possible through a joint venture between Masdar, DONG Energy and E.ON.

Masdar is developing numerous other renewable energy projects around the world, ranging from large-scale projects to smaller off-grid solutions to improve energy access in the developing world. Some of these projects include:

- **The Seychelles project** is an 8-turbine, 6-megawatt wind farm that will supply 10-15 per cent of Mahe Island's installed capacity.
- **The Tonga project** is a 500kw photovoltaic (PV) solar project on the island of Vava'u that will generate enough power to offset as much as 70 per cent of the island's electricity demand during the middle of the day
- **The Afghanistan project** will supply 600 residences with off-grid solar PV systems
- **The Mauritania project** is a 15 MW solar PV project in Nouakchott that will deliver 10 per cent of electricity capacity in Mauritania

Masdar Clean Energy is also committed to advancing carbon abatement solutions and technologies such as energy efficiency and carbon capture and storage (CCS). As a key technology that can contribute to the timely and effective reduction of carbon dioxide emissions, CCS will play an important role in climate change mitigation.

Masdar is developing one of the world's most ambitious, large-scale CCS projects in partnership with the Abu Dhabi National Oil Company (ADNOC) and others in the power and industrial sectors in the Emirate. The project will capture carbon dioxide emitted from power plants and heavy industry and transport it, via a national pipeline network, for injection into Abu Dhabi's oil and gas reservoirs for enhanced oil recovery.





Artist Impression:  
Masdar's Headquarters Building -  
Home to IRENA (left)

# Masdar City

Designed to be one of the most sustainable cities in the world, Masdar City is a clean-technology cluster attracting companies committed to advancing the new energy industry and establishing Middle East operations. Situated 17km from downtown Abu Dhabi, Masdar City is a special economic zone and pedestrian-friendly urban development where current and future renewable energy and clean technologies are showcased, marketed, researched, developed, tested and implemented.

Powered entirely by renewable energy, Masdar City combines passive and intelligent design to push the boundaries of sustainability. To date, its buildings reduce energy demand by 56 percent and potable water demand by 54 percent (ASHRAE). The city is showing the world how sustainable design and development can accommodate for denser populations with less resource usage.

At its core, Masdar City is home to the Masdar Institute of Science and Technology – a top-notch research university that is a source for innovation, technology, R&D and highly skilled graduates. Enrollment is expected to grow to between 600 and 800 student over the next five years and a major expansion is underway to double the size of the campus.

## Masdar City continues to grow.

Construction has already started on the International Renewable Energy Agency (IRENA) headquarters building, and the Siemens Middle East headquarters is nearing completion. In addition, construction has begun on the first commercial building, which will be home to a range of organisations, such as S.K Energy, General Electric, Mitsubishi Heavy Industries and the Global Green Growth Institute.

To create a vibrant community, a variety of hospitality, banking and retail outlets are already onsite, including an organic supermarket, a coffee shop and restaurants. Eventually, 40,000 people will live in Masdar City, with up to an additional 50,000 commuting to the city every day for work and study.

A view of the Masdar  
Institute building facade





## Associated Programmes

**Abu Dhabi Sustainability Week (ADSW)** is a global platform, hosted by Masdar, that addresses the interconnected challenges that affect the widespread acceleration and adoption of sustainable development and renewable energy. To seriously address the global energy challenge, the relationships between economic development, poverty eradication, energy security, water scarcity and climate change cannot be overlooked. The largest gathering on sustainability in the history of the Middle East, ADSW encourages actionable outcomes to carve a pathway toward sustainability worldwide.

## Participating Events and Conferences during ADSW

### World Future Energy Summit (WFES)

Since it was first held in 2008, the World Future Energy Summit has been a platform to facilitate practical progress in renewable energy. The urgent global need to find energy solutions that are both secure and sustainable is a challenge that requires a global response. The World Future Energy Summit, held every year in Abu Dhabi and hosted by Masdar, provides a crucial platform to address this challenge. Recognising that only an interdisciplinary approach to this enormous challenge will yield tangible results, the annual summit addresses issues of public policy, research and development and business in a coordinated approach.

Under the ongoing patronage of H.H. General Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, Masdar hosted the inaugural World Future Energy Summit in January 2008. In a short period, the summit has gained recognition as one of the world’s most influential gatherings of leaders in the clean technology and renewable energy sector. In 2012, for example, WFES was proud to bring together more than 35 official delegations (led by heads of state, royalty and ministers), 26,000 attendees, 600 exhibitors, 200 eminent speakers and 3150 high level delegates from 112 countries to discuss the key issues surrounding the provision of clean and secure energy.

WFES is unique in its ability to attract public and private-sector leaders to address the critical issues and identify the actions that must take place globally at corporate, political and economic levels. As a meeting opportunity, WFES is unrivalled in linking global project owners and solution providers with investors.

This extensive engagement from decision makers and influencers in the energy industry from across the world is helping to bring about solid and practical solutions to the challenges facing the world in terms of energy and climate change.

### The International Water Summit (IWS)

IWS is a new global platform for promoting water sustainability and the water-energy nexus in arid regions. As a natural extension of the UAE’s commitment to sustainability, IWS will bring together policymakers, scientists and business leaders to tackle the urgent challenges of wastewater and water access and security.

Winners of the 2012  
Zayed Future Energy Prize



## Zayed Future Energy Prize

The Zayed Future Energy Prize, launched in 2008 and managed by Masdar, represents the vision of the late founding father and President of the United Arab Emirates, Sheikh Zayed bin Sultan al Nahyan, who championed environmental stewardship and sustainability as an integral part of UAE history and heritage. Under the auspices of the Abu Dhabi Government, this annual award celebrates achievements that reflect impact, innovation, leadership and long-term vision in renewable energy and sustainability.

The Zayed Future Energy Prize has recognised some of the most innovative, visionary leaders in global sustainability. Our winners, finalists, and other entrants have already made a significant positive impact on the world’s environment with their multitude of solutions. They have been finding innovative ways to conserve energy, cut greenhouse gas emissions and increase the production of clean, renewable energy. In 2012, The prize extended its categories to now include: Large Corporation (recognition award), Small and Medium Size Enterprises (SME), Non-Governmental Organization (NGO), Lifetime Achievement Award and the Global High Schools Prize – awarded annually to up to 5 different schools from five regions.

As they continue to make advances in energy over the coming years and decades, the Zayed Future Energy Prize will be here to recognize, honour and reward them.



The enormously complex energy systems and solutions of tomorrow will have their origins in the research and development programmes of today.

Masdar takes a holistic approach to tackling these challenges, driving advances across the full spectrum of renewable energy and clean technologies.

The company moves swiftly and in sync with changing technologies and evolving landscapes, remains focused on commercial viability, and takes only those decisions and actions that can be repeated in the future without significant loss in quality, resources or efficacy. By doing all of this, Masdar (which means “the source” in Arabic) will be a wellspring of solutions that benefit not only its shareholders, but also the sustainability of Abu Dhabi, the UAE and the planet as a whole.

## A Future Energy Company for Today





View of the Masdar Institute  
building at Masdar City

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