Masdar City

Project Development Overview
Agenda

- Masdar Initiative
- Masdar City Design and Build Overview
- Masdar’s Business Model
- Life in Masdar City
Masdar’s Mission is clear

We are an Initiative of the Government of the Emirate of Abu Dhabi

To make Abu Dhabi an international hub for alternative energy

To create an entirely new economic sector in Abu Dhabi to lead this industry

To be a catalyst for change on a global scale
The Masdar Vision

The world’s first carbon-neutral, zero-waste city

- **Masdar City**
  - Graduate-level, research-driven institution focused on advanced energy and sustainable technology

- **Industries**
  - Invest in and develops large-scale renewable energy projects

- **Utilities & Asset Mgmt**
  - Invest in renewable energy, assets and technology, and utility scale renewable energy projects

- **Masdar Institute**
  - Specializes in greenhouse gas emission reduction projects

- **Carbon Mgmt**
The Masdar Institute

- Independent, not-for-profit, research-driven, graduate level institute
- Create a new generation of world energy leaders in Abu Dhabi; a generation that will have major influence worldwide
- Offers Masters and PhD programs in science and engineering disciplines, with a focus on alternative energy and sustainable technologies
- Located in Masdar City. The first courses start Sept 2009
- Full financial aid package for students

In partnership with:

Massachusetts Institute of Technology
Carbon Management Unit

- Monetizes GHG emissions under Kyoto CDM protocol
- Focusing on emission reduction technologies particularly CO$_2$ CCS
- Building a nationwide capture network (2013)
  - Transports CO$_2$ from industry and injects into oil wells to increase output
  - 8 projects in the UN registration pipeline, 9 others under development
Utilities & Asset Management Unit

Direct and strategic investments in renewable energy and sustainability companies focused on Solar Power (CSP), Photovoltaic (PV), Wind and Waste to-Energy

- Torresol (JV with Sener for CSP tower)
- Winwind (€220m DI in wind turbine company)
- London Array (JV with E.ON largest wind farm in the world 630MW)

- $250m Clean Tech Fund with Credit Suisse
  - Segway, Heliovolt, Sulphcell

- 1st of many 100 MW CSP plant in Abu Dhabi; using parabolic trough technology
- 500MW Hydrogen-fired power plant
Establish Global large-scale production assets in the renewable energy sector

Masdar PV: $600m investment in thin film PV plants in Germany and Abu Dhabi with initial 210MW output

Building a 4km² Solar Manufacturing cluster in Abu Dhabi
  - Crystalline-based PV
  - Thin film PV
  - Concentrated PV

Developing investments in energy storage, efficiency and lighting
Other avenues of involvement with Masdar

Honoring those who have made the greatest contribution to renewable energy and sustainable living.

Where the renewable energy industry meets with over 16,000 attendees.
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What is Masdar City?

A Sustainable City providing the highest quality of life with the lowest environmental footprint.

- 100 % Renewable Energy
- Zero Waste
- Carbon Neutral
- Fossil Fuel Free Zone
Total population of 90,000
40,000 residents
50,000 business commuters
Masdar City – Under Construction

Masdar Institute

Phase 1a

45,000 sq.m

August 2009
Traditional Arabic City Design

- Narrow streets
- Natural shading
- High Density/Low Rise Living
- Public spaces
- Mixed Use
- Walkable
Passive Design reduces Demand

Northeast/Southwest Orientation

Natural Wind Towers

Roof – Day Shading
What makes Masdar City Unique?

<table>
<thead>
<tr>
<th>Renewable Energy</th>
<th>The City will be powered with Renewable energy</th>
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<tbody>
<tr>
<td>Building Design</td>
<td>Building design will ensure the latest use of energy efficient technologies and smart design</td>
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<tr>
<td>Innovative Transportation System</td>
<td>The City will contain pioneering public transportation systems</td>
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<td>Recycling / Waste to Energy</td>
<td>The City will strive towards a zero waste objective</td>
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<tr>
<td>Masdar Institute</td>
<td>A graduate-level, research-driven institution in partnership with MIT</td>
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Conventional City

- Building Design: Conventional
- Energy Generation: Oil & Gas 80%
- Waste: Landfill 13%
- Transportation: Fossil fuel 7%

= 1,100,000 Tonnes CO₂

Masdar City

- Building Design: Energy Efficient -56%
- Energy Generation: Renewable -24%
- Waste: Recycling/Waste to Energy -12%
- Transportation: Electric/Solar -7%
- Carbon offsetting: Carbon Sequestration -1%

= 0 CO₂
Energy Generation
100% Renewable Energy

- Concentrated Solar Power: 35%
- Photo Voltaic: 42%
- ETC – Evacuated Thermal Tube Collector: 15%
- Waste to Energy: 7%
- Other: 1%

100% Renewable Energy
Masdar City will be the first land-based city to operate without fossil fueled vehicles.

Walking, electric vehicles, cycling, PRT and LRT are the modes of transportation within Masdar City.

With 40,000 commuters per day, Masdar City will have strategically placed parking areas for fossil-fueled vehicles.

### PRT Fast Facts

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<table>
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<tr>
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<tbody>
<tr>
<td>PRT Vehicles:</td>
<td>3,000</td>
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<tr>
<td>PRT Stations:</td>
<td>85-100</td>
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<tr>
<td>FRT Vehicles:</td>
<td>810</td>
</tr>
<tr>
<td>PRT Trips per day:</td>
<td>135,000</td>
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<tr>
<td>Max. Walking Distance to PRT Station:</td>
<td>150m</td>
</tr>
<tr>
<td>LRT Trips per hour:</td>
<td>5,000 people</td>
</tr>
</tbody>
</table>
Mobility

- LRT Station
- PRT Station
- Public Green Space
- Public Park
- Neighbourhood Centre
- Place of Worship
- Playground
- Workplaces
- Shops
- School
- Cycle / Segway
- Walking 2-3 min
- 150 m
- 300 m
Transport Grid

Car Free City

LRT

PRT
Waste Management

- 60% Materials Recycled
- 30% Waste-to-Energy
- 10% composting
MASDAR Water Strategy

Reduce water leakage to 3%
Recycle 90% of grey water
Reduce consumption to >80l/p/d
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Masdar City Business Model

- Positive Business Environment
- Cleantech Cluster
- R&D and Business Incubation
- Green Living
- Association with Masdar
- Access to Markets
Availability of capital sources to grow businesses (e.g. Masdar Clean Tech Fund)

Access to a community of venture capital firms specializing in funding and incubating cleantech

Access to extended supply chains through cluster of cleantech companies in Masdar

Benefit from the ‘One-Stop-Shop’ approach for cleantech companies

Involvement with leading research and industry best practice

Continuous formal and informal information sharing across the city

The expertise of the Masdar Institute’s faculty and graduates

A pool of skilled labour with expertise in cleantech that will be attracted to Masdar City
Green Living
Access to Markets

Residents
Adoption of the "One Planet Living" principles by BioRegional and WWF

Corporate Tenants
Fulfill corporate sustainability responsibilities

Access to Markets
Gateway to the expanding markets in India and China
Access to the growing markets in the GCC region
Association with Masdar

**UK Government Cooperates with Masdar**

The partnership with encompass on- and off-shore wind power generation, carbon capture and storage, solar energy and energy efficiency.

This paves the way for Masdar and the UK government to explore opportunities in renewable energy projects development.

Source: [http://www.ameinfo.com/174291.html](http://www.ameinfo.com/174291.html)

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**Masdar breaks ground on photovoltaic factory in Germany**

The plant will use advanced production technologies to bring PV closer towards grid parity, and enhance a local economy with a rich history of manufacturing and technology. The $230 million (EUR 180 million) German plant marks the first phase of Masdar’s $2 billion (EUR 1.3 billion) investment in thin-film PV manufacturing, one of the largest investments ever made in solar.

Source: [http://www.ameinfo.com/166720.html](http://www.ameinfo.com/166720.html)

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**Masdar invests €120m in WinWinD Oy**

WinWinD, one of the top turbine manufacturers in the world in the multi-megawatt segment, has established technological expertise, and has strong growth potential.

Masdar will work in partnership with the management of WinWinD to accelerate WinWinD’s geographic expansion in Europe, India and the Middle East.

Source: [http://www.ameinfo.com/169531.html](http://www.ameinfo.com/169531.html)

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**E.ON, Masdar form joint venture to invest in wind**

Masdar and E.ON form joint venture to invest in the world’s largest wind farm – London Array. Masdar has invested a 20% stake in the wind farm which is located 12 miles off the Kent and Essex coasts.

The wind farm will contain 271 turbines and produce up to 1,000 MW of energy upon completion which will power 750,000 homes.

Source: [http://www.ameinfo.com/171659.html](http://www.ameinfo.com/171659.html)

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**Masdar and Hydrogen Energy plan clean energy plant in Abu Dhabi**

Masdar, Abu Dhabi’s initiative for renewable and alternative energy and clean technology, and Hydrogen Energy, the joint venture between BP Alternative Energy and Rio Tinto, announced the signing of an agreement to work together on the front-end engineering design of an industrial-scale hydrogen-fuelled power generation project with capture of the carbon dioxide (CO2), which would then be available for transportation and storage.

Source: [http://www.ameinfo.com/144410.html](http://www.ameinfo.com/144410.html)

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**GE, Abu Dhabi firm in $8b joint venture**

General Electric Co and Abu Dhabi investment agency Mubadala Development Co said on Tuesday they have entered into an $8 billion joint venture.

GE will establish a clean energy technology center and an Ecomagination center in Masdar City which will house over 100 technologists focused on the sustainability industry.

Source: [http://www.ameinfo.com/164288.html](http://www.ameinfo.com/164288.html)
R&D and Business Incubation

**Research & Development**
- Access to the Masdar Institute
- Access to skilled labour from the Cleantech cluster
- Availability of leading-edge research facilities

**Business Incubation**
- Access to sources of capital from the VC community
- Support from IP rights and legal advice
- Ideal environment to pilot new technologies and test ideas
Business Environment

- Free Zone Status
- 0% taxes for companies and individuals
- 0% import tariffs
- 100% foreign ownership
- No restrictions on capital movement
- Trade without a local sponsor
- Hire expatriate staff
- Access staff from the Masdar Institute
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Life in Masdar City – Masdar HQ Exterior
Life in Masdar City – Masdar
HQ Interior
Life in Masdar City – Civic Square
Life in Masdar City – Streetscapes
Life in Masdar City – Terrace
The potential for global impact

‘Give me a long-enough lever and a place to stand, and I will move the World’  Archimedes, 250 B.C.