MASDAR CITY ECO-VILLA
NET-ZERO ENERGY
MASDAR CITY IS COMMITTED TO PROVIDING SUSTAINABLE HOUSING SOLUTIONS FOR ABU DHABI’S GROWING POPULATION.

The Masdar City Eco-Villa continues Abu Dhabi’s tradition of innovation by pioneering a new concept for the design, construction and operation of sustainable family homes. Solar photovoltaic (PV) panels are installed to generate more electricity than the Eco-Villa consumes.

ECO-VILLA GFA: 405 sqm

25m x 36m
1. Living Room
2. Dining Room
3. Kitchen
4. Laundry Room
5. Maid’s Room
6. Majlis
7. Guest Bathroom
8. Guest Bedroom
9. Courtyard
10. Master Bedroom
11. Family Room
12. Bedroom 1
13. Bedroom 2

<table>
<thead>
<tr>
<th>September 2016</th>
<th>October 2016</th>
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</thead>
<tbody>
<tr>
<td>The area is prepared and foundations are laid.</td>
<td>Completion of insulated concrete form (ICF) ground floor, and Eco-Villa fence.</td>
</tr>
</tbody>
</table>
ECO-VILLA FEATURES
SMART DESIGN AND RENEWABLE ENERGY

- Thermosyphon hot water generation: An efficient solar hot water system.
- AC
  - Variable refrigerant volume (VRV) air conditioning: VRV systems offer high levels of energy efficiency and flexibility.
- Lighting control system: All areas are equipped with motion sensors. The sensors, which are made of photocells, shut the lights off automatically when daylight lighting levels are adequate. A dimmer light option is also available.
- Insulated concrete walls: The Eco-Villa’s insulated concrete form (ICF) thermally massive walls have an external U-value of 0.16W/m².k.
- Rainwater collection tank: A rainwater harvesting system, installed underground, contributes to water reuse.
- Orientation: The Eco-Villa is oriented on a north-south axis.
- PV panels: The 89 high-performance PV panels are oriented to ensure maximum output of 40,000kWh.
- Water reduction: Low-demand water fittings are installed, helping to achieve a 35% interior water reduction compared with a traditional villa.
- Lighting: High-efficiency LED lighting with automated intelligent controls and interface is used throughout.
- Energy metering and occupant feedback: Provides full control over the villa’s energy output and provides information on the existing indoor environment.
- Management of waste: The Eco-Villa provides space for the storage and collection of waste and recyclable materials.

November 2016
Completion of ICF walls on the first floor.
ECO-VILLA
ENVIRONMENTAL HIGHLIGHTS

DETAILS OF ENERGY PRODUCTION AND CONSUMPTION

<table>
<thead>
<tr>
<th>Renewable Energy Output Eco-Villa</th>
<th>Energy Demand Eco-Villa</th>
<th>Produces more energy than it consumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>40,000 kWh per year</td>
<td>39,285 kWh per year</td>
<td>0 kWh per year</td>
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</table>

ENERGY CONSUMPTION

<table>
<thead>
<tr>
<th>Traditional Villa</th>
<th>Eco-Villa</th>
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</thead>
<tbody>
<tr>
<td>350 KWH sqm / year</td>
<td>97 KWH sqm / year</td>
</tr>
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</table>

ECO-VILLA ECONOMIC VALUE

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<tr>
<th>Traditional Villa</th>
<th>Eco-Villa</th>
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<tbody>
<tr>
<td>Based on energy consumption of:</td>
<td>350kWh sq.m/year</td>
</tr>
<tr>
<td>Annual energy cost saving based on energy price of 31.8 fils/kWh</td>
<td>AED32,500</td>
</tr>
</tbody>
</table>
**ECO-VILLA SUMMARY**

Energy consumption of **97kWh**, offset by the Eco-Villa’s solar PV panels

**72%**
energy reduction compared with a traditional villa of comparable size

**90%**
of construction materials are locally sourced

**0%**
Net-zero energy
Eco-Villa uses 0kWh sq.m/year

**100%**
Renewable Energy

**Eco-Villa mitigates 36 tonnes of CO₂ annually**

**Eco-friendly construction materials**

**Reused and certified timber**

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"THE ECO-VILLA CONSUMES LESS THAN ONE QUARTER ENERGY THAN TRADITIONAL VILLAS"