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 design, construction and operation of sustainable family homes. The Eco-Villa deploys PV panels generates more than it consumes.

ECO-VILLA GFA: 405 sqm

25m x 36m

- Living Room
- Dining Room
- Kitchen
- Laundry Room
- Maid’s Room
- Majlis
- Guest Bathroom
- Guest Bedroom
- Courtyard
- Master Bedroom
- Family Room
- Bedroom 1
- Bedroom 2

Ground Floor

First Floor

September 2016
Preparations and Foundations
ECO-VILLA FEATURES
SMART DESIGN AND RENEWABLE ENERGY

**Thermosyphon Hot Water Generation:**
Solar hot water efficient system

**Variable Refrigerant Volume Air Conditioning:**
VRV systems offer high levels of energy efficiency and flexibility.

**Lighting control system:**
All areas are equipped with motion sensors. During daylight, the sensors - which consists of photocells - shuts off the lights automatically when daylight levels are adequate. The dimming light option is also available.

**ICF walls:**
Insulated Concrete form (ICF) Thermally massive walls with External U-value 0.16W/m².k

**Rain water:**
Rainwater harvesting system that contributes to water reuse

**Window openings:**
External shading on East, South and West Facades

**Orientation:**
The Eco-Villa orientation is on the North South axis

**PV Panels:**
High performance photovoltaic generation oriented and included for maximum output of 40,000 kWh - 89 PV panels

**Energy Metering and Occupant Feedback:**
Provides full control over the of the villa’s energy output and provides information on the existing indoor environment.

**Water Reduction:**
35% Interior Water reduction and low demand water fittings

**Lighting:**
High Efficiency LED lighting with automated intelligent controls and interface

**Management of Construction Waste:**
Storage and collection of waste and recyclable materials

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ECO-VILLA ENVIRONMENTAL HIGHLIGHTS

DETAILS OF ENERGY PRODUCTION AND CONSUMPTION

<table>
<thead>
<tr>
<th>Renewable Energy Output</th>
<th>Energy Demand</th>
<th>Produces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eco-Villa</td>
<td>Eco-Villa</td>
<td>More energy than it consumes</td>
</tr>
<tr>
<td>40,000 kWh per year</td>
<td>39,285 kWh per year</td>
<td>&gt; 0 kWh per year</td>
</tr>
</tbody>
</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>
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ECO-VILLA ECONOMIC VALUE

<table>
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<tr>
<th>Energy Consumption</th>
<th>Traditional Villa</th>
<th>Eco-villa with PV</th>
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</thead>
<tbody>
<tr>
<td>350 kWh sqm/year</td>
<td>0 kWh sqm/year</td>
<td>32,500 AED</td>
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Annual energy cost saving based on (31.8 fils/kWh)

December 2017
Completion of Facade and interior works

January 2017
Completion of interior decorations, tests and final delivery
## ECO-VILLA SUMMARY

<table>
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<tr>
<th>Energy Consumption</th>
<th>Energy Reduction</th>
<th>Materials used in construction</th>
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<tr>
<td>97 kWh sqm</td>
<td>72% Energy Reduction Eco-Villa compared to Traditional Villa</td>
<td>90% materials used are locally sourced</td>
</tr>
<tr>
<td>0 kWh sqm / year</td>
<td>100% Renewable Energy</td>
<td>eco-friendly construction materials</td>
</tr>
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Emission reductions

36 tonnes of CO2 annually

Reused and certified timber

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