

# MASDAR CITY ECO-VILLA NET-ZERO ENERGY



# ECO-VILLA GENERATES MORE ENERGY THAN IT CONSUMES

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.

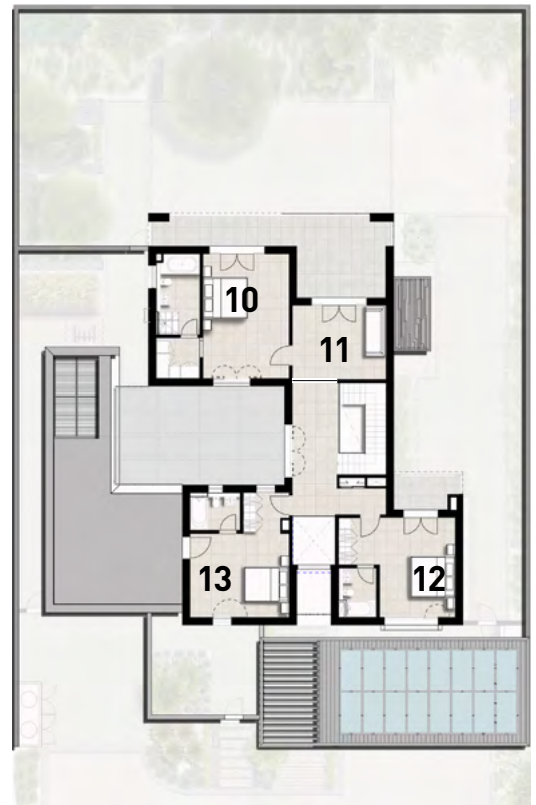
## ECO-VILLA GFA: 405 sqm

Ground Floor

First Floor

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



**September 2016**

The area is prepared and foundations are laid.



**October 2016**

Completion of insulated concrete form (ICF) ground floor, and Eco-Villa fence.

# ECO-VILLA FEATURES SMART DESIGN AND RENEWABLE ENERGY



**Thermosyphon hot water generation:**  
An efficient solar hot water system.



**Orientation:**  
The Eco-Villa is oriented on a north-south axis.



**Variable refrigerant volume (VRV) air conditioning:**  
VRV systems offer high levels of energy efficiency and flexibility.



**PV panels:**  
The 89 high-performance PV panels are oriented to ensure maximum output of 40,000kWh.



**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.



**Energy metering and occupant feedback:**  
Provides full control over the villa's energy output and provides information on the existing indoor environment.



**Insulated concrete walls:**  
The Eco-Villa's insulated concrete form (ICF) thermally massive walls have an external U-value of 0.16W/m<sup>2</sup>.k.



**Water reduction:**  
Low-demand water fittings are installed, helping to achieve a 35% interior water reduction compared with a traditional villa.



**Rainwater collection tank:**  
A rainwater harvesting system, installed underground, contributes to water reuse.



**Lighting:**  
High-efficiency LED lighting with automated intelligent controls and interface is used throughout.



**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

Renewable Energy Output  
Eco-Villa

**40,000**

kWh per year

Energy Demand  
Eco-Villa

**39,285**

kWh per year

Produces  
more energy than  
it consumes

**0**

kWh per year

## ENERGY CONSUMPTION

Traditional Villa

**350 KWH**

sqm / year

Eco-Villa

**97 KWH**

sqm / year

# ECO-VILLA ECONOMIC VALUE

Traditional Villa

Eco-Villa

Based on energy  
consumption of:

350kWh  
sq.m/year

0kWh  
sq.m/year

Annual energy cost saving  
based on energy price of  
31.8 fils/kWh

AED32,500



**December 2017**

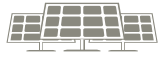
Completion of  
facade and interior  
works



**January 2017**

Completion of  
interior testing,  
testing and  
final delivery

# 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-friendly construction  
materials



Eco-Villa mitigates  
**36 tonnes**  
of CO<sub>2</sub> annually



Reused and certified timber



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

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