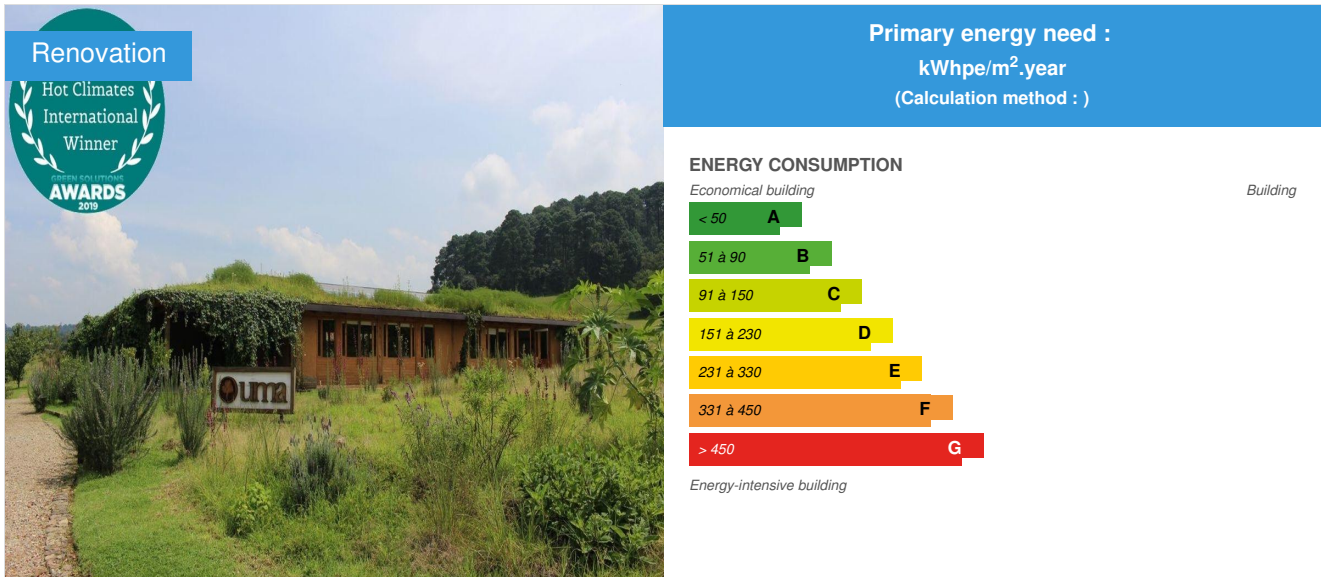


## Universidad del Medio Ambiente

by Gilda Plazas / 2019-06-12 13:55:23 / International / 8851 / EN



**Building Type :** School, college, university  
**Construction Year :** 2008  
**Delivery year :** 2019  
**Address 1 - street :** Valle del bravo 51200 VALLE DE BRAVO, Mexico  
**Climate zone :** [Cwb] Mild, dry winter, cool and wet summer.

**Net Floor Area :** 532 m<sup>2</sup>  
**Construction/refurbishment cost :** 800 000 €  
**Cost/m2 :** 1503.76 €/m<sup>2</sup>

**Certifications :**



**Proposed by :**



### General information

Universidad del Medio Ambiente won the Energy & Hot Climates Award of the 2019 Green Solutions Awards et the Mexico level + the international Energy & Hot Climates Award.

Ten years ago, a group of young Mexican professionals founded a university to address the environmental challenges that they saw in Latin America. Today, the Universidad del Medio Ambiente (UMA) offers master's degrees, workshops, diploma courses and consulting services focused on sustainability and socio-environmental regeneration. Located in the wooded and mountainous countryside two hours outside of México City, the **campus itself is also completely regenerative. UMA produces zero wastewater, grows its own food and is surrounded by a growing, edible forest. The university has also implemented green features that conserve natural resources.**

With **natural ventilation in classrooms, solar hot water collectors meeting 100% of hot water demand, solar panels and more**, UMA expects to reduce its energy usage by more than one half. The building is projected to limit nearly 90% of water use with such solutions as a rainwater harvesting system on the roof that collects water and a black water treatment and recycling system. Innovative building materials were also used to **reduce embodied energy by nearly 70%.**

These materials include compressed stabilized earth blocks for walls, timber window frames and more.

UMA offers a place for specialists, educators and practitioners to contribute to a more sustainable future. The university believes that each student entering their university will become an agent of change, both through personal transformation and their future career in sustainability. UMA received design guidance from a team of seven student practitioners during a university course that was facilitated by an instructor who holds an EDGE Expert credential. UMA has achieved final EDGE certification from GBCI.

## See more details about this project

<https://www.edgebuildings.com/projects/universidad-del-medio-ambiente/>

## Photo credit

Photos Courtesy of UMA

## Stakeholders

### Contractor

**Name :** Miguel Campero Cuenca

**Contact :** mc[at]grandgrupo.mx

### Stakeholders

**Function :** Designer

Oscar Hagerman

Architect

**Function :** Investor

Federico Llamas

Institute director

### Building users opinion

We shall create a habitat in which humans can live harmoniously with nature. The design consists of an edible forest, learning spaces and regeneration of environmental services. The process will generate places that invite visitors to discover and learn. Some of these places encourage observation and reflection, others inspire smells, colors and flavors, while some will inspire playfulness and interaction with other species, others will be designed as experiential/measurement tools that may amplify the experiences. Our proposal includes finding productive species in the community of Acatitlán to create a successive network that tells the story of the regeneration of the site over time, amplifying rhythms, dynamics and healthy relationships that occur in nature and people that are living in the community

## Energy

### Energy consumption

**Breakdown for energy consumption :** 4 kWhfe/m<sup>2</sup>.year : equipment, lift, STP, Water pumps

6 kWhfe/m<sup>2</sup>.year : catering

3 kWhfe/m<sup>2</sup>.year : lighting

**Initial consumption :** 29,00 kWhpe/m<sup>2</sup>.year

### Envelope performance

**More information :**

Roof U-value: 1.99

Wall U-value: 1.86

Glass U-value: 5.75

### Real final energy consumption

## Renewables & systems

### Systems

#### Heating system :

- No heating system

#### Hot water system :

- Solar Thermal

#### Cooling system :

- No cooling system

#### Ventilation system :

- Natural ventilation

#### Renewable systems :

- Solar photovoltaic

Renewable energy production : 54,29 %

## Products

### Product

Reduced Window to Wall Ratio - WWR of 17.81 %

Reflective Paint/Tiles for Walls - Solar Reflectivity (albedo) of 0.53

External Shading Devices - Annual Average Shading Factor (AASF) of 0.43

Natural Ventilation for Classrooms

Energy-Saving Light Bulbs - Internal / external Spaces

Solar Hot Water Collectors - 100% of Hot Water Demand

Solar Photovoltaics - 54.29% of Total Energy Demand

**Product category :** Second œuvre / Plomberie, sanitaire

Low-Flow Faucets in All Other Bathrooms - 2.89 L/min

Single Flush/Flush Valve Water Closets in Bathrooms - 4.8 lt/ flush

Water-Efficient Urinals in All Other Bathrooms - 0.01 L/flush

Water-Efficient Faucets for Kitchen Sinks - 7.2 L/min

Rainwater Harvesting System - 21.31% of Roof Area Used for Collection

Water-Efficient Landscaping - 0.52 L/m<sup>2</sup>/day

Black Water Treatment and Recycling System

**Product category :** Second œuvre / Cloisons, isolation

Insulation of Roof: U-value of 3.11

Insulation of External Walls: U-value of 1.99

-Roof construction : Asphalt Shingles on Timber Rafters

Clay Roofing Tiles on Timber Rafters

-External walls: Compressed Stabilized Earth Blocks

Timber Weatherboard on Timber Studs

-Internal walls : Compressed Stabilized Earth Blocks

-Flooring: Finished Concrete Floor

Stone Tiles/Slabs

-Window Frames: Timber

## Costs

### Construction and exploitation costs

Total cost of the building : 800 000 €

Additional information on costs :

This is not the renovation cost but the total investment including design, permits, clean energy technology and resources for the edible forest (not including the land). Considering the size of the project, this was approximately 10% less than the standard commercial cost for a similar building.

## Energy bill

Forecasted energy bill/year : 467,00 €

Real energy cost/m<sup>2</sup> : 0.88

## Health and comfort

### Water management

Consumption from water network : 6 540,00 m<sup>3</sup>

Consumption of harvested rainwater : 214,00 m<sup>3</sup>

Water Self Sufficiency Index : 0.03

Water Consumption/m<sup>2</sup> : 12.29

14 m<sup>3</sup>/day : landscaping

3 m<sup>3</sup>/day : cafeteria

1 m<sup>3</sup>/day : shower

### Comfort

**Health & comfort :** We shall create a habitat in which humans can live harmoniously with nature. The design consists of an edible forest, learning spaces and regeneration of environmental services.

Our proposal includes finding productive species in the community of Acatitlán to create a successive network that tells the story of the regeneration of the site over time, amplifying rhythms, dynamics and healthy relationships that occur in nature and people that are living in the community.

**Acoustic comfort :** The facility will serve as a protective blanket for its inhabitants in visual, acoustic, climatic and textured qualities inviting reflection, dialogue and learning.

## Carbon

### GHG emissions

GHG in use : 5,74 KgCO<sub>2</sub>/m<sup>2</sup>/year

## Contest

### Reasons for participating in the competition(s)

**Energy** (53% energy savings): Reduced window to wall ratio, reflective paint/tiles for walls, external shading devices, insulated roofing and external walls, natural ventilation for classrooms, energy-saving lighting, solar hot water collectors and solar photovoltaics.

**Water** (89% water savings): Water-efficient single flush water closets, water-efficient urinals and faucets, a rainwater harvesting system, water-efficient landscaping and a blackwater treatment and recycling system.

**Materials** (68% less energy embodied in materials): Asphalt shingles and clay roofing on timber rafters for roof construction, timber weatherboard on timber studs for external walls, compressed stabilized earth blocks for internal and external walls and timber window frames.

### Building candidate in the category



Energy & Hot Climates





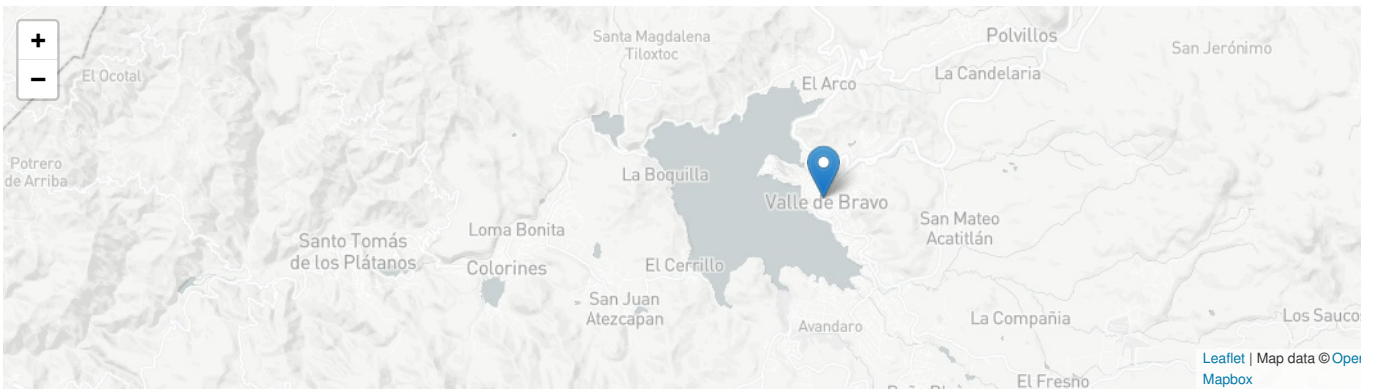
Low Carbon



Health & Comfort



Users' Choice



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