Universidad del Medio Ambiente

by Gilda Plazas / 2019-06-12 13:55:23 / Internazionale / 8683 / EN

Primary energy need :
kWhpe/m^2.year
(Calculation method :)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

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^2
Construction/refurbishment cost : 800 000 €
Cost/m2 : 1503.76 €/m^2

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/m2.year : equipement, lift, STP, Water pumps
6 kWhfe/m2.year : catering
3 kWhfe/m2.year : lighting
Initial consumption : 29,00 kWhpe/m^2.year

Envelope performance

More information :
Roof U-value: 1.99
Wall U-value: 1.86
Glass U-value: 5.75

Real final energy consumption

Final Energy : 12,55 kWhfe/m^2.year

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 : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '14'

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/m²/day
Black Water Treatment and Recycling System

Product category : Table 'c21_italy.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '9'

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 ressources for the edible forest (not including the land). Considering the size of the project, this was approximatively 10% less than the standard commercial cost for a similar building.

Energy bill

Forecasted energy bill/year : 467,00 €

Real energy cost/m2 : 0.88

Health and comfort

Water management

Consumption from water network : 6 540,00 m^3

Consumption of harvested rainwater : 214,00 m^3

Water Self Sufficiency Index : 0.03

Water Consumption/m2 : 12.29

14 m3/day : landscaping

3 m3/day : cafeteria

1 m3/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 $KgCO_2/m^2$/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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