

Template for Evidence(s) UI GreenMetric Questionnaire

University : Alexandria University
Country : Egypt ...
Web Address : <https://alexu.edu.eg/> ...

[2] Energy and Climate Change (EC)

[2.9] Elements of Green Building Implementation as Reflected in all Construction and Renovation Policies



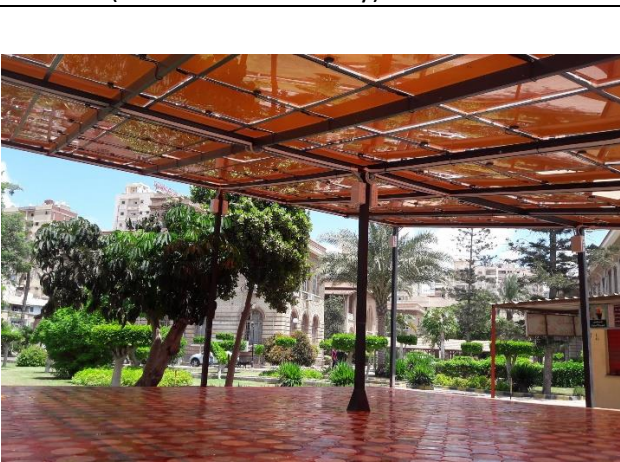
Green Building Implementation - Green Technologies implemented at the Abis Campus (Alexandria University). All new buildings in Abis campus are designed with large windows to get maximum benefit from daylight and ventilation



All new and renewed teaching rooms contain well equipped technological facilities (screens, data shows and white boards).



Solar Energy Center at the Faculty of Science (Alexandria University)



BIPV Roof Pergola, Faculty of Science in Moharram Bek (Alexandria University)

BIPV Garden Pergola, Faculty of Science in Moharram Bek (Alexandria University)



Green building implementation through the use of sun breakers in the SSP building at the Faculty of Engineering



Solar photovoltaic with a capacity of 220 kilowatts on the 2000 m² roof top of the building of the Mechanical Engineering Department at the Faculty of Engineering

Description:

Applying green building concepts in the Faculty of Engineering - Alexandria University in 2020.

The buildings of the Faculty of Engineering - Alexandria University were chosen to be the nucleus from which to implement green building concepts regarding the general vision for applying environmentally friendly green building requirements to the Faculty of Engineering buildings (Report is attached).

In the report, the faculty buildings were studied, and the summary of the report was as follows:

1. Mechanical Engineering Building: Complies with green building requirements (LEED) with the silver category.
2. Preparatory building: conforms to green building requirements (LEED) with the silver category.
3. Administration building: It does not currently comply with green building requirements (LEED), but it is possible with simple modifications to adopt it.
4. Electrical Engineering Building: It does not currently comply with green building requirements (LEED), but it is possible to adopt it with simple modifications.

After evaluating the Faculty of Engineering buildings, the elements of Green Building Implementation was considered in all building's maintenance activity.

Elements of Green Building Implementation as Reflected in all new construction and renovation policies:

The new and renovated University buildings)

Alexandria University set up a construction policy for the renovation and maintenance of the Facilities and building new building. This policy includes the following elements: Smart Buildings, Renewable energy usage, Natural ventilation, full natural daylighting, LED lighting, passive Infrared Sensors.

- The area of the new Campus is 160 acres (667,730.988 m²), a general site for educational buildings, and 120 acres are complementary activities. The percentage of green areas and lake is about 52% in addition to 25% streets and lanes.
- All new buildings in Abis campus are designed with large windows to get maximum benefit from daylight and natural ventilation. In addition, all University buildings have good natural ventilation and daylight.
- Passive Infrared (PIR) Sensors were implemented in some Faculties for motion-activated lighting to detect changes in heat signatures when someone or something moves within the sensor's range. These sensors will be implemented in phases in for all faculties and institutes of the university.
- Water-saving plots are used, which will reduce water consumption by about 30%. The sewage water will be treated and reused in the irrigation of green areas in the project.



- Rainwater is collected in the main lake and used for irrigation.
- The use of plants with few water rationed plants to reduce irrigation needs in addition to absorbing quantities of rainwater to reduce the severity of rain spells.
- As for energy, all the buildings have solar energy generation cells to provide part of the building's needs, which are estimated at about 45%, in addition to using energy-saving lamps (LED).
- The public site lighting poles are powered by solar energy.

The Faculty of Science:

Research Project: Development and implementation of decentralised solar-energy-related innovative technologies for public buildings, in the Mediterranean Basin

System Application	Number of modules	Solar System kWp	Power (kWh)
BIPV façade brise-soleil	120	17.28	26350
BIPV garden pergola	90	8.1	23270
BIPV roof pergola	30	4.1	
	Total Power (kWh)		49,620

Environmental Benefits

Life time CO ₂ emission savings	556,935 kg
Life time SO ₂ emission savings	2,004 kg
Life time NO _x emission savings	668.322 kg

University administration building

The project of "supplying, installing and operating the photovoltaic solar plant with a capacity of 20.1 kW above the administration building of Alexandria University in Shatby was launched by the Arab Renewable Energy Company, on 2/14/2020. The capacity of the station per month is 20.1 kW, while the capacity consumed from the building is 255 kW / month, meaning that the station provides within 8% of the total monthly consumption. Total Solar energy per year = **241.2 KWh**.

Higher Institute of Public Profession

The Institute has two initiatives to exploit solar energy at the Institute through two units of photovoltaic cells (50 watts each) that are currently installed and are exploited to provide the electrical energy necessary to operate the Ultra-Filtration unit located in one of the laboratories of the Department of Materials Science for educational purpose. Moreover, five units of photovoltaic cells (260 watts each) were installed to operate the discussion room at the Institute and to provide it with sufficient energy for lighting purposes and to operate its display device. Total Solar energy per year = **360 KWh**.

The Faculty of Engineering

The implantation of the new Solar Station is completed. The implementation of the solar photovoltaic panels was performed in December 2022 with a capacity of **220 kilowatts** on the 2000 m² roof top of the building of the Mechanical Engineering Department at the Faculty of Engineering.

Alexandria University have generalized this initiative in some of the faculties of Alexandria University in gradual stages.

Additional evidence link: <https://alexu.edu.eg/index.php/about-us-ar>

Link for LED lighting:



https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5935&catid=21&lang=ar-AA

Link for Solar Energy:

https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5936&catid=21&lang=ar-AA

Link for Sustainable Development: <https://alexu.edu.eg/index.php/en/sustainable-development>

<https://alexu.edu.eg/index.php/en/2015-11-24-10-38-07/ranking?id=6011>

<http://sustainability.alexu.edu.eg/>

Link for Green University:

https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5932&catid=21&lang=ar-AA

Solar Energy at Alexandria University

The Faculty of Agriculture has 2 renewable energy centers and one center at the main building of the University.

1) The renewable Energy Center in Wadi El-Natroom.

There are two units from the network:

- 7 kw hybrid unit for photovoltaic cells and 5 kw for air turbine.
- 50 kw hybrid unit for photovoltaic cells and 50 kw for air turbines (under maintenance).

They are all used in student training and research for graduate students and faculty members.

2) The renewable Energy Center at the Agriculture Research and Experiments Station in Abis Campus.

- The capacity of the center is 130 kw/h connected to the electricity grid.

3) The renewable Energy Center at the main building of the University.

- The capacity of the center is 20 kw/h connected to the electricity grid.

The services provided by the center:

- 1) Research and development: Encouraging applied research on renewable energy at AU and through collaborations with other national and international universities. Development of hybrid systems in renewable energy and its uses in water pumping and water desalination and development of remote and desert areas. Development of research in energy from biomass and waste. Development of thermal uses of solar energy.
- 2) Consultations: Various consultations in renewable energy systems, especially hybrid systems, drying and solar heating.
- 3) Education and Training: Supporting the renewable energy education at AU. Developing and delivering courses, e-learning, workshops, training courses, and conferences on various renewable energy systems.
- 4) Serving the Egyptian community by providing all renewable energy information to the public.

Equipment at the center:

- 1) The center has many devices for different applications of renewable energy.
- 2) A hybrid system to generate electricity from the sun with a capacity of about 130 kilowatts.
- 3) E-learning courses on the site.

System Application	Solar System power kWp	Air Turbine power	Energy (kWh)
Wadi El-Natroom 1, Photovoltaic cells	7		7000
Wadi El-Natroom 2, Photovoltaic cells	50		50,000
Wadi El-Natroom 1, Air turbines		5	5000
Wadi El-Natroom 2, Air turbines		50	50,000
Abis Campus			130
University Main building			20
	Total Power (kWh)		112,150

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Community Service & Environment Development

The Faculty of Science:

Research Project: Development and implementation of decentralized solar-energy-related innovative technologies for public buildings, in the Mediterranean Basin

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Ratio of renewable energy production divided by total energy usage per year

No	Renewable Energy	Production (in kWh)
1	Solar panel	57,150 + 49,620 + 241.2 + 360 + 220 = 107,591.2
2	Windmill	55,000
	Total	162,591.2

162,371.2 / 4329779.781 (Electricity usage) = 3.75%

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Sincerely,


11-10-2023

Prof.
Community Service & Environment Development
Alexandria University

