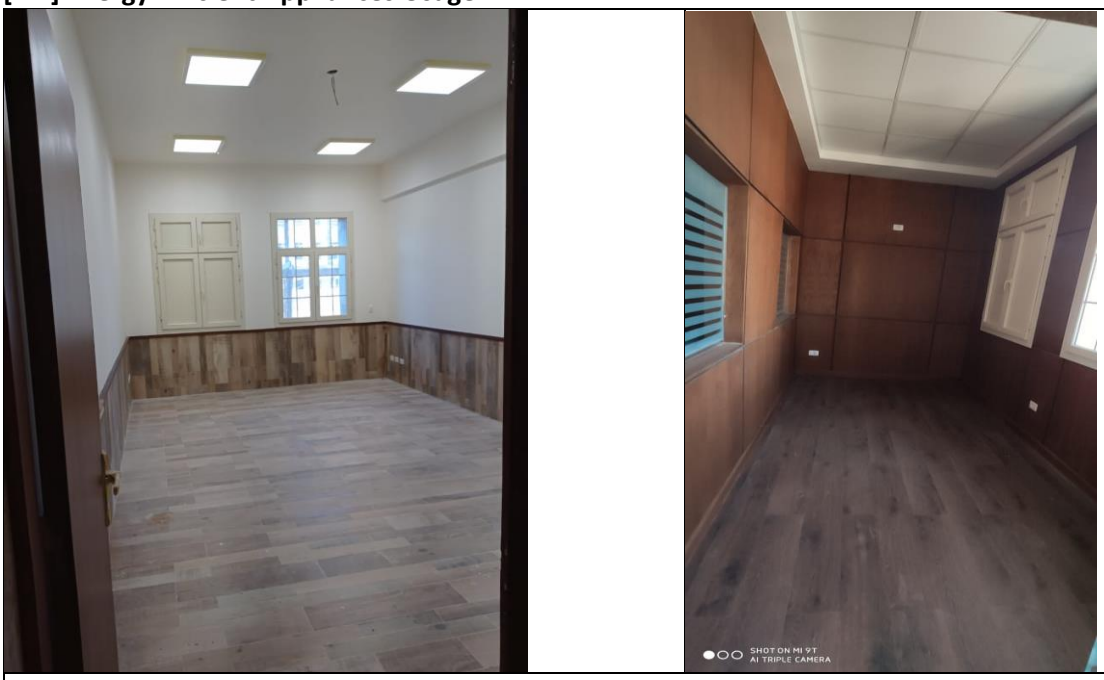
Energy Efficiency appliances(1)

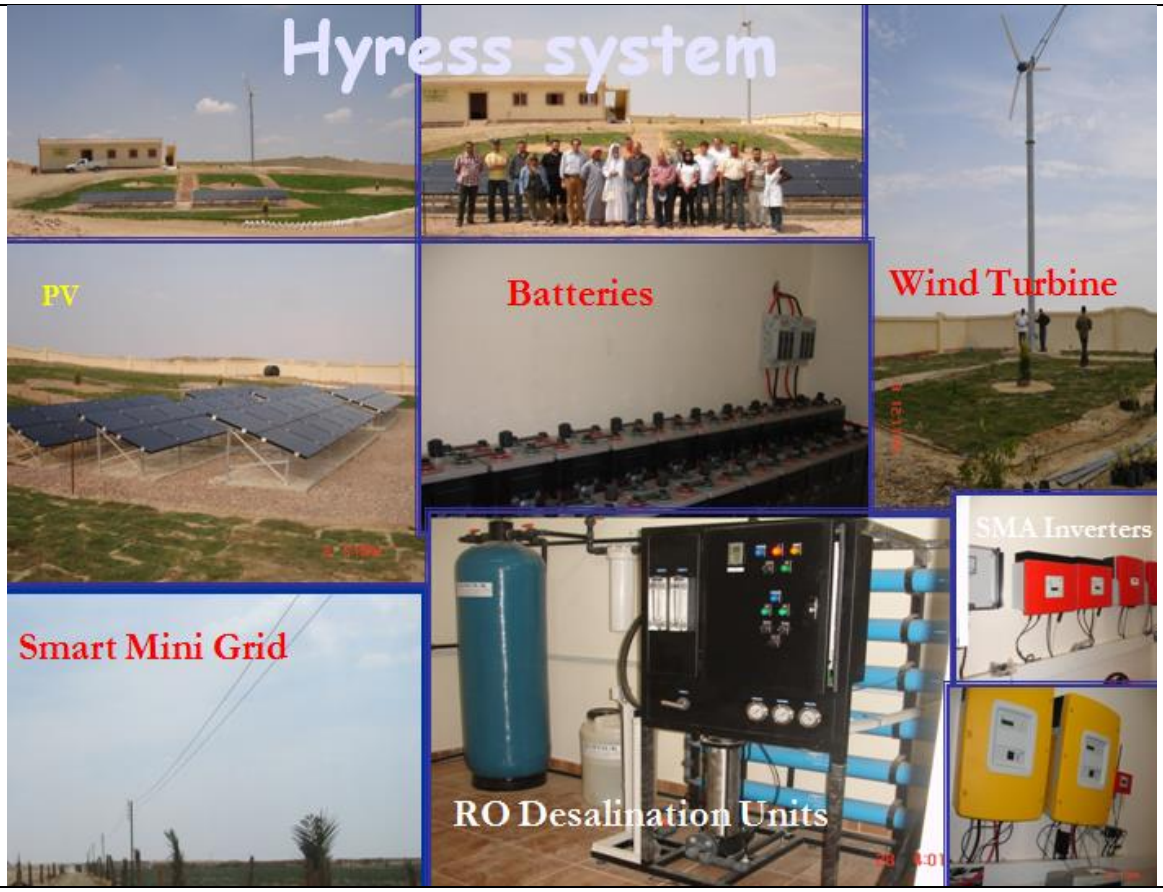
[2] Energy and Climate Change (EC)

[2.1] Energy Efficient Appliances Usage



Energy Efficient Appliances Usage: Use of LED lighting and lamps (Abis Campus, Alexandria University)

Energy Efficient Appliances Usage: Solar Energy Center at the Faculty of Agriculture (Alexandria University)

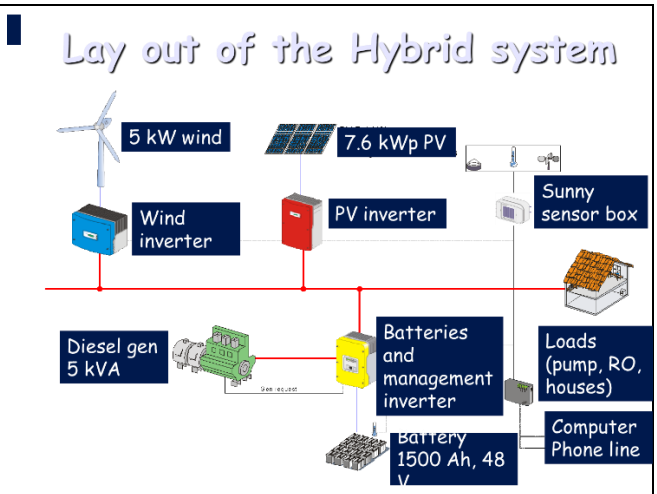


Solar Energy Center at the Faculty of Agriculture (Alexandria University)

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

100 KW Hybrid Wind/PV System (50 KW PV and 50 KW Wind)

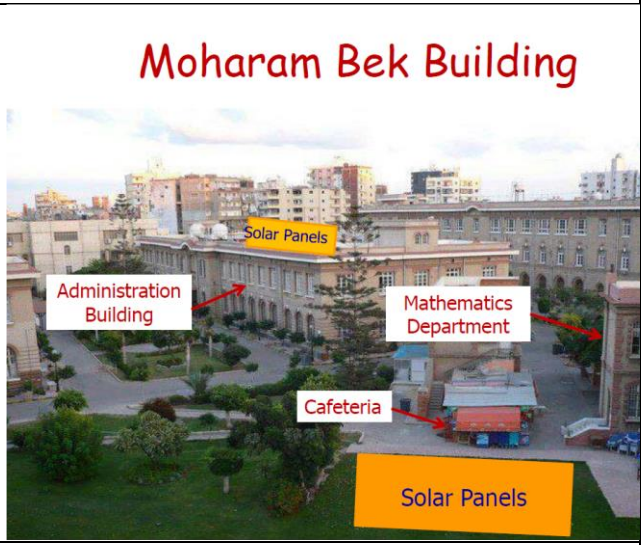
HYRESS Site at Wadi El-Natroon, Solar Energy Center at the Faculty of Agriculture (Alexandria University)



The modular hybrid power supply concept proposes the coupling of all sources of energy, storage media and loads on the AC-side (Faculty of Agriculture, Alexandria University).

BIPV Façade Brise-Soleil System
Solar Energy Project at the Faculty of Science (Alexandria University)

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



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

Description:

Alexandria University intends to realize further energy savings by paying close attention to energy management. All the faculties and institutes of the university realize their own energy-saving potential by means of LED lighting and the deployment of sustainable technology.

Alexandria University Project on using LEDs as Energy-Efficient Bulbs (2019-2022):

Within the framework of the University's keenness to transform into a green, environmentally friendly university that works to enhance its resources and rationalize energy consumption, the Department of Community Service Development has launched a project for the total transformation of the used LED bulbs instead of the fluorescent ones. The light-emitting diode (LED) bulbs are more efficient, and energy-saving compared to fluorescent bulbs, with a relatively longer life span.

The project has been implemented in phases since 2019 based on the preparation of an inventory of the total numbers needed for all faculties and institutes of the university. The first quarter, the numbers required, which represents the types of 60 cm, 120 cm and 9 watts' bulbs, has been spent and installed, which are almost 30%. In parallel, appropriate measures were taken to dispose of the lost fluorescent lamps through one of the companies concerned with safe disposal. The second step required the purchase and transformation of 37% of the total needs of the faculties and institutes of the university.

During the current phase we are processing the third step of purchasing and transformation of around 92% of the total needs of the faculties and institutes of the university (attached pdf file).

The Table below summarizes the total number of LED bulbs that are required for complete transformation into using green energy source along with the percentage of the bulbs that were already replaced over the last 3 years.

LED 60 cm

LED Lamps	Total Number required	Total number energy Efficient appliances (replaced)	Percentage
2019	39198	10142	25.9%
2020		12504	31.9
2021	…	12900	32.9%
		Total Percentage	**90.7%**

LED 120 cm

LED Lamps	Total Number required	Total number energy Efficient appliances (replaced)	Percentage
2019	30799	9874	32.1%
2020		12500	40.6%
2021	…	6221	20.2%
		Total Percentage	**92.9%**

LED 9 watts

LED Lamps	Total Number required	Total number energy Efficient appliances (replaced)	Percentage
2019	5190	1678	32.3%
2020		1998	38.5%
2021	…	1282	24.7%
		Total Percentage	**95.5%**

Alexandria University Program to reduce Electricity consumption from Air Conditioners and electric devices such as Computers, printers, photocopiers, surveillance cameras.

1. All newly purchased AC are inverter AC to reduce the electricity consumption (attached pdf file).
2. The new electric devices such as Computers, printers, photocopiers, surveillance cameras are energy efficient devices (attached pdf file).
3. All electronic devises must be shut down at night, when not used.
4. Regular Maintenance of all devices.

5. The thermostats of the air conditioner are set at 25°C, and direct sunlight is avoided by using sun protection curtains

Solar Energy Center at the Faculty of Agriculture (Alexandria University)
Hybrid Renewable Energy Systems to Supply Services in Rural Settlements of Mediterranean Partner Countries.

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-Natroon 1, Photovoltaic cells	7		7000
Wadi El-Natroon 2, Photovoltaic cells	50		50,000
Wadi El-Natroon 1, Air turbines		5	5000
Wadi El-Natroon 2, Air turbines		50	50,000
Abis Campus			130
University Main building			20
	Total Power (kWh)		112,150

The Faculty of Science:

Research Project: Development and implementation of decentralized 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

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**.

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
2	Windmill	55,000
	Total	162,371.2

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

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