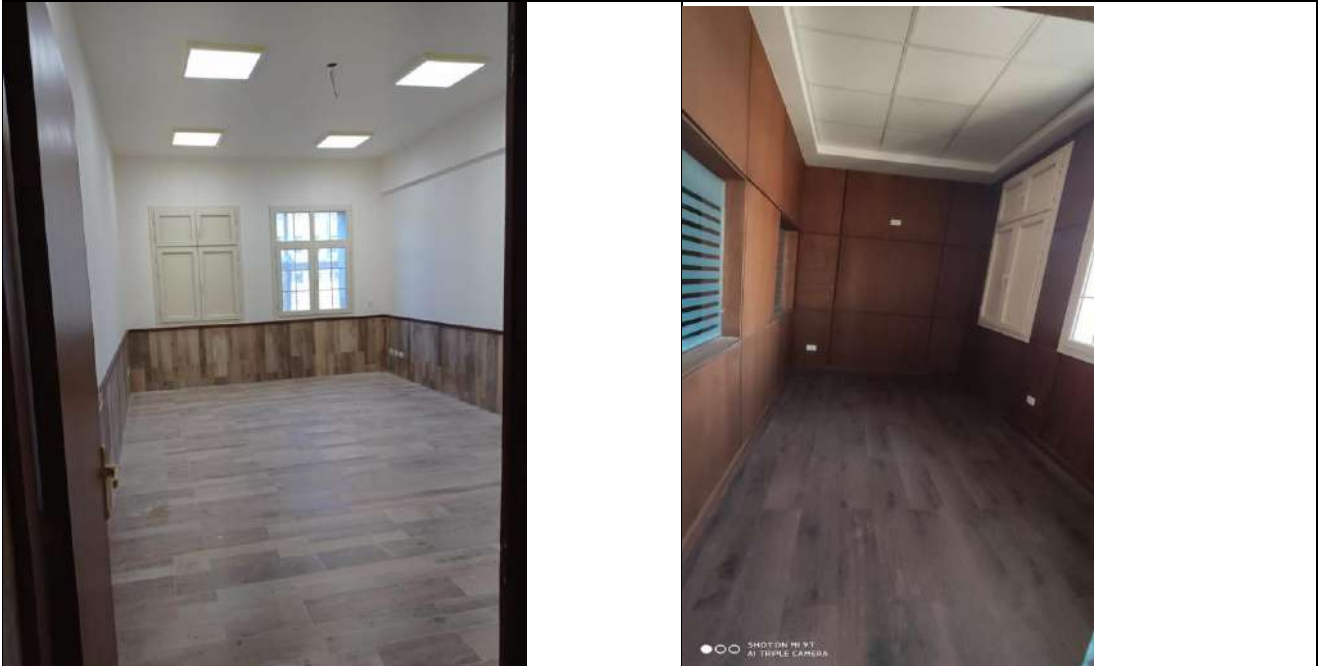


Template for Evidence(s) UI GreenMetric Questionnaire

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

[2] Energy and Climate Change (EC)

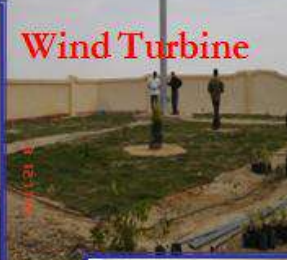

[2.1] Energy Efficient Appliances Usage



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)

<h1>Hyress system</h1>		
 <p>PV</p>	 <p>Batteries</p>	 <p>Wind Turbine</p>
 <p>Smart Mini Grid</p>	 <p>RO Desalination Units</p>	 <p>SMA Inverters</p>

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



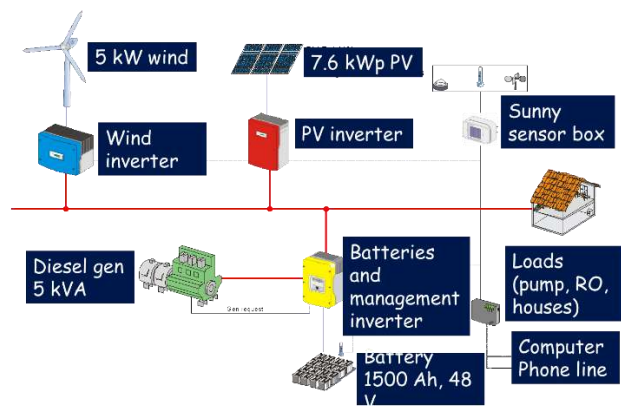
Solar Energy Center at the Faculty of Agriculture (Alexandria University)



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



Lay out of the Hybrid system



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)



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:

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. The third step required the purchase and transformation of 25% of the total needs of the faculties and institutes of the university.

During the current phase we are processing the last step of purchasing and transformation of all remaining LED bulbs (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 4 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%
2022		3652	9.3%
		Total Percentage	100%

LED 120 cm

LED Lamps	Total Number required	Total number energy Efficient appliances (replaced)	Percentage
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2019	30799	9874	32.1%
2020		12500	40.6%
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LED 9 watts

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2019	5190	1678	32.3%
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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 devices must be shut down at night, when not used.
4. 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.
5. Regular Maintenance of all devices.
6. 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**.

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.



Renewable energy production 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

Fab Lab Project (Alexandria University)

The overall goal of the project is to develop the circular and creative economy model by creating an innovation place equipped with machines Low Tech in Alexandria is hosted by Alexandria University. This place will play a role in creating local dynamism Transversal to become a crossroads between different audiences and actors from different backgrounds. To connect waste collection Plastic and its evaluation. Horizons Solidarités and the University of Corsica, in partnership with their peers in Alexandria, based on their experience in Fab Lab Corte, conduct experiments on recreating value for plastic in Alexandria. The goal is to connect all actors from assembly through training to development and dissemination.

The scope of work in the project

- **Environment, climate, and energy**
- **Education, social aspect, and research**

These goals will be implemented through the establishment of a FabLab within Alexandria University, which is a space for innovation. Derives place this innovation is energized by a generation that has innovative ideas in the fields of environment, citizenship, and culture. This revival is embodied in women and the men who are partners in the project. The high skills of Alexandria University and Senghor University, Francophone operator in Alexandria, ensures the long-term commitment of their students and the sustainability of the local dynamism. Implementation benefits from facilities Headquarters provided by Alexandria University Project Engine. VSI contributes to the unification of links between regions. Project depends on the Alexandria Business Association (ABA), a trade organization that invests in creating startups in the circular economy and selling finished products. A multi-representative consortium from both sides of the Mediterranean could be formed from these dynamics that will support the project over time.

The French side confirmed that the Fab Lab at the University of Corsica in France has become a very successful experiment on the economic and environmental levels, and is considered one of the most important strategic projects in France and receives the attention of the French Presidency and the Mediterranean region. The French side explained that it seeks to benefit from the expertise of Alexandria University, and that they are fully prepared. To provide full support for the project and coordinate with the relevant authorities in France for the success of this experiment, which will benefit both sides on the environmental, economic and environmental levels.

Led by the South Region and its partner Alexandria Governorate, this project aims to be part of an inter-regional dynamic with the participation of the **Corsican community**. This project is part of the “Zero Plastic Waste” regional strategy in the Mediterranean. It is also part of the dynamics of the memorandum signed on September 5, 2022 between the region and IUCN Med on the occasion of the World Nature Congress in Marseille, which aims to develop joint actions for the benefit of a Mediterranean region without plastic. On the other hand, this project is part of the context of the twenty-seventh session of the Conference of the Parties held in Egypt. It joins the global effort undertaken by the Egyptian state in order to effectively combat the effects of climate change. Its realization in Alexandria makes it possible to structure a permanent cooperation with the governorate around a symbolic project that will, in the long term, enhance the social impact of research and



University cooperation. In addition, this project promotes decentralized cooperation between the three regions.



Indeed, supporting this project will highlight the role of the region, Alexandria Governorate, and Corsica in supporting innovative solutions to adapt regions to changing Climate. The strategy is based on four pillars: **digital communication in three languages, the production of digital communication media intended for the general public, organizing competitions for artists and architects from the two countries to enhance the innovative role Fab Lab, and discussions of ideas supported by all partners as a regional facilitator.** In addition, a dedication ceremony for the Fab Lab will be held in the presence of elected officials, governors, university presidents, and will be followed by the symposium in Alexandria is a continuation of COP 27, which was held in November 2022.

A system for monitoring and evaluating the project will be developed by members of the steering committee with the support of specialists. The monitoring and evaluation system will include the quantitative, qualitative, and financial components of the project. It will make it possible to measure the effectiveness of this place of innovation as a driver of sustainable and inclusive development at the local and Mediterranean levels. Indicators for this monitoring and evaluation system will be identified and validated by the Steering Committee at the beginning of the project to verify throughout the implementation period whether the results are consistent expected meets set goals. Answers will need to be provided to the items specified in the reference system approved by the Steering Committee.

Link for Fab Lab Project

<http://alexu.edu.eg/index.php/%D8%A3%D8%AD%D8%AF%D8%AB-%D8%A7%D9%84%D8%A3%D8%AE%D8%A8%D8%A7%D8%B1/6840-%D8%AC%D8%A7%D9%85%D8%B9%D8%A9-%D8%A7%D9%84%D8%A5%D8%B3%D9%83%D9%86%D8%AF%D8%B1%D9%8A%D8%A9-%D8%AA%D8%A8%D8%AD%D8%AB-%D8%A5%D9%86%D8%B4%D8%A7%D8%A1-%D9%85%D8%B9%D9%85%D9%84>

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

Material components 2022-2023

M	The side	LED bulbs (provided / not provided /	Computers	Air Conditions	Photocopier	Security cameras	Fire Extinguishers	Fire Alarm System	Fire Hydrants	Water Taps
1	Public Administration	2075	450	139	83	47	202	1	9	100
2	General administration of university cities	5500	130	234	19	23	729	0	0	55
3	General Administration of Library Affairs	0	75	9	5	16	168	1	0	8
4	Faculty of Dentistry	5678	148	314	39	79	166	1		485
5	faculty of Pharmacy	6540	352	165	24	80	271	0	0	10
6	Faculty of medicine	6000	1599	853	124	95	571	1	33	10
7	College of Veterinary Medicine	1327	0	0	0	0	160	0	0	10
8	College of Nursing	1050	225	92	34	40	155	0	0	100
9	College of Science	8785	314	195	72	35	302	1	50	428
10	College of Engineering	3123	270	172	21	39	516	3	0	45
11	Faculty of Tourism and Hotels	300	158	54	10	0	83	0	0	8
12	College of Fine Arts	0	103	62	20	0	301	1	0	84
13	College of Physical Education - Girls	200	256	44	26	26	93	1	4	200
14	College of Physical Education - Boys	125	165	65	20	0	145	0	0	50
15	Faculty of Economic Studies and Political Sciences	2216	49	19	19	0	48	0	11	0
16	College of Computers and Data Sciences	0	150	0	5	0	0	0	0	0
17	College of Early Childhood Education	0	84	21	9	0	66	0	0	14
18	collage of rights	1000	236	165	22	0	172	1	1	1
19	Faculty of Education	1550	300	83	12	30	205	1	0	120
20	Commerce College	13404	724	227	30	25	150	0	0	176
21	Faculty of Agriculture, Shatby	3300	367	40	37	35	212	6	0	84
22	Faculty of Agriculture - Sabapasha	1400	127	49	14	16	178	1	9	105
23	college of Literature	2650	350	132	19	54	123	0	0	464
24	College education quality	288	98	28	18	4	60	0	0	14
25	Medical Research Institute	5000	208	148	19	39	180	0	0	260
26	Institute of Graduate Studies and Research	3604	182	80	18	3	116	1	0	216
27	Higher Institute of Public Health	0	0	0	0	0	0	0	0	0
	Total	38160	3827	1389	319	271	2648	15	25	1841

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VICE PRESIDENT

Community Service & Environment Development

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- Education, social aspect, and research

Sincerely,


11-10-2023

Prof.

**Community Service & Environment Development
Alexandria University**

