

Carbon emissions in CO2e for electricity, water and paper

	Value	Conversion factor	CO2e	Scope emissions
Electricity (kilowatt)	7106641	0.591	4200024.8	1 &2
Gasoline(Liters)	59129.75	0.2408	14238.4438	1 &2
Diesel (Liters)	12785	0.3696	4725.336	
subtotal			4218988.58	1 &2
Water (cubic meters)	759298	0.5791	439709.4718	3
Paper (packages)	47911 (*0.75km)= 3533.25 kg	2.8	9893.1	3
subtotal			449602.572	3
Total			4668591.15	

Statement of the colleges and institutes' consumption of electricity water and paper

No	college or institute	Electricity(kilowatt)	Water(cubic meter)	Gas(cubic meter)	Gasoline(liter)	Diesel(liter)	Paper(package)
1	Faculty of Law	238855	5836	0	1550	1350	3237
2	Faculty of Arts	275000	14030	0	3000	0	4000
3	Faculty of Commerce	7906	19233	0	4884	0	1774
4	Faculty of Science	274701	86361	1293	10000	5000	2000
5	Faculty of Medicine	647408	65605	0	1666	0	7385
6	Faculty of Pharmacy	500101	15436	1034	1820	360	2500
7	Faculty of Engineering	1100585	41871	22	8640	0	4295
8	Faculty of Agriculture	1731321	99534	3700	8710	0	1429
9	Higher Institute of Public Health	97237	1386	0	2000	0	575
10	Faculty of Education	1677	1677	0	2500	2000	2136
11	Faculty of Dentistry	16327	27326	0	1126	245	1335
12	Medical Research Institute	229780	73621	0	750	400	3881
13	Veterinary Medicine	210716	81755	0	2526	2850	500
14	Institute of Graduate Studies and Research	949	8313	-	260	-	650
15	Faculty of Tourism and Hotels	400	3052	0	957.75	0	820
16	Faculty of Fine arts	4842	23451	0	40	0	1124
17	Physical education for boys	455160	89994	0	2500	60	1000
18	Physical education for girls	604725	48209	0	1000	0	899
19	Agriculture of Saba Pasha	174272	11263	1022	210	520	695
20	Faculty of Nursing	242764	22263	0	70	0	2888
21	Faculty of Specific Education	400	3248	0	1000	0	450
22	Faculty of Early childhood education	400	2954	0	3920	0	664
24	University Administration	291115	12880	0	0	0	3674
	Total	7106641	759298	7071	59129.75	12785	47911

ash



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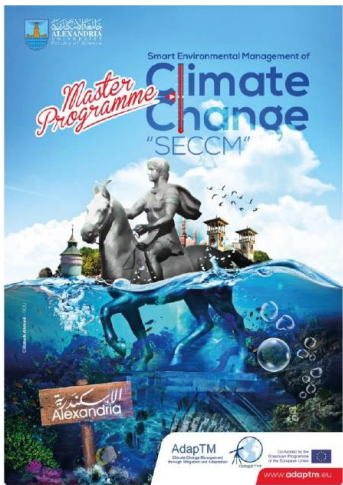
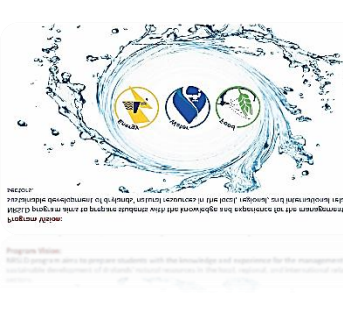

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adm



Impactful university program(s) on climate change

No	Programs	Scope (international / regional / national / local / etc)	Total Participants	Photo	URL	Short Description
1	Solar Energy Center at the Faculty of Science (Alexandria University)	<ol style="list-style-type: none"> 1) Research and development, 2) Energy saving and environmental benefits. 3) Education and Training: 	20 Professor at Physics Department and 10 postgraduate students and 40 students			<p>Project title: Development and implementation of decentralised solar-energy-related innovative technologies for public buildings, in the Mediterranean Basin</p> <p>The system of solar energy applied at the Faculty of Science in El Shatby is BIPV Façade Brise-Soleil, using Crystalline Semi-transparent glass-laminated Solar Technology.</p>
2	Solar Energy Center at Faculty of Science in Moharram Bek (Alexandria University)	<ol style="list-style-type: none"> 1) Research and development 2) Energy saving and environmental benefits. 3) Education and Training: 	Professor at Physics Department and 10 postgraduate students and 40 students			<p>Project title: Development and implementation of decentralised solar-energy-related innovative technologies for public buildings, in the Mediterranean Basin</p> <p>The system of solar energy applied at the Faculty of Science in Moharam Bek is BIPV in the Garden Pergola, using Thin film Semi-transparent glass-laminated thin film Solar Technology.</p>

						While, that used for the BIPV Roof Pergola is performed using Flexible thin film Solar Technology.
3	Smart Environmental Management of Climate Change in collaboration with Catania University, Italy	2 year International Postgraduate Master program (4 semesters) at the Faculty of Science	30 Professors and Associate professors. 10-15 students join the program Yearly		https://emuni.si › ADAPTM-handout_2_Mod	AdapTm-Erasmus project The participating countries and Universities: Italy, Greece, Lithuania, Slovenia, Egypt (Alexandria University, Suez Canal University, South Valley University, Arab Academy for Science and Technology and Maritime Transport).
4	Natural Resources Sustainability for Land Development in collaboration with Aachen University, Germany	2 year International Postgraduate Master program (4 semesters) at the Faculty of Science	30 Professors and Associate professors. 10-15 students join the program Yearly		https://suremap.eu https://www.facebook.com/suremapproject https://www.linkedin.com/company/suremap-project	Erasmus+ Project, European Union The participating countries and Universities: Germany (RWTH Aachen), Egypt (Alexandria University, Heliopolis University, the American University in Cairo, Aswan University), Cyprus (CITY College – Sheffield University), Italy (University of Palermo), Spain (Technical University of Madrid).
5	Sustainable Management of Fisheries and Aquaculture Science, in collaboration with University	2 year International Postgraduate Master program (4 semesters) at the Faculty of Science	30 Professors and Associate professors. 10-15 students join the program Yearly		http://fishaqu.eu	(Erasmus+ Project, European Union) The participating countries and Universities: Portugal (University of Aveiro), Italy, Croatia, Slovenia, Egypt (Alexandria University, Aswan University, Matrouh University, Arab Academy for Science and Technology and Maritime Transport).

	of Aveiro, Portugal.					
6	Production of Bio-Diesel from Algae in Selected Mediterranean Countries: Med-Algae Project, Faculty of Sciece, Alexandria University, Egypt	<p>Research project: The project objective is to explore:</p> <p>1- The development of microalgae-based biodiesel production and other valuable products in six Mediterranean countries (Cyprus, Egypt, Greece, Italy, Lebanon and Malta).</p> <p>2- The current level of technology, the relevant market structure, and the governmental and environmental boundaries will be mapped in the participating countries, in order to identify the most promising strategies in each country.</p>	15 Professors and Associate professors. 10-15 postgraduate students			It is funded by CBCMED-ENPI (CROSS BORDER COOPERATION IN THE MEDITERRANEAN-European Neighborhood and Partnership Instrument)
7	Solar Energy Center at the Faculty of Agriculture	<p>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.</p>	20 Professor and 60 students		E-learning courses on the site Link: www.areac-agr.com	<p>The Faculty of Agriculture has 2 renewable energy centers and on center at the main building of the University.</p> <p>1) The renewable Energy Center in Wadi Natrun.</p> <p>There are two units from the network:</p> <ul style="list-style-type: none"> -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). <p>They are all used in student training and research for graduate students and faculty members.</p>

		<p>Development of thermal uses of solar energy.</p> <p>2) Consultations: Various consultations in renewable energy systems, especially hybrid systems, drying and solar heating.</p> <p>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.</p> <p>4) Serving the Egyptian community by providing all renewable energy information to the public.</p>				<p>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.</p> <p>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.</p> <ul style="list-style-type: none"> The center along with partner from Greece, Germany, Spain, Morocco and Tunisia were awarded a Six Frame work project (FP6 project) from the European commission to develop Hybrid renewable energy system to supply service for Mediterranean partner countries.
8	Climate Change and Sustainable Development Master Program	2 year National Postgraduate Master program (4 semesters) at the Higher Institute of Public Profession	15 Professors and Associate professors. 10-15 postgraduate students join the program Yearly			<ul style="list-style-type: none"> The climate change and sustainable development master degree prepares graduates to target jobs in the various emerging career paths in environmental economics and climate change including: <ul style="list-style-type: none"> Governmental agencies and municipalities which develop plans for climate change mitigation and adaptation. Consultancy companies carrying out Environmental Impact Assessment, developing, implementing or monitoring climate change mitigation and adaptation projects. Climate change research, teaching and information dissemination.

						<ul style="list-style-type: none">• NGOs and stakeholder organizations involved in climate change impacts assessment and sustainable development.
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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

الطاقة الشمسية بكلية العلوم طاقة نظيفة صديقة للبيئة

تطبيق نظام البناء المتكامل باستخدام
الخلايا الشمسية (BIPV)



لمزيد من المعلومات:
قسم الفيزياء - كلية العلوم - جامعة الإسكندرية
أ.د. أسامة الشاذلي
elshazlyo@gamil.com
د. أشرف عبد المنعم
ashmoussa2@yahoo.com

مبنى كلية العلوم بالشاطبي الألواح الشمسية الشفافة واجهة جميلة للمبنى



تعمل الألواح الشمسية الشفافة كستائر شمسية للمبنى (حجب أشعة الشمس، وفي نفس الوقت تسمح بمرور الضوء للداخل للمبنى، كما أنها تتميز بجمالية للمبنى، بجانب توليد الطاقة الكهربائية).



BIPV Façade Brise-Soleil

Technology	Semi-transparent glass-laminated crystalline modules
Rated Power	17.26 kWp
Electrical Energy	26.35 MWh/year (approximate)
Energy Savings	7.7 % of the total used energy of El-Shatby Building
Number of modules	120
Panels area	140 m ²

مبنى كلية العلوم بمحرم بك



أنواح مرنة للمظلة ذات الاستخدامات المتعددة



تقع المظلة أعلى سطوح أحد مباني الكلية، وتتميز بمظهرها الإسطواني، واستخداماتها المتعددة، بجانب توليد الطاقة الكهربائية.

BIPV Roof Pergola	
Technology	Flexible thin film
Rated Power	4.1 kWp
Electrical Energy	7.27 MWh/year (approximate)
Energy Savings	1.25 % of the total used energy of Moharam Bek Building
Number of modules	60
System area	66 m ²

مبنى كلية العلوم بمحرم بك



المظلة الشفافة ذات الاستخدامات المتعددة



تقع المظلة بجانب كافتريا الطلبة، وتتميز بلمحنتها الجمالية وتجب أشعة الشمس، وفي نفس الوقت تتيح إضاءة جيدة، بجانب توليد الطاقة الكهربائية.

BIPV Garden Pergola	
Technology	Semi-transparent glass-laminated thin films
Rated Power	8.1 kWp
Electrical Energy	16 MWh/year (on the average)
Energy Savings	2.75 % of the total used energy of Moharam Bek Building
Number of modules	90
System area	132 m ²

طاقة خضراء مستدامة صديقة للبيئة

(رؤية مصر ٢٠٣٠)

قامت كلية العلوم بالإستفادة من الطاقة الشمسية بتنفيذ ثلاث محطات لتوليد طاقة كهربائية نظيفة، عملا من منطلق أن جامعة الإسكندرية تعرص على أن تكون جامعة صديقة للبيئة وذلك بالحد من الأثر البيئي للإنبعاثات الغازات المسببة للاحتباس الحراري (الناجم من قطاع الطاقة) عن طريق توفير التكنولوجيا المستدامة اللازمة، تماشيا مع رؤية مصر ٢٠٣٠.

الإبعاثات التي توفرها أنظمة أنظمة الطاقة الشمسية (فى مدة ٢٥ عاما)	
غاز (CO ₂)	٥٥٦,٩٣٥ كجم
غاز (SO ₂)	٢,٠٠٤ كجم
غاز (NO _x)	٦٦٨,٣٢٢ كجم

نظام البناء المتكامل باستخدام الخلايا الشمسية

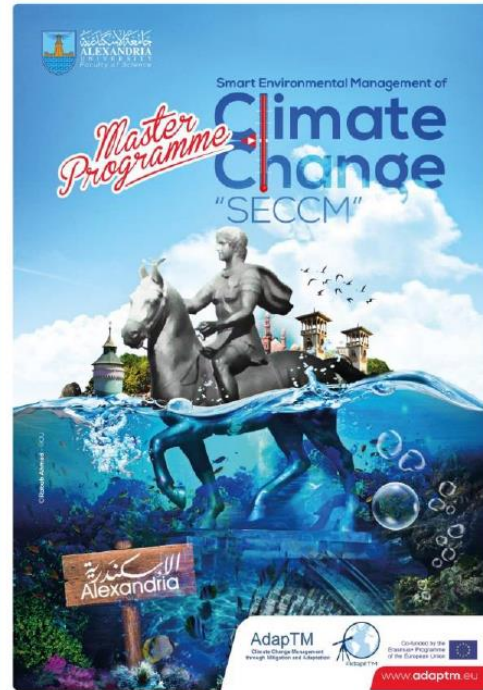
يعتبر نظام البناء المتكامل باستخدام الخلايا الشمسية (BIPV) نظام متعدد الوظائف، حيث تصل الخلايا الشمسية محل مواد البناء التقليدية بالإضافة إلى توليد الطاقة الكهربائية، وهو نظام حديث تم تطبيقه لأول مرة بالإسكندرية، وتتميز أنظمة الطاقة الشمسية التي تم تركيبها بأنها جزء من المبنى وتؤدي أكثر من وظيفة، فهي توفر الحماية من أشعة الشمس، وهو أمر ضروري للغاية في الإسكندرية لإرتفاع درجة الإشعاع الشمسي بها، وفي نفس الوقت لا تعجب الضوء، كما أن لها مظهر جمالي يزيد من قيمة المبنى، بجانب توليد الطاقة الكهربائية.

تعريف الطلاب والمجتمع المدني بأهمية الطاقة الشمسية

لقد تم تصميم ثلاث نماذج مختلفة من تطبيقات نظام البناء المتكامل باستخدام الخلايا الشمسية وتثبيتها بكلية العلوم - جامعة الإسكندرية لإتاحة الفرصة للطلاب والمجتمع المدني بالإسكندرية لزيادة وعيهم بأهمية الطاقة الشمسية والتعرف على أحدث الأنظمة.

أنظمة الطاقة الشمسية بكلية العلوم

القدرة الكلية	٢٩,٥ كيلو وات
الطاقة الكهربائية المنتجة فى الفترة من يونيو ٢٠١٦ إلى ديسمبر ٢٠١٩	٩٦,٩ ميغا وات. ساعة
إجمالي الثمن الكلى للطاقة المتولدة (تسعيرة شركة الكهرباء ٠,٩٥ جنيها/كيلووات)	٩٢٠٥٥ جنيها



Smart Environmental Management of

Climate Change

"SECCM" *Project Master*

Cooperation

SECCM is a Master Degree program: the result of cooperation between 4 Egyptian Universities and 4 European universities and institutions in the framework of Erasmus+ funded project "Climate Change Management through Adaptation and Mitigation – AdapTM" (2017-2020). The cooperatively designed program benefits from an international and interdisciplinary perspective, European framework of recognition and wide network of involved professors.

Egyptian Partners	European Partners
Alexandria University	University of Catania, Italy
Arab Academy for Science and Technology and Maritime Transport	University of Klaipėda, Lithuania
Suez Canal University	Euro-Mediterranean University, Slovenia
South Valley University	National Observatory of Athens, Greece



M.Sc. in:
Natural Resources Sustainability for Land Development (NRSLD)
Under the framework of SuReMap project
(Sustainable Resource Management Programme to solve Deserted Challenges)

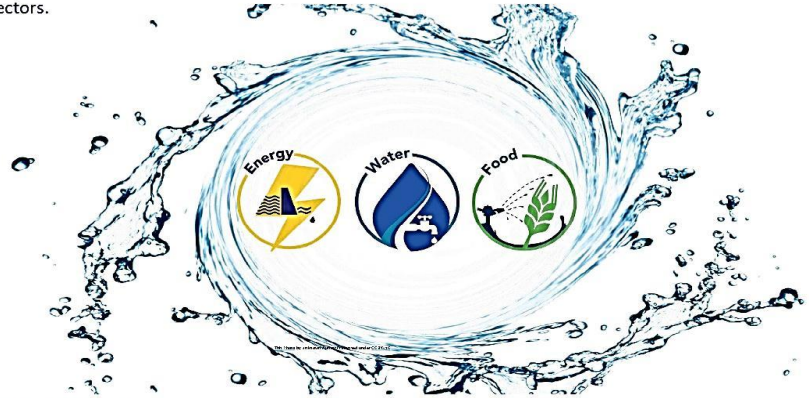
SuReMap Project:

Aims to establish interdisciplinary programs that train students to address water, energy & food-related challenges in "Egypt's 2030 strategy".

NRSLD is an outcome of the SureMap Erasmus+ project that includes a consortium of 8 Egyptian and European universities. The program is cooperatively designed by the consortium, therefore; it has the advantage of the international and interdisciplinary perspective, European framework of recognition, and benefits from a wide network of participating professors from the following universities: RWTH Aachen, Heliopolis University, Alexandria University, CITY College – Sheffield University, The American University in Cairo, University of Palermo, Aswan University, and Technical University of Madrid.

Program Vision:

NRSLD program aims to prepare students with the knowledge and experience for the management and sustainable development of drylands' natural resources in the local, regional, and international related sectors.

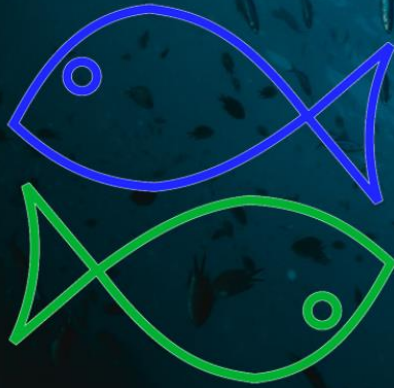


Program Mission:

The Faculty of Science through NRSLD program seeks to qualify the graduates to be competitive at local, regional, and international levels, by creating an appropriate educational environment and fostering ethically, scientifically, and professionally sound approaches that enable graduates to serve the community and the institutions closely related to sustainable development plans.



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FISHeries
AQUaculture

FishAqu Project

A consortium of eight EU & Egyptian universities are establishing a modern, needs-oriented master study programme on fisheries and aquaculture.

Med-algae
Production of Biodesign from Algae



Visitors,
Stakeholders &
Media

29 March 2014



Document prepared by Prof Sherine Khattab



Carbon Footprint (CO₂ emission in the last 12 months, in metric tons)

Alexandria University's Carbon Footprint (2021/2022)

During the very few past years, the climate change and the global warming facing the entire universe have gained much more attention due to their direct effects on the human life on earth. As a result, countries, organizations, and people have noticed that it is now the time to face these challenges and as an initial step, we must first determine or calculate the amount of pollution that we cause to our planet, then we shall work on ourselves to minimize this pollution. One of the most famous methods to monitor the climate change is to determine what is known by Carbon Footprint.

The term "Carbon Footprint" is usually used as shorthand for the amount of emitted carbon (in tons) by an organization or country. This footprint is also an important component of the Ecological Footprint, since it is one competing demand for biologically productive space. Carbon emissions from burning fossil fuel usually accumulate in the atmosphere if there is not enough biocapacity dedicated to absorb these emissions. Therefore, when the carbon footprint is reported within the context of the total Ecological Footprint, the tons of carbon dioxide emissions are expressed as the amount of productive land area required to sequester those CO₂ emissions, which tells us how much biocapacity is necessary to neutralize these emissions.

Measuring Carbon Footprint in a certain area just shows us how much biocapacity is needed to take care of our untreated carbon waste and to prevent carbon accumulation in the atmosphere, which as a consequent can enable us to address the climate change challenge in a clearer way. In fact, the climate problem emerges because the planet does not have enough biocapacity to neutralize all these emissions. Humanity's carbon Footprint has increased 11-fold since 1961. Reducing humanity's carbon Footprint is the most essential step we can take to end overshoot and live within the means of our planet.

The climate pact approved in Paris in December 2015 represented an important step in re-imagining a fossil-free future for our planet. Nearly 200 countries around the world, including Egypt, agreed to keep global temperature rise well below 2°C. According to the known data from (Intergovernmental Panel on Climate Change) IPCC's 2014 report that a concentration of greenhouse gases in the atmosphere of 450 ppm CO₂ equivalent gives us a 66% chance to comply with the Paris Agreement's (2°C) goal. In contrast, the National Oceanic and Atmospheric Administration of the United States Department of Commerce (or NOAA) reports that in 2020 we were already at 504 ppm CO₂ equivalent. This confirms that the problem is increasing and there is a critical demand to rapidly solve it. Although Egypt contributes with a small portion in the global emissions of greenhouse gases, but this small portion is growing with time. In addition, Egypt is also expected to suffer from shortage of water, decrease in agricultural crops, rising sea levels due to increase in temperature and change in rainfall patterns.

In the light of the above mentioned information and according to the "Sustainable Development Strategy: Egypt's Vision 2030", Alexandria University, as a very important educational institution, has taken the first steps to work on reducing carbon emissions as one of the most important sources of greenhouse gases and has implemented a plan to monitor and calculate the "Carbon Footprint since

the academic year 2018 / 2019” for all its faculties, institutes and its administrative buildings in order to aid in decision-making.

When calculating the Carbon Footprint for all Alexandria University buildings for the Academic year (2021/2022), the approximate amount of emitted CO₂ was **4,715.1992 CO₂e**.

The total carbon footprint of the Faculties and Institutes of Alexandria University (Ton CO₂e)

Faculty/Institute	The total carbon footprint (Ton CO ₂ e)		
	2018/2019	2020/2021	2021/2022
University Administration Building	186.2	NA	186.330
Faculty of Arts	66.46	235.887	179.299
Faculty of Commerce	47.29	412.128	29.3102
Faculty of Education	27.048	21.807	9.264
Faculty of Medicine	7445.993	1817.232	433.984
Faculty of Dentistry	69.278	705.702	29.379
Faculty of Engineering	521.076	693.748	675.702
Faculty of Agriculture	4875.12	1326.267	1066.346
Faculty of Pharmacy	394.462	318.059	306.118
Faculty of Science	749.7	317.362	218.947
Faculty of Nursing	169.912	122.79	161.580
Faculty of Veterinary Medicine	106.611	186.221	172.431
Higher Institute of Public Health	20.616	12.646	59.204
Medical Research Institute	203.7	555.478	186.894
Institute of Graduate Studies and Research	21.629	10.92	7.246
Faculty of Physical Education for girls	543.296	277.671	380.872
Faculty of Physical Education for boys	1679.1	214.835	319.100
Faculty of Specific Education	15.866	12.069	3.613
Saba Pasha Faculty of Agriculture	214.748	92.785	109.632
Faculty of Education for Early Childhood	13.403	33.4747	4.745
Faculty of Fine Arts	126.219	22.654	19.541
Faculty of Tourism and Hotels	47.420	9.924	4.525
Faculty of Law	26.313	141.668	151.137
Total	24,148 CO₂e	7,541.33 CO₂e	4,715.1992 CO₂e

Carbon footprint per square meters = 4715.11992 /4284495.26 m² (total area of Alec. Univ.)=110052co2e/m²

This report came out as a result of the concerted efforts of the academic community of Alexandria University during the academic year 2021-2022 in collecting, analyzing and editing this report in accordance with international standards and controls for carbon footprint calculations.

In order to allocate the specific position of Alexandria University regarding the extent of its contribution to carbon emissions among similar institutions, it was necessary to compare these emissions with other universities around the world.

University	Last Carbon Footprint Report	Carbon Footprint Total value (metric tons)
American University in Cairo (AUC)	2019/2020	34,391.3 CO_{2e}
Cape Town University (Republic of South Africa)	2018	75,187 CO_{2e}
Arizona University (USA)	2017	258,088 CO_{2e}
Alexandria University (Egypt)	2021/2022	4,715.1992 CO_{2e}

Conclusion:

According to the Carbon Footprint for all Alexandria University buildings for the Academic year (2021/2022), which is approximately 4,715.1992 CO_{2e}, one can conclude that the sustainability program of Alexandria University was very successful. The total electricity usage of Alexandria University Campus in 2021/2022 is 7106641 kWh. The total electricity usage decreased by 18.5% compared to year 2020/2021. On the other hand, a significant decrease in the consumption of paper packages is observed. The paper packages used in all Alexandria University buildings for the Academic year (2021/2022) is 47911 packages, while in the previous year (2020/2021) the consumed paper packages were 84689 paper packages (approximately 43% decrease).

Factors for conversion from consumption to Ton CO₂ a:

The conversion factor for electrical consumption according to the study of the American University in Cairo (2017)		0.5791 to (metric tons CO_{2e})
The conversion factor of gasoline and diesel according to the study of the American University in Cairo (2017)		0.2408 (Gasoline) to (metric tons CO_{2e}) 0.3696 (Diesel) to (metric tons CO_{2e})
International conversion factor (corresponding to the same value that was obtained from the officials of the Egyptian Drinking and Water Company Authority)		0.5791 to (metric tons CO_{2e})
Use of paper	The amount of consumption of copying and printing papers (A4/70gm) for the college for one academic	Number of packages per year *Package weight = Total weight of packages per year

	year from the reality of the college purchases.	
	Conversion factor according to the study of the American University in Cairo (2017).	2.8 to (metric tons CO₂e)

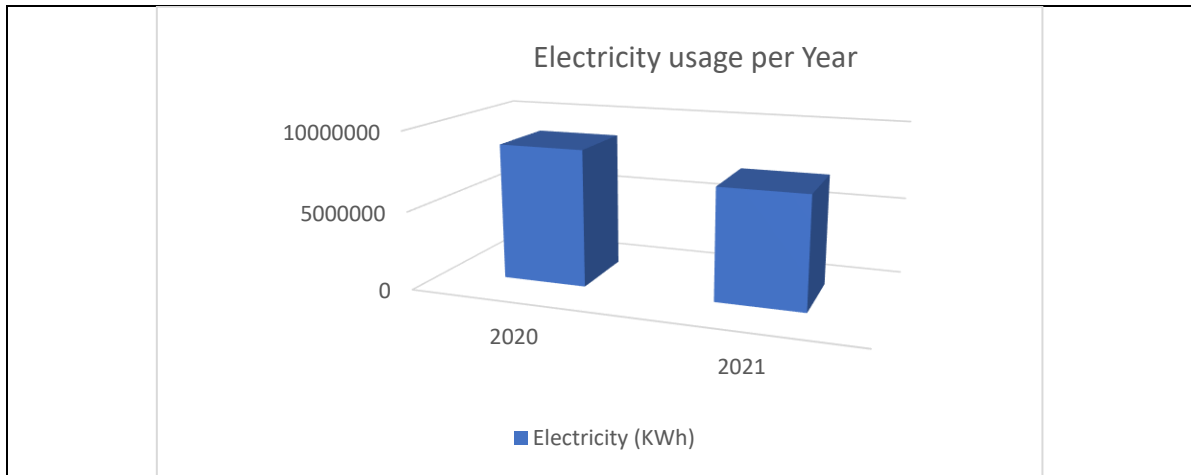
Additional evidence link:

https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5933&catid=21&lang=ar-AA

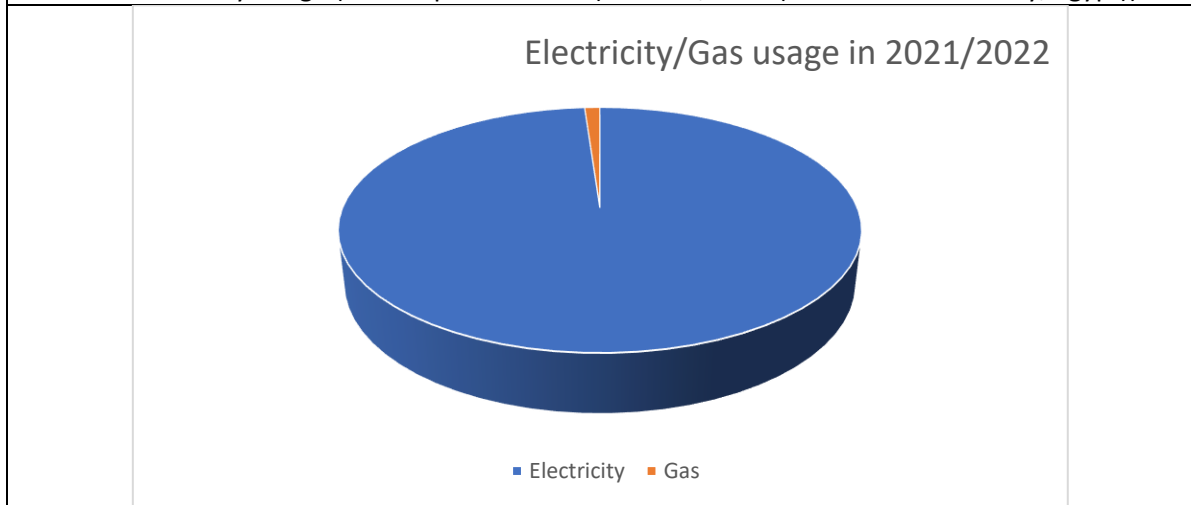
Document prepared by Prof. Sherine Khattab



Electricity Usage per Year (in Kilowatt hour)



Total Electricity Usage (All Campus Locations) in 2020/2021 (Alexandria University, Egypt))



Total Electricity/Gas Usage ratio (All Campus Locations) in 2021/2022 (Alexandria University, Egypt))

Description:

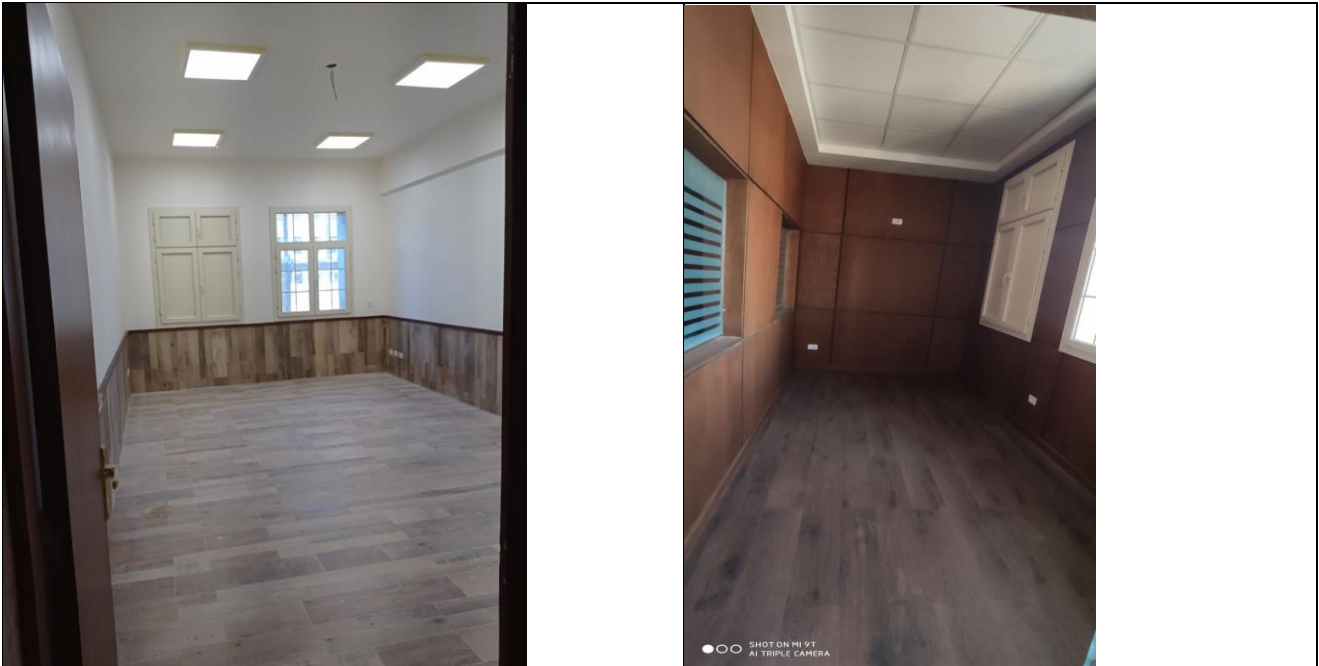
The total electricity usage of Alexandria University Campus in 2021/2022 is 7106641 kWh. The total electricity usage decreased by 18.5% compared to year 2020/2021. The total Gas usage of Alexandria University Campus in 2021 is 7071 m³ (80345 kWh). On the main campus area of Alexandria University electricity is used for lighting, cooling, heating and laboratory appliances.

Document prepared by Prof. Sherine Khattab

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)

(Second HEEPF Project)

www.areas-agr.com

E-Learning Lab

الخلايا الكهروضوئية
 أ. د. محمد الوهاب شادي، فاسم
 مركز البحوث والدراسات الزراعية، الإسكندرية

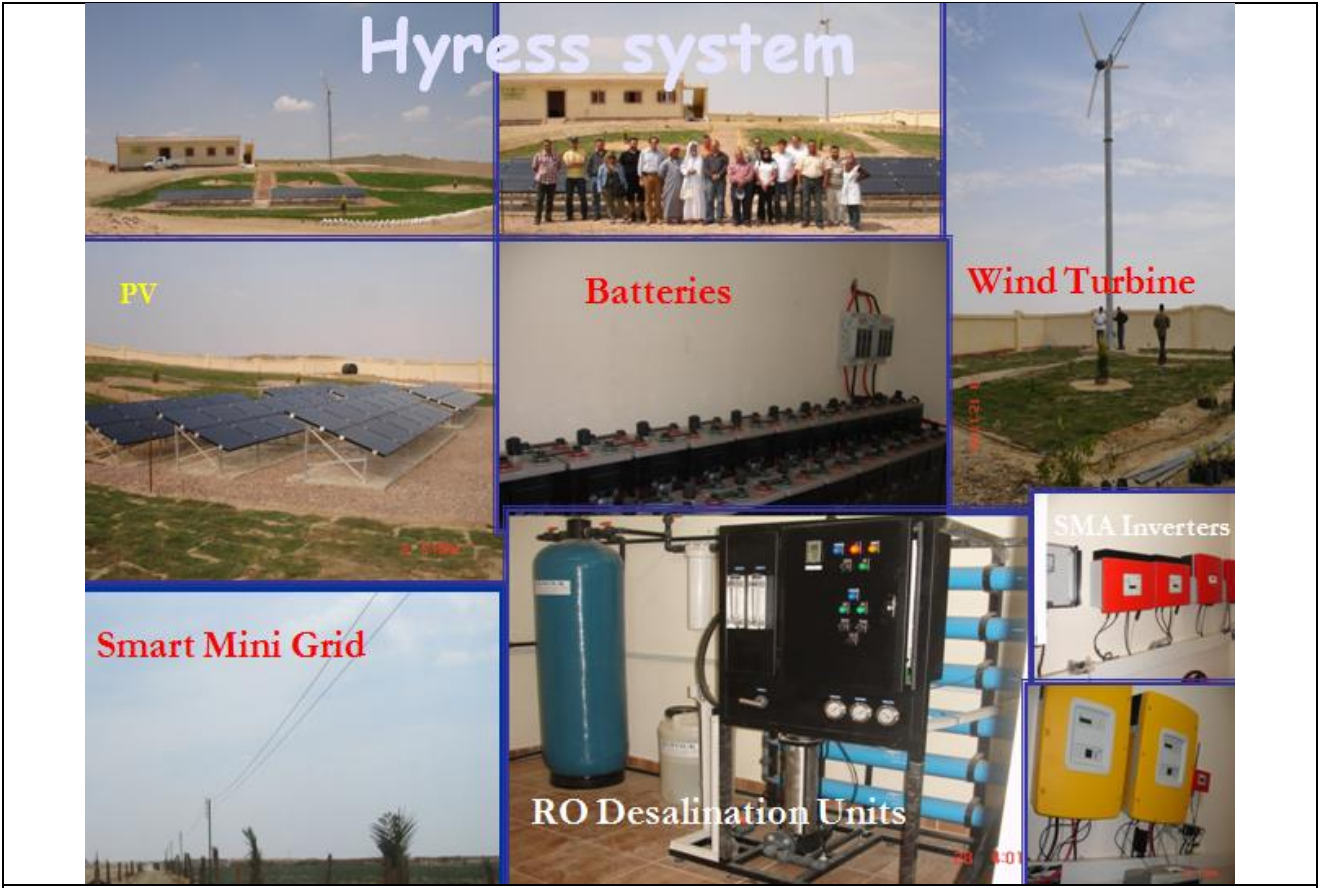
التعلم الحراري للطاقة الشمسية
 د. محمد الوهاب شادي، فاسم
 مركز البحوث والدراسات الزراعية، الإسكندرية

الطاقة المتجددة
 د. محمد الوهاب شادي، فاسم
 مركز البحوث والدراسات الزراعية، الإسكندرية

الطاقة من الشتل الحيوية
 أ. د. محمد الوهاب شادي، فاسم
 مركز البحوث والدراسات الزراعية، الإسكندرية

EVACUATED TUBE SOLAR COLLECTOR

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)



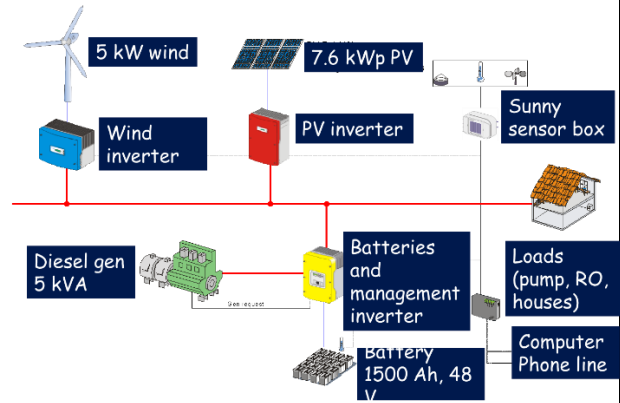
100 KW Hybrid Wind/PV System (50 KW PV and 50 KW Wind)



HYRESS Site at Wadi El-Natroon

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

Lay out of the Hybrid system



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)

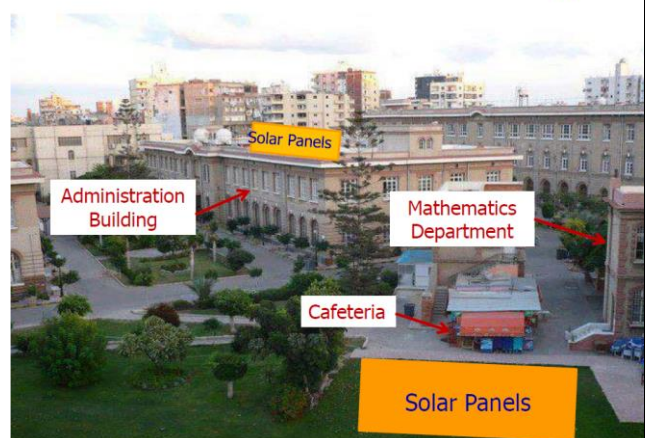


BIPV Garden Pergola, Faculty of Science in
Moharram Bek (Alexandria University)



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

Moharam Bek Building



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%
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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. Regular Maintenance of all devices.

- 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:

- 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.
- Consultations:** Various consultations in renewable energy systems, especially hybrid systems, drying and solar heating.
- 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.
- Serving the Egyptian community by providing all renewable energy information to the public.

Equipment at the center:

- The center has many devices for different applications of renewable energy.
- A hybrid system to generate electricity from the sun with a capacity of about 130 kilowatts.
- 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 (kWp)		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	
BIPV roof pergola	30	4.1	49,620
	Total Power (kWh)		

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:

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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:

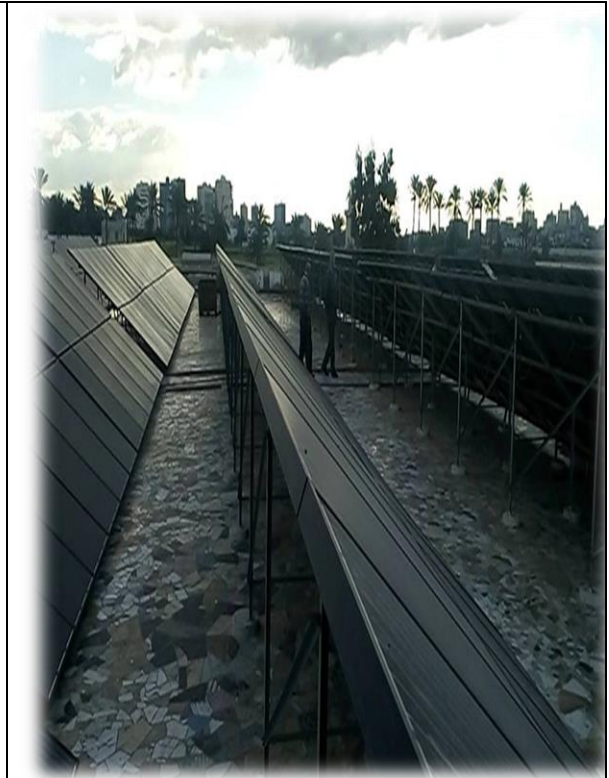
https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5932&catid=21&lang=ar-AA

Document prepared by Prof. Sherine Khatab

Greenhouse gas emission reduction program



1. LED lighting and lamps (Abis Campus, Alexandria University)



2. Renewable energy (Solar Energy Center at the Faculty of Agriculture, Alexandria University)



3. Ride Share using the University Shuttle (Alexandria University)



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



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

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

Description:

Table: Greenhouse gas emission sources at Alexandria University Campus

	Emission data	Definition
Scope 1	Stationary combustion	Stationary combustion refers to the burning of fuels to produce electricity, steam, and heat in a fixed location, such as boilers, burners, heaters, kilns, and engines.
	Mobile combustion	Burning of fuels by institution-owned transportation devices
	Process emissions	Direct greenhouse gas (GHG) emissions from physical or chemical processes rather than from fuel combustion
	Fugitive emissions	Hydrofluorocarbon releases during the use of refrigeration and air conditioning equipment and methane leakage from natural gas transport
Scope 2	Purchased electricity	Indirect GHG emissions result from the generation of the electricity purchased and used by the institution

Scope 3	Waste	Indirect GHG emissions resulting from the incineration or landfill of your institution's solid waste
	Purchased water	Indirect GHG emissions resulting from the generation of water supply purchased and used by the institution
	Commuting	Indirect GHG emissions resulting from regular commuting from and to institutions by students and employees (i.e., reducing regular commuting by using shared vehicles, carpooling)
	Air travel	Indirect GHG emissions resulting from air travels paid by institutions (i.e., reducing the number of staff air travel opportunities)

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

Scope 1, Stationary combustion and Mobile combustion: These GHG sources are reduced by Ride Share using the University Shuttle and Carpool, by the decrease of burning of fuels. In addition, the use of bicycles reduces the GHG source.

Scope 1, Fugitive emissions: 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. This will reduce the use air conditioning equipment and accordingly decrease GHG.

Scope 2, Purchased electricity: As for energy, all the new buildings in Abis Campus 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). In addition, the public site lighting poles are powered by solar energy.

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

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

Scope 3, Waste: Alexandria university program to reduce the use of paper and plastic in campus.

- 1) Development of electronic archiving system; the university faculties and the main campus are moving toward the electronic archiving system to reduce paper consumption.
- 2) University decrees to reduce the use of paper in the campus:
 - 2.1: The president decree to use the e-mails for communications inside the campus and between the university main campus and all the other campuses.
 - 2.2: In the situations, the university or any of its faculties need to print the official documents; this has to be on recycled paper (2 faces copy).
 - 2.3: The University formulated a community for administrative reform to minimize the administrative processes and decrease the use of papers except in who are relevant to financial process.
- 3) Digital transformation toward electronic exams to reduce paper consumption.
- 4) Digital transformation toward electronic course to reduce paper consumption and books printing.

5) Electronic administration of student courses by about 50% instead of written administration to reduce paper consumption.

Scope 3, purchased water: The University has applied a strategy in the faculties to decrease water consumption through installation of special parts on water taps, showers, toilette, and bathroom bidet which can conserve about 50% of water consumption. Water saving devices are used instead of traditional devices. For example, the use of a hand-washing faucet with automatic control via a sensor, and high-efficiency bathroom devices. Supplying water taps with water conservation units. Adopting a mechanism to maintain water pipes to prevent waste resulting from leaks.

In addition, a policy for the reduction of purchased water was implemented in Abis Campus 1) 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. 2) Rainwater is collected in the main lake and used for irrigation. 3) 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.

Scope 3, Commuting: These GHG sources are reduced by Ride Share using the University Shuttle and Carpool, by the decrease of burning of fuels. In addition, the use of bicycles reduces the GHG source.

Scope 3, Air travel: The University usually support the travel of Faculty members and student once every two years for attending conferences. Lately, since the covid 19 pandemic, and the increase in air travel Tickets, the support of travel was stopped.

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2	Windmill	55,000
	Total	162,371.2

SCOPE 1

Electricity produced by renewable energy: $162371.2 * 0.5791$ (conversion factor) = 94029.1619 CO₂ e
Percentage of renewable energy production to the total energy usage /year = $162371.2 / 710664 = 22.847\%$

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

Link for LED lighting:

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Link for Green University:

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Document prepared by Prof. Sherine Khattab

Number of innovative program(s) in energy and climate change

<p>1</p>	 <p>(Second HEEPF Project)</p> <p>www.areac-agr.com</p> <p>E-Learning Lab</p> <p>الكهرباء و ضوءية الخلايا أ.د. عبد الوهاب شلبي، فاسم</p> <p>تخزين الحرارة لطاقة الشمس أ.د. محمد عبد الوهاب شلبي، فاسم</p> <p>أساليب طاقة الرياح وتطبيقاتها أ.د. عبد الوهاب شلبي، فاسم</p> <p>طاقة المتجددة أ.د. محمد عبد الوهاب شلبي، فاسم</p> <p>الطاقة من المخلف الحيوية أ.د. عبد الوهاب شلبي، فاسم</p> <p>EVACUATED TUBE SOLAR COLLECTOR</p>
<p>Solar Energy Center at the Faculty of Agriculture (Alexandria University)</p>	
<p>2</p>	 <p>Old HYRESS system</p> <p>New STDF system</p>
<p>Windmill and Solar Panels (Solar Energy Center at the Faculty of Agriculture - Alexandria University)</p>	

2



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

3



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



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

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



4 Production of Bio-Diesel from Algae in Selected Mediterranean Countries: Med-Algae Project (Faculty of Science, Alexandria University)



Algae Cultivated In Flat Panel Photo-Bioreactor, Med-Algae Project (Faculty of Science, Alexandria University)

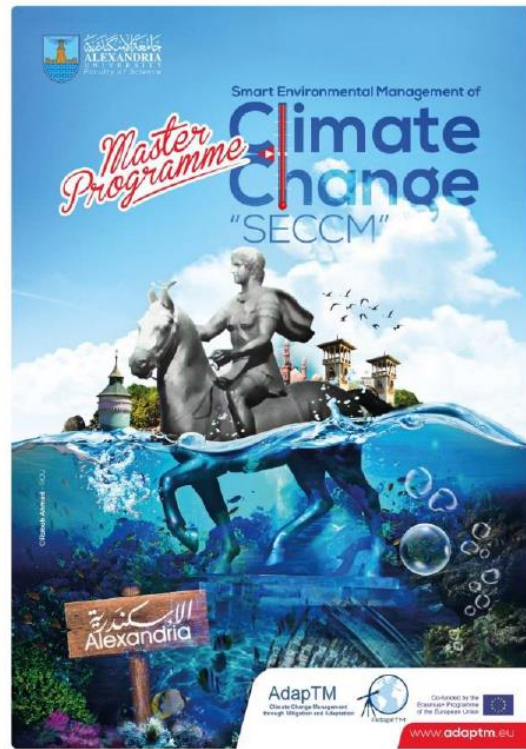
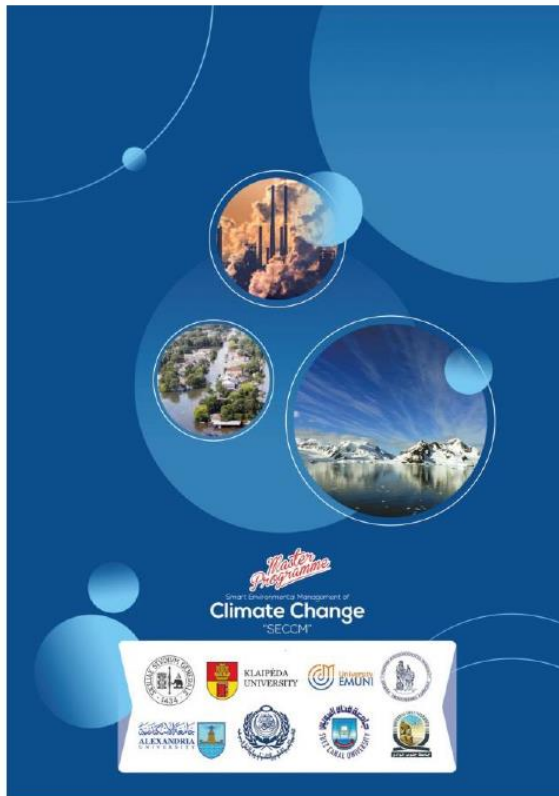


4 Seawater tank outside the chamber, Med-Algae Project (Faculty of Science, Alexandria University)



Open Ponds with running algal cultures, Med-Algae Project (Faculty of Science, Alexandria University)

5



Smart Environmental Management of Climate Change Master Program (Alexandria University, Egypt)

6

FishAqu Project

A consortium of eight EU & Egyptian universities are establishing a modern, needs-oriented master study programme on fisheries and aquaculture.

Sustainable Management of Fisheries and Aquaculture Science Master Program (Alexandria University, Egypt)



M.Sc. in:
Natural Resources Sustainability for Land Development (NRSLD)
Under the framework of SuReMap project
(Sustainable Resource Management Programme to solve Deserted Challenges)

SuReMap Project:

Aims to establish interdisciplinary programs that train students to address water, energy & food-related challenges in "Egypt's 2030 strategy".

NRSLD is an outcome of the SureMap Erasmus+ project that includes a consortium of 8 Egyptian and European universities. The program is cooperatively designed by the consortium, therefore; it has the advantage of the international and interdisciplinary perspective, European framework of recognition, and benefits from a wide network of participating professors from the following universities: RWTH Aachen, Heliopolis University, Alexandria University, CITY College – Sheffield University, The American University in Cairo, University of Palermo, Aswan University, and Technical University of Madrid.

Program Vision:

NRSLD program aims to prepare students with the knowledge and experience for the management and sustainable development of drylands' natural resources in the local, regional, and international related sectors.



Program Mission:

The Faculty of Science through NRSLD program seeks to qualify the graduates to be competitive at local, regional, and international levels, by creating an appropriate educational environment and fostering ethically, scientifically, and professionally sound approaches that enable graduates to serve the community and the institutions closely related to sustainable development plans.



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Natural Resources Sustainability for Land Development Master Program (Alexandria University, Egypt)

Description:

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

a) The renewable Energy Center in Wadi Natrun.

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.

b) 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.

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

- The center along with partner from Greece, Germany, Spain Morocco and Tunisia awarded a Six Framework project (FP6 project) from the European commission to developed Hybrid renewable energy system to supply service for Mediterranean partner countries.
- The center representing AU and Las Palm University in Spain awarded a project from the Spanish cooperation Spanish Agency for International Co-Operation (AECE), in the area of water desalination by Renewable Energy.
- Recently with cooperation with the Faculty of Engineering, the center awarded an STDF project. The project title is "Development of hybrid renewable energy - RO desalination system and minigrids for remote and desert areas in Egypt (HAREDES)".

The Center Goals are to:

- Remove the knowledge barriers against the installation of RE systems in Egypt.
- Enhance the utilization of renewable energy.
- Develop educational and e-learning program about renewable energy.
- Educate students, graduates, public and key stakeholders in Egypt and the Arab world on the various sources of renewable energy and its successful applications.
- Build the infrastructure necessary to develop, install and maintain renewable energy applications.
- Present a show case or a model for the successful utilization of renewable energy in Egypt.
- Continue excellence in all of our educational programs.

The services provided by the center:

- 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.
- Consultations:** Various consultations in renewable energy systems, especially hybrid systems, drying and solar heating.
- 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.
- Serving the Egyptian community by providing all renewable energy information to the public.

Equipment at the center:

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

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

3- 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

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
2	Windmill	55,000
	Total	161,770

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

4- The Faculty of Science:

Research Project: Production of Bio-Diesel from Algae in Selected Mediterranean Countries: Med-Algae Project

The project objective is to explore:

- 1- The development of microalgae-based biodiesel production and other valuable products in six Mediterranean countries (Cyprus, Egypt, Greece, Italy, Lebanon and Malta).
- 2- The current level of technology, the relevant market structure, and the governmental and environmental boundaries will be mapped in the participating countries, in order to identify the most promising strategies in each country.

Studied Strains *Chlorella* sp was chosen to be the common examined strain between the partners. In addition, native algal strains from each participant country were isolated and identified.

Both *Chlorella* sp and locally isolated microalgae have been examined under lab and out-door scale.

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

5- Smart Environmental Management of Climate Change in collaboration with Catania University, Italy

2 year Postgraduate Master program (4 semesters).

AdapTm-Erasmus project: The participating countries and Universities: Italy, Greece, Lithuania, Slovenia, Egypt (Alexandria University, Suez Canal University, South Valley University, Arab Academy for Science and Technology and Maritime Transport).

Program start date: year 2019

Link: <https://emuni.si> › ADAPTM-handout_2_Mod

6- Sustainable Management of Fisheries and Aquaculture Science, in collaboration with University of Aveiro, Portugal.

2 year Postgraduate Master program (4 semesters).

(Erasmus+ Project, European Union): The participating countries and Universities: Portugal (University of Aveiro), Italy, Croatia, Slovenia, Egypt (Alexandria University, Aswan University, Matrouh University, Arab Academy for Science and Technology and Maritime Transport).

Program start date: year 2021

Link: <http://fishaqu.eu>

7- Natural Resources Sustainability for Land Development in collaboration with Aachen University, Germany

2 year Postgraduate Master program (4 semesters).

Erasmus+ Project, European Union: The participating countries and Universities: Germany (RWTH Aachen), Egypt (Alexandria University, Heliopolis University, the American University in Cairo, Aswan University), Cyprus (CITY College – Sheffield University), Italy (University of Palermo), Spain (Technical University of Madrid).

Program start date: year 2022

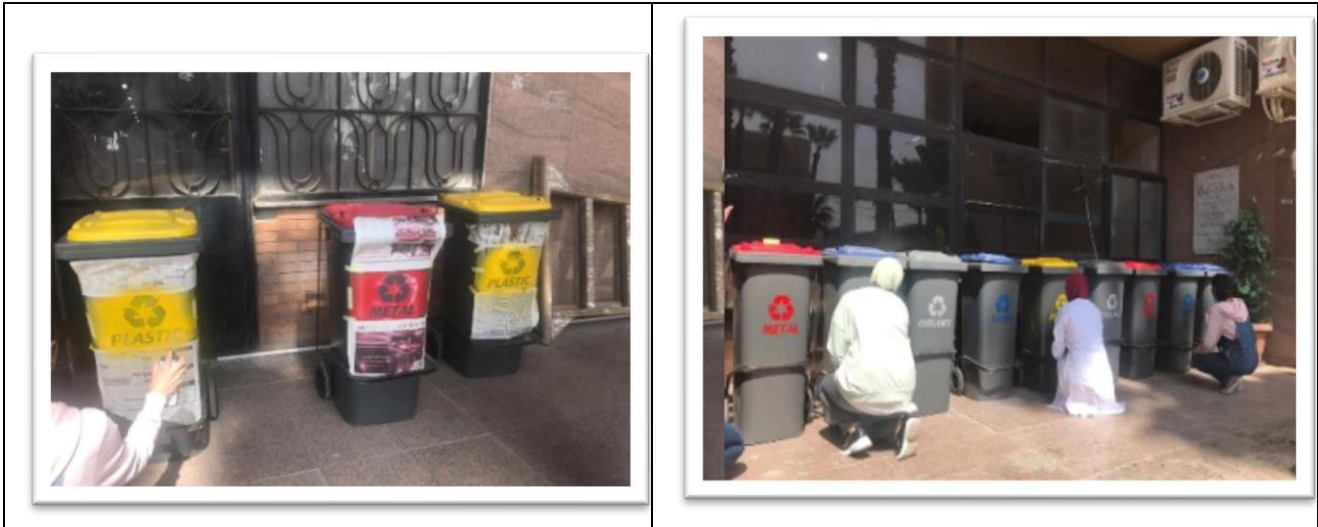
Link:

YouTube: <https://suremap.eu>

facebook: <https://www.facebook.com/suremapproject>

LinkedIn: <https://www.linkedin.com/company/suremap-project>

1 Waste recycling



Recycling Program for University Waste (Alexandria University, Egypt)



Recycling of plastic waste at the Faculty of Science (Alexandria University, Egypt)

Description:

Alexandria University developed the initiative of "separating and recycling waste", which aims to protect the environment, maintain the cleanliness of colleges and develop environmental awareness within the framework of the concepts of green economy and sustainable development to achieve the vision of Egypt 2030.

1-The University applied a strategy in all its faculties to segregate the waste into special containers for plastic, papers, glass, and metal objects.

2- The University set an initiative for waste recycling in all faculties with a set of labeled containers for waste segregation distributes in each faculty.

3- The University set initiative for increasing the awareness about Purchase Recycled Products: It is important to buy products made from recycled materials to strengthen the market for recyclables.

4-The University developed an initiative with the governorate (Alexandria Youth alliance) to participate with us in waste management initiative.

5-The University has a contract with Nahdet-Misr Company (the official company in the governorate for waste disposal) for collection and recycling.

6- The University is trying to develop an initiative as a student project with Titan® Company for manufacturing of MDF sectors using university collected waste for maximal benefit from this waste.

7- University students at the Faculty of Science initiated a student project for plastic recycling.

Our recycling program aims to recycle waste by separating it from the source into:

- Organic waste and food residues.
- Plastic waste and plastic bags .
- Mineral waste and carbonated water cans.
- Paper waste

This allows the recycling and utilization of as much of the waste as possible instead of disposing of it in landfills, which will eventually lead to its burning and the consequent pollution of the environment and the increase in emissions of greenhouse gases. Our university promotes maintaining the campus environment in clean condition using high quality non-toxic detergents and cleaning materials.

Reduction of Paper and Plastic use on Campus



Program for separation of Paper, Plastic, aluminum cans, glass and organic waste in Campus (Alexandria University, Egypt)	Plastic recycling machine at the Faculty of Science (Alexandria University, Egypt)
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Program 1: Development of electronic archiving system; the university faculties and the main campus are moving toward the electronic archiving system to reduce paper consumption.

Program 2: University decrees to reduce the use of paper in the campus:

2.1: The president decree to use the e-mails for communications inside the campus and between the university main campus and all the other campuses.

2.2: In the situations, the university or any of its faculties need to print the official documents; this has to be on recycled paper (2 faces copy).

2.3: The University formulated a community for administrative reform to minimize the administrative processes and decrease the use of papers except in who are relevant to financial process.

Program 3: Digital transformation toward electronic exams to reduce paper consumption.

Program 4: Digital transformation toward electronic course to reduce paper consumption and books printing.

Program 5: Electronic administration of student courses by about 50% instead of written administration to reduce paper consumption.

Additional evidence link:

<https://www.alexu.edu.eg/index.php/en/community-development-and-environmental-affairs/6435-alexandria-university-initiative-to-separate-and-recycle-waste>

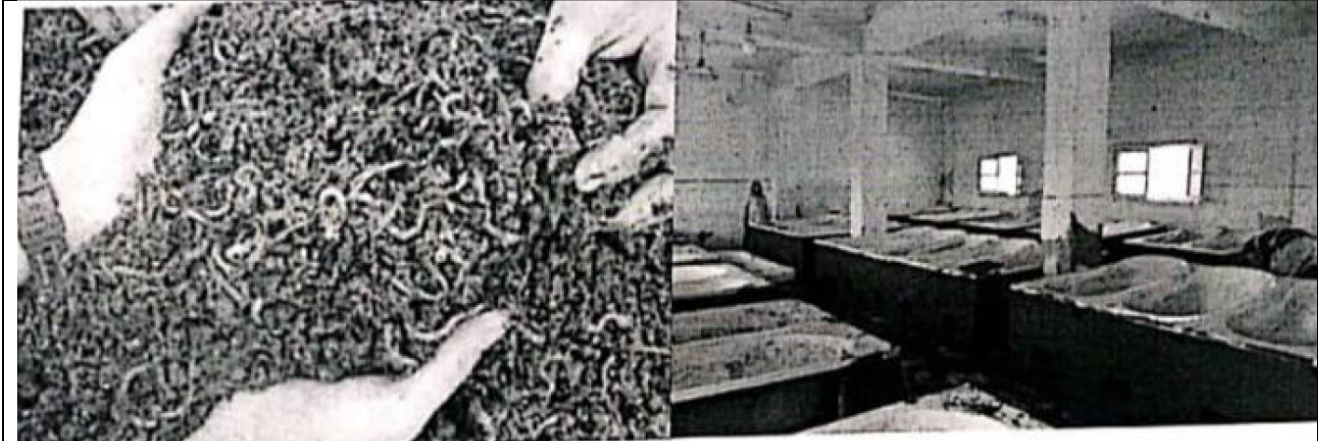
Additional evidence link:

<https://www.alexu.edu.eg/index.php/en/community-development-and-environmental-affairs/6435-alexandria-university-initiative-to-separate-and-recycle-waste>

3. Reduction of Organic Waste Treatment



Leaves and organic waste were treated for the vermi-compost to produce organic fertilizers to use in the Campus gardens (Alexandria University).



The Faculty of Agriculture recycles 100% of its organic waste (Alexandria University).

Description:

1- The strategy of the Faculty of Agriculture for the recycling of organic waste:

The Faculty of Agriculture recycles 100% of its organic waste through the following procedure:

- Utilization of the treated agricultural byproducts in farm animals feeding.
 - Utilization of the treated agricultural byproducts for the vermi-compost to produce organic fertilizers.
 - Utilization of the treated agricultural byproducts through a special insect (black soldier) to produce organic fertilizers and protein sources.
 - Mass production of active Biochar from agricultural waste to remove any water impurities or pesticides residues.
- 2- The organic waste in Alexandria University is handled according to the contract with Nahdet Misr company. All organic wastes are collected in organic waste containers. Then the company collects these waste bags and delivers it to waste treatment facility for processing.
 - 3- In addition, the University students at the Faculty of Science initiated a student project for organic waste recycling. Leaves and organic waste were treated for the vermi-compost to produce organic fertilizers to use in the Campus gardens (Alexandria University).

Additional evidence link: <https://www.alexu.edu.eg/index.php/en/community-development-and-environmental-affairs/6435-alexandria-university-initiative-to-separate-and-recycle-waste>

4. Inorganic Waste Treatment



Recycling Program for both materials and equipment with metals and derivatives (Alexandria University, Egypt)

Description:

5. Disposal of Inorganic Waste

The University follows the Egyptian laws associated with disposal of hard materials waste No. (6) for the year 2009 and No. (9) for the year 1982 concerning with environment protection. Alexandria University has a yearly contract with **Alexandria Governorate Hazardous Waste Management (NASERIA)** for the disposal of Inorganic Waste (attached a copy of the Contact).

1- In general the hard material waste in the University is divided into two types including:

- **Non-medical waste:**

Products which are collected and stored in a far place in the faculties which are then removed to a general dump for recycling.

Heavy metal: Heavy metal waste consists of both materials and equipment with metals and derivatives.

Examples: Batteries, amalgam, broken mercury thermometers.

- **Medical waste:**

Medical waste consists of several different subcategories that should all be dealt with in the same way:

Potential infectious waste includes all waste items that are contaminated with or suspected of being contaminated with body fluids.

Examples include:

Blood and blood products, used catheters and gloves.

2. Inorganic Wastes are collected in separate containers labelled for inorganic waste. The garbage bags are collected daily by Nahdet Misr company for processing.
3. Batteries and other E-wastes are collected separately inside Alexandria University Campus and are delivered for special treatment by Nahdet Misr company. The E-Material are never trashed into a regular trash.

6. Recycling of Solid and Electronic Waste in the Faculties and Institutes of Alexandria University

According to the decision of Alexandria University to transfer all solid waste to institutes, colleges, hospitals and university cities of the University at the Agricultural Research and Experiments Station in Abis as a central storehouse for the collection of iron priests (Wood - Iron - Alumetal - Computers - Projectors - Photocopiers - Printers - Fire Extinguishers - Doors - windows - wires, lighting poles, electric panels.....etc.), which are considered valuable solid waste worth recycling.

Recycling of solid waste is a good investment project, and with the increase of environmental awareness worldwide, the demand of recycled materials will rise. Alexandria University can save production and energy costs and reduce the negative impacts that the extraction and processing of virgin materials has on the environment.

Recycling old devices saves energy. It also means that fewer raw materials need to be drawn from nature to create new devices. Reusing old devices prevents e-waste by keeping it out of landfills.

The environmental aspect: The process of recycling solid and electronic waste mainly contributes to reducing the percentage of pollution of all kinds, by reducing the accumulation of waste, which contribute greatly in pollution of the environment due to the release of polluting gases and toxic elements in the air, water, and land. The process of recycling solid and electronic waste contributes in reducing the impact of human activity on the planet Earth.

Economic aspect: The process of recycling solid and electronic waste play an important role in the reduction of economic expenditures, helping countries to meet the challenges related to the high prices of raw materials such as oil and coal. Recycling reduces the reliance on the export of the primary resources of many industries, thus reducing the cost of production. Which result in lower bill of taxes, customs duties, insurance premiums, transportation. On the other hand, the recycling process helps in reducing the consumption of natural raw materials used in different industries. Accordingly, the Energy consumption for manufacturing and production processes will be reduced.

The disposal Program

- A specialized committee is selected including a member from the Engineering Department, according to the devices or tools under investigation.

- In case the devices are not useful, the committee recommends that the items will be transferred to the Agricultural Research and Experiments Station in Abis.
- Recycling warehouses are divided into sections according to the type of materials being recycled, for example: Calculators, printers, wood, Aluminum, etc
- Working teams are selected from the university faculties' maintenance units to benefit from these solid and electronic waste.
-

Additional evidence link: Maintenance Unit for lab apparatus and electronics:

https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5912&catid=21&lang=ar-AA

7.Toxic Waste Treatment



Description:

The biohazards, medical hazards, and toxic chemical compounds are handled by a **special contract** with **Nahdet Misr for Modern Environmental services** company, which process these wastes according to the Egyptian law number 6 for year 2009 and low number 9 for year 1982. (attached Contract copy)

- **Medical waste:**
Medical waste consists of several different subcategories that should all be dealt with in the same way:
Potential infectious waste includes all waste items that are contaminated with or suspected of being contaminated with body fluids.
Examples include:
Blood, blood products, used catheters and gloves.

8.Sewage Disposal



The sewage water will be treated and reused in the irrigation of green areas in the project (Alexandria University)



The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm.

Description:

Elements of Green Building Implementation as Reflected in all new construction and renovation policies in the new buildings in Abis campus:

- The area of the project is 160 acres, 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.
- 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.

Sewage Disposal and recycling

- Providing a sewage treatment plant at the university to make it suitable for irrigating green areas and gardens inside the university campus.
- The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm. The recycled water is rich with natural fertilizers and enhances the crops production.
- In addition, the water recycling in Fish Aquaculture of the Faculty of Agriculture, Alexandria University: The water sewage of the Aquaculture of the Faculty of Agriculture, Alexandria University which consist of eight ponds (one acre and quarter/each) in Abis region. Alexandria University used the recycled water for crops culturing in the adjacent agriculture research center in Abis.
- The use of biochar produced from Agricultural waste and waste Forests in residual removal chlorpyrifos pesticide Imidacloprid is from water agricultural drainage. Cooperation project between the Egyptian Academy of Research Science and Technology and the Czech Academy of Sciences.

Additional evidence link

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

Document prepared by Prof. Sherine Khattab



Ratio of renewable energy production divided by total energy usage per year: = 2.29%



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



Example of Windmill and Solar Panels (Solar Energy Center at the Faculty of Agriculture - Alexandria University)



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

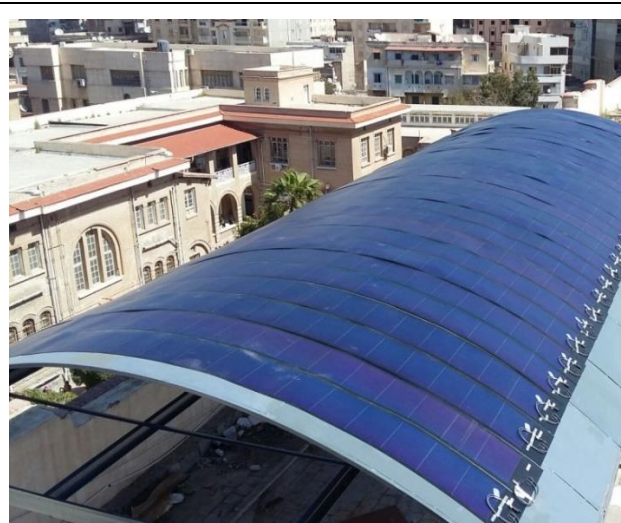
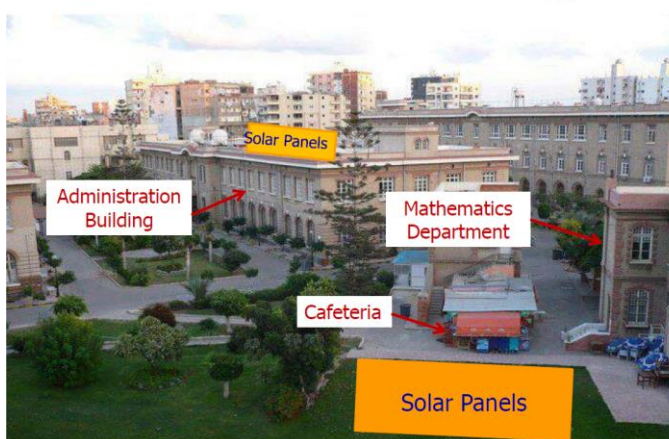


Solar Panels (Solar Energy Center at the Faculty of Agriculture - Alexandria University)



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

Moharam Bek Building

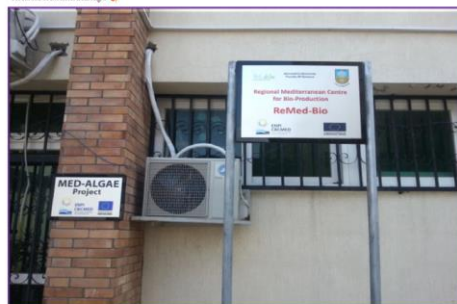


BIPV Roof Pergola, Faculty of Science in Moharram Bek (Alexandria University)



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

Med-algae
Production of Biodiesel from Algae



Visitors,
Stakeholders &
Media


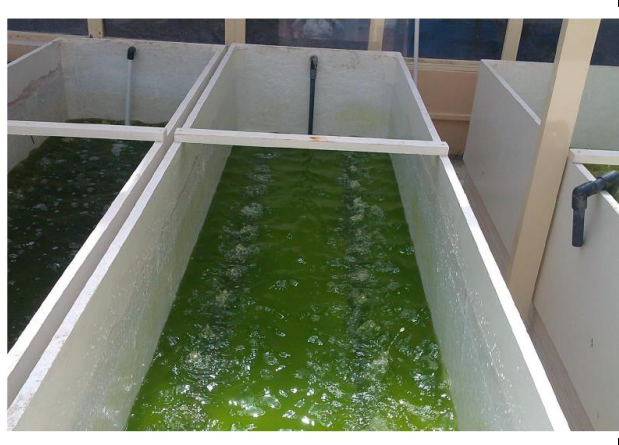
29 March 2014



Project
funded by the
EUROPEAN UNION



Production of Bio-Diesel from Algae in Selected Mediterranean Countries: Med-Algae Project (Faculty of Science, Alexandria University)

	
<p>Algae Cultivated In Flat Panel Photo-Bioreactor, Med-Algae Project (Faculty of Science, Alexandria University)</p>	<p>Open Ponds with running algal cultures, Med-Algae Project (Faculty of Science, Alexandria University)</p>

Description:

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

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.

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

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
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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

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 = 107,371.2
2	Windmill	55,000
	Total	162,371.2

162,371.2 / 7106641 (Electricity usage) = 2.29%

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

Document produces by Prof. Sherine Khattab



Smart Building Implementation: Abis Campus (11 University buildings)

***Min. at least five requirements for each building**

No.	Name	Place	automation		safety				energy		water		Indoor environment				lighting				Building Area (m ²)
			B1	B2	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	L3	L4	
1	University Alexandria; Abis Campus, Buildings 1-11	Alexandria, Egypt			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	667,730.988
Total																					667,730.988

Please compile one row for each building (or homogeneous part of it) by ticking with a "X" for each requirement

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

- The area of the project 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% atreets and lanes.
- Water-saving plots are used, which will reduce water consumption by abut 30%. The sewage water will be trated 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 enery 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 punlic site lighting poles are powered by solar enery.

Total Building Area

$$\frac{\text{total building area}}{\text{total area}} \times 100\%$$

Total Building Area:

$$\frac{667730.988 \text{ m}^2}{2225769.96 \text{ m}^2} \times 100\% = 30\%$$

Smart building implementation

$$\frac{\text{total smart building area}}{\text{total building area}} \times 100\%$$

Smart building implementation

$$\frac{135,500 \text{ m}^2}{667730.988 \text{ m}^2} \times 100\% = 20\%$$

Building 1



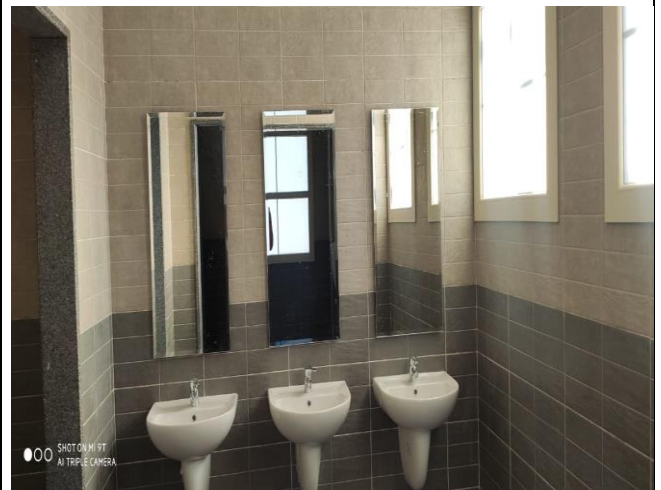
Building 1



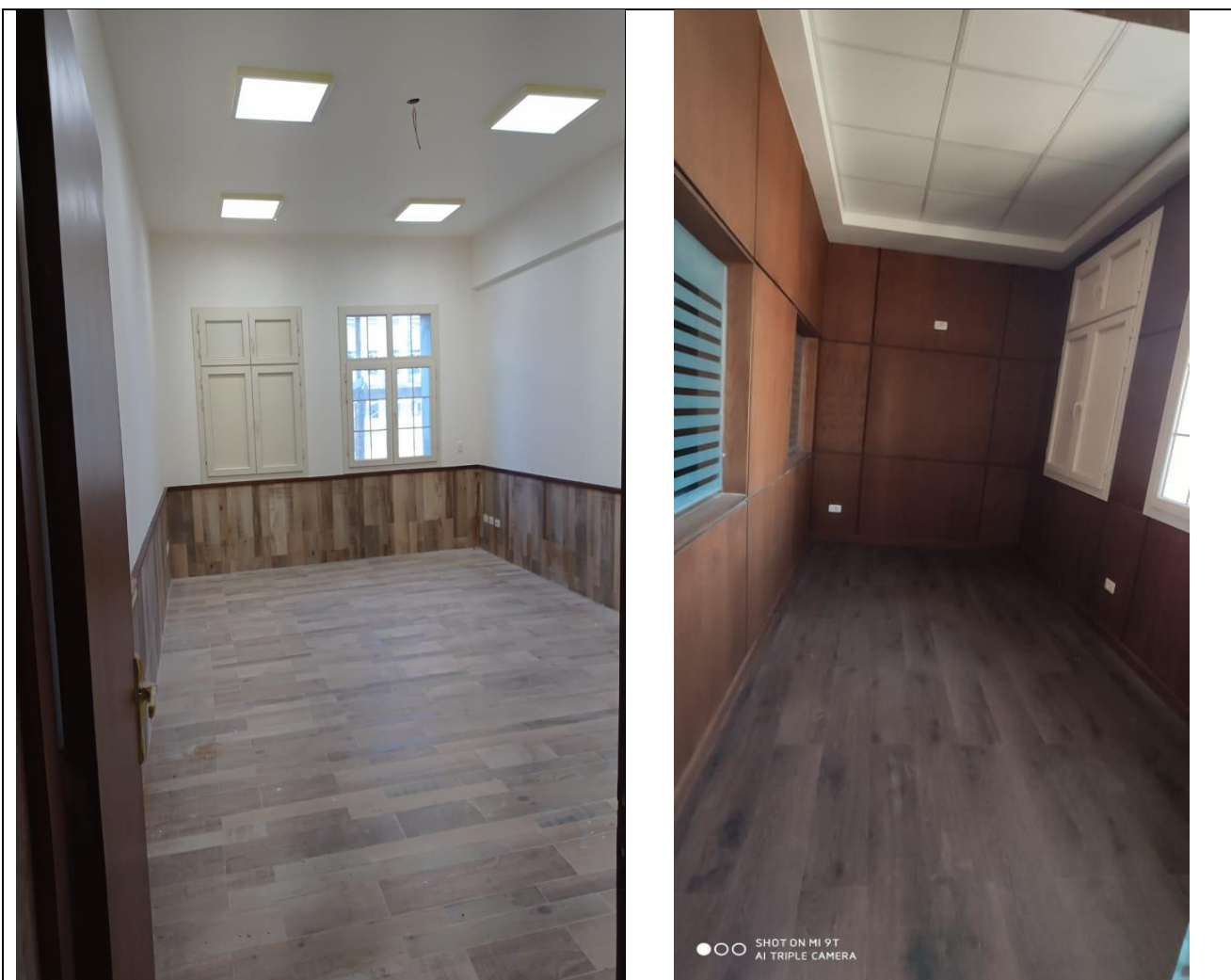
Building 3



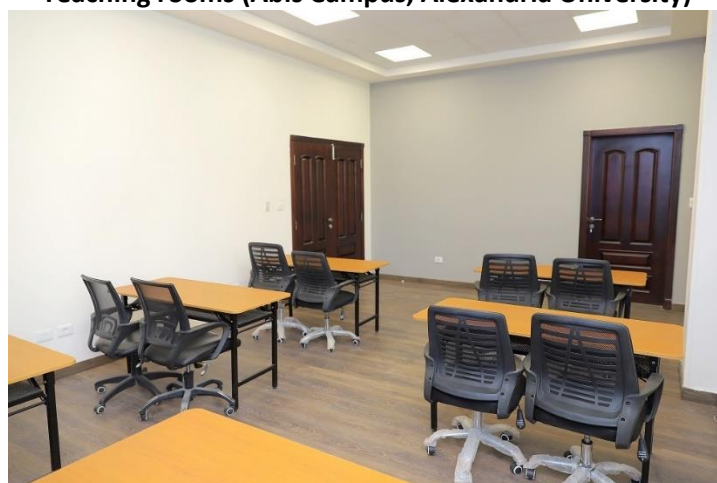
Building 4 (Bathroom, water saving)



Building 1-11 (LED Lighting)



Teaching rooms (Abis Campus, Alexandria University)





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



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- 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.

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:

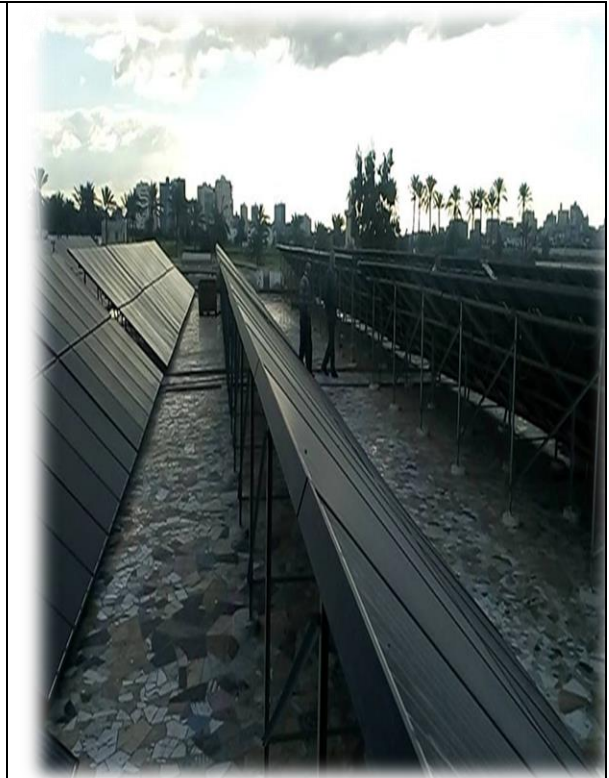
https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5932&catid=21&lang=ar-AA

Document prepared by Prof. Sherine Khatablue

Greenhouse gas emission reduction program



1. LED lighting and lamps (Abis Campus, Alexandria University)



2. Renewable energy (Solar Energy Center at the Faculty of Agriculture, Alexandria University)



3. Ride Share using the University Shuttle (Alexandria University)





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



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

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

Description:

Table: Greenhouse gas emission sources at Alexandria University Campus

	Emission data	Definition
Scope 1	Stationary combustion	Stationary combustion refers to the burning of fuels to produce electricity, steam, and heat in a fixed location, such as boilers, burners, heaters, kilns, and engines.
	Mobile combustion	Burning of fuels by institution-owned transportation devices
	Process emissions	Direct greenhouse gas (GHG) emissions from physical or chemical processes rather than from fuel combustion
	Fugitive emissions	Hydrofluorocarbon releases during the use of refrigeration and air conditioning equipment and methane leakage from natural gas transport
Scope 2	Purchased electricity	Indirect GHG emissions result from the generation of the electricity purchased and used by the institution

Scope 3	Waste	Indirect GHG emissions resulting from the incineration or landfill of your institution's solid waste
	Purchased water	Indirect GHG emissions resulting from the generation of water supply purchased and used by the institution
	Commuting	Indirect GHG emissions resulting from regular commuting from and to institutions by students and employees (i.e., reducing regular commuting by using shared vehicles, carpooling)
	Air travel	Indirect GHG emissions resulting from air travels paid by institutions (i.e., reducing the number of staff air travel opportunities)

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

Scope 1, Stationary combustion and Mobile combustion: These GHG sources are reduced by Ride Share using the University Shuttle and Carpool, by the decrease of burning of fuels. In addition, the use of bicycles reduces the GHG source.

Scope 1, Fugitive emissions: 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. This will reduce the use air conditioning equipment and accordingly decrease GHG.

Scope 2, Purchased electricity: As for energy, all the new buildings in Abis Campus 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). In addition, the public site lighting poles are powered by solar energy.

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

Alexandria University Program to reduce Electricity consumption from Air Conditioners and electric devices such as Computers, printers, lab apparatus.

1. All newly purchased AC are inverter AC to reduce the electricity consumption.
2. The new electric devices such as Computers, printers, lab apparatus are energy efficient devices.
3. All electronic devices 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

Scope 3, Waste: Alexandria university program to reduce the use of paper and plastic in campus.

- 1) Development of electronic archiving system; the university faculties and the main campus are moving toward the electronic archiving system to reduce paper consumption.
- 2) University decrees to reduce the use of paper in the campus:
 - 2.1: The president decree to use the e-mails for communications inside the campus and between the university main campus and all the other campuses.
 - 2.2: In the situations, the university or any of its faculties need to print the official documents; this has to be on recycled paper (2 faces copy).
 - 2.3: The University formulated a community for administrative reform to minimize the administrative processes and decrease the use of papers except in who are relevant to financial process.
- 3) Digital transformation toward electronic exams to reduce paper consumption.
- 4) Digital transformation toward electronic course to reduce paper consumption and books printing.

5) Electronic administration of student courses by about 50% instead of written administration to reduce paper consumption.

Scope 3, purchased water: The University has applied a strategy in the faculties to decrease water consumption through installation of special parts on water taps, showers, toilette, and bathroom bidet which can conserve about 50% of water consumption. Water saving devices are used instead of traditional devices. For example, the use of a hand-washing faucet with automatic control via a sensor, and high-efficiency bathroom devices. Supplying water taps with water conservation units. Adopting a mechanism to maintain water pipes to prevent waste resulting from leaks.

In addition, a policy for the reduction of purchased water was implemented in Abis Campus 1) 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. 2) Rainwater is collected in the main lake and used for irrigation. 3) 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.

Scope 3, Commuting: These GHG sources are reduced by Ride Share using the University Shuttle and Carpool, by the decrease of burning of fuels. In addition, the use of bicycles reduces the GHG source.

Scope 3, Air travel: The University usually support the travel of Faculty members and student once every two years for attending conferences. Lately, since the covid 19 pandemic, and the increase in air travel Tickets, the support of travel was stopped.

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.

6. All newly purchased AC are inverter AC to reduce the electricity consumption (attached pdf file).
7. The new electric devices such as Computers, printers, photocopiers, surveillance cameras are energy efficient devices (attached pdf file).
8. All electronic devices must be shut down at night, when not used.
9. Regular Maintenance of all devices.
10. 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

SCOPE 1

Electricity produced by renewable energy: $162371.2 * 0.5791$ (conversion factor) = 94029.1619 CO₂ e
Percentage of renewable energy production to the total energy usage /year = $162371.2 / 710664 = 22.847\%$

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>

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Link for Green University:

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

Document prepared by Prof. Sherine Khattab

Statement of the colleges and institutes' consumption of electricity water and paper

No	college or institute	Electricity(kilowatt)	Water(cubic meter)	Gas(cubic meter)	Gasoline(liter)	Diesel(liter)	Paper(package)
1	Faculty of Law	238855	5836	0	1550	1350	3237
2	Faculty of Arts	275000	14030	0	3000	0	4000
3	Faculty of Commerce	7906	19233	0	4884	0	1774
4	Faculty of Science	274701	86361	1293	10000	5000	2000
5	Faculty of Medicine	647408	65605	0	1666	0	7385
6	Faculty of Pharmacy	500101	15436	1034	1820	360	2500
7	Faculty of Engineering	1100585	41871	22	8640	0	4295
8	Faculty of Agriculture	1731321	99534	3700	8710	0	1429
9	Higher Institute of Public Health	97237	1386	0	2000	0	575
10	Faculty of Education	1677	1677	0	2500	2000	2136
11	Faculty of Dentistry	16327	27326	0	1126	245	1335
12	Medical Research Institute	229780	73621	0	750	400	3881
13	Veterinary Medicine	210716	81755	0	2526	2850	500
14	Institute of Graduate Studies and Research	949	8313	-	260	-	650
15	Faculty of Tourism and Hotels	400	3052	0	957.75	0	820
16	Faculty of Fine arts	4842	23451	0	40	0	1124
17	Physical education for boys	455160	89994	0	2500	60	1000
18	Physical education for girls	604725	48209	0	1000	0	899
19	Agriculture of Saba Pasha	174272	11263	1022	210	520	695
20	Faculty of Nursing	242764	22263	0	70	0	2888
21	Faculty of Specific Education	400	3248	0	1000	0	450
22	Faculty of Early childhood education	400	2954	0	3920	0	664
24	University Administration	291115	12880	0	0	0	3674
	Total	7106641	759298	7071	59129.75	12785	47911

adm



Carbon emissions in CO2e for electricity, water and paper

	Value	Conversion factor	CO2e	Scope emissions
Electricity (kilowatt)	7106641	0.591	4200024.8	1 &2
Gasoline(Liters)	59129.75	0.2408	14238.4438	1 &2
Diesel (Liters)	12785	0.3696	4725.336	
subtotal			4218988.58	1 &2
Water (cubic meters)	759298	0.5791	439709.4718	3
Paper (packages)	47911 (*0.75km)= 3533.25 kg	2.8	9893.1	3
subtotal			449602.572	3
Total			4668591.15	

Carbon emissions in CO2e for electricity, water and paper

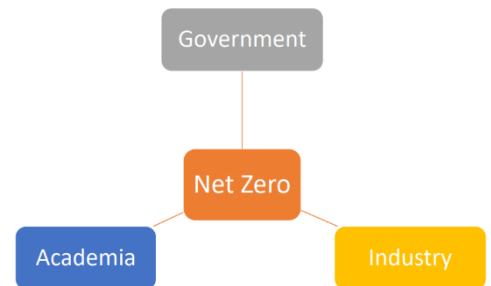
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Paper (packages)	47911 (*0.75km)= 3533.25 kg	2.8	9893.1	3
subtotal			449602.572	3
Total			4668591.15	



A Road Map

Towards Net Zero Emissions through Synergy Between Academia, Government and Industry

- Roadmap Towards Net Zero Emissions
- Alexandria University Climate Change Strategy Map
- Alexandria University Climate Change Projects
 - Green Hydrogen
 - Electric Vehicles
 - Alexandria Water and Energy Services Company (AWESCO)
 - Suez Canal Impact on Shipping Emissions
 - Egypt as an International Energy Hub and Enhancing its Energy Mix
 - Egypt as a World Hub for Electronics Design and Manufacturing
 - Coastal Protection and Flood Management for Alexandria Governorate
 - Alexandria Sustainable Development Center of Excellence (ASD)
 - Alexandria Center for Greener Blue Economy



ALEXANDRIA UNIVERSITY COP27 STRATEGY MAP



Activity 1 SCOPE2

Alexandria University is working with its partners from Academia and industry to transform Kima Fertilizer company to a green company for the production of Ammonia. The hydro power plant technology

Activity 2

Alexandria University is working with its partners from Academia and government and private sectors to develop a powertrain control system to support group transportation buses.

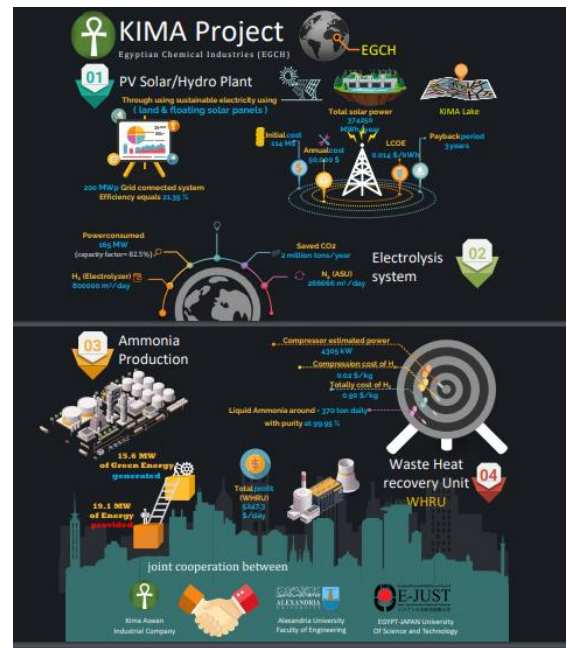
DECARBONIZATION OF THE FERTILIZER INDUSTRY EGYPTIAN CHEMICAL INDUSTRIES - KIMA

- Hybrid renewable energy production from solar power/hydro power.
- Green hydrogen production by water electrolysis.
- Pressurized tank design for green hydrogen storage.
- Green ammonia production from green hydrogen.



Industrial and Academic Partners

Featured In



AN ELECTRIC POWERTRAIN FOR CITY BUS TRANSPORT VEHICLES

- The goal of the project is to develop a configurable powertrain control system that can support different categories of transportation buses.
- The developed powertrain will be used to convert a 12m bus into a fully electric bus.
- The project is sponsored through ITIDA – Ministry of Communications (5 million EGP).
- Project delivery date is February 2023.

Sponsor

Industrial and Academic Partners

Activity 3 SCOPE1

Establishment of an Energy service company owned by Alexandria University to operate in the field of energy and water resources. The company will include members from stakeholders who contribute to the high energy consumption. The main objective of the company is to reduce the carbon footprint and implementing the concept of Energy performance contracting

Mission & Vision

- ✓ To make Egypt's Built Environment & Industry a leading example of Energy Efficiency
- ✓ Help Alexandria to be a Green & Sustainable City
- ✓ Lower the carbon footprint of the Region
- ✓ Introduce and implement the concept of Energy Performance Contracting



Blower Door Model



Combustion Analyzer



Duct Blaster System



Thermal Infrared Camera

Energy Audit Team

Project outlines

Alexandria University is planning to establish an "ESCO" Energy Service Company to operate in the fields of Energy and Water Resources under law 23 y2018

The company will be owned by Alexandria University with members of the board from several reputable stakeholders

Simply define the current energy profile for buildings or industrial activities, propose energy retrofitting techniques with acceptable payback times.


These studies will be used to convince funding agencies to fund the proposed optimization strategies in order to reduce overall energy consumption and carbon footprint and will be paid back by energy savings from utility bills over the time indicated by the study. AWECO will act as the third party for all Energy contracting practices.

Activity 4 SCOPE2


Alexandria University work collaboratively with the Suez Canal Maritime transport to reduce the impact of Suez Canal due to carbon emissions. The main goal of the project is to reduce the emissions nationally and globally.


SUEZ CANAL IMPACT ON THE REDUCTION OF SHIPPING EMISSIONS

- Maritime transport is the backbone of international trade and the global economy.
- Over 80% of the volume of international trade in goods is carried by sea (UNCTAD, 2018).
- Suez Canal is a strategic nexus for global supply chains and among the world's most significant trade chokepoints.
- 18,880 vessels passed via SC in 2019 with a total deadweight of about 1 billion tons.
- That represents about 10% of the world's trade volume passed via SC.
- The distance saved reached about 10,000 miles (18,000 Km) on certain voyages which contributes to immense fuel and emission savings, in addition to the contribution to the global economy.



Industrial and Academic Partners





Activity 5: Energy Hub SCOPE1

Alexandria University is working nationally to establishing Egypt as an international energy hub to secure energy from multiple sources. The main aim is to reduce emissions and logistics of energy transportation.

EGYPT AS AN INTERNATIONAL ENERGY HUB AND ENHANCING ITS ENERGY MIX

International Energy Hub

- › Establishing Egypt as an international energy hub between the current producers in Asia and the industrialized countries in Europe to reduce the costs, emissions and the logistics of energy transportation.
- › Securing energy for Egypt from multiple sources.
- › Trade income.
- › Increased ship movement with possible addition of services
- › Effective utilization of Egypt LNG resources (2 plants)

Enhancing Egyptian Energy Mix

- The future energy strategy should be based on a balanced energy mix of all sources of energy.
- Innovation and Investment into reducing the harmful emissions from fossil fuels to make them cleaner.
- Efficiency of existing energy systems should be increased by a combination of technological solutions, improvement of building codes and implementation of regulations and effective audits

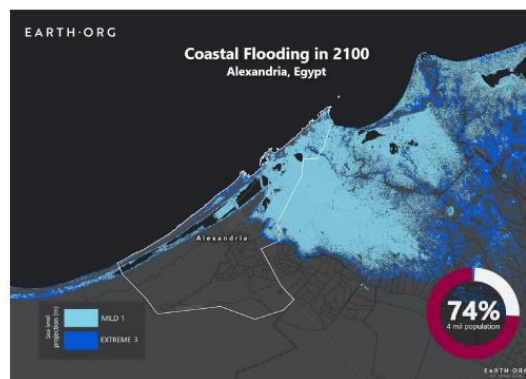
Activity 6 Coastal Hazards SCOPE3

A Road Map for

1)creating a reliable risk assessment map for

Alexandria that involves identifying the study area along the coastline of Alexandria, 2)Providing the local authorities and policy makers with updated data for the vulnerable areas subjected to flooding. 3) Accurate prediction and enabling readiness facing sea-level-rise under extreme events. 4) Increase the public awareness of the sea-level-rise and extreme events. 5) Preparing a hydrodynamic model resulting in selection of the appropriate needed coastal and shoreline protection structures. 6) Use of permeable pavement to reduce the risk of flood in a pilot area in Alexandria

CLIMATE CHANGE AND ITS EFFECT ON ALEXANDRIA DUE TO SEA LEVEL RISE



- Several studies conducted regarding the vulnerability of Alexandria Governorate, indicated that in the event of a rise in sea level of half a meter, it is expected that 30% of the city will be inundated, which will lead to displacement of nearly 1.5 million people or more, 195,000 jobs will be lost, and land and property losses estimated to be \$30 trillion.
- Results of 0.5m SLR scenario in Alexandria predicted losses of 45% of recreational areas, 13% of residential area, 12% of industrial area, 30 % of the services, and 21% of tourism attractions, if no precautionary actions are taken.

Activity 7. SCOPE3 Building Materials, Construction, Infra Structure, Industry, Energy & Resources

Aims to : Provide a hub to cooperate with relevant industry, & research entities to provide access & dissemination of needed knowledge & practices & adaptation of appropriate technologies.

- o Partner with government, industry to help overcome resourcing challenges, towards greener technologies & sustainable strategies.

Stakeholders: Manufacturing companies of cement, concrete, steel, ceramics, bricks, asphalt; petro-chemicals, fertilizers, gases, textiles, paper...etc.

- o Building & construction sector.
- o Transportation & energy sectors.
- o Ministries, government agencies & code development entities

ALEXANDRIA SUSTAINABLE DEVELOPMENT CENTER OF EXCELLENCE (ASD)
 Green Campus – Alexandria University



SOLE
High Energy efficiency for the public stock Buildings in Mediterranean



Project funded by the
EUROPEAN UNION

Industrial and Academic Partners






Establishment of a 200 kW solar power plant in the Faculty of Engineering – Alexandria University

Activity 8 SCOPE3: Alexandria centre for greener blue economy

ALEXANDRIA CENTER FOR A GREENER BLUE ECONOMY

THE BLUE ECONOMY



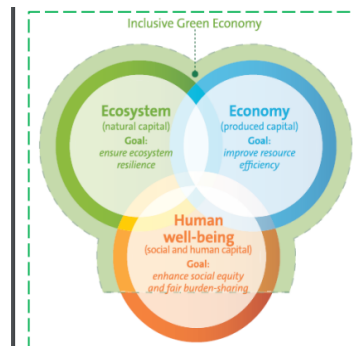
Blue Economy - Definition

Sustainable use of ocean, sea and river resources for:

- o Economic growth.
- o Improved livelihoods.
- o Job creation.
- o Mitigation of the impacts of climate change.
- o Meeting the food needs of a growing global population.

Blue Economy - Challenges

- o Frequent flooding.
- o Marine pollution.
- o Lack of trained personnel.
- o Over-exhaustion of resources.
- o Lack of regional cooperation.



Green Economy - Definition

Low carbon, resource efficient and socially inclusive economy in which growth is driven by investment in:

- o Infrastructure and assets that allow reduced carbon emissions and pollution.
- o Enhanced energy efficiency.
- o Prevention of the loss of biodiversity and ecosystem services.

Blue Economy vs Green Economy

- o Green economy tends to focus on sectors of energy and transport, while blue economy tends to focus on marine and coastal resources.
- o Both incorporate climate change mitigation and adaptation strategies.
- o Regional cooperation in implementation of both types of economies would lead to prosperity growth for all countries involved while preserving their resources.

Vision

Towards a greener blue economy for the benefit of the citizens of all Mediterranean countries

Center Services



Research	Training	Consultation
-----------------	-----------------	---------------------

Mission and Goals

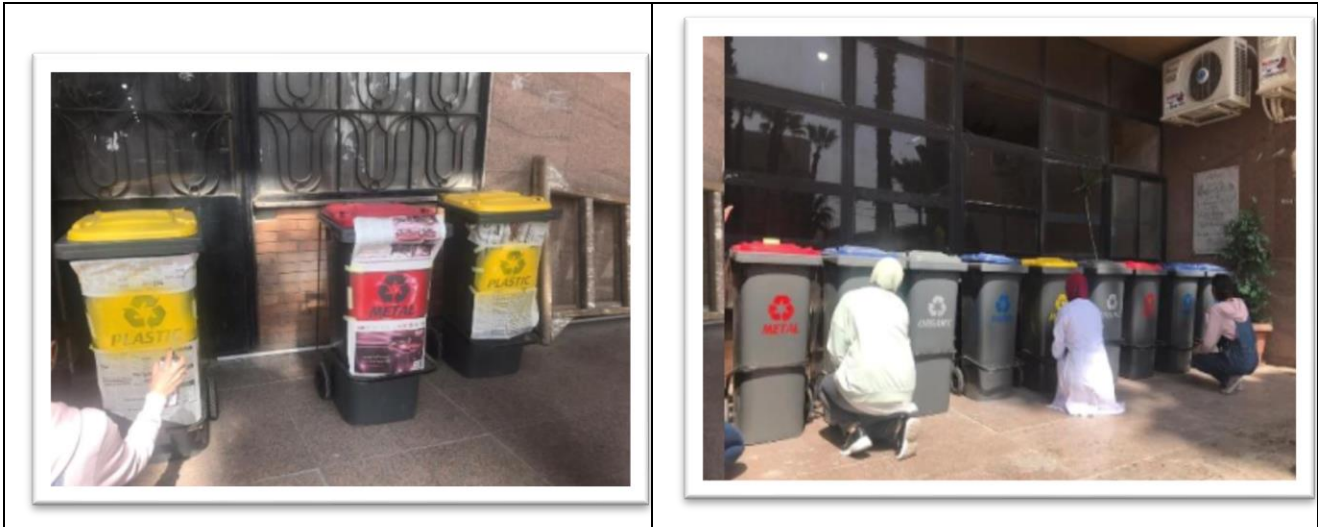
- o Conduct studies about the challenges of merging green economy requirements into blue economy applications.
- o Offer solutions to assist in the development and sustainability of resources that comply with standards of efficiency, effectiveness and prosperity.
- o Achieve just distribution of wealth among successive generations of our region.
- o Formulate strategies to mitigate and adapt to the negative effects of climate change and reduce the emission of greenhouse gases.
- o Incorporate cultural, civilizational and social aspects within the sustainable blue economy strategies.

- o Ten scholarships offered by Alexandria University to graduate students from the Mediterranean Region.
- o Scholarships to be also offered by partner Euro-Mediterranean Universities.
- o Strategic partnership with ASCAME and scholarship offering with scheduled start date of Spring 2023.

Strategic Partners

1 Waste recycling



Recycling Program for University Waste (Alexandria University, Egypt)



Recycling of plastic waste at the Faculty of Science (Alexandria University, Egypt)

Description:

Alexandria University developed the initiative of "separating and recycling waste", which aims to protect the environment, maintain the cleanliness of colleges and develop environmental awareness within the framework of the concepts of green economy and sustainable development to achieve the vision of Egypt 2030.

1-The University applied a strategy in all its faculties to segregate the waste into special containers for plastic, papers, glass, and metal objects.

2- The University set an initiative for waste recycling in all faculties with a set of labeled containers for waste segregation distributes in each faculty.

3- The University set initiative for increasing the awareness about Purchase Recycled Products: It is important to buy products made from recycled materials to strengthen the market for recyclables.

4-The University developed an initiative with the governorate (Alexandria Youth alliance) to participate with us in waste management initiative.

5-The University has a contract with Nahdet-Misr Company (the official company in the governorate for waste disposal) for collection and recycling.

6- The University is trying to develop an initiative as a student project with Titan® Company for manufacturing of MDF sectors using university collected waste for maximal benefit from this waste.

7- University students at the Faculty of Science initiated a student project for plastic recycling.

Our recycling program aims to recycle waste by separating it from the source into:

- Organic waste and food residues.
- Plastic waste and plastic bags .
- Mineral waste and carbonated water cans.
- Paper waste

This allows the recycling and utilization of as much of the waste as possible instead of disposing of it in landfills, which will eventually lead to its burning and the consequent pollution of the environment and the increase in emissions of greenhouse gases. Our university promotes maintaining the campus environment in clean condition using high quality non-toxic detergents and cleaning materials.

Reduction of Paper and Plastic use on Campus



Program for separation of Paper, Plastic, aluminum cans, glass and organic waste in Campus (Alexandria University, Egypt)

Plastic recycling machine at the Faculty of Science (Alexandria University, Egypt)

Program 1: Development of electronic archiving system; the university faculties and the main campus are moving toward the electronic archiving system to reduce paper consumption.

Program 2: University decrees to reduce the use of paper in the campus:

2.1: The president decree to use the e-mails for communications inside the campus and between the university main campus and all the other campuses.

2.2: In the situations, the university or any of its faculties need to print the official documents; this has to be on recycled paper (2 faces copy).

2.3: The University formulated a community for administrative reform to minimize the administrative processes and decrease the use of papers except in who are relevant to financial process.

Program 3: Digital transformation toward electronic exams to reduce paper consumption.

Program 4: Digital transformation toward electronic course to reduce paper consumption and books printing.

Program 5: Electronic administration of student courses by about 50% instead of written administration to reduce paper consumption.

Additional evidence link:

<https://www.alexu.edu.eg/index.php/en/community-development-and-environmental-affairs/6435-alexandria-university-initiative-to-separate-and-recycle-waste>

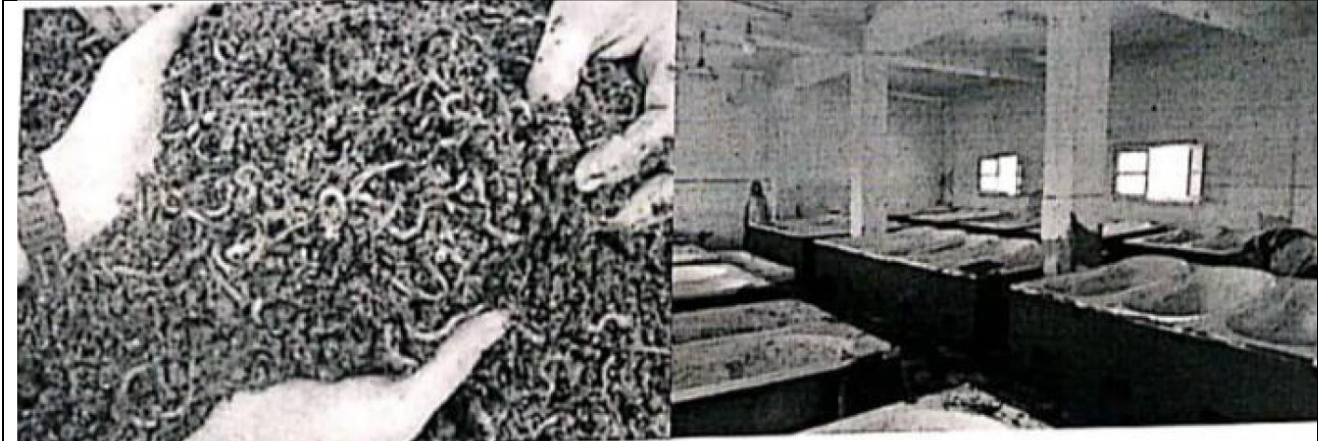
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3. Reduction of Organic Waste Treatment



Leaves and organic waste were treated for the vermi-compost to produce organic fertilizers to use in the Campus gardens (Alexandria University).



The Faculty of Agriculture recycles 100% of its organic waste (Alexandria University).

Description:

1- The strategy of the Faculty of Agriculture for the recycling of organic waste:

The Faculty of Agriculture recycles 100% of its organic waste through the following procedure:

- Utilization of the treated agricultural byproducts in farm animals feeding.
 - Utilization of the treated agricultural byproducts for the vermi-compost to produce organic fertilizers.
 - Utilization of the treated agricultural byproducts through a special insect (black soldier) to produce organic fertilizers and protein sources.
 - Mass production of active Biochar from agricultural waste to remove any water impurities or pesticides residues.
- 2- The organic waste in Alexandria University is handled according to the contract with Nahdet Misr company. All organic wastes are collected in organic waste containers. Then the company collects these waste bags and delivers it to waste treatment facility for processing.
 - 3- In addition, the University students at the Faculty of Science initiated a student project for organic waste recycling. Leaves and organic waste were treated for the vermi-compost to produce organic fertilizers to use in the Campus gardens (Alexandria University).

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4. Inorganic Waste Treatment



Recycling Program for both materials and equipment with metals and derivatives (Alexandria University, Egypt)

Description:

5. Disposal of Inorganic Waste

The University follows the Egyptian laws associated with disposal of hard materials waste No. (6) for the year 2009 and No. (9) for the year 1982 concerning with environment protection. Alexandria University has a yearly contract with **Alexandria Governorate Hazardous Waste Management (NASERIA)** for the disposal of Inorganic Waste (attached a copy of the Contact).

1- In general the hard material waste in the University is divided into two types including:

- **Non-medical waste:**

Products which are collected and stored in a far place in the faculties which are then removed to a general dump for recycling.

Heavy metal: Heavy metal waste consists of both materials and equipment with metals and derivatives.

Examples: Batteries, amalgam, broken mercury thermometers.

- **Medical waste:**

Medical waste consists of several different subcategories that should all be dealt with in the same way:

Potential infectious waste includes all waste items that are contaminated with or suspected of being contaminated with body fluids.

Examples include:

Blood and blood products, used catheters and gloves.

2. Inorganic Wastes are collected in separate containers labelled for inorganic waste. The garbage bags are collected daily by Nahdet Misr company for processing.
3. Batteries and other E-wastes are collected separately inside Alexandria University Campus and are delivered for special treatment by Nahdet Misr company. The E-Material are never trashed into a regular trash.

6. Recycling of Solid and Electronic Waste in the Faculties and Institutes of Alexandria University

According to the decision of Alexandria University to transfer all solid waste to institutes, colleges, hospitals and university cities of the University at the Agricultural Research and Experiments Station in Abis as a central storehouse for the collection of iron priests (Wood - Iron - Alumetal - Computers - Projectors - Photocopiers - Printers - Fire Extinguishers - Doors - windows - wires, lighting poles, electric panels.....etc.), which are considered valuable solid waste worth recycling.

Recycling of solid waste is a good investment project, and with the increase of environmental awareness worldwide, the demand of recycled materials will rise. Alexandria University can save production and energy costs and reduce the negative impacts that the extraction and processing of virgin materials has on the environment.

Recycling old devices saves energy. It also means that fewer raw materials need to be drawn from nature to create new devices. Reusing old devices prevents e-waste by keeping it out of landfills.

The environmental aspect: The process of recycling solid and electronic waste mainly contributes to reducing the percentage of pollution of all kinds, by reducing the accumulation of waste, which contribute greatly in pollution of the environment due to the release of polluting gases and toxic elements in the air, water, and land. The process of recycling solid and electronic waste contributes in reducing the impact of human activity on the planet Earth.

Economic aspect: The process of recycling solid and electronic waste play an important role in the reduction of economic expenditures, helping countries to meet the challenges related to the high prices of raw materials such as oil and coal. Recycling reduces the reliance on the export of the primary resources of many industries, thus reducing the cost of production. Which result in lower bill of taxes, customs duties, insurance premiums, transportation. On the other hand, the recycling process helps in reducing the consumption of natural raw materials used in different industries. Accordingly, the Energy consumption for manufacturing and production processes will be reduced.

The disposal Program

- A specialized committee is selected including a member from the Engineering Department, according to the devices or tools under investigation.

- In case the devices are not useful, the committee recommends that the items will be transferred to the Agricultural Research and Experiments Station in Abis.
- Recycling warehouses are divided into sections according to the type of materials being recycled, for example: Calculators, printers, wood, Aluminum, etc
- Working teams are selected from the university faculties' maintenance units to benefit from these solid and electronic waste.
-

Additional evidence link: Maintenance Unit for lab apparatus and electronics:

https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5912&catid=21&lang=ar-AA

7.Toxic Waste Treatment



Description:

The biohazards, medical hazards, and toxic chemical compounds are handled by a **special contract** with **Nahdet Misr for Modern Environmental services** company, which process these wastes according to the Egyptian law number 6 for year 2009 and low number 9 for year 1982. (attached Contract copy)

- **Medical waste:**
Medical waste consists of several different subcategories that should all be dealt with in the same way:
Potential infectious waste includes all waste items that are contaminated with or suspected of being contaminated with body fluids.
Examples include:
Blood, blood products, used catheters and gloves.

8.Sewage Disposal



The sewage water will be treated and reused in the irrigation of green areas in the project (Alexandria University)



The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm.

Description:

Elements of Green Building Implementation as Reflected in all new construction and renovation policies in the new buildings in Abis campus:

- The area of the project is 160 acres, 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.
- 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.

Sewage Disposal and recycling

- Providing a sewage treatment plant at the university to make it suitable for irrigating green areas and gardens inside the university campus.
- The irrigated water supplied to the fish farm at the Agriculture Experimental Research Station of the Faculty of Agriculture is recycled to irrigate the crops, vegetables, and fruits of the land farm. The recycled water is rich with natural fertilizers and enhances the crops production.
- In addition, the water recycling in Fish Aquaculture of the Faculty of Agriculture, Alexandria University: The water sewage of the Aquaculture of the Faculty of Agriculture, Alexandria University which consist of eight ponds (one acre and quarter/each) in Abis region. Alexandria University used the recycled water for crops culturing in the adjacent agriculture research center in Abis.
- The use of biochar produced from Agricultural waste and waste Forests in residual removal chlorpyrifos pesticide Imidacloprid is from water agricultural drainage. Cooperation project between the Egyptian Academy of Research Science and Technology and the Czech Academy of Sciences.

Additional evidence link

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

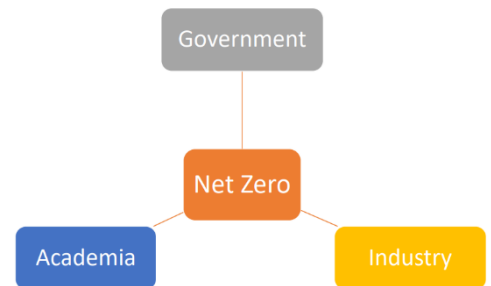
Document prepared by Prof. Sherine Khattab



A Road Map

Towards Net Zero Emissions through Synergy Between Academia, Government and Industry

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- Alexandria University Climate Change Projects
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ALEXANDRIA UNIVERSITY COP27 STRATEGY MAP



Activity 1 SCOPE2

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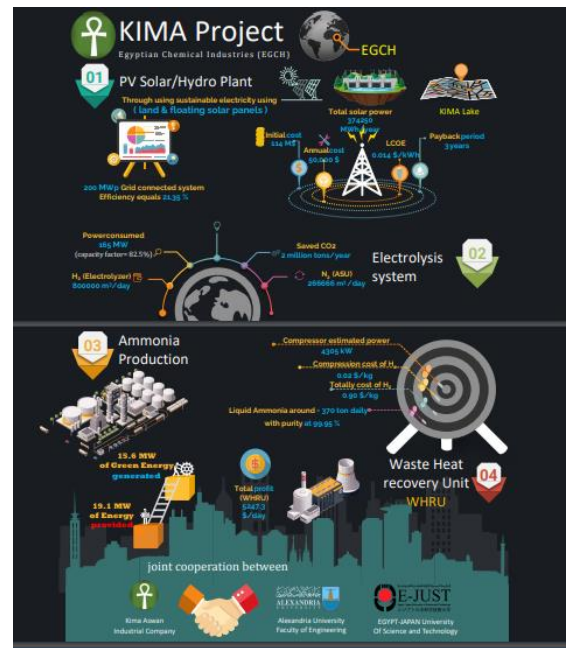
DECARBONIZATION OF THE FERTILIZER INDUSTRY EGYPTIAN CHEMICAL INDUSTRIES - KIMA

- Hybrid renewable energy production from solar power/hydro power.
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Industrial and Academic Partners

Featured In



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- The developed powertrain will be used to convert a 12m bus into a fully electric bus.
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Sponsor

Industrial and Academic Partners

Activity 3 SCOPE1

Establishment of an Energy service company owned by Alexandria University to operate in the field of energy and water resources. The company will include members from stakeholders who contribute to the high energy consumption. The main objective of the company is to reduce the carbon footprint and implementing the concept of Energy performance contracting

Mission & Vision

- ✓ To make Egypt's Built Environment & Industry a leading example of Energy Efficiency
- ✓ Help Alexandria to be a Green & Sustainable City
- ✓ Lower the carbon footprint of the Region
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Blower Door Model



Combustion Analyzer



Duct Blaster System



Thermal Infrared Camera

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Simply define the current energy profile for buildings or industrial activities, propose energy retrofitting techniques with acceptable payback times.


These studies will be used to convince funding agencies to fund the proposed optimization strategies in order to reduce overall energy consumption and carbon footprint and will be paid back by energy savings from utility bills over the time indicated by the study. AWECO will act as the third party for all Energy contracting practices.

Activity 4 SCOPE2



Alexandria University work collaboratively with the Suez Canal Maritime transport to reduce the impact of Suez Canal due to carbon emissions. The main goal of the project is to reduce the emissions nationally and globally.

SUEZ CANAL IMPACT ON THE REDUCTION OF SHIPPING EMISSIONS

- Maritime transport is the backbone of international trade and the global economy.
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Industrial and Academic Partners

Activity 5: Energy Hub SCOPE1

Alexandria University is working nationally to establishing Egypt as an international energy hub to secure energy from multiple sources. The main aim is to reduce emissions and logistics of energy transportation.

EGYPT AS AN INTERNATIONAL ENERGY HUB AND ENHANCING ITS ENERGY MIX

International Energy Hub

- › Establishing Egypt as an international energy hub between the current producers in Asia and the industrialized countries in Europe to reduce the costs, emissions and the logistics of energy transportation.
- › Securing energy for Egypt from multiple sources.
- › Trade income.
- › Increased ship movement with possible addition of services
- › Effective utilization of Egypt LNG resources (2 plants)

Enhancing Egyptian Energy Mix

- The future energy strategy should be based on a balanced energy mix of all sources of energy.
- Innovation and Investment into reducing the harmful emissions from fossil fuels to make them cleaner.
- Efficiency of existing energy systems should be increased by a combination of technological solutions, improvement of building codes and implementation of regulations and effective audits

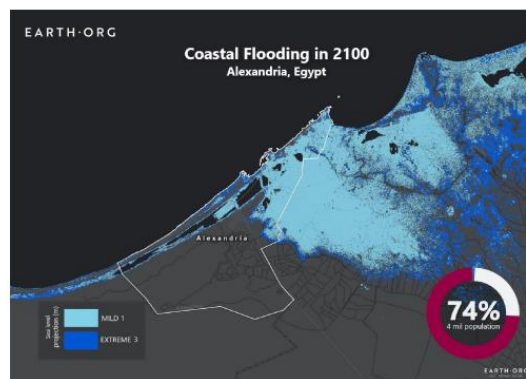
Activity 6 Coastal Hazards SCOPE3

A Road Map for

1)creating a reliable risk assessment map for

Alexandria that involves identifying the study area along the coastline of Alexandria, 2)Providing the local authorities and policy makers with updated data for the vulnerable areas subjected to flooding. 3) Accurate prediction and enabling readiness facing sea-level-rise under extreme events. 4) Increase the public awareness of the sea-level-rise and extreme events. 5) Preparing a hydrodynamic model resulting in selection of the appropriate needed coastal and shoreline protection structures. 6) Use of permeable pavement to reduce the risk of flood in a pilot area in Alexandria

CLIMATE CHANGE AND ITS EFFECT ON ALEXANDRIA DUE TO SEA LEVEL RISE



- Several studies conducted regarding the vulnerability of Alexandria Governorate, indicated that in the event of a rise in sea level of half a meter, it is expected that 30% of the city will be inundated, which will lead to displacement of nearly 1.5 million people or more, 195,000 jobs will be lost, and land and property losses estimated to be \$30 trillion.
- Results of 0.5m SLR scenario in Alexandria predicted losses of 45% of recreational areas, 13% of residential area, 12% of industrial area, 30 % of the services, and 21% of tourism attractions, if no precautionary actions are taken.

Activity 7. SCOPE3 Building Materials, Construction, Infra Structure, Industry, Energy & Resources

Aims to : Provide a hub to cooperate with relevant industry, & research entities to provide access & dissemination of needed knowledge & practices & adaptation of appropriate technologies.

Stakeholders: Manufacturing companies of cement, concrete, steel, ceramics, bricks, asphalt; petro-chemicals, fertilizers, gases, textiles, paper...etc. o Building & construction sector. o Transportation & energy sectors. o Ministries, government agencies & code development entities

Activity 8 SCOPE3: Alexandria centre for greener blue economy

ALEXANDRIA SUSTAINABLE DEVELOPMENT CENTER OF EXCELLENCE (ASD)
Green Campus – Alexandria University



SOLE
High Energy efficiency for the public stock Buildings in Mediterranean



Project funded by the EUROPEAN UNION

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ALEXANDRIA CENTER FOR A GREENER BLUE ECONOMY

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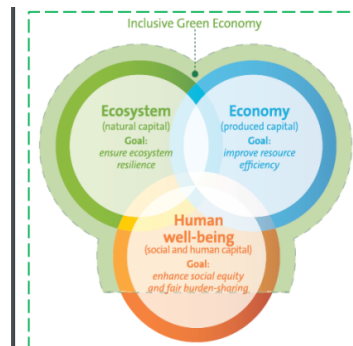
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Sustainable use of ocean, sea and river resources for:

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Blue Economy - Challenges

- o Frequent flooding.
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Low carbon, resource efficient and socially inclusive economy in which growth is driven by investment in:

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Blue Economy vs Green Economy

- o Green economy tends to focus on sectors of energy and transport, while blue economy tends to focus on marine and coastal resources.
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Vision

Towards a greener blue economy for the benefit of the citizens of all Mediterranean countries

Mission and Goals



- o Conduct studies about the challenges of merging green economy requirements into blue economy applications.
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Center Services

Research	Training	Consultation
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Strategic Partners

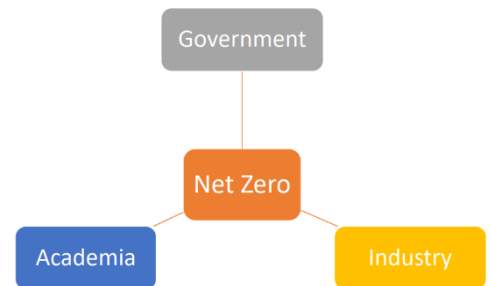





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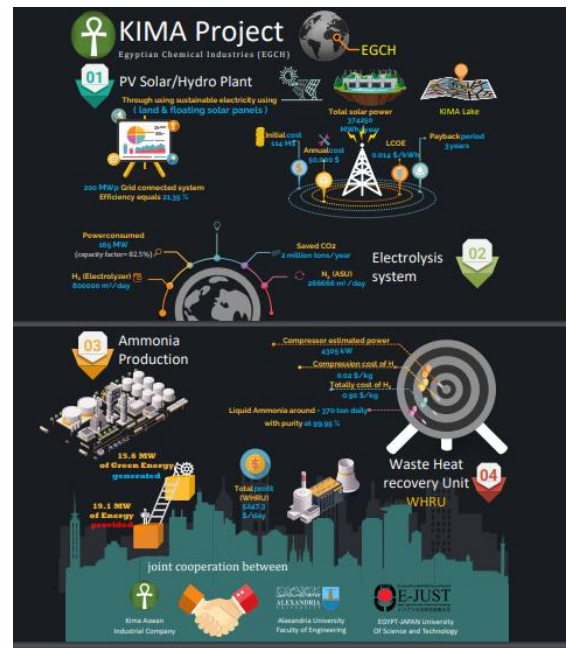
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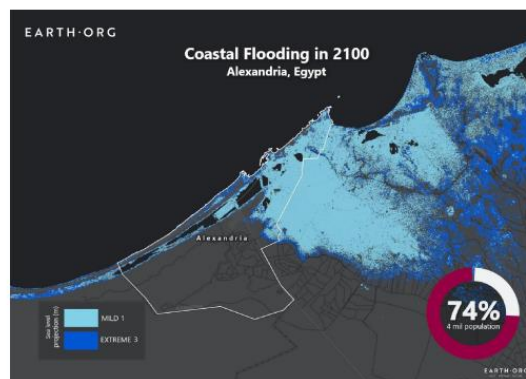
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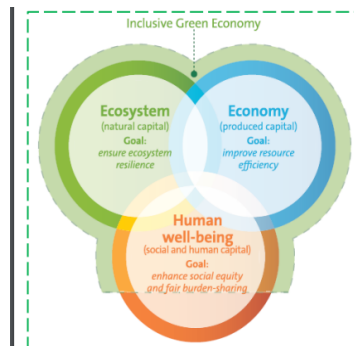
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Strategic Partners

Alexandria University participates in the Forum of Activities and Events of Egyptian Public Universities to Confront Climate Change 2022

Under the patronage of Dr. Ayman Ashour, Minister of Higher Education and Scientific Research, and the Supreme Council of Universities, Alexandria University participated in the Forum of Activities and Events of Egyptian Public Universities to Confront Climate Change 2022.

Prof. Konsowa, the President of Alexandria University, indicated that the university participated in the forum's work with a set of research topics in the field of climate change and relevant applied projects, including:

- uses of green hydrogen and green ammonia in the fertilizer industry,
- establishment of a company for energy and water services, and
- localization of the electric car industry in Egypt.
- role of the Suez Canal in reducing carbon emissions at the global level,
- establishment of the Alexandria University Center for the blue-green economy,
- the role of Egypt as a regional center for energy and the establishment of the Alexandria University Center for Sustainable Development.



Prof. Konsowa added that that the forum discussed the main all axes of climate change issues and its impacts on various sectors in Egypt and the world as well as the mechanisms of adaptation and mitigation, stressing on the need for cooperation and support for scientific research in various environmental fields to confront the negative effects of climate change.

AS a side event events, the minister inspected the exhibition section forum, which contains models of applied projects from Egyptian public universities related to the axes of climate change, and miniature models of scientific research outputs from public universities in the areas of facing climate changes and natural sustainability, as well as applied research posters from public universities. Linked to the axes of climate change.

The recommendations of the forum were as follows:

- The Universities Forum to be held periodically in the presence of industry sector and civil society to facilitate partnerships based on directing innovation in the fields of green industries and the green economy.
- Preparing a document to combat climate change that includes all Egyptian universities. The document includes general strategic lines to assist universities in drawing a clear roadmap to provide solutions to limit or adapt to climate changes.
- Establishing companies specialized in energy and water in Egyptian universities.
- Establishing an observatory and a unified database at the level of Egyptian universities to follow up the international and local publication of research in the areas of climate change, activating the national strategy for property rights and encouraging patents in this field
- Establishing a national centre for integrated studies in the field of climate change.
- Strengthening early warning systems and forecasting climate changes to reduce their risks and help develop plans to confront them.
- Motivating Egyptian universities to promote and improve the educational environment to keep pace with fourth-generation universities and create an atmosphere that contributes to creativity and innovation.
- Encouraging researchers to conduct applied scientific research in the areas of climate change.
- Creating a green environment within the university community.
- The necessity of establishing a sustainability centre in each university.
- Follow on with the project of protecting Egyptian antiquities.
- Establishing cooperation protocols between Egyptian public universities and the Egyptian Association for the Protection of Beaches.
- Maximizing the utilization of industrial, agricultural, animal and solid waste.
- Maximizing the utilization of rice straw in the production of weather-resistant plastic lumber.
- Promote the development of varieties of crops that are resistant to climatic fluctuations.
- Adopting a national project to study and document the genetic diversity of wild plants that are threatened with extinction.
- The trend towards expanding the use of new and renewable energy sources, the use of organic farming systems, and the use of scientific innovations to reduce carbon emissions.
- Launching a number of initiatives, competitions and exhibitions to increase the dissemination of environmental awareness and ecotourism.
- Implementation of projects for harvesting and storing water and artificial recharge to charge groundwater in areas suitable for water harvesting.
- Converting lighting poles in universities and streets to the use of moving solar cells for lighting
- Adopting of the project idea to popularize the cultivation of jojoba plants on a large scale.
- Developing smart systems that work on a mobile application to regulate the charging of electric cars on the highways in Egypt.
- Interest in developing innovation in the field of energy storage and linking it to renewable energy systems.
- Using innovative technologies to desalinate brackish sea water based on renewable energy.



“Carbon Footprint of Alexandria University”

(2020 / 2021)

Over the past few years, the interest in global warming and climate change has increased being significantly one of the dangers facing human life and the Earth's ecosystems because of its impact on the basic elements of life:

- ✓ Production of food and water and the impact on public health.
- ✓ Use of physical and natural capitals.
- ✓ The social consequences that may affect human well-being and impede progress and economic growth for our present and future generations.

Consequently, countries and people have realized that the time has come to work towards facing these challenges and trying to mitigate the effects of climate change.

Since the late 1990s, due to the emissions of greenhouse gases from human production and consumption activities, the term “Ecological Footprint” has become popular, from which the term “**Carbon Footprint**” was later derived, which describes the rate of carbon dioxide emission at various levels (e.g. individuals, institutions, factories and even countries), and it is usually expressed in ton of carbon dioxide emissions per year (CO₂ Ton/Year).

This indicator sheds light on the impact of human activities on the environment, specifically on climate change, which infers the negative contribution to increasing environmental loads.

Carbon footprint is measured in order to:

1. Evaluate the institution by comparing the environmental services provided with the level of demands on the biosphere, in order to save natural resources.
2. Encourage decision makers and individuals to incorporate environmental care into their daily practice to maintain a healthy and sustainable environment for a long time.

3. The carbon footprint has the ability to transform sustainability from a vague concept into a measurable goal, which is a global approach that seeks to preserve the environmental resources available to the individual from excessive consumption.

The "Sustainable Development Strategy: Egypt's Vision 2030" represents an essential station in the comprehensive development process in Egypt and is intended to improve the quality of life at the present time without prejudice to the rights of future generations to a better life. Accordingly, Egypt was one of the countries that signed the climate agreement established in Paris during the year 2015, which entered into force at the beginning of the year 2020, and thus it became necessary for Egypt to confront climate change and reduce the effects of rising temperatures by reducing the quantities of gases emitted and causing global warming to levels that can be plants, trees, soil and oceans can absorb it naturally.

Although the percentage of Egypt's contribution to global emissions of greenhouse gases is small, it has become significantly increased over the past few decades. Reports of international organizations and bodies issued during the past few years indicated that Egypt is among the most vulnerable countries in the world to the effects of climate change in the Mediterranean region. As a result, Egypt is expected to suffer from a shortage of water quotas, drought and a lack of crops productivity, increasing desertification, rising sea levels, losses in tourism resources, and so on.

The increased demand for water combined with the possibility of a decrease in the total flow of the Nile makes agriculture particularly vulnerable to climate change. Furthermore, since most of Egypt's agriculture takes place in the Nile Delta, which lies below sea level and along the Mediterranean coast, sea level rise has the potential to affect crops and their productivity. High salinity water is more likely to infiltrate the delta, which could render existing croplands unsuitable for production and significantly affect fisheries in lakes in and around the delta. Higher temperatures and changing rainfall patterns would have different effects on primary crops in Egypt. For example the yields of crops such as wheat,



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rice, maize and citrus may decrease between 10-20 % by changing the incidence of plant pathogens due to changing rainfall patterns and high temperatures, and this negatively affects local production, which is estimated at 12% of the total production.

Based on these facts, **Alexandria University**, as an effective public educational institution, is keen to perform its duty towards the local environment and believing in its responsibility towards achieving the state's vision (Egypt Vision 2030 for Sustainable Development). In this view, Alexandria University has took the initiative to work on reducing carbon emissions as one of the most important sources of greenhouse gases and has implemented a plan to record and calculate the first "**Carbon Footprint Report 2018 / 2019**" in its various colleges and administrative buildings as one of the forms of contribution in determining vision and decision-making.

This year (2020/2021), a comparison of total CO₂ emission of faculties and institutes to that of the first carbon footprint report (2018/2019) has been made as follows:

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Faculty/Institute	The total carbon footprint (2018/2019)	The total carbon footprint (2020/2021)
University Administration Building	186.2	NA
Faculty of Arts	66.46	235.887
Faculty of Commerce	47.29	412.128
Faculty of Education	27.048	21.807
Faculty of Medicine	13731.52	1817.232
Faculty of Dentistry	69.278	705.702
Faculty of Engineering	521.076	693.748
Faculty of Agriculture	4875.12	1326.267
Faculty of Pharmacy	394.462	318.059
Faculty of Science	749.7	317.362
Faculty of Nursing	169.912	122.79
Faculty of Veterinary Medicine	106.611	186.221
Higher Institute of Public Health	20.616	12.646
Medical Research Institute	203.7	555.478
Institute of Graduate Studies and Research	21.629	10.92
Faculty of Physical Education for girls	543.296	277.671
Faculty of Physical Education for boys	1679.1	214.835
Faculty of Specific Education	15.866	12.069
Saba Pasha Faculty of Agriculture	214.748	92.785
Faculty of Education for Early Childhood	13.403	33.4747
Faculty of Fine Arts	126.219	22.654
Faculty of Tourism and Hotels	47.420	9.924
Faculty of Economic studies & Political Science	26.313	NA
Faculty of Law	290.969	141.668

Total footprint calculation in Faculties and Institutes of Alexandria University	24148 CO₂e	7541.33 CO₂e
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This report came out as a result of the concerted efforts of the academic community of Alexandria University during the academic year 2018-2019 in collecting, analyzing and editing this report in accordance with international standards and controls for carbon footprint calculations.

In order to allocate the specific position of Alexandria University regarding the extent of its contribution to carbon emissions among similar institutions, it was necessary for to compare these emissions with other universities around the world.

University	Last Carbon Footprint Report	Carbon Footprint Total value
American University in Cairo (AUC)	2018	42,989
Cape Town University (Republic of South Africa)	2018	75,187
Arizona University (USA)	2017	258,088
Alexandria University (Egypt)	2018	24,148
Alexandria University (Egypt)	2020	7541.33

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2.11 Total carbon footprint (CO₂ emission in the last 12 months, in metric tons)

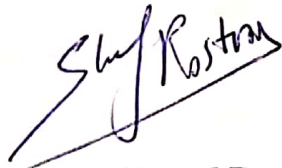
7541.33 metric tons

Justification: Due to the covid-19 pandemic, a lot of activities - consuming energy and increasing the carbon footprint- were cancelled, or replaced by an electronic alternative, thus decreasing the resultant total carbon footprint for the year (2020/2021) in comparison to (2018/2019).

2.12 Total carbon footprint divided by total campus population (metric tons per person)

7541.33 / 212403 = 0.0355

Vice Dean of Community Service and Environment Development
Faculty of Pharmacy – Alexandria University



Prof. Sherif Ahmed Rostom



Climate Action Strategy of Alexandria University

Egypt's National Climate Change Strategy 2050 – launched on the sidelines of [the United Nations Conference of the Parties on Climate Change \(COP26\)](#) in Glasgow – targeted five main objectives, including:

- realizing sustainable economic growth through cutting emissions of various sectors,
- promoting use of new energy resources,
- producing energy from waste and
- using alternative energy like green hydrogen.

Alexandria university : A Green University

Believing in the pioneering role of Alexandria University in changing many societal and environmental beliefs and practices that could negatively affect climate changes and carbon emissions, and in the belief of the Egyptian leadership in the importance of universities' commitment to participate in developing environmentally friendly infrastructure, arranging universities according to sustainable development processes and adherence to green environment standards. It was important to have a proposal that fits the nature of the environment and Alexandria University more accurately.

This proposal has been prepared as part of the community service and environmental development sector initiative towards the implementation of the state's general policies that were launched by the necessity of sustainability and the role of universities in preserving the green environment through the university's unity and activities and the product of scientific research and its application.

As this proposal adopts the implementation of the goals of the United Nations to achieve true sustainable development, whether for the university community or the surrounding community, in line with Egypt's 2030 Sustainable Development Plan and in accordance with the recommendations of the United Nations on the necessity of campus sustainability.

Whereas, the sustainability measure for green universities is concerned with environmentally friendly green universities and depends on 10 basic axes that represent the basic concepts of the principles of preserving the environment, sustainability, environmentally friendly infrastructure and standards for both energy, climate exchange, waste management, water management, internal transport, environmental quality, and sustainability compliance with environmental laws and legislation.

The proposal includes a set of integrated standards on strategies, tools and resources that the university should adopt and use in order to achieve the principle of sustainability. And also to bring about a positive change in the environmental aspect on the university campus by emphasizing the achievement of sustainability in university buildings, by taking the necessary measures to reduce environmental impacts and work to reduce the negative environmental footprint of Alexandria University and raise the positive environmental footprint of the university.

Whereas, the green economy in the context of sustainable development is one of the important tools available to achieve the areas of development, and the green economy contributes to eliminating waste of resources, achieving economic growth, promoting social inclusion, improving human conditions, creating job opportunities and providing decent work for all. At the same time, concern for the continuation of the planet's ecosystems in the proper performance of their functions, and a clear

understanding of the interdependence between environmental sustainability and good political practices and effective institutional mechanisms, so that this will be decisive criteria for setting an effective national policy and making a fundamental contribution to the international efforts to achieve sustainable development.

Objectives :

- Contributing to spreading the culture of sustainability in Egyptian universities.
- To contribute to making the buildings of Alexandria University environmentally friendly.
- Promote university-led social change in relation to sustainability goals.
- Contributing to achieving global goals for preserving the environment.



Proposed criteria to achieve the principle of green sustainability:

1. Energy and Climate Change (EC). Using solar energy as a clean source of electricity as an alternative to electricity based on fuels.
2. Providing green spaces on campus.
3. Transfer within the university. Adopting means of transportation inside and outside the university campus for students, staff and faculty members that do not pollute the environment.
4. Waste Management (WS).
5. Water (WR).



Smart Green University Proposal Indicators :

1. Energy and Climate Change (EC)

According to this indicator, solar energy is relied on as a clean and renewable source of electricity instead of relying on traditional sources of electric energy that depend on fossil fuels and pollute the environment. In this context, we suggest:

- The use of lighting poles inside the university campus equipped with solar cells for night lighting.
- Putting solar energy cells on the roofs of buildings inside the campus to provide those buildings with electric energy during work periods.
- Supplying cafeterias on campus with solar energy cells to generate electricity instead of the traditional sources of electric energy
- Adopting the use of LED lighting that save electrical energy inside the campus buildings instead of the traditional lighting that use more electrical energy.
- Taking into account the use of devices that help to save electricity as much as possible on the campus.
- Establishing a mechanism to save the use of electric energy inside the university campus that ensures the ideal use of electric energy inside the classrooms, as well as administrative offices during non-working hours, to prevent energy waste and achieve optimal use of it while continuing to maintain the efficiency of the educational process.
- Adopting the concept of the smart building in order to accommodate the use of all devices energy saving which means using internet-connected technology, as an integral part architecture engineering to monitor and control structural design elements to share information between users, systems and buildings.

2. Providing green spaces on campus

Designing open spaces inside the university campus in a way that provides the largest possible amount of green spaces and trees, which would reduce the rate of carbon dioxide emissions resulting from activities on the campus.

3. Transfer within the university

The transportation system plays an important role on the level of carbon emissions and pollution sources in the university. The transportation policy encourages reducing the number of cars in universities, and the use of campus buses and bicycles which works to create a healthy environment. Also, this policy encourages students, staff, and faculty to walk around, and to avoid using private cars. The use of environmentally friendly public transportation will reduce the carbon level on campus

- Providing bicycle parking in suitable spaces that allow students and workers to use them to move within the university campus effectively as an alternative to traditional means of transportation.

- Providing mass transportation (buses) for staff and faculty members to travel to and from the university campus instead of using private cars as a single means of transportation, which will reduce carbon dioxide emissions.

- Adopting the state's initiative to provide bicycles announced by the Ministry of Youth and Sports under the slogan "Your bicycle is Your Health" for students and workers with supported prices to expand the base for practicing sports and make sport a lifestyle



4. Waste Management (WS)

According to this indicator, a policy is adopted to recycle waste by separating it from the source into four types

- Organic waste and food residues.
- Plastic waste and plastic bags.
- Mineral waste and carbonated water cans.
- Paper waste

.This allows for the recycling and utilization of as much of that waste as possible instead of disposing of it in landfills, which will eventually lead to its burning and the consequent pollution of the environment and the increase in emissions of greenhouse gases

.Adopting a mechanism for healthy food and beverage dealings within university cities (providing healthy, balanced foods, a mechanism for packaging food and drinks, storing them, and a mechanism for maintaining a healthy atmosphere for dining places on campus)

.Adopting a mechanism to maintain the campus environment in a clean image and the quality of detergents, pesticides and chemicals used in that.



Adoption of a preservation mechanism

5. Water (WR)

Campus water use is an important indicator in the sustainability scale. The aim is to urge universities to reduce water use, increase water conservation programs, and protect the environment. Among these

criteria: a water conservation program, a recycling program Water, Using Water-Saving Equipment, and Treating Wastewater Through:

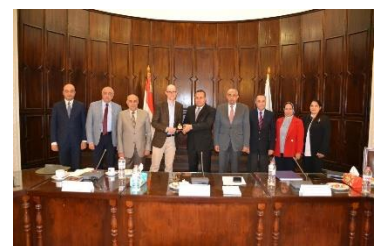
- Water-saving appliances are used instead of traditional appliances. This indicates the extent to which water-saving devices are used (for example, using a sensor-controlled automatic hand washing faucet, and highly efficient bathroom appliances).
- Supplying water taps with water saving units.
- Adopting a mechanism for maintaining water pipes to prevent waste resulting from leaks.
- Adopting plans and mechanisms to maintain the university's internal supply networks and taps to prevent water wastage.
- Providing a wastewater treatment plant in the university to make it suitable for irrigation of green spaces and gardens located within the university campus



The following are examples of the activities of climate actions strategy in Alexandria University. This strategy goes in line with the Egypt Vision 2030 which focuses on serving the United Nations Sustainable Development Goals.

Collaborations:

- Dr. Abdelaziz Konsowa, the president of Alexandria University receives Dr. Stephen Davison the Vice President of the Climate Group at the University of Cambridge, UK and responsible for international cooperation in the COP26 Network of Universities
The meeting involved discussions on ways of cooperation between the two universities on the issue of climate change and ways to enhance academic and research relations and aspects of joint cooperation in preparation for a conference COP27.



There was a display of the university action plan of Alexandria University in collaboration with partner universities such as American university in Cairo, Achaan university in Germany,, Ein shams university in Cairo, Egyptian Japanese university, and others.

Alexandria University will present several projects in COP 27 in Green hydrogen, Electric Vehicles, energy and water services, Suez Canal Impacts, Energy mix and electric hub, electric manufacturing services, and centre if excellence for sustainable development



- **Alexandria University receives the scientific advisor of the German Embassy in Cairo**

Dr. Abdelaziz Konsowa, President of Alexandria University received Mr. Philip Moby, the scientific advisor at the Federal German Embassy in Cairo, at the university's administration headquarters to discuss ways of cooperation between Alexandria University and German universities in the scientific, academic and research fields of common interest.



Dr. Konsowa stressed the keenness of Alexandria University, within the framework of Egypt's Vision 2030 and in preparation for the United Nations Climate Change Conference 2022 (COP27), to cooperate with German universities in environmental issues and areas related to water, its desalination, its re-exploitation and related industries, clean energy and its advanced technology. He pointed out the importance of studying the problem of climate change and global warming facing the world in general and Alexandria in particular, in addition to active participation and cooperation in solving problems that direct the industrial community.

Mr. Moby praised the level of Alexandria University graduates and researchers, stressing the importance of continuing cooperation between Alexandria University and the scientific community in German universities, referring to the activities related to spreading environmental awareness, conferences, seminars and workshops held by the German Embassy in Cairo..

AdapTM

Climate Change Management
through Mitigation and Adaptation

Co-funded by the
Erasmus+ Programme
of the European Union



Alexandria University is part of the “Adap TM” network of universities, which started in 2018 till current.

Around 200 undergraduate students from faculties of Science, Engineering and Agriculture are part of this network and carry out activities on climate change Adaptation. Alexandria university local partners in this network are the Arab academy for Science, Technology and Maritime Affairs (AASMT), Suez Canal University , and South valley university. In coordination with the **Italy**; University of Catania (UNICT), **Lithuania**; Klaipeda University (KU), **Slovenia**; Euro-Mediterranean University (EMUNI), **Egypt**; and The National Observatory of Athens (NOA) institute, **Greece**.

. The project open avenues for students to undertake activities, and open job opportunities in the climate of climate change adaptation. The network also allow enrolment in the Master’s degree in climate Change Management, Smart Environmental Climate Change Management (SECCM). This Master program is running in the faculty of science – Alexandria University



AdapTM is a project financed by about 771.000 EURO from Erasmus + (KA2 Capacity building in the field of higher education). AdapTM aims to ensure the design and

implementation of an interdisciplinary Master degree study programme in the field of climate change, in order to support Egypt with the integration of emerging technologies in climate change management in a competence-based education system, hence advancing higher education. According to the Bologna Process and European standards for quality of education.

AdapTM propose:

1. a new curriculum and enhanced syllabi in climate change based on ECTS;
2. AdapTM network and collaboration platform as learning and academic environment;
3. innovative teaching materials for: Geophysics and Geoinformatics, Climate and Global Changes, Smart Environment Technology Programminig, Mathematical Modelling of Environment, Remote Sensing of the Environment;
4. including textbooks, mobile lectures, e&m-learning modules;
5. implementation of competence-based curriculum approach based on modern learning technologies;
6. retraining of EG universities' staff developing their teaching expertise in technologies integration to SEM;
7. mobility of students for intensive courses at EU and EG universities.
8. re-training, training of EG universities academic staff on how to organize courses in climate change with the integration of technologies, academic and students mobility.

Egypt hosts the conference of the parties to the United Nations climate change convention

under the name “ Man and the Environment- climatic disasters”

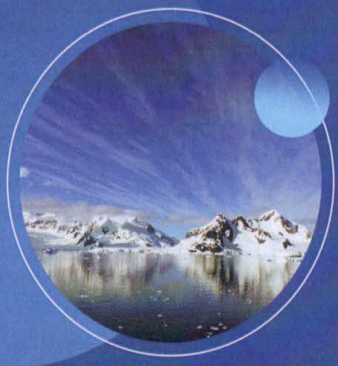


The conference is open to students and public

Egypt hosts the conference of the parties to the United Nations climate change convention under the name “ Man and the Environment”



The conference is open to students and public



Master Programme
Smart Environmental Management of
Climate Change
"SECCM"



Smart Environmental Management of

Master Programme **Climate Change**
"SECCM"



AdapTM
Climate Change Management
through Mitigation and Adaptation



Co-funded by the
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of the European Union

www.adaptm.eu



Smart Environmental Management of

Climate Change

"SECCM" Project Master

Cooperation

SECCM is a Master Degree program; the result of cooperation between 4 Egyptian Universities and 4 European universities and institutions in the framework of Erasmus+ funded project "Climate Change Management through Adaptation and Mitigation - AdapTM" (2017-2020). The cooperatively designed program benefits from an international and interdisciplinary perspective, European framework of recognition and wide network of involved professors.

Egyptian Partners	European Partners
Alexandria University	University of Catania, Italy
Arab Academy for Science and Technology and Maritime Transport	University of Klaipėda, Lithuania
Suez Canal University	Euro-Mediterranean University, Slovenia
South Valley University	National Observatory of Athens, Greece

Program outline

SECCM is a unique and interdisciplinary program combines the different approaches of natural and applied sciences to study climate change, its causes and effects and how to deal with and adapt to them.

The program prepares high-level graduates with the required knowledge and skills to work in different governmental and private institutions and organizations associated with local, regional and international efforts to deal with climate change, which is considered as one of the greatest current challenges for modern societies.

Program vision

The aim of SECCM is to be a pioneer program in preparing professionals to manage climate change in the local, regional and international environmental, research and industrial sectors.

Program mission

The Faculty of Science - Alexandria University seeks to qualify the graduates of SECCM to compete at the local and regional levels. By creating a suitable university environment, the graduate, who is ethically, scientifically and professionally distinguished in this field, will be able to serve the society and its institutions closely linked to sustainable development plans.

Stakeholders

- Ministries and government institutions (Ministry of Environment - Ministry of Irrigation and Water Resources - Egyptian Environmental Affairs Agency - Remote Sensing Authority - ...).
- Consulting companies that carry out EIA studies, develop, implement and monitor climate change mitigation and adaptation projects.
- Non-governmental and international and regional organizations participating in the assessment, mitigation and adaptation of climate change impacts.
- Industrial companies and research centers.

Admission requirements

Hold a B.Sc. in Science, Engineering or Agriculture with a minimum CGPA 2.333 (Good)

Program structure

SECCM is designed to comply with the Bologna Declaration and according to the demands of the Strategic Framework for European Cooperation in Education and Training (ET 2020).

2 years (4 semesters, 120 ECTS)

The student should complete 60 ECTS core courses in the first two semesters, 30 ECTS elective courses in the third semester, and 30 ECTS for the M.Sc. thesis in the fourth semester.

Semester 1 (30 ECTS core courses)	Semester 3 (to select 30 ECTS elective courses)
<ul style="list-style-type: none"> • Introduction to Climate Change • Meteorology and Climate Observation • Marine Resources and sustainability • Environment Risk Assessment and Management 	<ul style="list-style-type: none"> • Climate and Ocean Modeling • Climate Smart Agriculture • Nanotechnology and Climate Change • Sustainable Blue Economy • Coral Reefs and Climate Change • Energy Efficiency Management in Maritime Industry • Environmental Impact Assessment • Integrated Coastal Zone Management • Climate Change and Biodiversity • Global Environmental Governance • Strategic Planning and Project Management • Quality and Safety Management Systems • Climate Change effects on Coastal Dynamics • Adaptation Strategies to Climate Change for Hydraulic Risk Prevention in Coastal Areas • Climate Change Policy of the EU • Adaptation and Mitigation to Climate Change in Spatial Planning
Semester 2 (30 ECTS core courses)	
<ul style="list-style-type: none"> • Climate Change Management • Numerical Modeling and tools • GIS and Remote Sensing • Research Methodology and Ethics 	
Semester 4	
<ul style="list-style-type: none"> • 30 ECTS for the M.Sc. thesis 	

Language

English is the medium of instruction. All students are expected to demonstrate and acceptable of English proficiency both in oral and written communication skills.

Contact person

Prof. Mohamed Shaltout, Oceanography Department

+20 1005255393

Mohamed.shaltot@alexu.edu.eg

Dr. Ahmed Elshazly, Oceanography Department

+20 1221121052

Ahmed.elshazly@alexu.edu.eg

▲ 5 selected students will have the opportunity to be fully funded to travel to Europe

"Italy, Lithuania, or Slovenia"

for 14 days for theoretical, practical and field work.

Shuttle Services

The university owns a number of about 21 shuttle services.

The buses provided are divided into small 30 passengers' vans and big 50 passengers' buses.

The university provide a regular path shuttle services for the administration departments that does not enter the university campus and have a designated parking area outside the campus.

Moreover, the university allows other community owned shuttle services to offer their service to the students and staff by opening some temporary help disks on the campus grounds with affordable prices.(attached is the evidence of the actual number of transportation means owned by Alexandria University

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Vice president for environmental affairs
and community services

Professor Dr. Alaa Eldin Ramadan Mostafa



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Transportation initiatives to decrease private vehicles on campus

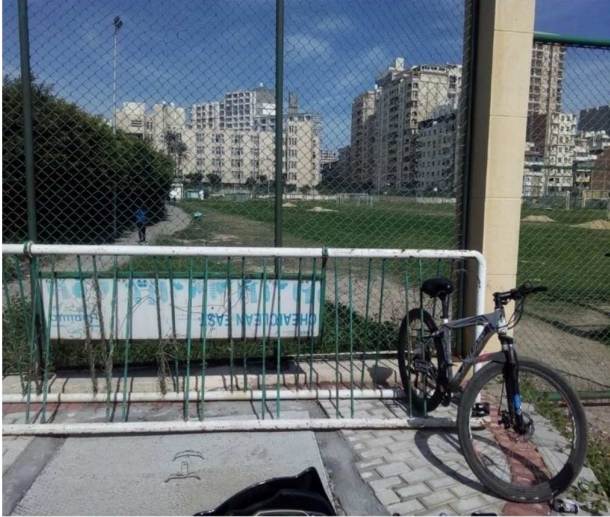
Regarding the transportation programs designed to limit the parking areas on campus for the last three years (2017 to 2019):

There is a program in preparation to try to limit the parking areas on campus, the plan aims to:

- increase the awareness of sharing the colleges one car going and coming from campus (if they live in near destinations),
- To provide more shuttle services to students, staff, administration members and employees.
- Students who live near the campus sites, are advised to use bicycles.
- A competition between the faculties in the university named “towards an Eco faculty” was set This competition encourages all the different faculties to use their resources in a way that fulfills the idea of Green Faculty Green Environment.



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Pedestrian path policy on campus

Walkways for pedestrians are the principal means of travel between buildings and activities on the central campus. The engineering department in the university designed the walkways in the campus premises to be about 40-55% of the campus total space.

The university puts efforts in

- Providing sidewalks and walkways separate from motor vehicle traffic.
- Raise awareness of pedestrian safety in and around campus and it encourages pedestrians to practice good safety habits since Pedestrian and vehicle paths frequently intersect on campus. Pedestrians should refrain from texting on smartphones and listening to music with headphones when they are crossing vehicle paths.
- ensuring that Vehicles use a marked vehicle path, and they should use rules of the road while approaching an intersection with a roadway and come to a complete stop prior to proceeding through the intersection with Pedestrian crosswalks.



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- There is a marked special path for the blind people in special parts of the pedestrian walkways. Also, there are ramps for wheelchair services for disabled or injured people.

Vice president for environmental affairs
and community services

Professor Dr. Alaa Eldin Ramadan Mostafa



Activities of the Scientific Forum for Climate Change
and its Relationship with Sports

Organization of the Festival of Running and Biking

As part of the climate change activities and its relation to sports



تحت رعاية الاستاذ الدكتور / عبدالعزيز قنصوه "رئيس جامعة الإسكندرية"
تنظم كلية التربية الرياضية أبوقير بالتعاون مع كلية العلوم
مهرجان جري ودراجات ضمن فعاليات الملتقى العلمي
للتغيرات المناخية وعلاقتها بالرياضة



The faculty of Engineering organizes a symposium entitled “Climate Changes between Risks and Adaptation”



Under the auspices of Dr. Abdelaziz Konsowa, President of Alexandria University, the Faculty of Engineering, Alexandria University, in cooperation with the Environmental Affairs Agency, organized, on Thursday, corresponding to 10/20-2022, a symposium entitled “Climate change between risks and adaptation” In the presence of Dr. Said Allam, Dean of the Faculty of Engineering, Dr. Essam Wahba, Vice Dean for Graduate Studies and Research and the Acting Vice Dean for Education and Student Affairs, Dr. Walid Abdel Azim, Vice Dean for Environmental Affairs and Community Service, and Dr. Sameh Riad, Undersecretary of the Ministry of Environment in Alexandria and Head of the Agency Environmental Affairs for the West Delta Region, Dr. Hossam Maghazi, the former Minister of Water Resources and Irrigation, Dr. Dina Al-Jayar, Assistant Professor in the Department of Chemical Engineering, the conference coordinator, and a group of faculty members, heads of companies’ boards and experts.



President of Alexandria University Attends Educational Seminar with Young Politicians



The President of Alexandria University, Professor Dr. Abdelaziz Konsowa participated today, Thursday the 3rd of November 2022, in the educational seminar organized by the university, in cooperation with the Youth Coordination of Political Parties and Politicians, under the title "Climate Action Path from Stockholm to Sharm el-Sheikh" and a panel discussion on the national dialogue, in the presence Dr. Wael Nabil, Vice President for Education and Student Affairs, in addition to several members of the House of Representatives and the Senate, deans, vice deans, faculty members and students of different faculties, in the conference hall of the Faculty of Nursing in Smouha.



In his speech, Dr. Abdelaziz Konsowa confirmed that the university is working to provide integrated studies to achieve industrial growth and transformation into green industry, referring to COP27 climate conference aim in achieving a balance between growth rates and setting environmental issues as a top priority. He also stressed the importance of the developed countries fulfilling their commitments towards developing countries and helping them to face the effects of climate change. Dr. Konsowa said that Alexandria University is working according to a well-studied strategy that is in line with Egypt's strategic vision for sustainable development 2030 and is capable of facing challenges and achieving international competitiveness.



On their part, Parliament members thanked Alexandria University for hosting seminars and workshops aimed at spreading community awareness of environmental and climate issues, stressing the role of the Youth Coordination in organizing a number of public events, to listen to the youth expressing their opinions, and receiving suggestions and inquiries to be presented to the Parliament and the National Dialogue Table.



The meeting witnessed various discussions among the attendees that dealt with the economic, social and cultural challenges facing the country, how to confront them and provide out-of-the-box solutions in light of the available resources.











Faculty of Pharmacy organizes a sports marathon for walking and cycling entitled "Running for Green"

Under the patronage of H.E. Prof. Dr. Abdelaziz Konsowa, President of Alexandria University, the Community Service and Environmental Development Sector at the Faculty of Pharmacy, in cooperation with the students of the Scientific Society of Faculty of Pharmacy, organized a



sports marathon for walking and cycling under the title "Running for Green" within the framework of the preparations of Faculty of Pharmacy and University of Alexandria for the Climate Change Conference COP27 to be held in Sharm el-Sheikh in November 2022.

Prof. Dr. Mervat Kassem, Dean of Faculty of Pharmacy, pointed out that the marathon was launched from the front of the Bibliotheca Alexandrina to the Citadel of Qaitbay with the participation of about 150 individuals, and an elite of Faculty staff members, Faculty employees, and students. She explained that the organization of the marathon came with the aim of unify the students and Faculty members as one family and to encourage the students to practice sports to improve their physical and mental health, which reflects positively on their academic performance.

Meanwhile, Prof. Dr. Sherif Rostom, Vice Dean of Community Service and Environmental Development, stated that the marathon is part of a campaign adopted by Faculty of Pharmacy entitled "Go Green" that includes several events within the framework of the state's directions for

sustainability in preserving the environment and combating climate change "Prepare for Green".

At the end of the marathon, prizes and certificates of appreciation were handed over to the winners of the top three places in both the walking and cycling competitions.

