Template for Evidence(s)
UI GreenMetric Questionnaire

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

[2] Energy and Climate Change (EC)

[2.3] Smart Building Implementation:

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
2	University administration building	Alexandria, Egypt		X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	1940
3	Faculty of Physical Education for Boys	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	113311.93
4	Faculty of Physical Education for Girls	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	2891
5	The medical complex	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	91216
6	Faculty of Science in Horia Street	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	22197
7	Faculty of Science in Moharram Bek	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	5485
8	Faculty of Engineering	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	111034
9	Campus of Humanities and Social Sciences	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	80707
10	Faculty of fine Arts	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	2569
11	Faculty of Specific Education	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	1194
12	Faculty of Early Childhood Education	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	1407

13	Medical Research Institute (Horia Street - Smouha)	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	2500
14	Higher Institute of Public Profession	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	700
15	University land in Smouha (College of Nursing - Children's Hospital - Faculty members residences)	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	105218.22
16	Land of Mouwasat Hospital	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	20234.27
17	Institute of Graduate Studies and Research	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	2764
18	Faculty of Agriculture Saba Pasha	Alexandria, Egypt		X		X	X		X	X	X	X	X	X		X	X	X	X	X	144200.934
	Total																				1,377,300.34

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

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

The buildings of the Faculty of Engineering - Alexandria University were chosen to be the nucleus from which to implement green building concepts regarding the general vision for applying environmentally friendly green building requirements to the Faculty of Engineering buildings (Report is attached).
In the report, the faculty buildings were studied, and the summary of the report was as follows:
1. Mechanical Engineering Building: Complies with green building requirements (LEED) with the silver category.
2. Preparatory building: conforms to green building requirements (LEED) with the silver category.
3. Administration building: It does not currently comply with green building requirements (LEED), but it is possible with simple modifications to adopt it.
4. Electrical Engineering Building: It does not currently comply with green building requirements (LEED), but it is possible to adopt it with simple modifications.

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

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

Green building implementation in new construction and renovation policies focuses on several key elements designed to enhance sustainability, reduce environmental impact, and promote energy efficiency. These elements are typically reflected in guidelines and frameworks, such as LEED (Leadership in Energy and Environmental Design) or other local and international standards.

1. Energy Efficiency

- Integrating solar and wind energy sources into building design reduces reliance on non-renewable resources.

- Installing systems that optimize ventilation with minimal energy consumption.
- Automated lighting systems that respond to occupancy or time of day.
- 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.

2. Sustainable Materials: Incorporating materials like recycled steel, concrete, or reclaimed wood.

3. Indoor Environmental Quality

- Maximizing the use of daylight to reduce artificial lighting and improve occupant well-being.
- Ensuring adequate ventilation and using non-toxic building materials to maintain clean indoor air.
- Designing spaces to maintain comfortable temperatures naturally through insulation and proper orientation.

4. Site Selection and Sustainable Landscaping: The area of the project is 160 acres (667,730.988 m^2), 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.

5. Water Efficiency and Reduction

- Water-saving plots are used, which will reduce water consumption by abut 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.
- Air conditioning water collection and reuse unit in Faculty of Engineering.
- Wastewater treatment unit at the Faculty of Engineering.
- Reusing wastewater from sinks, showers, and laundry for irrigation or flushing toilets.
- Using drip irrigation and other systems that minimize water use.

6. Sustainable Transportation: Proximity to Public Transport: Locating buildings near public transit hubs to reduce the need for private vehicle use.

Total Building Area

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

Total Building Area:

$$\frac{2{,}385{,}538.83\ m^2}{8{,}083{,}208.27\ m^2} \times 100\% = 30\%$$

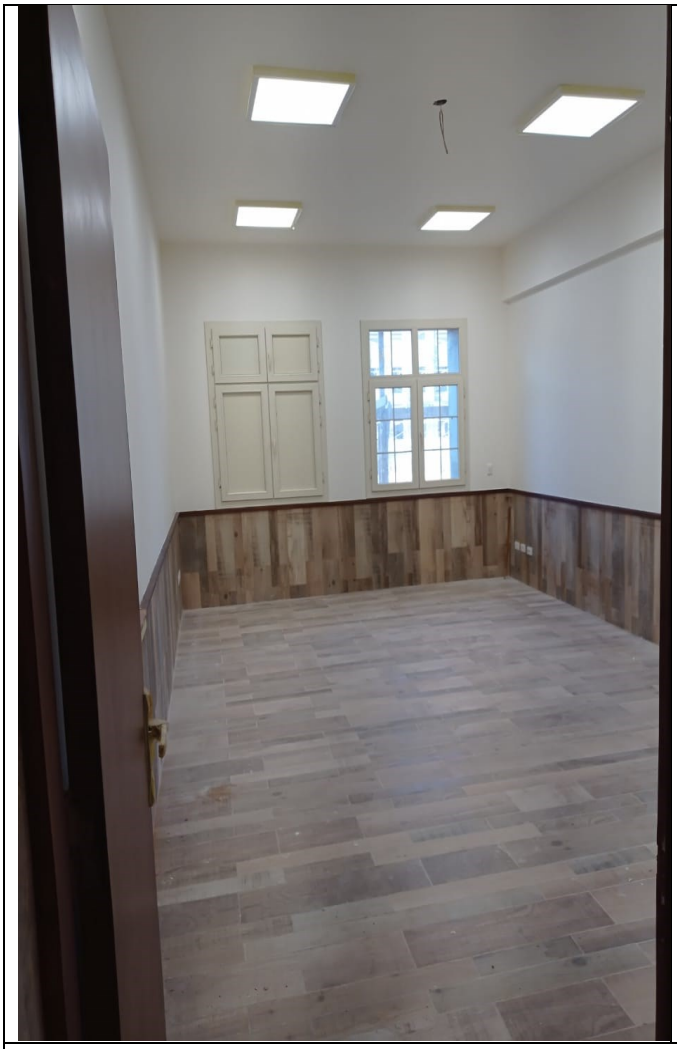
Smart building implementation

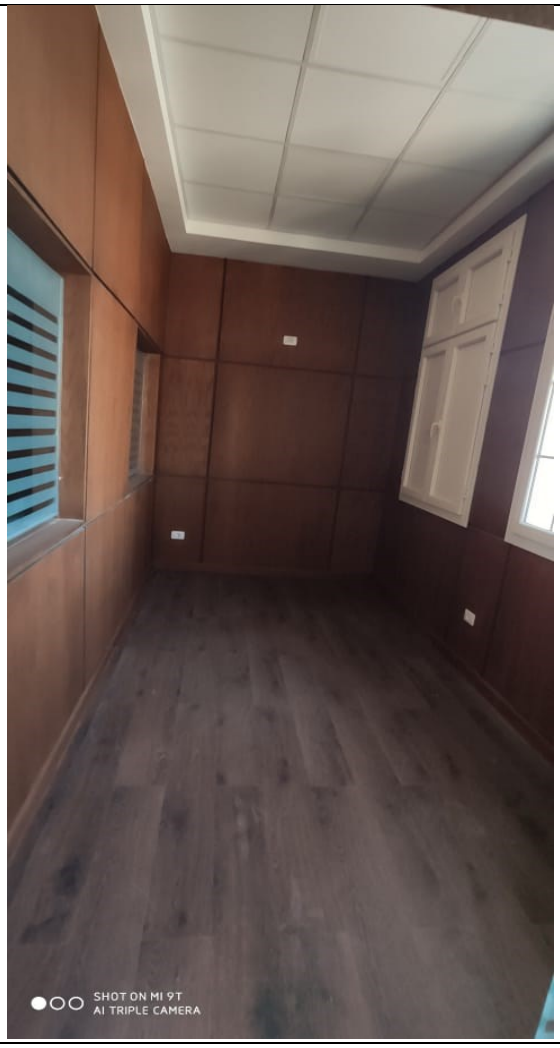
$$\frac{total\ smart\ building\ area}{total\ building\ area} \times 100\%$$

Smart building implementation

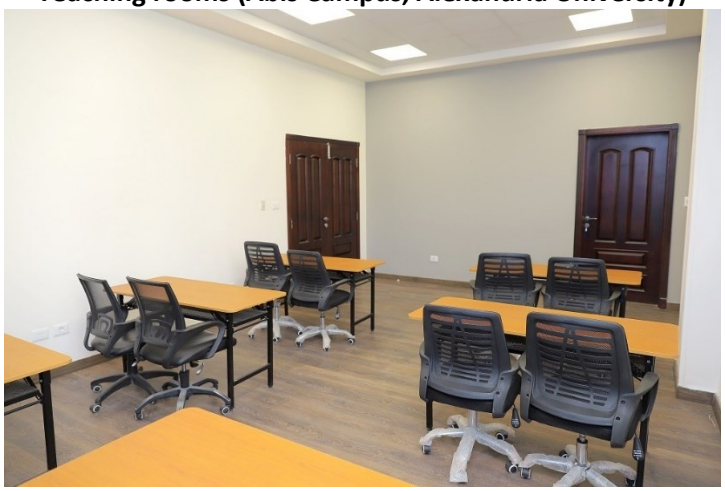
$$\frac{1{,}377{,}300.34\ m^2}{2{,}385{,}538.83\ \ m^2} \times 100\% = 57.7\%$$

Building 1	Building 1
	
Building 3	Building 4 (Bathroom, water saving)
	
Building 1-11 (LED Lighting)	

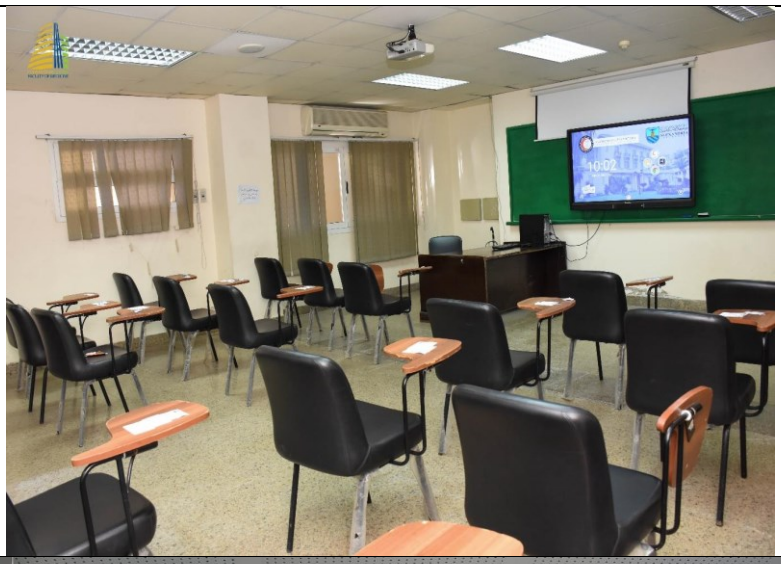


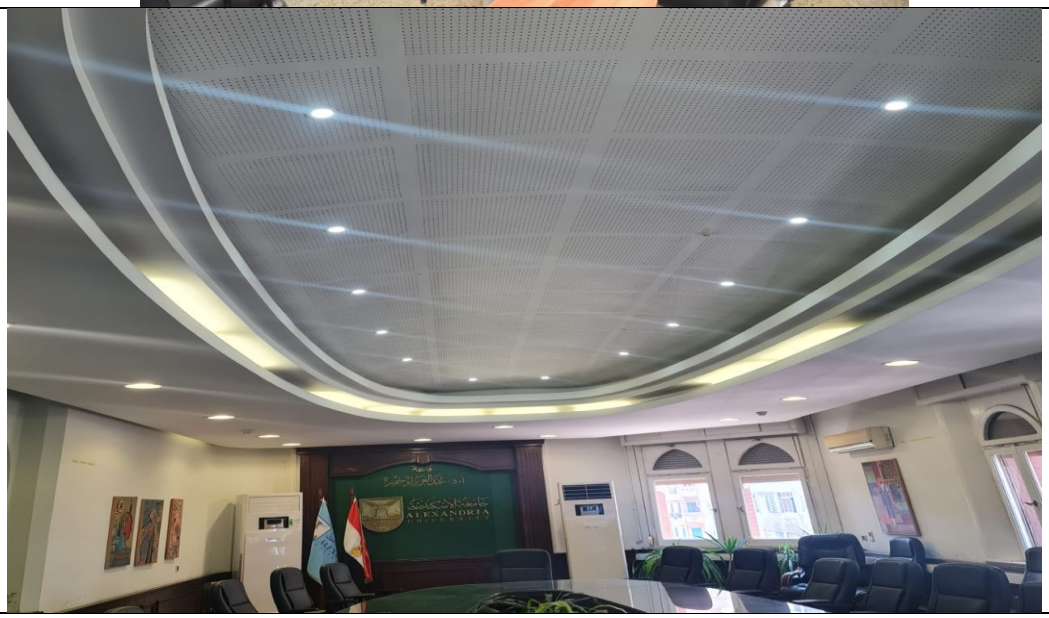


Teaching rooms (Abis Campus, Alexandria University)



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

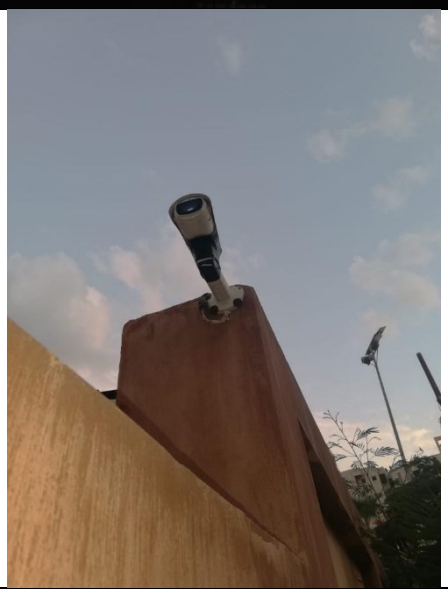


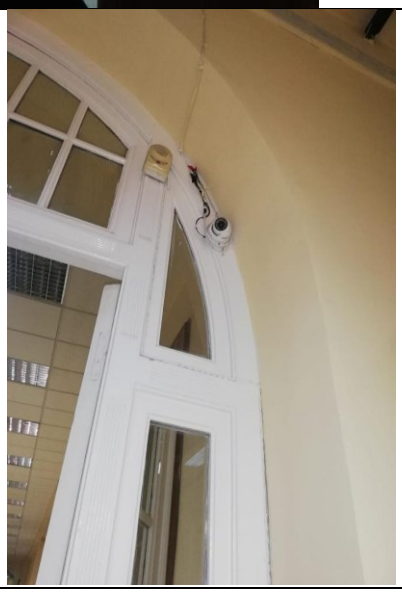


Alexandria University Initiative on Using LED Lamps as Energy Saving Lamps (2019-2023)

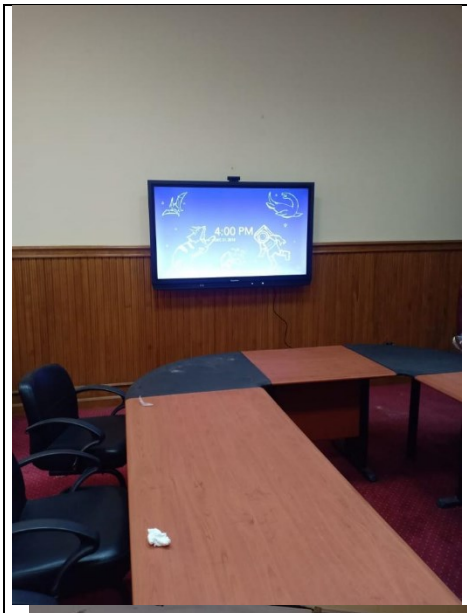
Alexandria University Initiative workshop on using LED Lamps as Energy Saving Lamps

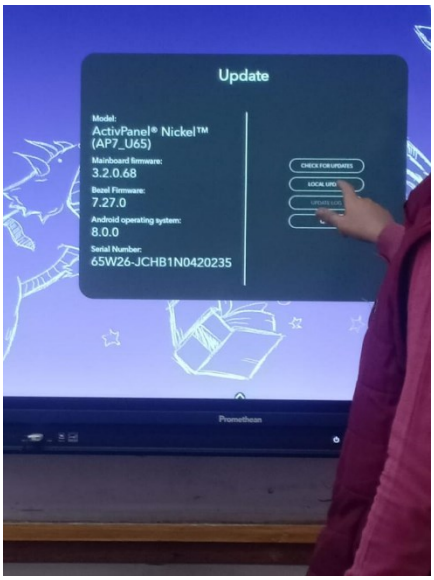
Green building implementation through the use of sun breakers in the SSP building at the Faculty of Engineering



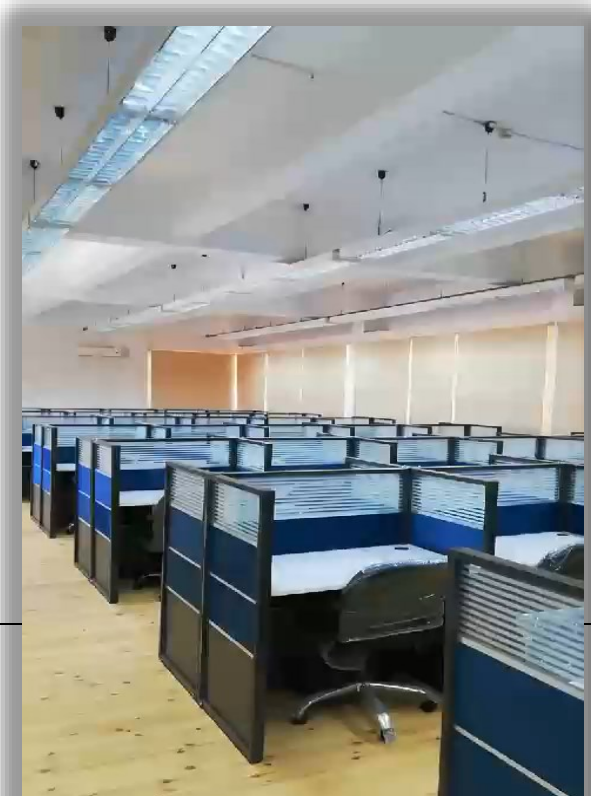


Video Surveillance of all buildings



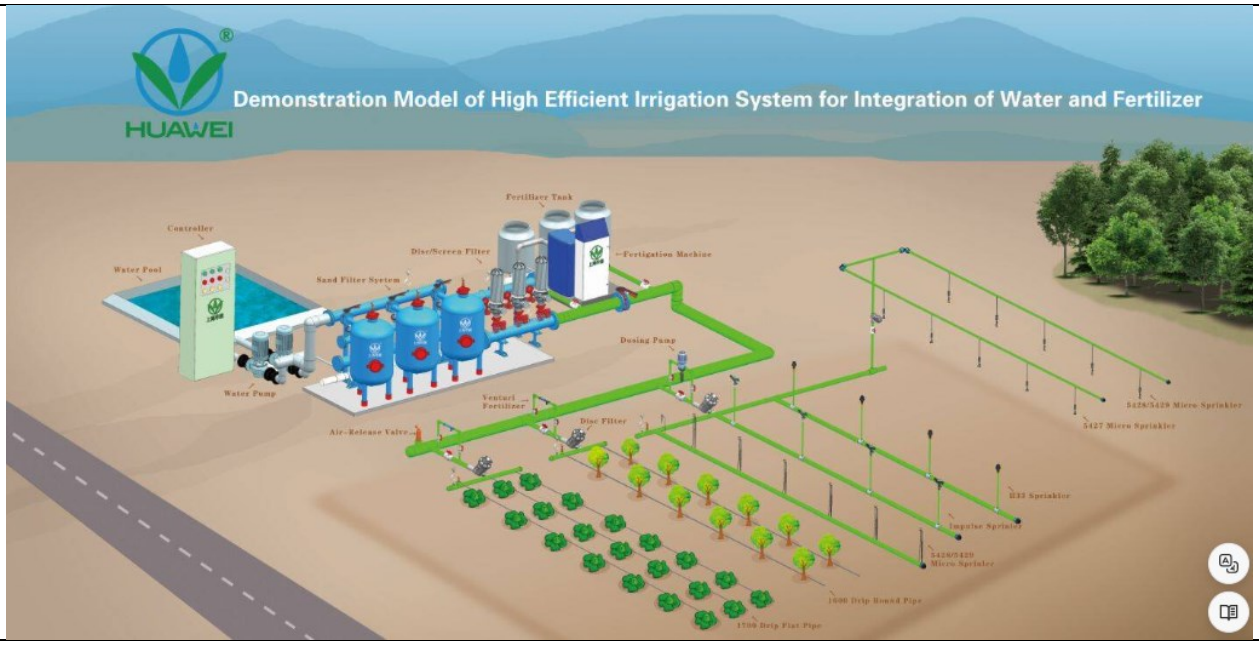


Smart screens are used in all lecture halls



Implementation of a new virtual lab at the Faculty of Science with the Capacity of 210 Computers, which will be also used for Electronic Exams

Setting up computer labs across various faculties at Alexandria University.



An IoT-based agroecological farming project at Alexandria University Farm was implemented by Shanghai Water Saving Irrigation Corp. The company previously developed an automated irrigation system using IoT technology for modern irrigation practices. This platform was designed to irrigate economically important crops and enhance irrigation systems, aiming to address water scarcity issues in Egypt

Link for Sustainable Development: https://alexu.edu.eg/index.php/en/sustainable-development
https://alexu.edu.eg/index.php/en/2015-11-24-10-38-07/ranking?id=6011
http://sustainability.alexu.edu.eg/
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 Green University:
https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5932&catid=21&lang=ar-AA

Smart Building Implementation

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Smart building implementation

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Sincerely,

Prof. Said Mohamed Allam
Vice PRESIDENT
Community Service & Environment Development
Alexandria University