



# Goal 7 – Affordable and Clean Energy

7 AFFORDABLE AND CLEAN ENERGY



## Our Aim

Ensure access to affordable, reliable, sustainable and modern energy and link energy-related research with the current needs and future plan of the AAST and community. Moreover, make AAST a center of excellence in the field of energy by following an Energy Management and Environment policy which implies;

- Applying strategies and building standards for conscious energy consumption, planting and energy management.
- Utilizing renewable energy sources through several solutions to provide a clean and efficient energy for future generations
- Serving the community efficiently and resourcefully
- Developing cooperation with government and public enterprises towards green energy.
- Developing collaborative strategies and agreements with the local, national and international entities to support green energy innovations.
- Supporting focused research in environmental design, green architecture and sustainability through the encouragement of multi-discipline project to deliver an innovative solution.

## Last Year Recorded

World wide 22

Arab Country

Egypt 3

## Our Progress through 20/21

### Teaching

#### ❖ Energy Program

Energy Program B.Sc., Meng. and M.Sc. programs include:

- B.Sc. of Energy Engineer, (smart village)

[http://www.aast.edu/en/colleges/coe/smartvillage/dept/index.php?unit\\_id=529](http://www.aast.edu/en/colleges/coe/smartvillage/dept/index.php?unit_id=529)



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

- **Meng in Renewable energy and environment engineering (Alexandria)**

[https://aast.edu/en/colleges/coe/alex/dept/programtemp.php?program\\_id=251&unit\\_id=74](https://aast.edu/en/colleges/coe/alex/dept/programtemp.php?program_id=251&unit_id=74)

- **M.Sc. in Renewable energy and environmental engineering (Alexandria)**

[https://aast.edu/en/colleges/coe/alex/dept/programtemp.php?program\\_id=245&unit\\_id=74](https://aast.edu/en/colleges/coe/alex/dept/programtemp.php?program_id=245&unit_id=74)

- **M.Sc. in Electrical Smart Grid engineering (Alexandria)**

[https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page\\_id=4500050](https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=4500050)

- **M.Sc. of Smart Control Systems for Energy Management (Alexandria)**

[https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page\\_id=7400022](https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=7400022)

There are also energy-related training courses offered by AASTMT

- **Training courses**

1. Renewable Energy System
2. Solar energy
3. Practical fundamental solar energy
4. Wind Energy System
5. Energy Management and Auditing (EMA)
6. Building Management system (BMS)

### 50 kW Solar Power Plant (On-Grid) with Weather Station. (ABB)

- On-grid
- Off-grid
- Hybrid
- For education, research and training purpose in addition to energy efficient and management





## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport



### ❖ Energy-related graduation projects 2020

#### 1. Graduation Projects of Electrical and Energy Eng. Department- Smart Village Campus

[https://aast.edu/en/colleges/coe/smartvillage/dept/contenttemp.php?page\\_id=52900035](https://aast.edu/en/colleges/coe/smartvillage/dept/contenttemp.php?page_id=52900035)

##### • Academic Year 2019-2020

- Modeling, Analysis, Fabrication and Experimental Investigation of Small Horizontal Axis Wind Turbine
- Digital IoT Based Multi-Function Relay

##### • Academic Year 2020-2021

- Planning and designing a long-term charger positioning plan in Egypt and Implementation of a commercial low-cost Electric Vehicles Level 2 charging.
- Blind Solar Tracker.
- Smart Low Voltage Switch Gear
- Solar Energy System with IOT Automation
- Optimization System of Environmentally Friendly Micro Grids.



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

### 2. Graduation Projects of Marine Engineering Department-Abukir campus (2020-2021)

[https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page\\_id=4800011](https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=4800011)

- Ocean thermal energy application technologies for Autonomous Underwater Vehicle.

### ❖ Energy-related graduation projects 2021

#### 1. Graduation Projects of Electrical and Control Engineering Department-Abukir campus (2021-2022)

[https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page\\_id=4500057](https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=4500057)

- Electric Automated Guided Vehicle
- Solar powered CCTV system
- Energy Management System for Smart Hotel Project

#### 2. Graduation Projects of Mechanical Engineering Department-Abukir campus (2021-2022)

[https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page\\_id=5300011](https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=5300011)

- Irrigation system combined with solar panel
- Desalination power and hydrogen production using fuel cell
- New methods for improving the efficiency of photovoltaic
- Improving the productivity of solar still water desalination
- Hybrid vertical axis wind turbine
- Design and economic feasibility of a solar powered atmospheric air water generator
- Design of geothermal –solar combined chimney power plant for continuous power generation

#### 3. Graduation Projects of Marine Engineering Department-Abukir campus (2021-2022)

[https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page\\_id=4800011](https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=4800011)

- Energy-Efficient Ship Operation through the Ship Speed Prediction

## Initiatives

### ❖ 2020 Initiatives

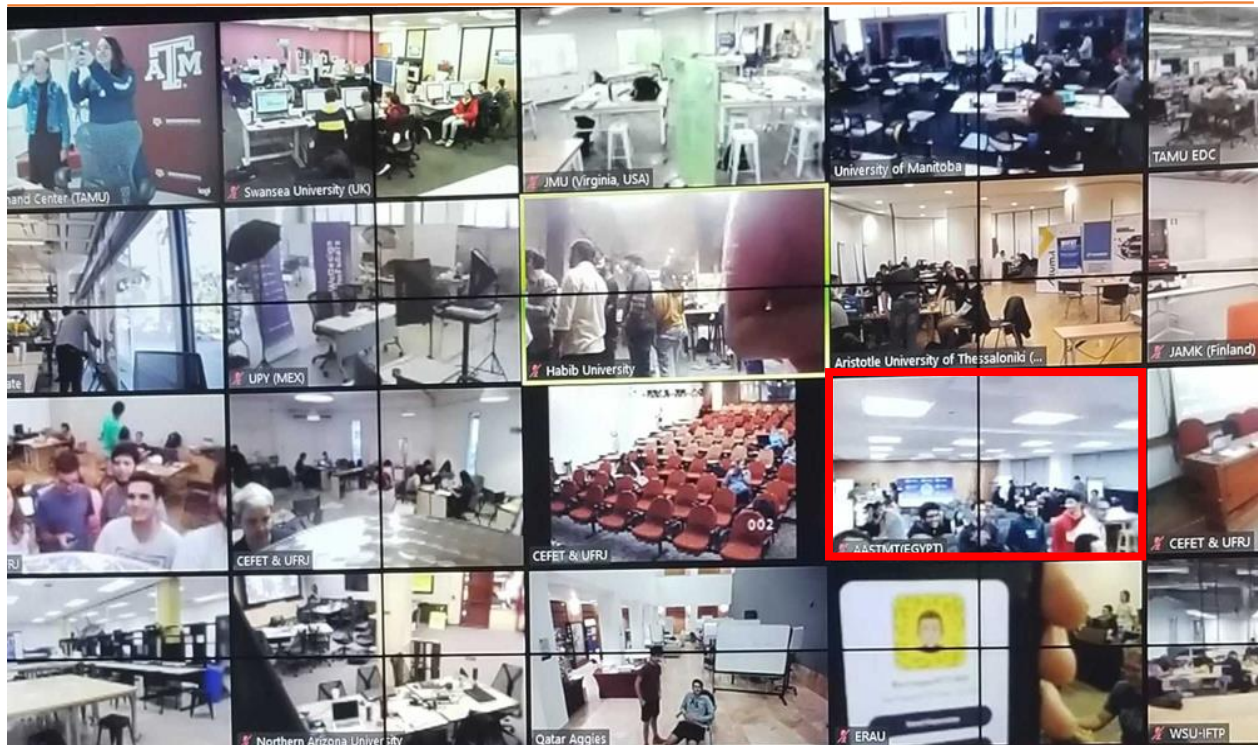
#### February 2020: Invent for the Planet

Invent for the Planet global challenge has been held in AASTMT Smart Village Campus February 2020 for the second time after 2018. Invent for the Planet is hosted by Texas A&M University and it is a 48-hour intensive design competition, which took place at more than 30 universities around the world. Students developed solutions for major issues facing society that have arisen as our world continues to modernize and become more populated. Over the course of two days, students at each campus formed teams, developed a plan and prototype, created a business plan and pitched it to a panel of judges. These students' activities and challenges cultivate the ability of the students to communicate and work effectively in teams and also to teach students how to analyze and implement interdisciplinary engineering projects.

[https://aast.edu/en/colleges/coe/smartvillage/dept/contenttemp.php?page\\_id=52900026](https://aast.edu/en/colleges/coe/smartvillage/dept/contenttemp.php?page_id=52900026)



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport



Picture of the command center video wall where all universities had a livestream of their local competitions.

### **February 2020: AASTIANS go Green” Campaign at AASTMT Smart Village Campus**

Within the Arab Academy for Science, Technology and Maritime Transport (AASTMT) social responsibility, as well as, AASTMT and the Egyptian Ministry of Local Development “Protocol Of Cooperation” on organizing the planning and implementation of the campaign AASTMT Green that was held on Wednesday 21- 1- 2020, the activities of “AASTIANS go Green” campaign has been started on Monday 10- 2- 2020, at AASTMT Smart Village Campus, in the presence of H.E Prof. Dr. Ismail Abdel Ghafar Ismail - AASTMT President, Prof. Dr. Mona Fouad - AASTMT Smart Village Campus Academic Dean, and Prof. Dr. Enas Barsoum - Advisor to AASTMT President for Student Affairs.

[https://aast.edu/en/sites/port\\_saeid/news.php?unit=1&event=4120&event\\_type=1&language=1](https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=4120&event_type=1&language=1)

### **March 2020: AASTMT Smart Village Campus Marathon of “AASTians go Green” Campaign**

With the achievement of "Egypt Vision 2030" sustainable development goals, as in keeping with the Arab Academy for Science, Technology and Maritime Transport (AASTMT) social responsibility, as well as, AASTMT and the Egyptian Ministry of Local Development "Protocol Of Cooperation" on organizing the planning and implementation of "AASTians go Green" campaign that was held in January 2020, AASTMT organized a Marathon on Thursday 5- 3- 2020, at AASTMT Smart Village Campus, under the patronage of H.E Mr. Ahmed Aboul Gheit - Secretary General of the League of Arab States, H.E Major General Mahmoud Shaarawy – Egyptian Minister of Local Development, H.E Prof. Dr. Ashraf Sobhy - Egyptian Minister of Youth and Sports, and H.E Prof. Dr. Yasmine Fouad - Egyptian Minister of Environment.



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

[https://aast.edu/en/sites/port\\_saeid/news.php?unit=1&event=4160&event\\_type=1&language=1](https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=4160&event_type=1&language=1)

[https://aast.edu/en/sites/port\\_saeid/news.php?unit=1&event=4161&event\\_type=1&language=1](https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=4161&event_type=1&language=1)



### ❖ 2021 Initiatives

**February 2021: Energy Research unit announces the foundation of NET ZERO Emission Community to spread green energy awareness and encourages energy conservation initiatives.**

إعلان

تعلن وحدة بحوث الطاقة بكلية الهندسة عن تأسيس رابطة  
**NET ZERO EMISSION COMMUNITY**  
وذلك للتوعية بأهمية استخدام الطاقة النظيفة وترشيد الطاقة تحت شعار  
**GREEN CAMPUS**  
لتقليل الانبعاثات وتغير المناخ  
فعلى من يرغب فى الانضمام الى الرابطة سرعة تسجيل بياناته لدى  
ا.د.مصطفى عبد الجليل (رئيس وحدة بحوث الطاقة-كلية الهندسة)  
غرفة 302

للتسجيل البيانات  
Scan the QR Code



Email: mostafa.gelie@aast.edu



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

### June 2021: Environment Day Initiative by Energy Research Unit

In concern of realizing and activating sustainable developments goals, the energy research unit in AAST, Abukir announces the environment day initiative which will take place on Monday the 20<sup>th</sup> of June, 2021.

**Environment Day Initiative**

Your role in activating sustainable development goals (Sdgs), with respect to energy and water preservation, is quite important ! Participate with us in consumption conservation on the Environment Day taking place on 20/6/2021 by following these instructions:

1. Switch off lights and conditioners in empty rooms and offices.
2. Use lights and conditioners only when mandatory.
3. Adjust the conditioner reference temperature to not less than room temperature (25°C)
4. Preserve water use and don't waste it in vain.

**Be Positive**

Energy Research Unit

6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

### Awareness campaigns for energy conservation initiated by Energy Research Unit

Save Blue ... Live Green

Do you know that saving 1m<sup>3</sup> of water daily can save energy use for water desalination and sewage water treatment by 3.5 kW and save carbon dioxide emissions by almost 3kg.

**Water is life! Treat it right...**

**Be Positive**

Energy Research Unit

6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

حافظ على المياه والطاقة والبيئة بنهضة  
استهلك المياه

هل تعلم أن توفير لتر من الماء من المياه يوميا يوفر في استهلاكك طاقة نظيفة مياة النيل وهالجة الصريف 3,5 ك.وات ويوفر كمية من ثاني أكسيد الكربون بحوالي 3 كيلو جرام.

**كن إيجابيا**

وحدة بحوث الطاقة

6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY

12 RESPONSIBLE CONSUMPTION AND PRODUCTION





**كن ايجابيا**

هل تعلم أن إطفاء إضاءة قاعة لمدة ساعة في اليوم توفر تقريبا 1/2 (نصف) كيلو جرام من غاز ثاني أكسيد الكربون!!!

ساهم في تقليل ثاني أكسيد الكربون بإطفاء الأنوار و مكيف الهواء في أي قاعة او مكتب بعد الإستخدام

وحدة بحوث الطاقة

SUSTAINABLE DEVELOPMENT GOALS  
8  
7







## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

### November 2021: SDG Awareness session on November 2021

[https://aast.edu/en/news.php?unit\\_id=656&language=1&page=33&event=469&get\\_event\\_type=1](https://aast.edu/en/news.php?unit_id=656&language=1&page=33&event=469&get_event_type=1)

An introductory session on entrepreneurship to raise awareness of the sustainable development goals

An introductory session on the field of entrepreneurship to encourage and educate students about the goals of sustainable development through active participation in the Enactus competition, which is interested in encouraging and educating university youth to find new ideas that help in sustainable development

PUBLISHED ON: MONDAY, 01 NOV 2021

TAGS: SUSTAINABLE, EDUCATING, ENCOURAGING



### December 2021: Orientation seminar on The Importance of GOING GREEN and the benefits of reducing plastic consumption on the environment

[https://aast.edu/en/news.php?unit\\_id=656&language=1&event=511&get\\_event\\_type=1](https://aast.edu/en/news.php?unit_id=656&language=1&event=511&get_event_type=1)



A seminar for students of the Faculty of Management under the Department of Environmental Conservation and the benefits of reducing energy consumption on the environment

An Orientation session for students of College of Management and Technology Alamein Hull on Sunday 12th December 2021 about "The Importance of Going Green and the benefits of reducing plastic consumption for the environment" presented by Dr. Mahmoud El Bishbishy - Former President of Rotary Alexandria West.



## Research

### ❖ 2020 Funded Research Projects

#### 1. High Level Renewable and Energy Efficiency Master Courses (HEBA)

[https://aast.edu/en/scientific-research/projects/project.php?uid=16&proj\\_id=5](https://aast.edu/en/scientific-research/projects/project.php?uid=16&proj_id=5)

#### Acronym:

HEBA

#### Full title:

High Level Renewable and Energy Efficiency Master Courses

#### Project Duration

46 Months

#### Project Start Date

2017-11-01 00:00:00

#### Project End Date

2021-10-30 00:00:00

HEBA is a three years project started on October 15, 2017, and funded by the European Union through Erasmus+ program. The project aims to reform and improve existing master programs in Energy Efficiency (EE) and Renewable Energy (RE) on single technology and energy systems level, improving existing or establishing Centers/Laboratories of EE+RE in Jordan, Lebanon, and Egypt. The consortium will help the society to protect the earth. It will help in providing qualified professional resources capable of sustaining and managing the huge effort of EE+RE infrastructure development. Special emphasis will be given to advanced energy management. HEBA will be oriented to further development of the process of interaction with professional communities and reflects their requirements in the developed curriculum. The EU experience is a major component in the success of the HEBA project. The courses/modules and adapted curricula within HEBA project should be based on the needs and challenges of the building/industry/energy sectors.

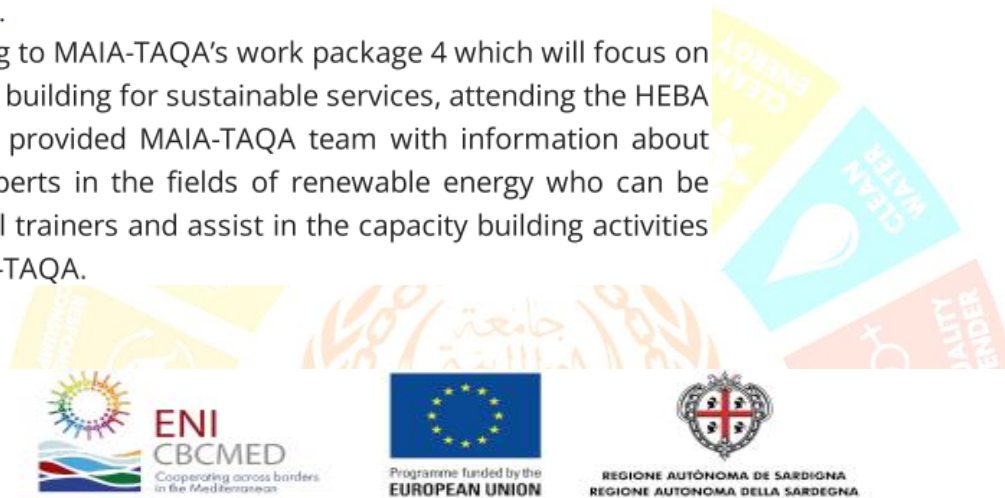
Moreover, an online regional webinar on “High Level Renewable Energy and Energy Efficiency – HEBA” on July the 2th 2020.



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

This webinar is a deliverable of the Erasmus Plus Project entitled: **High Level Renewable Energy and Energy Efficiency Master Courses** whose partners are universities from Austria, Italy, Germany, Cyprus, Lebanon, Jordan and Egypt for building capacity of Egypt in renewable energy and energy efficiency to build a model for the environment change in Egypt and use that to draw a roadmap for the renewable energy and urban planning.

Referring to MAIA-TAQA's work package 4 which will focus on capacity building for sustainable services, attending the HEBA webinar provided MAIA-TAQA team with information about local experts in the fields of renewable energy who can be potential trainers and assist in the capacity building activities of MAIA-TAQA.



HEBA

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

### Building Capacity of AASTMT LABs in Renewable Energy and Energy Efficiency

**Dr Mahmoud Elwadie**

Arab Academy for Science, Technology and Maritime Transport  
Smart Village Campus, Egypt

**Theba**

DISCLAIMER: This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.  
HEBA Project Number: 585740-EPP-1-2017-1-AT-EPPKA2-CBHE-JP



## **2. AASTMT participation in "Green Land: GREEN-skills for a sustainable Development" Project funded by European Union (GREENLAND)**

[https://aast.edu/en/sites/port\\_saeid/news.php?unit=1&event=5406&event\\_type=1&language=1](https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=5406&event_type=1&language=1)

**Acronym:**

**GREENLAND**

**Full title:**

**GREEN-skills for a Sustainable Development**

**Start date**

**16 October 2020**

**End date**

**15 April 2023**

The project objective is to increase the employability of NEETs (up to 30 years old) and women (all ages) by providing them with marketable skills and qualifications to prepare them for skill-based occupations within the Green and Circular Economy sectors and reduce skill mismatches in rural areas particularly affected by the climate change.

AASTMT has participated in this project that promotes social inclusion and fight against poverty by providing unskilled and underprivileged young people with marketable skills in the Green and Circular Economy, with the potential to generate thousands of jobs. To reach its objective, the project will create new curricula based on market needs, skills transfer to NEETs and women, media-based training tools, and cultural exchanges among young people, as the Mediterranean area suffers from extremely high rates of youth and female unemployment. AASTMT cooperates with the project partners from Lebanon, Jordan, Egypt, Palestine, Italy, Portugal, and Greece, as to achieve the requirements and objectives of the GREENLAND project, where the thematic objective is the Promotion of social inclusion and the fight against poverty, as AASTMT main role is to manage the work package 4 (WP4), which represents the essence of the project, by establishing an e-platform containing specialized curricula based on market needs to transfer skills to NEETs in addition to providing advanced training tools, GREENLAND project is the creation of new employment opportunities that will be reinforced by the sector-skills alliances between the Technical and Vocational Education and Training institutions (TVETs) and the Small and Medium Enterprises (SMEs).



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

### 3. AASTMT student activities and research projects on "clean energy - advanced and sustainable technology" at AASTMT Smart Village Campus

[https://aast.edu/en/sites/port\\_saeid/news.php?unit=1&event=4162&event\\_type=1&language=1](https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=4162&event_type=1&language=1)

Within the Arab Academy for Science, Technology and Maritime Transport (AASTMT) strategy of achieving Excellence in Education, H.E Prof. Dr. Ismail Abdel Ghafar Ismail Farag - AASTMT President welcomed H.E Prof. Dr. Ashraf Sobhy - Egyptian Minister of Youth and Sports on Thursday 5- 3- 2020, at AASTMT Smart Village Campus, where AASTMT student presented their activities, as well as, AASTMT students and academic staff members research projects on "clean energy - advanced and sustainable technology", then H.E Egyptian Minister of Youth and Sports visited AASTMT Smart Village Campus modern laboratory complex, where all the attendees praised level of AASTMT educational services and students.

#### ❖ 2021 Funded Research Projects

##### 1. Research on Optimizing the Effect of Loads on Characteristics of Power Electronics Converters for Renewable Energy Applications

[https://aast.edu/en/scientific-research/projects/project.php?uid=16&proj\\_id=28](https://aast.edu/en/scientific-research/projects/project.php?uid=16&proj_id=28)

###### Project Duration

12 Months

###### Project Start Date

2021-10-01 00:00:00

###### Project End Date

2022-09-30 00:00:00

The main objectives of this project proposal are to: -Perform mathematical analysis on the effect of different loads when connected to the renewable via the interface of power electronics converter. - Better understanding of the load effect on overall performance of power electronics converters and associated control techniques such maximum power tracking with PV or wind applications. - Implement a prototype setup for experimental study for different system topologies for practical validation - Develop a standardized method of the selection and design of the suitable converter and control technique for a given load within renewable energy applications for enhanced overall system performance.



## 2. MULTIDIMENSIONAL STUDY OF WIND ENERGY POTENTIAL IN ALAMEIN

[https://aast.edu/en/scientific-research/projects/project.php?uid=16&proj\\_id=15](https://aast.edu/en/scientific-research/projects/project.php?uid=16&proj_id=15)

### **Project Duration**

12 Months

### **Project Start Date**

2021-10-01 00:00:00

### **Project End Date**

2022-09-30 00:00:00

The Egyptian economic transformation vision foresees the north coast as one of the main pillars for future economy and development. Transformational urban and economic development is being carried out along the 400 km length coastline from New Alamein eco-city to Al-Salloum. The north coast region The World Bank global wind atlas shows that the average energy density in that region is in the range of 0.5 to 1 kW/m<sup>2</sup> and average wind velocity higher than 5 m/s. These estimations show promising potential of wind energy. This project presents the first comprehensive evaluation of wind energy viability and feasibility in Egypt's north coast. The project adopts a multidimensional approach to reproduce the spatiotemporal wind field over the north coast utilizing status quo GIS-BIM-CFD integrated simulation systems. The project's primary goal is to identify the best wind energy systems for power generation in the region and estimate its economic feasibility. Secondary objectives include identification of the main characteristics of atmospheric boundary layer and urban aerodynamics of Alamein city. The outcome of this project will be the first comprehensive evaluation of wind energy potential in Alamein city and region.

### **❖ Publications**

#### **1. Renewable Energy and Sustainable Development (RESD) journal**

<http://apc.aast.edu/ojs/index.php/RESD>

Link for publications in journals

[https://www.scilit.net/articles/search?offset=0&q=container\\_group\\_id%3A%2868381%29](https://www.scilit.net/articles/search?offset=0&q=container_group_id%3A%2868381%29)

The journal is **financially supported by the Arab Academy for Science, Technology and Maritime Transport** in order to maintain quality open-access source of research papers on renewable energy and sustainable development.



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

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The RESD journal is a biannual international peer-reviewed journal featuring open-access and free charge fees. It presents a global forum for dissemination of research articles, case studies and reviews focusing on all aspects of renewable energy and its role in sustainable development for authors and readers.

The journal aims to present to the international community important results of work in the fields of renewable energy and sustainable development research to help researchers, scientists, manufacturers, institutions, world agencies, societies to keep up with new developments in theory and applications. Experimental, computational and theoretical studies are all welcomed to RESD. The topics of focal interest to RESD include, but are not limited to, all aspects of wind energy, wave/tidal energy, solar energy, Hydropower, Geothermal Energy, Hydrogen & Fuel Cells as well as energy from biomass and biofuel. The Energy Savings and efficient energy is a major interest of the RESD journal. The integration of renewable energy technologies in electrical power networks and smart grids is another topic of interest to RESD.

### **2. Samples of energy-related publications of AAST staff in international conferences**

- [Power Flow Control of a Hybrid Battery/Supercapacitor Standalone PV System under Irradiance and Load Variations](#)

NE Zakzouk, RA Lotfi in 2020 10th International Conference on Power and Energy Systems (ICPES), pp. 469-474

- [The use of double skin and photovoltaics in AAST Campus in South Valley, Egypt](#)

Ahmed Fikry Abou El Wafa in 2021 8<sup>th</sup> international scientific conference on Digital technology in Architecture, Arts and Era Challenges



## Agreements

### Memorandum of Understanding (MoU) between AASTMT and other national and regional entities to support government intention towards green energy

#### ➤ MoU between AASTMT and British University in Egypt (BUE)-Wind Energy Division (15-17/4/2019 for 1 year)

The Parties are part of the consortium of the Erasmus Plus “WESET” project “Wind Engineering Skills in Egypt and Tunisia”, Project Number: Project Number: 586039-EPP-1- 2017-1-ES-EPPKA2-CBHE-JP, recognize the many benefits of an academic partnership in an increasingly interdependent world, and therefore, they hereby register their intentions to establish formal links between their Wind Energy Centers built within the WESET project. For instance, the institutions put at the service of each other the facilities created within the established centers, at AASTMT and the BUE to carry out and support projects that promote the mutual interests of the two labs. The period of duration is one year.



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#### MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (“MoU”) is entered into as of the last date of signature (the “Effective Date”), by and between:

1. **The Arab Academy for Science, Technology and Maritime Transport (AASTMT)**, Wind Energy Center, Abu Kir Campus, in **Alexandria, Egypt** and represented for the purpose of this agreement by Professor Yasser Gaber Dessouky, dean of scientific research and innovation and coordinator of AASTMT for WESET Project, (hereinafter referred to as “AASTMT”),
2. **The British University in Egypt CRE- Wind Energy Division**, in **Cairo, Egypt** and represented for the purpose of this agreement by Professor Ahmed Reda El Baz, CRE deputy director wind energy division and coordinator of BUE for WESET Project, (hereinafter referred to as “BUE”).





## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

### ➤ MoU between AASTMT and Ain Shams University (ASU), Faculty of Engineering, Wind Energy Center (15-17/4/2019 for 1 year)

The Parties are part of the consortium of the Erasmus Plus “WESET” project “Wind Engineering Skills in Egypt and Tunisia”, Project Number: Project Number: 586039-EPP-1- 2017-1-ES-EPPKA2-CBHE-JP, recognize the many benefits of an academic partnership in an increasingly interdependent world, and therefore, they hereby register their intentions to establish formal links between their Wind Energy Centers built within the WESET project. For instance, the institutions put at the service of each other the facilities created within the established centers, at AASTMT and the at ASU to carry out and support projects that promote the mutual interests of the two labs. The period of duration is one year.



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And,

2. **Ain Shams University, Faculty of Engineering** Wind Energy Center, in **Cairo, Egypt** and represented for the purpose of this agreement by Dr Amr Yehia Elbanhawy, coordinator of ASU wind engineering centre and coordinator of ASU for WESET project, (hereinafter referred to as “ASU”).

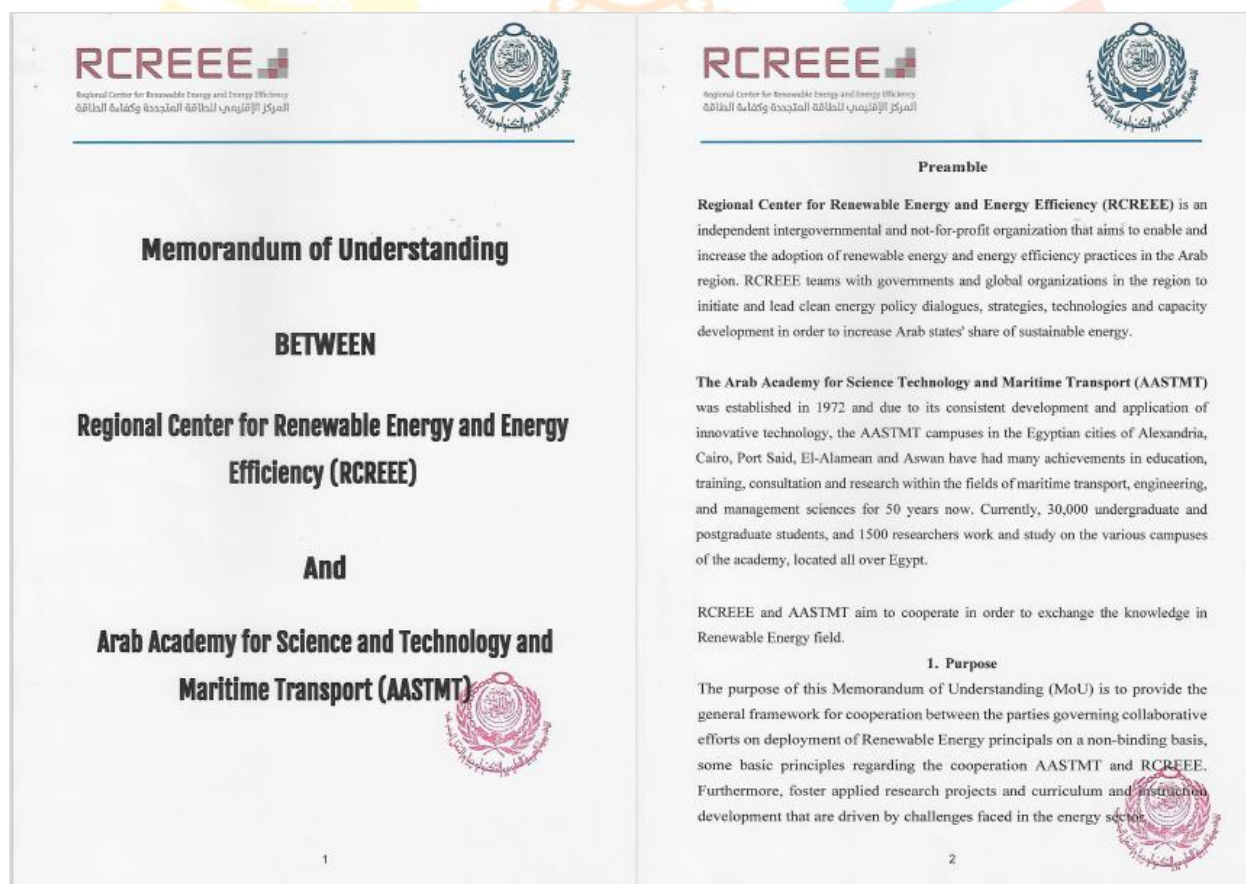


## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

- MoU between AASTMT and Regional Center for Renewable Energy and Energy Efficiency (RCREEE) (21-2-2021)

### 1. Purpose

The purpose of this Memorandum of Understanding (MoU) is to provide the general framework for cooperation between the parties governing collaborative efforts on deployment of Renewable Energy principals on a non-binding basis, some basic principles regarding the cooperation AASTMT and RCREEE. Furthermore, foster applied research projects and curriculum and instruction development that are driven by challenges faced in the energy sector.





## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport

### ➤ MoU between AASTMT and Housing and Building National Research Center (HBRC) (12-10-2021)

The purpose of this Memorandum of Understanding (MoU) is to provide the general framework for cooperation between the parties governing collaborative efforts on deployment of Renewable Energy principals on a non-binding basis, some basic principles regarding the cooperation AASTMT and HBRC. Furthermore, foster applied research projects and curriculum and instruction development that are driven by challenges faced in the energy sector. The AASTMT is a part of the consortium of the Erasmus Plus “WESET” project “Wind Engineering Skills in Egypt and Tunisia”, Project Number: Project Number: 586039-EPP-1- 2017-1-ES-EPPKA2-CBHE-JP. The AASTMT and HBRC recognize the many benefits of an academic partnership in an increasingly interdependent world, and therefore, they hereby register their intentions to establish formal links between the Wind Energy Center built within the WESET project in the AASTMT and the HBRC.



### Memorandum of Understanding

BETWEEN

Housing and Building National Research Center (HBRC)

And

Arab Academy for Science and Technology and Maritime Transport (AASTMT)



## Public Engagement

### ❖ **Trainings and seminars organized by Energy Research Unit**

#### - **Free Wind Online Training**

**13 - 14  
October  
2021  
05:00 - 08:00**

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

**WE SET**

**Project WESET's Online Wind Energy Training**

Project WESET (Wind Engineering Skills in Egypt and Tunisia) is an Erasmus+ European Union funded project aimed at building capacity at higher education and governance institutions in Egypt and Tunisia.

**Objectives**

- Disseminate the outcomes of WESET Project.
- Enhance the stakeholder's knowledge about Wind Energy and its trend in Egypt
- Know the theoretical and practical aspects of wind turbine components, operation and control

**Outlines**

- Introduction and Wind Energy (WE) in Egypt
- Fundamentals of WE and Aerodynamics
- Wind Turbine Mechanics and Dynamics
- Pitch, Yaw, and Drivetrain systems
- Tower Design and Trends
- Wind Turbine Generators
- Wind Farm Power Transmission
- Grid Code and Regulation
- Lightening Protection of WF
- Control strategies and Control Anatomy
- Operation, Load Mitigation and Control

**zoom**

Meeting ID: 92500407638  
Pass code: 857783

Contact: Prof. Mostafa Abdelgeliel,  
Head of Energy research unit, AAST, Tel.  
01220646998

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- **PV market seminar**



❖ **AASTMT Energy Consultancy**

**1. Energy Management Service of AASTMT Productivity and Quality Institute (PQI)**

AASTMT PQI has a great role in supporting energy-efficient systems and offering energy management services by introducing the following;

- **ISO 50001 Energy management Systems Consultancy Service (EnMS)**

[https://aast.edu/en/institutes/pqi/contenttemp\\_item.php?unit\\_item=342&page\\_id=34200027](https://aast.edu/en/institutes/pqi/contenttemp_item.php?unit_item=342&page_id=34200027)

The purpose of the EnMS is to enable organizations to establish or re-structured the systems and processes necessary to improve energy performance, including energy efficiency, use, consumption and reduce running cost. ISO 50001 (Energy Management System) is based on the ISO management system model familiar to more than a million organizations worldwide who implement standards such as ISO 9001 (quality management), ISO 14001 (environmental management), ISO 22000 (food safety), ISO/IEC 27001 (information security). ISO 50001 can be implemented individually or integrated with other management system standards.



Benefits of ISO 50001 Application:

- Improves existing management systems.
- Leverages existing continual improvement processes.
- Develops a baseline of energy use.
- Actively manages energy use and costs.
- Reduce emissions without a negative impact on operations.
- Continual improvement of energy use versus product output over time.
- Potential for savings to be used for emission credits.
- Improves maintenance process culture in all types of organization.
- Generates a new source of thinking in energy Consumption model.

➤ **Energy and Environmental Management courses**

Environmental Management System (EMS) and Energy Management System (EnMS) helps sustainable businesses and help to reduce an organization's impact on the environment while improving operating efficiency, controlling, and reducing your organization's energy consumption, which reflects on, reducing product manufacturing costs as energy costs rise. Thus, AASTMT offers the following courses

- **Energy management training courses**

Energy management courses focus on the proactive assessment and management of energy systems resulting in successful economic and environmental results.

[https://aast.edu/en/institutes/pqi/contenttemp\\_item.php?unit\\_item=343&page\\_id=34300118](https://aast.edu/en/institutes/pqi/contenttemp_item.php?unit_item=343&page_id=34300118)

- **Environmental management training courses**

Environmental management courses focus on how to mitigate the adverse effects of business and industrial operations on the Earth's environment.

[https://aast.edu/en/institutes/pqi/contenttemp\\_item.php?unit\\_item=343&page\\_id=34300113](https://aast.edu/en/institutes/pqi/contenttemp_item.php?unit_item=343&page_id=34300113)



## 2. Maritime Research and Consultation Center

Examples of projects developed by this center

### - Project I: Energy Audit for Green Port

#### Purpose of work

Analyze the current state of Energy consumption and affordable green system. Then, determine the gap between current state and national and international the sustainable development goals (SDGs). Finally, provide the solution and specify road map for Green system

### - Project II: Electrification of River Vehicles

#### Purpose of work

Transforming the Nile river vehicles to electrified ones powered by PV panels installed at their surface as a source of sustainable clean energy



PV-equipped electric river vehicle

### ❖ **AASTMT assistance to for start-ups that support green energy**

AASTMT provides assistances for start-ups that support a low-carbon economy or technology. Hereby, two foster startup cases are illustrated as follows;

#### 1- **Mobile solar charger**

One student of the faculty of Engineering has been develop a company before graduation to build a Mobile solar system for different industrial and commercial application such as Super Markets, Moles, Hotels, etc.. graduated student.



## Sustainable Development Goals Arab Academy for Science, Technology and Maritime Transport



2- A team of some graduated has been established to build an electric vehicle and its part.



### دعوة للإنضمام لأسرة تكنولوجيا السيارات الكهربائية

في إطار تعظيم تنمية قدرات الطلاب لتعلم التكنولوجيات الحديثة في مجال السيارات الكهربائية ونظم الشبكات الكهربائية الذكية (Smart Grids) يتشرف قسم الهندسة الكهربائية والتحكم بكلية الهندسة – أبو قير وتحت رعاية Egypt IEEE Power Electronics Society (PELS) Chapter أن يطلق نداء للراغبين للإنضمام بواقع عدد (3) طلبة من كل سنة دراسية كمرحلة أولى.

The team will learn and contribute to the following areas:

- **Technology:** Vehicle, battery, and electric power systems, design, control and optimization
- **Consumer behavior:** technology adoption and driver behavior
- **Awareness of EV benefits** on individuals, community, and utility.
- **Participation** on the related activities and competitions.
- **Establishment** of the Egypt IEEE PELS Student Chapter



To join, please contact:

**Prof. Mostafa Saad Hamad**

Electrical and Control Engineering Dept.  
College of Engineering- AASTMT  
Chairman of Egypt IEEE PELS Chapter

Room G302

[Mostafa.hamad@staff.aast.edu](mailto:Mostafa.hamad@staff.aast.edu)





## Case Study

### I. Energy Consumption Reduction in AASTMT Abukir Campus

In association with energy research unit, the Central Energy Committee carried out building upgrading and smart energy metering towards energy consumption reduction in AASTMT- Abukir Campus. This includes applying LED lighting technology, remote monitoring of the electrical loads in order to assign the priority as well as installing clean energy-efficient PV stations.

- **Upgrading building B**

[../././openfiles/opencmsfiles/pdf\\_retrieve/cms.php?disp\\_unit=3/7-2-004-1.pdf](http://.../openfiles/opencmsfiles/pdf_retrieve/cms.php?disp_unit=3/7-2-004-1.pdf)

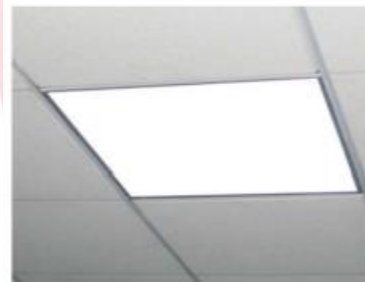
- **Modernization of air-conditioners to energy-saving central air-conditioning**



**Installing smart electricity meters and updating panels**



**LED lighting**





• **Upgrading Building G**

[../.../openfiles/opencmsfiles/pdf\\_retrieve\\_cms.php?disp\\_unit=3/7-2-004-2.pdf](http://.../openfiles/opencmsfiles/pdf_retrieve_cms.php?disp_unit=3/7-2-004-2.pdf)

Central air conditioning (chiller)



Smart electricity meters.



LED lighting



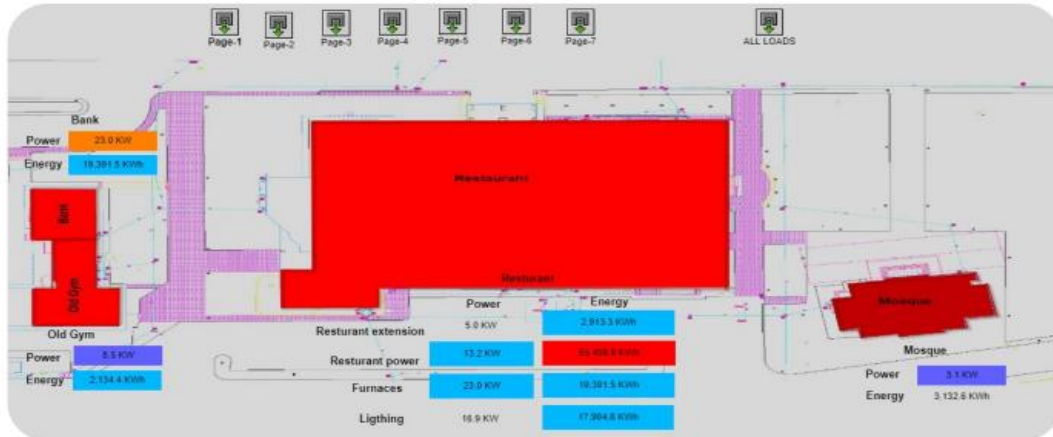
**50 kW Solar Power Plant (On-Grid) with Weather Station.  
Installed on floor of building G.**



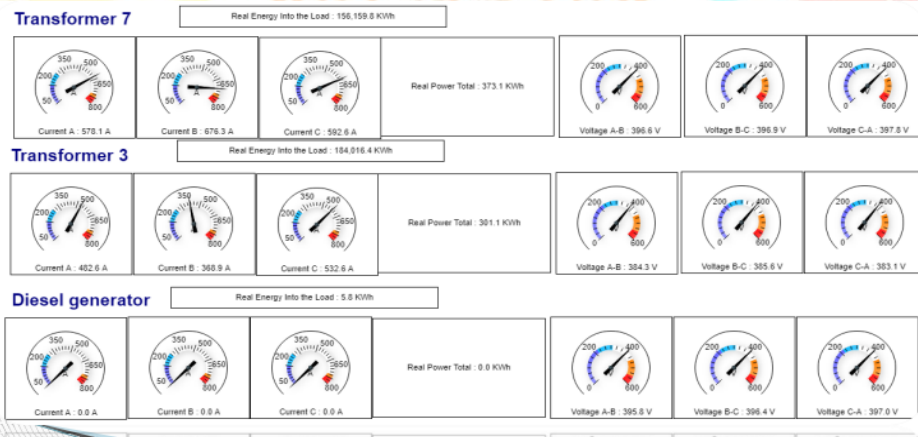


• Monitoring

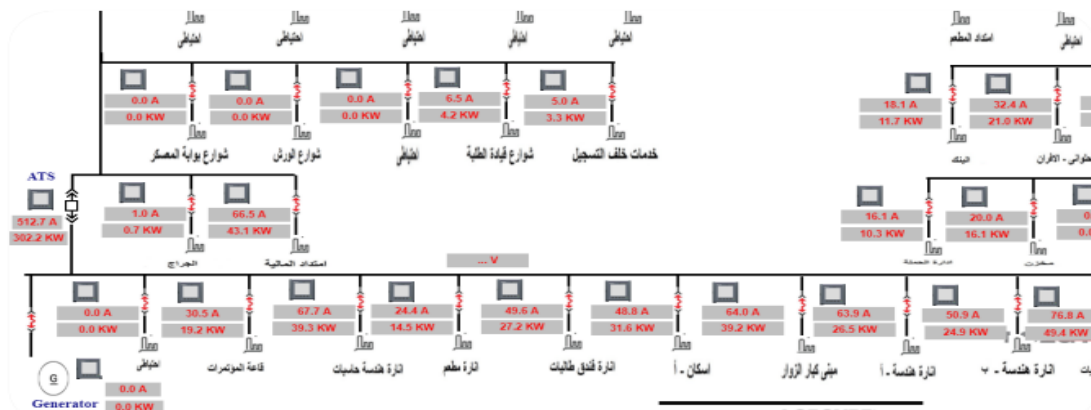
Implement Online Monitoring of Energy Consumption in Abu-Kir Coumps



Energy Meters



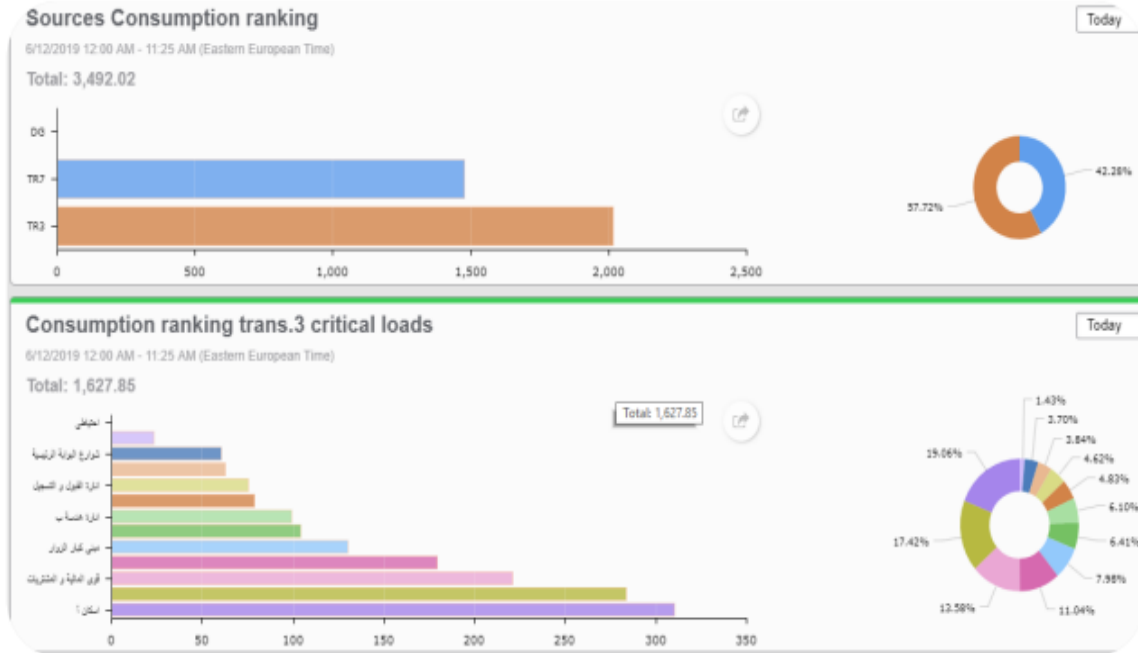
Power Station Monitoring system





- Energy plan for energy reduction including lighting, HVAC, utility, etc

### Sources Consumption Ranking



**Results:** Energy Consumption reduction by 20.5% in 2020 rather than the consumption in 2019

جدول تحليل الاستهلاك للطاقة الكهربائية للاكاديمية العربية للعلوم والتكنولوجيا والنقل البحري  
لاعوام 2020/2019 لاي قتر

الفرق في الاستهلاك KWH	نسبة الفرق في الاستهلاك %	عام 2020					عام 2019					الشهر المحاسبة
		اجمالي قيمة الاستهلاك بالجنيه	تعريفية الاستهلاك بالقرش	الاستهلاك الشهري KWH	تعريفية اقصى حمل بالجنيه	اقصى حمل	اجمالي قيمة الاستهلاك بالجنيه	تعريفية الاستهلاك بالقرش	الاستهلاك الشهري KWH	تعريفية اقصى حمل بالجنيه	اقصى حمل	
124706	22.3808327	1035712	1.15	681906	60	4192	803960	1.05	557200	50	4378	شهر 1
116810	17.1129372	1170822	1.15	799393	60	4192	926712	1.05	682583	50	4200	شهر 2
-348488	-47.45711	695229	1.15	385834	60	4192	981038	1.05	734322	50	4200	شهر 3
-302593	-40.264131	767786	1.15	448927	60	4192	999096	1.05	751520	50	4200	شهر 4
-146133	-22.296765	719697	1.15	509267	60	2234	898170	1.05	655400	50	4200	شهر 5
-224952	-34.791377	618905	1.15	421622	60	2234	888903	1.05	646574	50	4200	شهر 6
-400708	-41.562865	764302	1.15	563393	60	1940	1330416	1.15	964101	60	3695	شهر 7
-176531	-22.3663	821052	1.15	612741	60	1940	1129363	1.15	789272	60	3695	شهر 8
-189730	-19.65490	1008312	1.15	775576	60	1940	1331802	1.15	965306	60	3695	شهر 9
-122182	-12.47	1187370	1.15	857609	60	3352	1348460	1.15	979791	60	3695	شهر 10
-42007	-3.853	971947	1.15	670284	60	3352	1503878	1.15	1090311	60	4167	شهر 11
-258590	-33.2536	798016	1.15	519040	60	3352	1144295	1.15	777630	60	4167	شهر 12
اجمالي نسبة فرق الاستهلاك	-20.5377	Reduction between 2019 and 2020=20.5% Total energy used = 34538.4 GJ/2019 and 26084.1312 GJ/2020 University floor space = 218.400 m <sup>2</sup>										



## II. Energy Management training courses offered by AASTMT Productivity and Quality Institute (PQI)

These training courses are offered to industrial entities to focus on the proactive assessment and management of energy systems resulting in energy-efficient outcomes and successful economic and environmental results.

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الدورات التدريبية في مجال إدارة الطاقة

### Training Courses in Energy Management

#	Course Title	Date	Trainees No.	Company Name
1	Understanding Energy Management System ISO 50001 & Internal Audit	Feb 2020	11	- Egyptian Ethylene & Derivatives Company
2	Internal Audit for Energy Management System ISO 50001 Requirements	April 2019	10	- Misr Petroleum
3	Energy Management System Awareness ISO 50001	Feb 2019	10	- Misr Petroleum
4	ISO 50001:2018 Energy Management System Lead Auditor Training Course	July 2020	8	- Samsung Masr
5	ISO 50001:2018 Energy Management System Lead Auditor Training Course	September 2020	5	- Misr Petroleum - Alexandria Electricity Distribution Co - Abu Qir fertilizers Co

