7.2.6. Divestment Policy

2023–2024

AAST Energy Research Unit and Energy Management Committee focus on divesting from carbon intensive industries by directing investments and research towards green clean energy and carbon emissions reduction, as well as expansion in renewable energy employment. This is demonstrated in *Green Energy and Energy Management Policy* which includes within its context AASTMT commitment to conduct Investments and Research towards low-carbon renewable energy sources as well as energy efficiency and decarbonization aspects.

Check on the AASTMT news page

The Investments and Research aspects in this Policy include the following;

Investments

- Divesting investments from carbon-intensive energy industries notably coal and oil to renewable energy initiatives including wind, solar, hydro, bioenergy, …. etc. projects.
- Sustainability-focused investment approach towards projects that promote environmental conservation, and clean energy technologies.
- Investments in start-ups and businesses that not only demonstrate a potential for economic growth, but also operate responsibly with a strong focus on sustainability and environmental stewardship.

Research

- Expand research on clean energy industry and green infrastructure projects that meet internationally recognized sustainability standards.
- Focus on carbon emission reduction projects and energy recovery projects via energy recuperation.

Moreover, there is the *Sustainable Investment Policy-statement* which focuses on investments in Renewable Energy initiatives, including but not limited to wind, solar, hydro, and bioenergy projects.
Check Sustainable Investment Policy on AASTMT webpage

2023/2024 Measures towards Green Renewable Energy

Towards Green Renewable Energy Expansion, AASTMT takes consistent measures that are continuously carried out, besides yearly updated ones. This is reflected in the increase of low-carbon sources' share in AASTMT total energy supply, as well as in the implemented innovations and prototypes of related projects and investment. These measures are detailed in AASTMT 2024 plan towards Green Sustainable Energy and their effectiveness are validated in 2024 Energy Progress Report, as summarized below.

AASTMT 2024 Plan towards Clean Sustainable Energy on AASTMT webpage
AASTMT 2023/2024 Energy Progress Report on AASTMT webpage

2024 AASTMT Measures to Divert to Clean Energy

Starting from 2022 along to 2024, AASTMT took consistent steps towards renewable energy (RE) sources employment, with a particular focus on solar power, by installing and functioning about 230 kW solar of photovoltaic (PV) side and mounted stations as well as solar heaters as follows,

- In Aswan branch a 150kW grid tied PV power station is mounted in the form of a roof mounted station and a side mounted one. Both work with net metering system.
- A grid-tied PV power station with a capacity of 50 kW is installed in the Seventh Engineering Building in Alexandria- Abukir campus with net metering system.
- In 2022, solar heaters were installed in the Pharmacy college- Alex. Abukir campus, while others were planned to be installed to replace the electric heaters in students' dorms – Alex. Abukir campus and are put into action in 2024.

(a)

(b) *(c)*

Figure 1: Solar installation in AASTMT campuses (a)150kW grid-tied roof and side mounted PV station in Aswan campus, (b) 50kW – grid tied PV station in Abukir Campus, (c) Solar Heaters in Abukir campus

However, to sustain and expand AASTMT efforts towards renewable energy solutions, regular measures are taken into account, besides initiatives and projects initiated annually to serve this goal.

1. Regular Measures

- **Continuous maintenance, routine cleaning and improvements** in the existing solar installations help to maintain and even improve their output power thus enhancing its energy share in all AASTMT consumption.
- **Investments in Energy-related LABs** intalled in AASTMT different campuses to guarantee continuous maintenance and improvements, thus assisting in consultancy, research and trainings.

These Labs include;

- **Energy Research Unit LAB in 7th Engineerring Building - Alexandria Headquarter**
  Energy Research Unit LAB on AASTMT webpage
- **Energy LAB in Eletrical Energy Engineering Department - Smart Village Campus**
  Eletrical Energy Engineering LAB on AASTMT webpage
- **Environmental Monitoring and Climate Change Laboratory - Scientific Research & Innovation Centre**
  Environmental Monitoring and Climate Change Laboratory on AASTMT webpage

2. AASTMT 2024 Plan

Annually, AASTMT participates in renewable energy-related projects and improves the outcomes of already existing ones to serve the industry and community effectively and resourcefully. Besides, campaigns and technical talks are organized to increase the awareness about RE importance and technicality. Moreover, studies are conducted for renewables expansion in AASTMT infrastructure and facilities.

- Study the potential of expanding renewable infrastructure among different AASTMT campuses by installing new solar stations and other renewable solutions. See 2024/2025 proposal to establish a solar power plant and two electric vehicle charging units at the College of Eng. and Technology building – Alamein
  2024/2025 Study and Proposal for establishing PV station and EV charging units in Alamein Branch
- Addition of Renewable Energy Educational Lab in the Electrical and Control Eng. Dept-room G142 at AASTMT Alexandria - Abukir campus.

  It presents the essential need to prepare students with a comprehensive background in renewable energies via three experimental kits. These lab experiments help the students understand the main concepts regarding renewable energy, energy measurement and energy storage. The three main resources are Solar, Wind and Fuel Cell. The laboratory serves renewable energy courses and summer school camps.

Fig. 2: Installed renewable energy educational lab in electrical and Control Eng. Dept. - Alex. Abukir campus

Renewable Energy Lab in EE Dept-AAST Abukir on AASTMT webpage

- Implement the outcomes of already existing research projects to serve the industry and community effectively and resourcefully via the implementation and testing of the unit designed in the research project: Monitoring, Assessment and Innovative Treatment Technology to Enhance Groundwater Quality for Irrigation Purposes toward Climate Change Adaptation (TREATMENT) Funded Project

The Renewable, Innovative and Integrated Water Treatment Unit designed in 2023 in the TREATMENT Project was installed and put into action in 2024. This unit uses energy harnessed from 7kW photovoltaic system to be used to lift water from a well, and subsequently, the water is directed through the four-stage nano-filter, where it undergoes a rigorous purification process. The end result is clean, potable water or water suitable for

irrigation and cultivation and almost 7kW PV system, serves as the sustainable energy source for the three-phase pump.

Project News on AASTMT webpage
TREATMENT Project on AASTMT webpage
Water Treatment Unit Report-May2024 on AASTMT webpage

(a)

(b)

Figure 3. TREATMENT Project Implementation (a) Solar PV Mounting Structure, (b) Realized Water treatment unit

- Encourage renewable energy-related events and activities (campaigns, initiatives, seminars, workshops, visits and trainings).
  Renewable Energy-related Events on AASTMT webpage
  Renewable Energy-related Activities on AASTMT webpage

- Prioritize renewable energy research projects and graduation projects.
  Renewable Energy Research Projects
  Renewable Energy Graduation Projects

- Prioritize renewable energy projects in AASTMT Industry Service Complex to serve the industry and community effectively and resourcefully.
  AAST ISC 2024/2025 projects

Renewable Energy-related 2024/2025 Projects in **AASTMT Industry Service Complex include,**

- ### Smart Solar Waste Compactor

"Smart Solar Waste Compactor," aims to develop an intelligent device for compacting plastic waste in various institutions such as schools, hospitals, and factories, relying primarily only on solar energy as its main power source. This project represents a practical solution that helps reduce plastic pollution, promotes the concept of a circular economy, and encourages institutions to sort their waste and gain financial returns from it.
Smart Solar Waste Compactor

- ### Solar Agricultural Robot

This is an integrated agricultural robot powered by solar energy and considered the second of its kind in the region. The robot was developed through joint funding from AASTMT and businessman Eng. Ahmed Abu Hashima in the project, named "LiDAR Navigation IoT Solar Agribot". This project aims to support smart clean and sustainable farming and reduce reliance on manual labor, particularly in desert and muddy environments.
Solar Agricultural Robot

- ### Liquid Tree

An environmental photobioreactor, powered by solar energy, is implemented to purify the air and produce oxygen using marine algae. The project is a low-cost version of a model used in the UAE, which costs around $10,000, while the students managed to build the unit in Egypt for less than 15,000 EGP. The amount of oxygen produced by this system is equivalent to that of ten mature trees, making it suitable for use in parks, schools, and crowded urban areas.

(a) *(b)* *(c)*

Figure 4: 2024 renewable energy-related projects in AASTMT Industry Service Complex
(a) Smart Solar Waste Compactor, (b) Solar Agricultural Robot, (c) Liquid Tree

The Liquid Tree

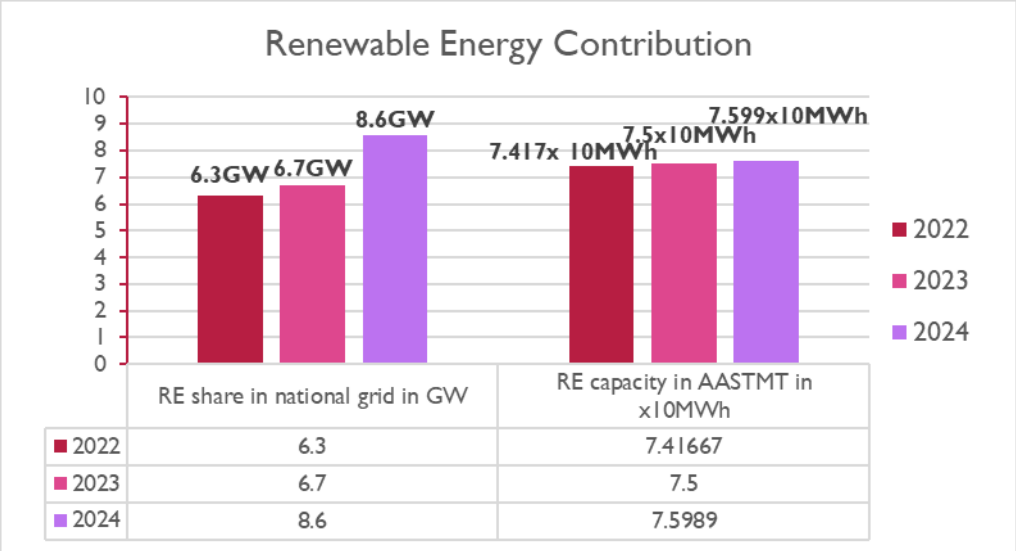
Validation of 2024 AASTMT measures to divert to clean energy

AAST commitment to divert to renewable clean energy is vivid in its investments and research in the field of low-carbon sustainable energy as discussed before. Moreover, for further validation, the share of low-carbon sources in AASTMT energy supply is discussed in 2024 AASTMT Energy and Carbon Insights Report and summarized below;

AASTMT 2024 Energy and Carbon Insights on AASTMT webpage

AASTMT energy demand is supplied mainly from the Egyptian national grid in which the renewable energy (RE) share has increased from 6.3GW in 2022 to 6.7Gw in 2023 till reaching 8.6GW in 2024 as per NREA Report 2024, achieving an increase by almost 6.3% from 2022 to 2023 and by 28.4% from 2023 till 2024 as shown in Fig.5. Besides renewable energy contributed in AASTMT from national grid, there are almost 230 kW solar energy installations on AASTMT campuses buildings, with production reaching almost 75989 kWh in 2024. The latter shows an increase of almost 1.3% from the 75000 kWh solar installations in 2023 as shown in Fig. 5.

This reflects AASTMT efforts to divert to clean energy, energy efficiency, reduce emissions and sustain serving the Environment. Conclusively, AASTMT average renewable energy share in supplying its total energy demand (including RE share in national grid and its solar installations) reached above 25% in 2024 which is more than the 24% in 2023, reflecting AAST continuous efforts and investments to increase its RES installations, meeting its roadmap of achieving 25% RES share by 2025 and progressing towards it long-term goal of 40% RES share by 2040.



	RE share in national grid in GW	RE capacity in AASTMT in x10MWh
2022	6.3	7.41667
2023	6.7	7.5
2024	8.6	7.5989

Figure 5. Renewable energy share in national grid [NREA Report 2024] and AAST RE installations

Table 1 shows the entire AAST energy density, including energy from national grid and from AASTMT total solar installations, in kWh/m^2 and GJ/m^2 in 2024 compared to that of 2023. The calculated energy density reached about 0.09363GJ/m^2 in 2024 which is less than the 0.09785GJ/m^2 in 2023 by almost 4.3%, mirroring AASTMT continuous efforts towards electrical energy conservation and energy efficiency improvement. Also, it is worth noting that AASTMT total energy consumption from low carbon sources (summing up RE sources share in

national grid and solar installation in AAST), has reached 17494GJ in 2024 which is more than the 17271GJ in 2023 by almost 1.29%, reflecting AASST support to transition to clean energy.

Table 1. Energy Density in GJ/m² for the entire AAST in 2024 compared to 2023

Year	Total Floor Area (m^2)	Total energy (kWh) (from Grid + AAST solar infrastructure)	Total energy (GJ) (from Grid + AASTMT solar infrastructure)	Density (GJ/m^2)	Energy from low carbon sources (GJ)
2023	735569.7	19,992,470	71972.892	0.09785	17271
2024	735569.7	19,131,865	68874.714	0.09363	17494

2022/2023 Measures towards Green Renewable Energy

Over the course of 2022 and 2023, AASTMT made significant strides in transitioning to renewable energy sources, with a particular focus on solar power. The university expanded its solar infrastructure by operating 214 kW of photovoltaics and solar panels which contributed in increasing AAST renewable energy share supply to 24% of AASTMT total energy needs in 2023. This growth was made possible through further investments in renewable energy infrastructure as well as improvements in the maintenance and operation of existing solar installations. Moreover, in 2022/2023, AASTMT has significantly expanded its contributions to renewable energy and climate change through investments, research and projects as well as grants and innovations whose outcomes flourished within this period.

1. Related measures are detailed in 2022/2023 AASTMT Energy Progress Report and summarized below;

AASTMT 2022/2023 Energy Progress Report on AASTMT webpage

These measures include;

- The university fully utilized it photovoltaic infrastructure in 2022 where a solar power station with a capacity of 50 kilowatts is installed in the Seventh Engineering Building in Alexandria campus and another one of 150 kW in Aswan. Both work with net metering system. Improvements in the maintenance and operation of existing solar installations in 2023 help to maintain and even improve their output power thus enhancing its energy share in all AASTMT consumption.
- Solar heaters have been installed in 2023 to replace the electric heaters in students' dorms – Alexandria campus- Abukir branch as was planned in 2022, besides the already applied solar heaters in the Pharmacy college.

Figure 1. 150kW solar power station in Aswan campus

Figure 2. Installed Solar Heaters

- Investments in Energy-related LABs intalled in AASTMT different campuses to guarantee continuous improvements and maintenance within these facilities which assist in consultancy, research and trainings. These Labs include;
  - **Energy Research Unit LAB in Seventh Engineerring Building - Alexandria Headquarter**

    Energy Research Unit LAB
  - **Energy LAB in Eletrical Energy Engineering Department - Smart village campus**

    Eletrical Energy Engineering LAB
  - **Environmental Monitoring and Climate Change Laboratory - Scientific Research & Innovation Centre**

    Environmental Monitoring and Climate Change Laboratory
- Participate in further renewable energy-related research projects and improve the outcomes of already existing ones to serve the industry and community effectively and resourcefully.

  It is worth noting that a number of renewable energy- related projects, undertaken by AASTMT, have resulted in significant outcomes in 2022/2023. Some examples are listed below.

  - **MAIA-TAQA Project (2019-2023);**

    An important outcome of this project is "The Innovation One Stop Shop (IOSS)" in the Energy research Unit LAB installed and operated in 2022. The IOSS main purpose in AASTMT is to support startups and industry with business models, besides being used for training and consultancy purposes with components and facilities related to Renewable Energy.

    MAIA-TAQA-IOSS
  - **Smart Solar-Powered Public Parking System Project;**

    This project was funded by Information Technology Industry Development Agency's (ITIDA) and Information Technology Academia Collaboration (ITAC). This was followed by a related project, "Smart Integrated On-Board Battery Charger for Electric Vehicle Applications". As an output of these projects, AASTMT Research and Development Center at Alamin campus designed and implemented two setups (PV-based Electric Vehicle Charger and Solar Power Smart Parking Meter) in AAST Abukir Campus in 2023 as a prototype for more duplicates.

    Smart Charger for Electric Vehicle

- **An Environmentally Friendly Electric Car Project**

An electric car, that uses water and hydrogen, was invented by a student team from the Institute of Technical and Vocational Studies at AASTMT Industry Service Complex (ISC) in 2023.

AASTMT Electric Car Project

Figure 3. Smart Solar-Powered Parking System

Figure 4. Electric car project

- **Monitoring, Assessment and Innovative Treatment Technology to Enhance Groundwater Quality for Irrigation Purposes toward Climate Change Adaptation (TREATMENT) Project**

In 2022/2023, a Renewable, Innovative and Integrated Water Treatment Unit is designed to use energy harnessed from solar photovoltaic system to be used to lift water from a well, and subsequently, the water is directed through the four-stage nano-filter, where it undergoes a rigorous purification process.

The end result is clean, potable water or water suitable for irrigation and cultivation and the PV system, serves as the sustainable energy source for the three-phase pump.

Treatment Project (2022-2023)

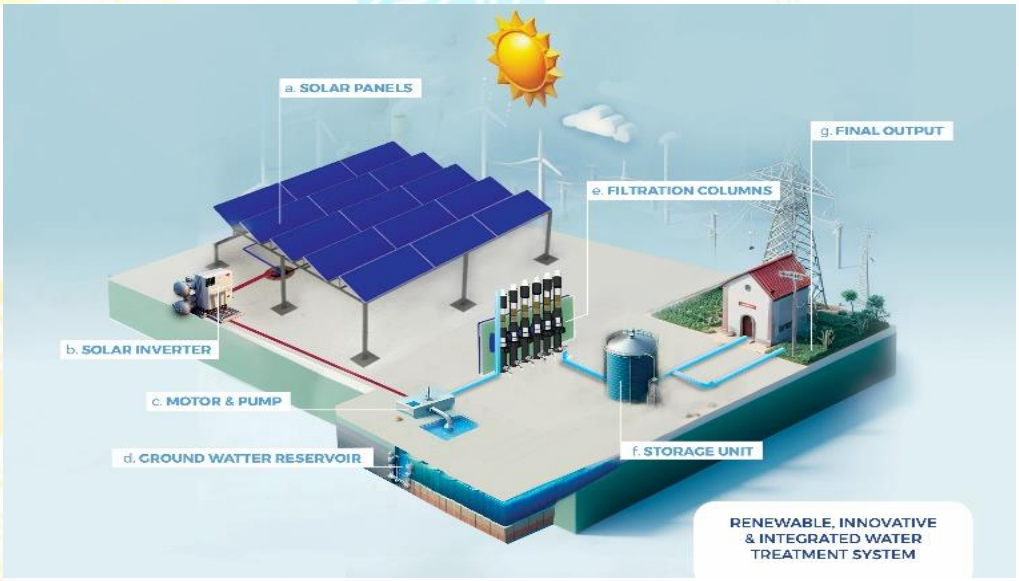


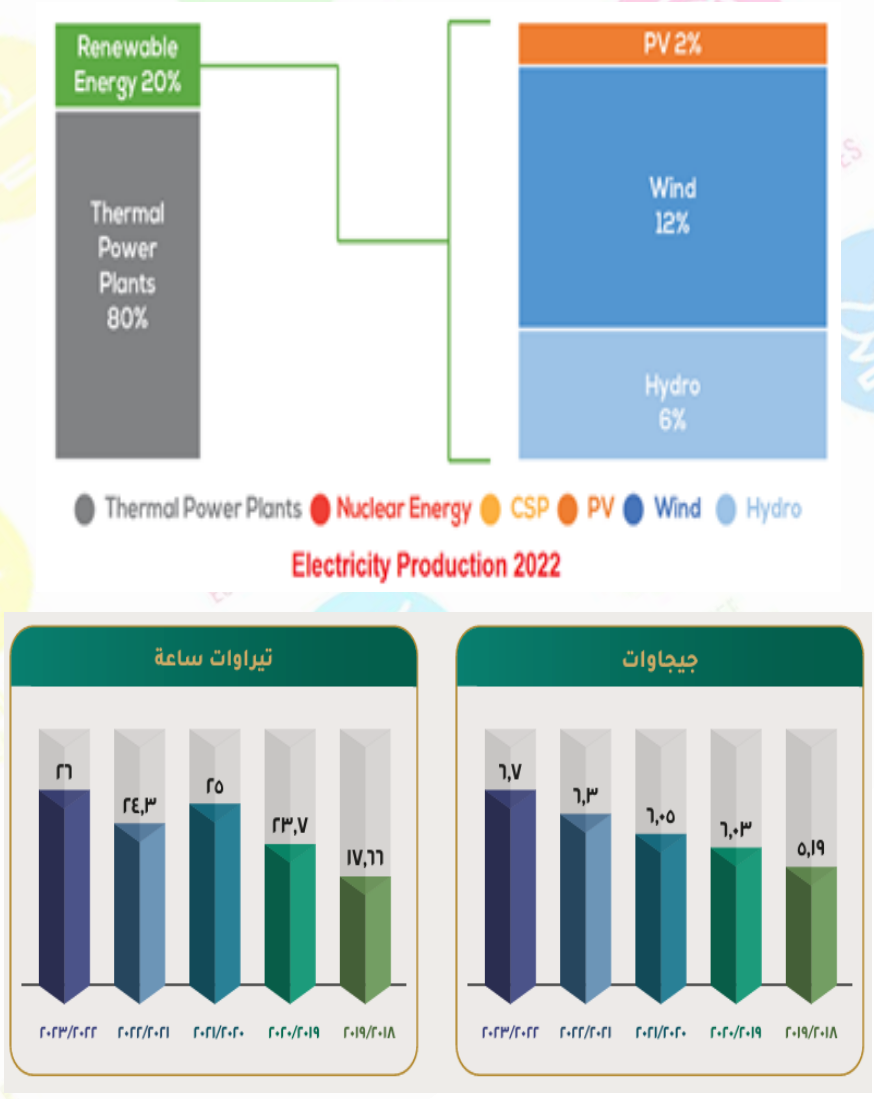
Figure 5. Renewable, Innovative and Integrated Water Treatment Unit

2. Renewable Energy Employment in AAST

The AAST energy consumption is supplied mainly from the national grid in addition to solar energy in average 214 kW installed on AASTMT campuses buildings in 2022/2023.

Noting that the national grid has 20% renewable energy according to National renewable energy Authority (NREA report 2022), as illustrated in **Error! Reference source not found.**Figure 6 (a) , and the national renewable energy share increased by almost 6.3% in 2023 as illustrated in Figure 6 (b). Hence, the renewable energy share in the national grid has increased to more than 21% in 2023. Thus, this contributed, besides the already installed 214 kW solar energy, to increase AASTMT average renewable energy share in supplying its total energy demand to around 24% in 2022/2023 which is more than the 21% in 2021/2022.

AASTMT 2022/2023 Insights



(a) (b)

FIGURE 6. RENEWABLE ENERGY IN NATIONAL GRID (A) IN 2022 (B) PROGRESS FROM 2018 TO 2023 [NREA REPORT 2023]

As shown in Table1, in 2022/2023, 270 GJ are supplied from renewable energy resources existing within AASTMT infrastructure which reflects AASTMT efforts to divert to clean energy, increase energy efficiency, reduce emissions and sustain serving the Environment. Moreover, Table 2 shows that 2022/2023 AASTMT total energy use from low-carbon renewable sources are 17271 GJ (270 GJ renewables installed in AASTMT and the rest from renewables' share in national grid) representing almost 24% of AASTMT energy supply.

Table 1: Energy Density in GJ/m^2 for the entire AAST in 2022/2023

Total Floor Area (m^2)	Consumption from grid (kW)	Consumption from grid (GJ)	Total energy (GJ) (Grid + Renewables)	Density (GJ/m^2)
735569.7	19917470	71702.89	(71702.89+270) 71972.892	0.09784

Table 2: Low-carbon Energy Use (2022/2023)

Total energy used	71972.892 GJ (71702.892 GJ from national grid + 270 GJ from renewables installed in AASTMT)
Total energy used from low-carbon sources	17271 GJ (270 GJ renewables installed in AASTMT and the rest from renewables' share in national grid)