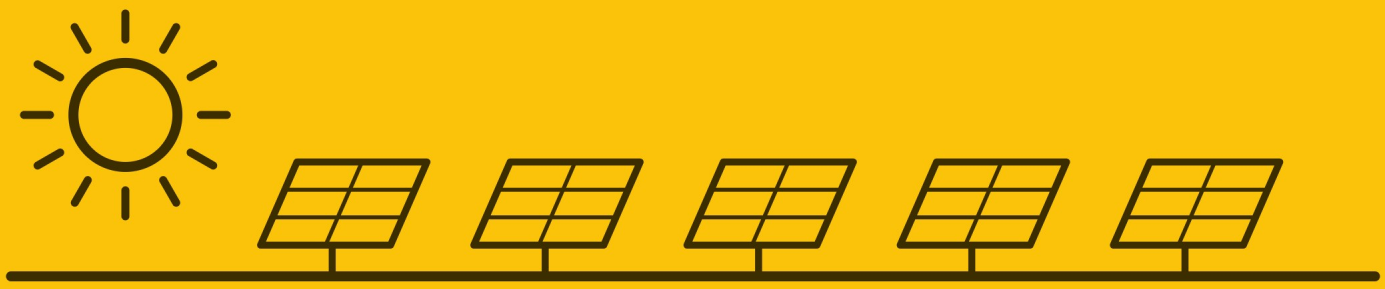
SUSTAINABLE DEVELOPMENT GOAL

7 AFFORDABLE AND CLEAN ENERGY

طاقة نظيفة وبأسعار معقولة



PROGRESS REPORT 2024–2025

ASSIUT UNIVERSITY
Report on progress against SDG 7

PREPARED FOR
International Ranking Office

SDG 7 · 2024–2025

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2024–2025 AT A GLANCE

35.0M kWh
Electricity used in 2024, down from 42.13M

4.57%
Renewable share in 2024, up from 1.27%

1.6M kWh
Renewable generation, 2024

€1.5M
KfW energy-efficiency programme, 7 projects

800 kW
Planned photovoltaic capacity

7.5%
Target cut in energy use vs 2022

80%+
Lighting fixtures converted to LED

108.4 MJ/m²
Energy-use density

5,000
Jojoba and fruit trees planted

Overview

EXECUTIVE SUMMARY

Assiut University reports a broad institutional programme supporting affordable and clean energy through energy-efficiency policies, building retrofits, renewable-energy deployment, carbon-management planning, energy audits, community engagement, government cooperation, and support for low-carbon innovation.

The university's principal institutional energy-efficiency project, “Improving Energy Efficiency in University Buildings,” is funded by the German Development Bank (KfW), runs from 2022 to 2026, and comprises seven projects with an overall reported value of approximately €1.5 million. The programme is expected to reduce annual energy consumption by 7.5% relative to the 2022 baseline. Planned photovoltaic installations have a stated capacity of 800 kW and projected annual generation of approximately 1.4 GWh.

ELECTRICITY USE AND RENEWABLE GENERATION

42.13M → 35.0M
kWh of electricity, 2023 to 2024

535,000 → 1.6M
kWh of renewable generation, 2023 to 2024

1.27% → 4.57%
Renewable share, 2023 to 2024

Total energy use is reported as 182,124 GJ across 1,680,000 m² of university floor space, equivalent to approximately 0.1084 GJ/m² (108.4 MJ/m²).

The supplied carbon-footprint table reports 672.5 tonnes CO_2 for Scope 1 and 21.1 tonnes CO_2 for Scope 2, for a combined total of 693.6 tonnes. However, the Scope 2 calculation contains a material unit inconsistency with the separately reported annual electricity consumption of 42.13 million kWh. This must be resolved before the carbon-footprint total is submitted as a verified institutional result.



Overview

KEY REPORTED INDICATORS

INDICATOR	REPORTED VALUE	STATUS / INTERPRETATION
Energy-efficiency investment	Approximately €1.5 million; seven projects	Ongoing project, 2022–2026
Expected annual energy reduction	7.5% against 2022 baseline	Target / projection, not confirmed achieved saving
Planned PV capacity	800 kW peak	Installation described as underway / planned
Projected PV generation	Approximately 1.4 GWh/year	Expected output
Electricity consumption, 2023	42.13 million kWh	Reported annual value
Electricity consumption, 2024	35.0 million kWh	Reported annual value
Renewable generation, 2023	535,000 kWh (1.27%)	Reported annual value
Renewable generation, 2024	1,600,000 kWh (4.57%)	Reported annual value
Total energy use	182,124 GJ	Period not specified in supplied data
University floor space	1,680,000 m^2	Reported area
Energy-use density	0.1084 GJ/m^2 (108.4 MJ/m^2)	Calculated from supplied total energy and floor space
Carbon footprint	693.6 tonnes CO_2	Source-reported total; Scope 2 requires correction

ELECTRICITY CONSUMPTION, KWH



RENEWABLE GENERATION, KWH



Indicator 1

ENERGY-EFFICIENCY POLICIES IN RENOVATIONS AND NEW BUILDS

Assiut University reports an institutional policy requiring energy-efficiency considerations in renovation and new construction projects. The policy was created in 1998 and reviewed in 2025. Its principal implementation example is the KfW-funded "Improving Energy Efficiency in University Buildings" project (2022–2026), which integrates modern energy-saving measures and aligns energy management with ISO 50001.

1998
Policy created

2025
Policy reviewed

ISO 50001
Energy-management alignment

- **Seven-project programme:** Electrical Engineering Department building, Architectural Engineering Department building, administrative building, Student Dormitory Building S, road lighting, and the wastewater pumping station. The source describes seven projects, although six components are named.
- **Research partners:** climate- and energy-related projects supported by STDF, NTRA, and the Academy of Scientific Research.
- **Other initiatives:** the Smart Urban Governance Center; passive air-conditioning using the solar-chimney concept; Urban Climate Labs for arid cities; a stand-alone PV system for green-hydrogen generation and storage; an AI-based map for solar-energy maximisation and prediction; and smart monitoring of the university power-distribution grid.
- **Energy Management Center:** coordinates conservation programmes, identifies technologies, promotes awareness, runs seminars and training, and studies improved control of air-conditioning and lighting.
- **Faculty committees:** conduct on-site monitoring of energy-saving measures.
- **IACA-9:** the 9th International Architectural Conference, on sustainable architecture, climate-responsive design, green buildings, energy-efficient construction, and urban resilience.
- **Seminar "Solar Energy: A Gift for Supporting Sustainable Development in Egypt":** on solar energy, energy security, emissions reduction, and the low-carbon transition.

EVIDENCE LINKS

→ Policy evidence
→ Energy Management Center
→ IACA-9
→ Solar-energy seminar

Indicator 2

UPGRADING EXISTING BUILDINGS FOR HIGHER ENERGY EFFICIENCY

Assiut University plans to upgrade existing buildings through the KfW-funded “Improving Energy Efficiency in University Buildings” project, implemented across 18 Egyptian public universities under the supervision of the Supreme Council of Universities, with technical support from GOPA Infra, during 2022–2026.

€1.5M
For Assiut University's seven projects

7.5%
Expected cut in annual energy use vs 2022

800 kW
Planned PV peak capacity

~1.4 GWh
Projected annual PV generation, about 4% of use

80%+
Lighting fixtures converted to LED

25–40%
Lower energy use for replaced equipment

- More than 80% of lighting fixtures in lecture halls, offices, laboratories, and outdoor areas have been converted to LED lighting.
- Motion sensors and daylight-detection systems have been installed in some corridors, classrooms, and outdoor spaces.
- Inverter air conditioners and variable refrigerant flow (VRF) systems improve cooling efficiency.
- Older office and laboratory equipment is being replaced with more efficient models, including Energy Star-certified equipment, estimated at 25–40% lower energy use.
- Solar-powered LED poles have been deployed in main pathways and parking areas, and annual energy audits identify further savings.
- Faculty of Engineering buildings incorporate natural ventilation, daylighting, LED lighting, periodic energy monitoring, inverter air conditioners, and efficient water heaters.

EVIDENCE LINKS

→ Building-upgrade plan
→ Arabic project page

Indicator 3

CARBON MANAGEMENT AND REDUCTION INITIATIVES

Assiut University reports a carbon-neutrality strategy aimed at moving toward a zero-carbon campus: assessing its carbon footprint; identifying emissions from electricity, transportation, and buildings; adopting renewable energy and energy-efficient technologies; improving transport; strengthening waste management; promoting sustainability awareness; engaging local partners; and monitoring progress.

The university estimates that energy savings from new projects could reduce emissions by approximately 1,600 tonnes of carbon equivalent a year, assuming 500 tonnes per GWh. The potential carbon-credit value is estimated at €48,000 a year, assuming €30 per tonne.

~1,600 t
Estimated annual emissions reduction (CO_2e)

€48,000
Estimated annual carbon-credit value

3.1 REPORTED CARBON-FOOTPRINT INVENTORY

SCOPE / FUEL	CONSUMPTION	EMISSION FACTOR	REPORTED EMISSIONS
Scope 1 – Gasoline (80 octane)	23,346 L	2.31 kg CO_2/L	53,929 kg CO_2
Scope 1 – Gasoline (92 octane)	51,721 L	2.31 kg CO_2/L	119,475 kg CO_2
Scope 1 – Diesel / solar	186,220 L	2.68 kg CO_2/L	499,070 kg CO_2
Total Scope 1	—	—	**672,474 kg (672.5 tonnes)**
Scope 2 – National grid	42.13 (unit unclear in source table)	0.5 kg CO_2/kWh	21,065,000 kg (21.1 tonnes)
Total reported Scope 1 + Scope 2	—	—	**693.6 tonnes CO_2**

Note: the Scope 2 figure of 21.1 tonnes corresponds to 42,130 kWh at 0.5 kg CO_2/kWh, while reported 2023 electricity use is 42,130,000 kWh. The inventory needs recalculating before submission (see indicator 14).

Indicator 3.2

OTHER CARBON-REDUCTION MEASURES

Campus tree planting

Presented as a climate-adaptation and carbon-absorption measure. 4,000 jojoba trees were planted at the Faculty of Agriculture demonstration farm with the Egyptian-Gulf Agricultural Land Company, and a further 1,000 fruit trees under the presidential "100 Million Trees" initiative during the 12th International Conference on Development and the Environment in the Arab World (25–27 February 2024).

"Taftaf" minibus services

Internal minibuses connect campus gates, faculties, and facilities, reducing reliance on individual private-car trips.

Zero-emission and electric vehicles

An initiative encouraging electric vehicles, including several electric-vehicle charging units installed on campus.

Ride-sharing and the "Mumayaz" app

A ride-sharing initiative and a student-developed app coordinate shared commuting and reduce individual car trips.

Carbon-footprint assessment initiative

Launched in fiscal year 2024/2025, starting at the Faculty of Education, to assess energy use and emissions and develop corrective measures.

4,000
Jojoba trees planted

1,000
Fruit trees, "100 Million Trees"

EVIDENCE LINKS

→ Carbon-management evidence
→ First Scientific Forum for Sustainable Green Environmental Projects
→ Faculty of Education carbon-footprint initiative

Indicator 4

UNIVERSITY ENERGY-EFFICIENCY PLAN

The energy-efficiency plan is coordinated through the Energy Management Center and supported by the KfW-funded building-improvement project. It combines energy-management systems, building retrofits, efficient equipment, renewable-energy deployment, and awareness activities.

- **Target:** reduce annual energy consumption by 7.5% relative to 2022 by the end of the project period in 2026.
- **Projected emissions reduction** from new projects: 1,600 tonnes of carbon equivalent a year, with a potential carbon-credit value of €48,000 under the stated assumptions.
- The university intends to monitor energy use and environmental performance and periodically assess progress toward its carbon-neutrality ambition.

EVIDENCE LINKS

→ Energy-efficiency plan
→ Energy Management Center

Indicator 5

ENERGY REVIEWS TO IDENTIFY AREAS OF WASTE

Regular energy reviews and faculty-level monitoring identify and reduce energy wastage: cleaning and maintaining lamps and fixtures, switching off lighting and air-conditioning in unoccupied spaces, committee meetings, implementation reports, and prioritising energy-efficient devices and supplies in procurement. These measures follow Assiut University Council Decision No. 643, with faculty committees monitoring implementation.

YEAR	ELECTRICITY CONSUMPTION	RENEWABLE GENERATION	RENEWABLE SHARE
2023	42,130,000 kWh	535,000 kWh	1.27%
2024	35,000,000 kWh	1,600,000 kWh	4.57%

Electricity consumption decreased by 7,130,000 kWh between 2023 and 2024, while renewable generation increased by 1,065,000 kWh.

EVIDENCE LINKS

→ Energy-review evidence
→ University energy-rationalisation decisions
→ Published research on energy-wastage areas

Indicator 6

POLICY ON DIVESTING FROM CARBON-INTENSIVE ENERGY INDUSTRIES

1994
Policy created

2025
Policy reviewed

The supporting narrative mainly describes electricity-rationalisation measures and reported reductions in energy use and CO_2 emissions. It states that electricity use in 2024–2025 decreased by approximately 1.1 GWh compared with 2023–2024, an estimated reduction of 535 tonnes CO_2 equivalent at 0.50 kg CO_2/kWh. It also reports a 3,478-tonne carbon-equivalent reduction in 2023 compared with 2019, despite additional hospital and faculty loads.

~1.1 GWh
Lower electricity use, 2024–2025 vs 2023–2024

535 t
Estimated CO_2e reduction

3,478 t
CO_2e reduction, 2023 vs 2019

Reported research covers climate-change impacts on renewable energy in Egypt, optimisation of solar PV systems, energy from footsteps and road humps, green-hydrogen systems, PV-powered agricultural pumping, and other clean-energy technologies.

EVIDENCE LINKS

→ Divestment policy page
→ Potential impacts of climate change on renewable energy in Egypt
→ Solar-energy seminar (Arabic)
→ PV stand-alone green-hydrogen publication (IEEE)
→ PV stand-alone green-hydrogen publication (MDPI)

Indicator 7

ENERGY-USE DENSITY

182,124 GJ
Total energy used

1,680,000 m^2
University floor space

0.1084 GJ/m^2
Energy-use density

108.4 MJ/m^2
Equivalent

Indicator 8

COMMUNITY PROGRAMMES ON ENERGY EFFICIENCY AND CLEAN ENERGY

Assiut University reports community-facing education, outreach, student innovation, and environmental initiatives that raise awareness of energy efficiency and clean energy:

A model for public universities

The KfW-supported building project is presented as a model for energy-efficiency improvements that other public universities can replicate.

"Eco-Fuel Innovators" · 2nd place

Converting agricultural residues such as rice straw and sorghum husks into biogas and secondary products through anaerobic processes.

"Blast-tech" · 4th place

Producing fuel from plastic through pyrolysis and treatment processes.

"Liquid Tree"

A 600-litre container using microalgae to absorb CO_2 and release oxygen through photosynthesis.

Assiut University Green Initiative

Promotes sustainability awareness and climate-change mitigation among students and staff.

First Scientific Forum on Green Sustainable Environmental Projects

Sessions on smart green projects and green entrepreneurship, an exhibition of recycling and sustainability innovations, and project awards.

Faculty of Science seminar

On climate change and its impact on the sustainable environment of living organisms.

"Plant Your Tree"

At the Faculty of Early Childhood Education, involving children, teachers, employees, and parents in planting and environmental education.

STEM environmental-project exhibition · 11 November 2024

Inaugurated by the university president, with a staircase that generates electricity, a device for re-purifying electricity, a waste-burning electricity-generation furnace, and a solar-powered farm. A solar-energy seminar also promoted renewable energy, energy security, and emissions reduction.

EVIDENCE LINKS

→ Community programme / Green Initiative
→ Plant Your Tree initiative
→ Solar-energy seminar

Indicator 9

PUBLIC COMMITMENT TO A 100% RENEWABLE-ENERGY TRANSITION

The supplied material records a “Yes” response on promoting a public pledge toward 100% renewable energy beyond the university. Cited evidence includes research on digital building-energy audits and simulation, the KfW programme, the PV stand-alone green-hydrogen project, the AI-based solar-energy optimisation project, and the “Assiut University and Our Green Future” charter.

Digital building-energy research used tools such as DesignBuilder to assess insulation, low-emissivity double glazing, and rooftop PV systems.

CLEAN-ENERGY PROJECT PORTFOLIO

PROJECT	FUNDING	PERIOD
KfW building energy-efficiency project	€1.5 million	2022–2026
STDF green-hydrogen project (Project 46069)	EGP 2,379,370	2022–2024
AI map for solar-energy maximisation and prediction (Project 46292)	EGP 1,415,650	2022–2024

EVIDENCE LINKS

→ Digital building-energy audit and simulation research

Indicator 10

DIRECT SERVICES TO LOCAL INDUSTRY

Assiut University provides direct services to local industry aimed at improving energy efficiency and clean energy, including assessments, workshops, and research into renewable-energy options.

EVIDENCE LINKS

→ Direct services to local industry



Indicator 11

SUPPORT FOR GOVERNMENT POLICY ON CLEAN ENERGY AND ENERGY-EFFICIENT TECHNOLOGY

Assiut University's research, infrastructure projects, and community initiatives support Egyptian government policy on clean energy and energy efficiency, in line with Egypt Vision 2030:

1. University experts provide technical consultation to ministries and local authorities on sustainable-energy solutions.
2. Academic staff take part in national platforms, strategic dialogues, and committees on urban planning, environmental assessment, and administrative reform.
3. The Energy Management Center provides technical consultation, feasibility studies, research, and advisory services to government and external institutions on renewable-energy transitions.
4. The KfW-funded building project is presented as a model for public-facility energy management, solar generation, and consumption optimisation.
5. Solar-technology research includes assessing solar-powered air-conditioning and operational systems with international organisations such as UNIDO.
6. Cooperation protocols with state bodies, including the Electronics Research Institute, support technology localisation, technical upgrading, and exchange of expertise.
7. The Sustainable Development and Environmental Awareness Center trains government and local administrative employees in Upper Egypt on renewable-energy project management and energy efficiency.

EVIDENCE LINKS

→ Government policy support indicator
→ Cooperation protocol with the Electronics Research Institute
→ Energy Management Center
→ Solar-energy symposium

Indicator 12

SUPPORT FOR START-UPS IN THE LOW-CARBON ECONOMY AND TECHNOLOGY

Assiut University supports start-ups and innovators in low-carbon technology and the green economy through technology-transfer, entrepreneurship, consultation, and research-development structures:

Integrated Technology Transfer Unit (ITTU)

Links research with industry and supports the transfer and commercialisation of sustainability research and clean technologies.

Technology Innovation and Entrepreneurship Center (TIEC) Hub

Mentorship, incubation spaces, and ideation camps for technology start-ups, including green technology and smart agriculture.

Green University Initiative

Supports projects on the circular economy, waste-to-energy, and renewable energy.

Energy Management Center

Technical consultation, feasibility studies, and advisory support for renewable-energy transitions.

Regional R&D center for new and renewable energy

The university reports establishing a regional center for research and development in new and renewable energy.

Faculty of Engineering Consultation Center

Technical studies, designs, site supervision, and laboratory testing for public infrastructure and government projects.

EVIDENCE LINKS

→ Start-up support indicator
→ Integrated Technology Transfer Unit
→ Technology Innovation and Entrepreneurship Center
→ Green University / Sustainable Development Center
→ Energy Management Center
→ Faculty of Engineering Consultation Center

Indicator 13

ADDITIONAL PROJECTS AND RESEARCH RELEVANT TO SDG 7

The supplied evidence includes applied research projects and student innovations that contribute to renewable-energy development, energy efficiency, and low-carbon technologies:

1. **PV stand-alone system for green-hydrogen generation and storage**
   For hybrid household loads. STDF Project 46069, 2022–2024; reported funding EGP 2,379,370.

2. **AI-based mapping for solar-energy maximisation and prediction**
   STDF Project 46292, 2022–2024; reported funding EGP 1,415,650.

3. **Dust and temperature effects at Benban Solar Farm**
   Research on dust accumulation and PV-cell temperature, including a practical indicator for optimising module-cleaning schedules.

4. **Wind from moving vehicles for highway lighting**
   A techno-economic study using vertical-axis wind turbines, estimating about 52.11 Wh a day per turbine, or about 19 kWh a year, for the studied scenario.

5. **PV water-pumping for a 50-acre farm**
   Optimisation of a PV water-pumping system to meet electricity and water demands on a farm in New Assiut City.

6. **The 3D-Printed Scout, Physics Department**
   Combines a vertical-axis wind turbine, solar-powered auxiliary supply, motion-activated lighting, and a Wi-Fi extender.

7. **Footsteps and road-hump generators**
   Student prototypes generating electricity; the footsteps prototype produced limited electricity, not enough to run lamps continuously.



Indicator 14

DATA-QUALITY ISSUES AND ACTIONS REQUIRED BEFORE SUBMISSION

01 Scope 2 carbon-footprint unit

The reported Scope 2 emissions of 21.1 tonnes correspond to 42,130 kWh at 0.5 kg CO_2/kWh, whereas reported 2023 electricity use is 42,130,000 kWh. Recalculate the institutional inventory using the correct activity-data unit and boundary.

02 Carbon-footprint year and boundary

Confirm the year and institutional coverage of the fuel and electricity data in the Scope 1 and Scope 2 inventory. The figures may not represent the same reporting year or boundary.

03 Energy-use-density period

Confirm the reporting year for 182,124 GJ and that the 1,680,000 m² floor-space figure covers the same sites and period.

04 KfW project scope

The source states seven projects but names six components. Add the seventh project or clarify whether one item contains several subprojects.

05 Smart-building area

Resolve the approximately 75,629 m² Faculty of Engineering smart-area claim against the separate generic building table totalling 11,450 m². That table uses “University X” labels and should not be presented as Assiut University evidence without correction.

06 Projected versus achieved savings

Keep the 7.5% annual energy reduction, 1.4 GWh PV generation, 4% energy coverage, 1,600-tonne CO_2 reduction, and €48,000 carbon-credit value identified as targets or estimates unless verified performance data are available.

Indicator 14

DATA-QUALITY ISSUES (CONTINUED)

07 Renewable-energy share

Provide meter records and confirm the calculation basis for the 2023 and 2024 renewable shares (535,000 / 42,130,000 and 1,600,000 / 35,000,000).

08 Divestment policy

Attach the actual 1994 policy and 2025 review record showing explicit divestment from coal, oil, or other carbon-intensive investments. Energy-saving activity alone does not establish divestment.

09 100% renewable-energy pledge

Attach a formal public pledge, signed charter, event record, or minutes that explicitly establish the 100% renewable-energy commitment and its scope.

10 Direct services to industry

Add named industry beneficiaries, service details, dates, and outcomes to substantiate the “Yes” response.

11 Tree-related carbon claims

Do not use generic tree-species absorption estimates as measured university sequestration. Provide species, planting date, survival, and a recognised calculation method if quantifying removals.

12 Reporting-period alignment

State whether each data point refers to a calendar, academic, or fiscal year, or a project period. In particular, clarify the 2024–2025 electricity reduction of about 1.1 GWh against the separate 2023 and 2024 annual totals.

Conclusion

WHERE ASSIUT UNIVERSITY STANDS

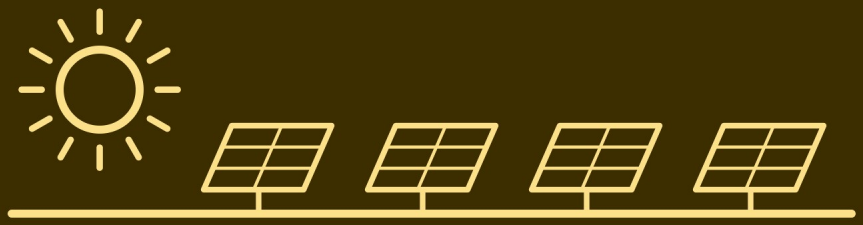
The supplied evidence indicates that Assiut University has established a wide-ranging programme that combines institutional energy management, building-efficiency improvements, solar-energy development, carbon-management planning, research, community education, government cooperation, and support for low-carbon innovation.

The strongest quantitative evidence is the reported decrease in annual electricity consumption from 42.13 million kWh in 2023 to 35.0 million kWh in 2024, together with the increase in renewable generation from 535,000 kWh to 1.6 million kWh. Before final submission, the university should resolve the Scope 2 carbon-footprint unit inconsistency and provide primary evidence for policy claims, public pledges, direct industry services, and measured project outcomes.

7

AFFORDABLE AND CLEAN ENERGY

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