

AASTMT Climate Action Plan 2024: Strategic Pathways to Sustainability and Carbon Reduction

1 Introduction

Purpose: This 2024 update reaffirms the Arab Academy for Science, Technology, and Maritime Transport's (AASTMT) commitment to climate action across operations, education, research, and community engagement. It aligns with AASTMT's documented interim and long-term emissions-reduction targets and maintains strict comparability with the published series by preserving the same scopes, boundaries, and methods.

Vision: AASTMT's long-term objective is a **50% reduction in total carbon emissions by 2040 (vs. 2019)**. On energy, the Academy continues to advance on-site renewables and efficiency to meet the institutional waypoint of **~25% renewable electricity by 2025** and to support the longer-term **40% renewables by 2040** trajectory noted in the Plan.

2024 status (inventory through year-end 2024): Total emissions are **103,862,750 kg CO₂e**—a further **−3.0%** from 2023 and **−32.8%** below the 2019 base year (**154,594,380.99 kg CO₂e**). Scope-level results: **Scope 1 = 1,092,500**, **Scope 2 = 897,250**, and **Scope 3 (selected categories) = 101,873,000 kg CO₂e**. These outcomes keep AASTMT comfortably within the **≥30% by 2025** pathway and aligned with the **−50% by 2040** goal.

Methods & scope: Accounting follows the **GHG Protocol** corporate standard with the same scope coverage used in prior reports to ensure year-over-year comparability:

- **Scope 1 (Direct):** University-controlled fuel use and **refrigerant** emissions.
- **Scope 2 (Indirect – Energy):** Purchased electricity (reported **location-based**), with on-site solar performance reported alongside Scope 2 results.

- **Scope 3 (selected categories):** Waste, paper, water, and electricity T&D losses—the same categories used in the published series.

2 Carbon Emissions Reduction Goals

Interim target: Maintain a **≥30% reduction** in total carbon emissions relative to **2019** by **2025**.

Long-term target: Achieve a **50% reduction** in total carbon emissions relative to **2019** by **2040**.

Core levers to deliver the targets

- **On-site renewables:** Operate and incrementally expand campus PV to reach an approximate **25% share of electricity by 2025**; report the metered annual share (PV kWh ÷ total purchased kWh).
- **Energy efficiency:** Sustain LED coverage and building-management-system (BMS) operations; prioritize BMS tuning (scheduling, set-points, alarms), targeted HVAC O&M, and sub-metering—led optimization to reduce Scope 2.
- **Direct emissions (Scope 1):** Focus on **refrigerant leak prevention and operational efficiency** in university-controlled sources.
- **Resource management (selected Scope 3):** Continue **waste sorting and recycling, paper-use controls, and water-efficiency** measures; apply the **transmission & distribution (T&D) loss** method defined in the Methodology section.

3 Renewable Energy Adoption (2024)

Targets

- Reach **~25%** of campus electricity from renewable sources by **2025**.
- Reach **40%** renewable electricity by **2040**.

Implementation priorities

- **Operate and expand on-site PV:** Maintain existing capacity (~215 kW) and add feasible rooftop/parking structures to support the 2025 waypoint and the 2040 trajectory.
- **Metered reporting:** Publish the annual renewable share as **PV kWh ÷ total purchased kWh**; include availability, downtime, and performance notes.
- **O&M excellence:** Standardize cleaning, inverter checks, and fault response to maximize output and persistence of savings.
- **Hybrid readiness:** Evaluate **battery storage** (and other clean options where practical) to improve self-consumption and peak management; proceed via small pilots with clear KPIs.
- **Connection & safety compliance:** Ensure grid interconnection, protection, and permits are current for all sites; document single-line diagrams and inspection logs.
- **Procurement & design standards:** Use lifecycle-costing, minimum performance ratios, warranty requirements, and end-of-life recycling provisions in all new renewable procurements.

4 Energy Efficiency Improvements (2024)

Objective

Reduce campus electricity consumption and associated **Scope 2** emissions through persistent operations and targeted upgrades.

Implementation priorities

- **LED persistence:** Maintain ~95% LED coverage; replace failures like-for-like with high-efficiency lamps and drivers.

- **BMS optimization:** Standardize scheduling, set-points, alarms, and occupancy modes across major buildings; document quarterly tuning cycles.
- **HVAC O&M:** Perform coil cleaning, filter regimes, refrigerant leak checks, and commissioning of controls to minimize run hours and improve COP/EER.
- **Sub-metering & data use:** Expand electrical sub-meters in high-load areas (HVAC, lighting, labs); use interval data for anomaly detection and targeted fixes.
- **Operational guidelines:** Implement after-hours shutdown checklists, plug-load controls, and default power-saving settings for IT equipment.
- **Projects pipeline:** Prioritize measures with clear payback (VFDs on fans/pumps, air-side economizer fixes, demand-controlled ventilation).

KPIs & reporting

- **Scope 2 total (kg CO₂e) and kWh/m²** by campus, reported quarterly.
- **BMS actions completed** per quarter (tuning logs) and **HVAC O&M tasks** completed vs plan.
- **Share of metered load under sub-metering (%)** and **identified anomalies resolved** (#/quarter).

Governance

Facilities and Sustainability Office co-own delivery; campus leads execute tuning and O&M per a published annual schedule.

5 Sustainable Resource Management (2024)

Objectives

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- Divert $\geq 70\%$ of campus waste from landfill by **2030**.
- Progress toward **zero-waste by 2040**, prioritizing reduction, reuse, and high-quality recycling/organics.

Implementation priorities

- **Standardized sorting system:** Campus-wide, color-coded bins with clear signage for **paper, plastics/metals, glass, e-waste, organics, residual**; place pairs/triads in high-traffic zones and teaching spaces.
- **Organics program:** Launch/expand cafeteria **food-scrap collection** and back-of-house separation; pilot composting or certified off-site processing with quality controls.
- **Paper-use controls:** Default **duplex/black-and-white** printing, digital submissions by default, and paper purchase caps; prioritize **recycled-content** paper.
- **Sustainable procurement:** Embed requirements for **minimal/recyclable packaging, reusable/durable** products, and **producer take-back** (IT/e-waste, lab consumables); include end-of-life provisions in contracts.
- **E-waste stewardship:** Secure collection, certified data wiping, and documented downstream recycling/repair.
- **Water efficiency linkages:** Routine **leak audits**, low-flow fixtures where feasible, and meter checks to reduce upstream material/energy use associated with water.
- **Data & logistics:** Weigh collections by **stream and campus**; track contamination rates; maintain recycler/composter **manifests** for audit.

KPIs & reporting

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- **Diversion rate (%) and landfill (kg/FTE)**, quarterly by campus.
- **Paper purchased (kg/FTE) and % recycled content.**
- **Organics captured (kg) and contamination rate (%)** in recycling/organics streams.
- **E-waste processed (kg)** with certified downstream documentation.
- **Water use (m³/FTE)** and corrective actions closed.
- Publish an **annual summary** and a brief **semester dashboard**.

Governance

Sustainability Office (policy & reporting), Facilities (operations & hauling contracts), and Procurement (supplier standards & take-back). Each campus assigns a waste lead to run training, spot checks, and monthly walk-throughs; results feed into the central KPI dashboard.

6 Integration of Sustainability in Education (2024)

Academic goal: Reach $\geq 90\%$ integration of climate and sustainability learning outcomes across undergraduate and postgraduate programs.

Implementation priorities

- **Curriculum mapping & updates:** Maintain a central map of courses with sustainability learning outcomes; refresh syllabi annually to embed **climate mitigation/adaptation, energy systems, circular economy, and environmental ethics**.
- **Module toolkit:** Provide ready-to-use lecture packs, case studies, and assessment rubrics for non-environment majors (business, IT, logistics, maritime, health, design).

- **Capstones & studios:** Require at least one **applied sustainability project** per program (e.g., building efficiency audits, waste analytics, renewable micro-siting, resilience planning).
- **Graduate programs:** Sustain and strengthen climate-focused postgraduate offerings (e.g., SECCM) with practitioner seminars and co-supervised theses.
- **Faculty development:** Run short clinics on integrating SDG-aligned outcomes, systems thinking, and data tools for emissions and resource analysis.
- **Student research & labs:** Prioritize projects on **renewables, sustainable transport, urban resilience, water & materials efficiency, and emissions accounting**; encourage publication or conference posters.

KPIs & reporting

- **Program coverage (%):** Share of UG/PG programs with approved sustainability learning outcomes.
- **Course coverage (%):** Share of courses delivering at least one assessed sustainability outcome.
- **Applied projects (#/year):** Capstones/studios addressing campus or community sustainability needs.
- **Faculty upskilled (#):** Participants completing curriculum integration clinics.
- **Student research outputs (#):** Peer-reviewed papers, conference contributions, or juried showcases.
- **External engagement (#):** Practitioner talks/clinics delivered with industry, government, or NGOs.

Governance

Vice President for Education (policy), Deans/Program Directors (curriculum delivery), Sustainability Office (toolkits, KPIs, annual audit), and Research Office (student projects and dissemination). Program accreditation cycles include a sustainability checkpoint to verify outcomes and evidence.

7 Community and Government Engagement (2024)

Objective

Strengthen partnerships with local governments, NGOs, and community groups to accelerate climate resilience and sustainable practices while creating applied learning opportunities for students.

Implementation priorities

- **Partnership MOUs:** Maintain/establish memoranda with municipalities and NGOs for projects in **urban greening, waste systems, flood-risk preparedness, and energy awareness.**
- **Climate workshops:** Deliver recurring workshops for residents, school leaders, and SMEs on **waste reduction, energy efficiency, water conservation, and sustainable mobility;** align content with campus programs to reinforce behavior change.
- **Joint resilience projects:** Co-deliver initiatives such as **neighborhood tree planting, drainage clean-up & mapping, community recycling hubs, and household energy audits;** document roles, timelines, and handover plans.
- **Student service-learning:** Embed community projects into capstones and studios (e.g., waste audits, PV pre-feasibility, BMS awareness in public buildings), coordinated with the Sustainability Office and program directors.

- **Communication & resources:** Publish simple how-to guides (sorting, energy tips, water saving), event calendars, and post-event summaries on the university website and social channels.
- **Funding & grants:** Pursue small grants with partners for pilot projects (organics, micro-forests, school retrofits), with clear KPIs and replication plans.

KPIs & reporting

- **Partnerships active (#) and MOUs signed/renewed (#).**
- **Workshops delivered (#) and participants reached (#) per semester.**
- **Joint projects completed (#) with quantified outputs (trees planted, bins installed, drains cleared, households audited).**
- **Student service-learning hours (#) and projects integrated into curricula (#).**
- **Community diversion uplift (%/kg) or estimated energy/water savings from joint actions where measurable.**
- **Publish a brief semester engagement dashboard summarizing activities and outcomes.**

Governance

Sustainability Office coordinates; Deanery of Student Affairs manages student participation; relevant faculties supervise service-learning; municipal/NGO focal points co-lead delivery. A short **annual partnership review** assesses results, renews priorities, and sets the next year's engagement calendar.

8 Monitoring and Reporting

Objective: Ensure transparent, audit-ready tracking of AASTMT's climate actions and outcomes.

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Core practices

- **Annual GHG inventory:** Compile a yearly emissions inventory for **Scopes 1, 2 (location-based), and selected Scope 3** categories (waste, paper, water, electricity T&D losses) using the same boundary and methodology for year-over-year comparability.
- **Factor registry & methods note:** Maintain a brief annex listing emission factors, data sources, and any assumptions; flag the **T&D loss %** used each year.
- **Data quality & QA:** Apply monthly data checks (completeness, outliers), quarterly internal reviews, and a **biennial third-party assurance** focused on methodology, calculations, and evidence trails.
- **KPI cadence:** Publish a concise **semester dashboard** (key scope totals, kWh/m², diversion %, paper/water KPIs) and an **annual sustainability report** summarizing progress and next-year actions.
- **Change management:** Use a simple **document control & restatement** rule—only restate prior years if scope/boundary/factor changes materially affect trends; record changes in a one-line change log.

Roles & tools

- **Sustainability Office:** owns methodology, QA, dashboards, and the annual report.
- **Facilities & Campus Operations:** provide energy, refrigerant, waste/water data and implement corrective actions.
- **Procurement & IT:** support data capture (sub-metering, invoices, asset logs) and archiving.
- **Academic & Student Affairs:** report education/engagement KPIs.

Table 1: Action Plan Table.

Objective	Action	Target	Timeline	Responsible Parties
Carbon Emissions Reduction	Track total vs 2019; issue annual GHG inventory	$\geq 30\%$ by 2025; 50% by 2040	Annual (inventory); semester (KPI)	Sustainability Office
Renewable Energy Adoption	Report metered PV kWh and annual % share	$\sim 25\%$ by 2025; 40% by 2040	Semester (dashboard); annual (report)	Facilities
Energy Efficiency Improvements	Log BMS tuning/HVAC O&M; report kWh/m ²	Year-on-year Scope 2 decline	Quarterly (ops log); semester (KPI)	Facilities & Campus Operations
Sustainable Resource Management	Weigh streams; track diversion & contamination	$\geq 70\%$ diversion by 2030	Semester (KPI); annual (report)	Campus Services & Procurement
Education & Research	Track program coverage and student outputs	$\geq 90\%$ programs with outcomes	Annual (audit)	Academic Affairs & Research Office
Community Engagement	Record workshops, MOUs, joint outputs	Regular sessions each semester	Semester (dashboard)	Public Relations & Outreach
Reporting & Accountability	Publish sustainability report and change log	Annual publication	Annual	Sustainability Office

This **Action Plan Table** provides a straightforward, transparent format for tracking AASTMT’s progress on sustainability and climate goals, facilitating alignment with long-term targets and fostering accountability across all initiatives.

9 Funding and Resources (2024)

Objective: Provide stable, diversified financing to deliver AASTMT’s climate targets and priority projects.

Funding streams

- **Public & multilateral:** National/municipal grants, regional programs, and multilateral climate funds (where eligible).
- **Industry & philanthropy:** Partnerships, sponsorships, and endowed gifts aligned with research, student projects, and community initiatives.
- **Performance-based savings:** Reinvest verified savings from **LED/BMS/HVAC** projects and waste-diversion into the efficiency and renewables pipeline (“revolving fund” model).
- **Research & education grants:** Competitive funding for applied research, curriculum innovation, and service-learning.

Allocation priorities

- **On-site renewables:** PV expansions, O&M, and small storage pilots that increase the metered renewable share toward **~25% by 2025** and support the **2040** trajectory.
- **Energy efficiency:** BMS tuning, HVAC O&M, sub-metering, and high-ROI retrofits that reduce **Scope 2**.
- **Sustainable resource management:** Sorting infrastructure, organics pilots, take-back schemes, and contamination reduction to lift diversion toward **2030** goals.

- **Education, research, engagement:** Course toolkits, capstone support, labs, and community partnerships that reinforce behavior change and applied outcomes.

Process & controls

- **Annual climate budget call:** One cycle each year; projects ranked by impact (tCO₂e reduced), payback, and strategic fit.
- **Gate reviews:** Concept → feasibility (tech/permits) → funding approval → M&V plan (kWh, kg, m³, tCO₂e) → closeout.
- **Procurement standards:** Lifecycle-costing, performance guarantees, O&M plans, warranties, and end-of-life provisions (e.g., PV/e-waste).
- **Documentation:** Central repository for grants, contracts, M&V results, and savings reallocation.

KPIs & reporting

- **Funds secured (currency/year)** by source; **% of climate plan funded**.
- **Capital deployed (currency)** and **projects delivered (#)** by pillar (renewables, efficiency, resources, education/engagement).
- **Measured outcomes:** tCO₂e reduced, kWh saved, diversion %, water saved; **simple payback (years)** achieved.
- **Reinvestment rate (%):** Share of verified savings rolled into the revolving fund.

10 Review and Updates

Purpose

Keep the Climate Action Plan current, comparable year-to-year, and responsive to stakeholder input, while preserving the same scopes, boundaries, and methods used across the reporting series.

Update principles

- **Cadence:** Annual inventory and report; semester KPI dashboards; biennial third-party assurance.
- **Comparability:** Restate prior years only if a scope/boundary/factor change materially affects trends; record any change in a one-line change log.
- **Stakeholder input:** Integrate feedback from students, staff, partners, and community programs.
- **Policy alignment:** Track national energy/climate signals and reflect them in context notes without altering targets unless formally approved.

Table 2: Review and Updates Table.

Review Activity	Objective	Frequency	Responsible Parties	Notes
Annual Emissions Review	Assess progress vs 2019 base and interim/long-term targets	Annual	Sustainability Office	Use verified activity data; keep methods/scopes consistent
Third-Party Assurance	Independent validation of methods, data, and results	Every 2 years	External Auditor	Management response and corrective-action log
Stakeholder Feedback	Gather input on priorities and delivery	Annual	Public Relations & Sustainability Office	Workshops/surveys; publish a brief summary
National Policy Check	Confirm alignment with national energy/climate context	Every 5 years (or as needed)	Sustainability & Policy Office	Update context footnotes; elevate target changes for approval
Progress Report	Public summary of outcomes and next actions	Annual	Sustainability Office	Includes KPI dashboard and change log



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Review Activity	Objective	Frequency	Responsible Parties	Notes
Curriculum Integration Review	Verify $\geq 90\%$ program coverage and evidence	Every 3 years	Academic Affairs	Sample syllabi, outcomes mapping, and improvements
Technology & Innovation Scan	Identify high-impact efficiency/renewables/resource options	Every 3 years	Facilities & IT	Shortlist pilots with KPIs and payback screen

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