

# Energy Efficiency and Clean Energy Action Plan

**TIIAME National Research University**

**Year: 2024**

**SDG Alignment:** Sustainable Development Goal 7

## 1. Objective

The primary objective of the **2024 Energy Efficiency and Clean Energy Action Plan** is to systematically reduce overall energy consumption, enhance energy-use efficiency, and expand the utilization of renewable energy sources across TIIAME National Research University. The plan supports institutional decarbonization, cost optimization, and long-term environmental sustainability in full alignment with national green-economy policies and international sustainability frameworks.

## 2. Energy Audit and Institutional Assessment

- Conduct a comprehensive, campus-wide energy audit to identify high-consumption zones, system inefficiencies, and priority intervention areas.
- Analyze real-time and historical energy-use data across academic buildings, laboratories, dormitories, and infrastructure facilities.
- Establish a ranked list of energy-efficiency investments based on cost-effectiveness, carbon-reduction potential, and technical feasibility.

## 3. Awareness, Capacity Building, and Training

- Implement structured training programs for faculty, administrative staff, and students on rational energy consumption and energy-efficiency practices.
- Integrate energy-efficiency modules into engineering and environmental curricula.
- Disseminate practical guidelines on electricity, heating, cooling, and equipment use to promote daily energy-conscious behavior.

## 4. Building Retrofit and Infrastructure Upgrading

- Upgrade thermal insulation, windows, and building envelopes to reduce heat loss and cooling demand.
- Replace conventional lighting systems with **high-efficiency LED lighting** supported by smart lighting control systems.
- Modernize heating, ventilation, and air-conditioning (HVAC) systems using energy-efficient technologies, supported by scheduled preventive maintenance for sustained performance.

## 5. Renewable Energy Integration and Expansion

- Expand the existing **solar photovoltaic infrastructure** to further offset grid electricity consumption.
- Assess the technical and economic feasibility of **small-scale wind and mini-hydropower systems** where site conditions permit.

- Prioritize decentralized clean-energy generation to strengthen energy security and reduce carbon intensity.

## 6. Digital Energy Management and Smart Monitoring

- Deploy advanced **Energy Management Systems (EMS)** for real-time monitoring and automated control of electricity consumption.
- Apply smart metering, demand-response technologies, and load-optimization tools to reduce peak demand and energy losses.
- Establish a unified digital energy dashboard for institutional energy tracking, benchmarking, and reporting.

## 7. Behavioral Change, Participation, and Engagement

- Promote a campus-wide culture of energy conservation through awareness campaigns, competitions, and incentive programs.
- Encourage active participation of students and staff in energy-saving initiatives and innovation challenges.
- Create platforms for feedback and continuous improvement in energy-efficiency implementation.

## 8. Institutional Collaboration and Strategic Partnerships

- Cooperate with national and international energy experts, engineering companies, and research institutions to access advanced energy-efficient technologies.
- Partner with energy suppliers, grid operators, and utility providers to benefit from incentive programs, efficiency rebates, and demand-side management initiatives.
- Strengthen industry–university cooperation in applied energy-efficiency research and pilot projects.

## 9. Monitoring, Evaluation, and Continuous Improvement

- Establish a structured monitoring and evaluation framework to track monthly and annual energy performance indicators.
- Compare actual energy performance against reduction targets and international benchmarks.
- Continuously refine energy-efficiency strategies based on data analytics, technical audits, and emerging best practices.

## 10. Expected Outcomes (2024–2027)

Through full implementation of this Action Plan, TIIAME National Research University aims to achieve:

- **A minimum 10–20% reduction in operational energy consumption,**
- **A significant increase in the share of renewable electricity,**
- **Lower greenhouse gas emissions** in accordance with institutional decarbonization targets,
- **Reduced operational costs** and improved energy security,
- Strengthened institutional positioning under **QS and THE SDG 7 sustainability rankings.**

## **Conclusion**

The 2024 Energy Efficiency and Clean Energy Action Plan establishes a comprehensive institutional framework for sustainable energy management at TIAME National Research University. By integrating infrastructure modernization, digital energy management, renewable energy expansion, and human-capital development, the University ensures measurable progress toward affordable, clean, and efficient energy use, reinforcing its strategic commitment to SDG 7 and the global climate agenda.