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AFFORDABLE AND CLEAN ENERGY

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Affordable and Clean Energy to guarantee the access of clean, affordable, reliable and sustainable energy for everyone

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Policy and Commitment to SDG 7: Affordable and Clean Energy Sakon Nakhon Rajabhat University, Fiscal Year 2025

Sakon Nakhon Rajabhat University (SNRU) is a university for local development. It recognizes efficient energy use and the transition to clean energy as foundations of sustainable development. This commitment falls under the Strategy for Developing the Management System, which calls for efficient and environmentally responsible resource use. It is aligned with the Energy Conservation Promotion Act, the Solar Energy Development Master Plan, and Thailand's clean-energy policy. Two key approaches link this commitment to clean-energy goals.

- Building a Clean Energy Campus: SNRU aims to keep raising the share of renewable energy on campus through rooftop solar PV, energy storage, and solar power for utilities such as pumping water for tap-water production.
- The university promotes energy conservation in every unit through energy-efficient equipment, regular maintenance of electrical and air-conditioning systems, and routine monitoring of electricity generation and use. This data informs energy planning and helps reduce the university's greenhouse-gas emissions.
- A knowledge hub for community clean energy. The Center of Excellence in Alternative Energy and the Faculty of Industrial Technology are SNRU's main vehicles for research, innovation and the transfer of practical clean-energy technologies to farmers, communities and local agencies.
- The aim is to lower energy costs, strengthen energy security and help communities become self-reliant.

SNRU applies clean-energy principles across all of its operations: managing energy on campus, building responsible energy habits among students and staff, and sharing knowledge with society. The university aims to be the region's model for accessible clean energy, in keeping with its role as a university for local development.

Key Activities & Projects : University measures towards affordable and clean energy

Sakon Nakhon Rajabhat University (SNRU) implements its clean-energy policy through measures covering energy generation, storage, use, and monitoring, as well as community outreach. The lead unit is the Building, Facilities, and Vehicles Section, General Affairs Division, Office of the President. The key measures are

1. Solar PV Rooftop

SNRU has installed rooftop solar PV in two phases. Phase 1 was funded by the Energy Conservation Promotion Fund and began operating in 2019. Phase 2 expanded the system in 2020. Panels now cover seven buildings, including the Central Building, the Engineering Technology Building, the Multipurpose Building, and the Sport Center, with a combined capacity of more than 505 kWp. The solar power directly replaces grid electricity, cutting both energy costs and the university's greenhouse-gas emissions.



2. Energy Storage System

Phase 2 includes a 300 kWh battery energy storage system at the Building, Facilities, and Vehicles office. It stores surplus daytime solar power for use during peak demand. This improves grid stability and power quality and makes better use of renewable energy.



3. Solar power for campus utilities

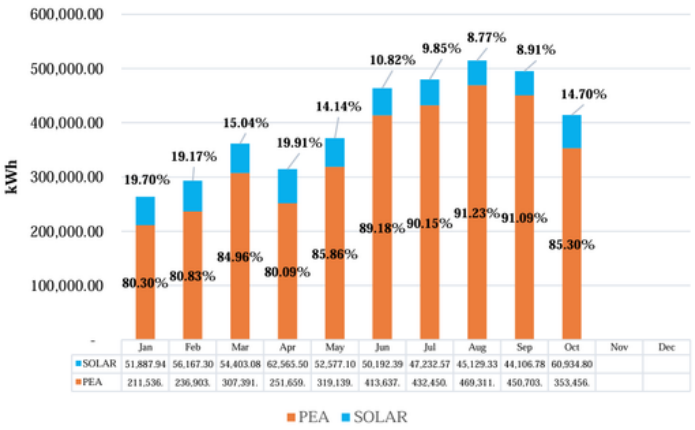
In FY2025, the Nong Hai Reservoir Improvement Project installed five solar water-pumping sets and three solar groundwater-pumping sets to supply the campus tap-water system. The project reduces electricity use for water supply and links clean energy with sustainable water management (SDG 6 and SDG 7).



Key Activities & Projects : University measures towards affordable and clean energy

4. Continuous energy monitoring and reporting

The Building, Facilities, and Vehicles Section records monthly figures: solar generation by building, electricity drawn from the Provincial Electricity Authority, and the cost savings achieved. It publishes renewable-energy performance reports on its website. These data guide energy planning and system maintenance so the solar system keeps running at full efficiency.



5. Energy conservation in buildings



SNRU has issued the "SNRU Energy Reduction Guidelines," based on the Cabinet-mandated energy-reduction measures for government agencies, and shares them with staff and students through university channels. The guidelines are:

- Set air conditioners in offices, classrooms, and meeting rooms to no lower than 26°C, and dress to suit the weather and the work.
- Switch off lights, air conditioners, computers, printers, photocopiers, and other non-essential equipment as soon as they are not in use.
- Turn on Energy Saver mode on computers and office equipment where appropriate.
- Take the stairs instead of the lift for short trips.
- Reduce paper use and switch to electronic documents.
- Plan official vehicle use, share rides only when necessary, and hold meetings online to save fuel.

These guidelines bring the whole university community into energy saving, covering both building electricity and travel fuel. Combined with on-campus solar power, they help lower costs and greenhouse-gas emissions over the long term.





6. Research and clean-energy transfer to communities

The Center of Excellence in Alternative Energy and the Faculty of Industrial Technology are SNRU's vehicles for clean-energy research and knowledge transfer to communities. In 2025, for example, the Ban Khaem Phueng cattle-raising learning center adopted solar power to cut production costs and farmers' greenhouse-gas emissions.

- SNRU's Center of Excellence on Alternative Energy (CEAE), under the Research and Development Institute, leads the university's clean-energy research.
- It runs five specialist laboratories:
  - Thermoelectric Research Laboratory
  - Thin Film Research Laboratory
  - Biomass Energy Research Laboratory
  - Battery Research Laboratory
  - Electro-Mechanical Energy Laboratory
- Its research covers waste-heat-to-power technology, energy materials, alternative batteries, and biomass energy. Findings are shared at national and international academic forums.





Teaching and awareness

- Students, teachers, and the public: CEAE runs an annual program, "Knowledge Transfer of Innovation and Technology of Alternative Energy" (KITA).
  - KITA2025 took place on 5 June 2025 with eight hands-on stations, including solar-energy innovation, thermoelectric device making, aluminum-air battery power generation, and essential-oil distillation from local herbs.
  - It was held alongside the "Innovation for Sustainable Local Development in the Northeast 2025" event, which drew 616 participants from 16 educational institutions.
  - Contests and seminars: CEAE also hosts innovation contests (ISDA) and academic seminars (PETM) to spark young people's creativity in alternative energy.
  - Partner schools: CEAE researchers teach alternative-energy innovation to students at the SNRU Demonstration School.



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7. Research & Awareness

SNRU uses its academic strengths to advance clean energy:

- Curriculum integration: SNRU offers energy-related programs from bachelor's to doctoral level:
  - B.Sc., M.Sc., and Ph.D. in Physics
  - M.Eng. and Ph.D. in Engineering
  - B.Tech. in Electrical and Electronics Technology (Faculty of Industrial Technology)
  - B.Sc. in Environmental Science
  - B.Ed. in Physics
- These programs teach renewable energy and sustainability, preparing graduates, teachers, and researchers to understand and develop clean-energy technologies.
- Research and technology development: The Center of Excellence on Alternative Energy, under the Research and Development Institute, is SNRU's main clean-energy research unit.
  - It runs five laboratories: thermoelectrics, thin films, biomass energy, batteries, and electro-mechanical energy.
  - Its researchers develop waste-heat-to-power technology, energy materials, alternative batteries, and biomass energy, publishing in international journals such as Thin Solid Films, Energy Procedia, and Materials Research Bulletin.
  - The center has research partnerships with universities in Thailand, Japan, China, Indonesia, and Vietnam.
- A model for the community: SNRU uses its campus and expertise as a learning resource and a channel for transferring clean-energy technology to local communities.
  - The campus rooftop solar and energy-storage systems demonstrate the technology in real use.
  - Every year, the center runs the KITA alternative-energy knowledge-transfer program and the ISDA innovation contest for students, teachers and the public.
  - SNRU helps farmers adopt solar power, for example, at the Ban Khaem Phueng cattle-raising learning center.

Energy-efficient renovation and building

Sakon Nakhon Rajabhat University (SNRU) develops its buildings and infrastructure within the framework of the University Master Plan. The Design and Construction Inspection Unit of the Building, Facilities, and Vehicles Section oversees every stage, from survey and design to final inspection, with energy efficiency considered across each building's life cycle. The key approaches are

1. Energy-efficient design for new buildings: New buildings follow the Building Energy Code. They make use of natural light and ventilation, reduce heat gain through insulation and building orientation, and have roof structures ready for future solar PV.
2. High-efficiency upgrades in existing buildings: Whenever a building is renovated or maintained, lighting is replaced with LED, and new air conditioners and appliances carry the Label No. 5 energy-efficiency rating.
3. Upgrading electrical and utility infrastructure: The Utilities and Infrastructure Development Project (2020-2024) upgraded campus electrical and utility systems to improve efficiency and reduce energy losses.
4. Putting existing roofs to work: Seven existing buildings were adapted to host rooftop solar PV, as described under the clean-energy measures.
5. Preventive maintenance and fast repairs: The Electrical and Buildings Units service electrical and air-conditioning systems on a regular schedule. Staff report faults through the E-Service system, and construction progress is tracked online, so buildings run at peak efficiency throughout their lifetime.


1. Faculty of Industrial Technology Building
2. Fine and Applied Arts and Music Building
3. Buildings and Grounds and Vehicle Services Building
4. Ratchaphruek Sports Complex Building
5. Indoor Sports Center Building
6. Central Academic Building


7. Faculty of Education Building (Building 22)
8. Faculty of Humanities and Social Sciences Building (Building 24)
9. Management Information Center Building
10. Faculty of Nursing Building
11. Office of the President Building (Building 10)
12. Environmental Science Building
13. Information Technology Center Building
14. Multi-Purpose Building (Building 20)


LED lighting system installed in university office buildings to improve energy efficiency and support green building implementation.

Rooftop solar photovoltaic (PV) system installed on a university building to generate renewable energy and reduce greenhouse gas emissions.

Naturally ventilated building space supporting passive cooling and sustainable campus operations.

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1. Retrofitting existing roofs to generate electricity: Seven existing buildings were upgraded to host rooftop solar PV, with 1,579 panels and a combined capacity of 505.28 kWp:

No.	Building	PV Modules (320 Wp)	Inverters (25 kW)	Capacity (kWp)
1	Central Building	454	6	145.28
2	Engineering Technology Building	336	4	107.52
3	Multipurpose Building	306	4	97.92
4	Ratchapruek Stadium	187	3	59.84
5	Sport Center	180	2	57.6
6	Building, Facilities and Vehicles Office	80	1	25.6
7	Aesthetic and Music Building	36	1	11.52
	Total	1,579	21	505.28

2. Upgrading building power systems with energy storage: The Building, Facilities, and Vehicles Office has a 300 kWh energy storage system (ESS) that stores surplus power for peak demand and keeps the building's power stable and of good quality.
3. Energy-efficient equipment and design: LED lighting is used in every building, and 46% of buildings are designed for natural ventilation to reduce air-conditioning loads.
4. Building-level energy monitoring: Each month, the Building, Facilities and Vehicles Section records solar generation for each building and compares it with electricity drawn from the Provincial Electricity Authority. These data guide building upgrades and maintenance.
5. Preventive maintenance and fast repairs: The Electrical and Buildings Units service electrical and air-conditioning systems on a regular schedule. Staff report faults through the E-Service system, so buildings run at peak efficiency throughout their lifetime.