WALAILAK UNIVERSITY

SDG REPORT 2025-2026



Times Higher Education Sustainability Impact Ratings 2026

SUSTAINABLE DEVELOPMENT GOALS

13 CLIMATE ACTION



1. LOW-CARBON ENERGY TRACKING AND MEASUREMENT FOR A SUSTAINABLE UNIVERSITY
2. ACHIEVING CARBON NEUTRALITY BY 2030 THROUGH COMPREHENSIVE GREENHOUSE GAS MANAGEMENT
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5. RESEARCH ON RUNOFF CHANGES IN THE PAK PHANANG BASIN FOR CLIMATE CHANGE ADAPTATION UNDER SDG 13



SDG 13 : CLIMATE ACTION

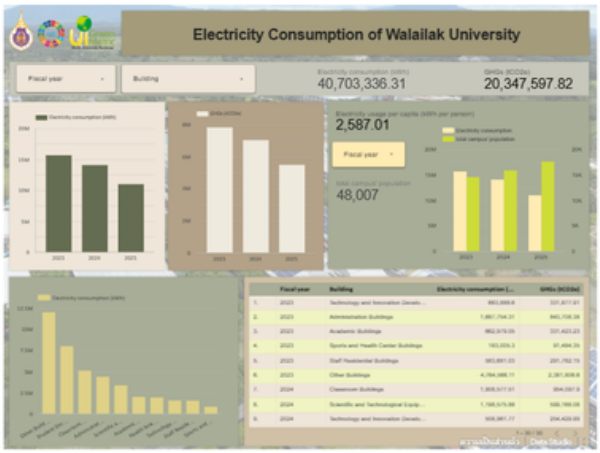
LOW-CARBON ENERGY TRACKING AND MEASUREMENT FOR A SUSTAINABLE UNIVERSITY

Walailak University (WU) recognizes that conventional electricity consumption can contribute to climate change and has therefore established policies and practices to promote the use of low-carbon and renewable energy across the university. To support the transition toward a more sustainable energy system, the university measures and tracks the amount of low-carbon energy used for the whole university, enabling it to assess current performance, identify opportunities for improvement, and guide future energy planning.





The university uses a total of 12,503.92 GJ/year of renewable energy out of total energy consumption of 39,519.41 GJ/year, representing 31.64% of total energy use. The renewable energy portfolio consists of solar energy at 12,400.75 GJ/year, combined heat and power (CHP) at 52.56 GJ/year, biogas at 39.42 GJ/year, and wind energy at 11.19 GJ/year. These figures provide quantitative evidence of the university's use of low-carbon energy and demonstrate the scale of renewable energy adoption across its operations.



The systematic collection and analysis of energy data provide a clear basis for measurement of low-carbon energy use. By quantifying renewable energy consumption and comparing it with total energy consumption, the university can assess its progress, identify gaps in the current energy mix, and determine opportunities to increase the share of low-carbon energy. The data also provide evidence for evaluating the effectiveness of existing energy policies and informing future energy strategies.

The implementation of multiple renewable energy sources demonstrates the university's development from policy commitment toward practical energy transformation. Solar energy serves as the primary renewable source, complemented by biogas, CHP, and wind energy. This diversification supports greater energy resilience while reducing dependence on higher-carbon energy sources and creating opportunities for further development of clean energy infrastructure.





The university's approach also supports diagnostics by using quantitative energy information to identify the current status and potential areas for improvement in low-carbon energy use. The results allow the university to understand the proportion of renewable energy within its overall energy consumption and use this information to determine where additional interventions may be most effective.





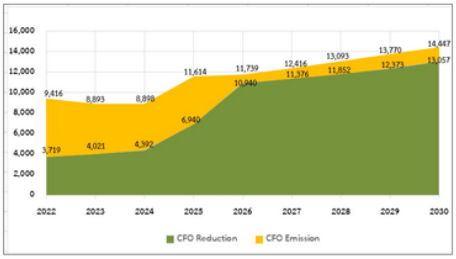
At the same time, promoting renewable energy contributes to engagement among relevant university units and stakeholders by translating the university's sustainability policies into practical energy practices. The measurable results provide a common basis for communicating progress and encouraging continued participation in the transition toward cleaner energy.

Overall, WU currently uses 12,503.92 GJ/year of renewable energy, equivalent to 31.64% of total energy consumption. The systematic measurement, evidence-based assessment, ongoing development, and stakeholder engagement provide a foundation for increasing low-carbon energy use and supporting the university's long-term transition toward a lower-carbon and more climate-resilient campus.

ACHIEVING CARBON NEUTRALITY BY 2030 THROUGH COMPREHENSIVE GREENHOUSE GAS MANAGEMENT



Walailak University has formally declared its commitment to becoming a Carbon Neutral University by 2030, reflecting its long-term commitment to climate action and sustainable university management. The university has publicly announced its Carbon Neutrality target through an official institutional declaration, establishing 2030 as the target year and providing a clear direction for systematic greenhouse gas reduction across university operations. In line with the Greenhouse Gas Protocol, the university conducts annual greenhouse gas inventories covering Scope 1, Scope 2, and Scope 3 emissions, enabling the university to identify major emission sources, monitor changes over time, and develop evidence-based measures for reducing its carbon footprint.



Scope 1: Direct Greenhouse Gas Emissions

Walailak University comprehensively accounts for emissions generated directly from its university operations. These include stationary combustion from diesel used in backup generators and LPG used in waste incineration, mobile combustion from university vans and buses, fugitive emissions from refrigerants such as R-32 and R-410A, chemical emissions associated with the university's water production system, fertilizer use in landscape management, and emissions related to waste management, including sanitary



landfill operations, organic waste composting, and the incineration of infectious and hazardous waste. To reduce these direct emissions, the university has implemented a range of mitigation measures, including replacing conventional diesel with B7 biodiesel, introducing electric vehicles to reduce dependence on fossil fuels, improving the efficiency of the university water production system, and replacing lolder refrigerants with lower-emission alternatives such as R-32. Collectively, these measures contribute to an estimated reduction of approximately 79.58 tCO_2e per year.

Scope 2: Indirect Emissions from Purchased Electricity



Walailak University monitors greenhouse gas emissions associated with electricity purchased from the national electricity grid. The university's annual inventory reports 5,214.37 tCO_2e from electricity purchased from the Provincial Electricity Authority (PEA). To reduce dependence on purchased electricity and lower associated greenhouse gas emissions, the university has continuously expanded the use of renewable and low-carbon energy sources across theuniversity. These include solar photovoltaic systems installed on university buildings, wind energy generation, and biomass energy initiatives. Renewable energy currently accounts for approximately 31.64% of the university's total electricity consumption, contributing to an estimated reduction of approximately 1,585 tCO_2e in greenhouse gas emissions annually.

Scope 3: Other Indirect Greenhouse Gas Emissions

In addressing Scope 3, or other indirect greenhouse gas emissions, Walailak University also identifies and monitors emissions arising from activities associated with university operations, including electricity consumption within leased facilities, waste generation and disposal, water consumption, transportation, and business travel, including air travel. To reduce these emissions, the university has implemented comprehensive waste reduction measures, expanded digital administration through E-Services to reduce paper consumption and unnecessary travel, promoted efficient water use, implemented vehicle registration and traffic management systems, and encouraged reductions in air travel where alternative approaches are practical. These measures contribute to an estimated reduction of approximately 49.75 tCO_2e per year, while also promoting more sustainable practices and behavioural change among students, staff, and other members of the university community.









As part of its ongoing carbon management system, Walailak University continuously monitors electricity generation and consumption from low-carbon energy sources. The university collects and evaluates data on electricity generated from solar photovoltaic systems, wind energy, and biomass,

together with annual electricity consumption, electricity use by individual buildings, greenhouse gas emissions associated with electricity consumption, and the proportion of renewable energy in the university's overall energy mix. Annual monitoring records total electricity consumption of 10,977,613.39 kWh, of which renewable energy accounts for 31.64%. This systematic monitoring provides the university with measurable evidence for evaluating the effectiveness of its renewable energy initiatives and identifying opportunities for further improvement.



Walailak University also places strong emphasis on public commitment, transparency, and accountability in its pathway toward Carbon Neutrality. The University's Carbon Neutrality commitment, greenhouse gas inventories, renewable energy information, and carbon reduction programmes are made publicly accessible through official university communication channels and websites. This approach enables students, staff, government agencies, partner organisations, and the wider community to monitor the university's progress toward its 2030 Carbon Neutrality target and demonstrates the university's commitment to transparent climate action.

Through comprehensive greenhouse gas accounting across Scope 1, Scope 2, and Scope 3, combined with measurable emission reduction programmes, systematic renewable energy monitoring, and continued investment in low-carbon technologies, Walailak University is strengthening its institutional capacity to manage greenhouse gas emissions and reduce its carbon footprint. These integrated actions provide a measurable and evidence-based pathway toward the university's goal of becoming a Carbon Neutral University by 2030, while supporting the broader transition toward sustainable and climate-resilient university development.

LOCAL CLIMATE EDUCATION PROGRAMMES AND CAMPAIGNS

Local Climate Education Programmes



Walailak University provides local education programmes and campaigns on climate change that connect climate-related knowledge with practical challenges faced by local communities. These programmes address climate change risks, impacts, mitigation, adaptation, impact reduction, and preparedness, while engaging community members, entrepreneurs, and local enterprises in developing practical solutions.

Key programmes include Sustainable Energy Management and Renewable Energy, which promotes reducing fossil fuel consumption and increasing renewable energy use to reduce greenhouse gas emissions and slow the rise in global temperatures. The Water Management and Water Resource Conservation programme helps communities understand and manage water variability while strengthening their capacity to prepare for risks such as droughts and floods.

The university also promotes Waste Management and Recycling to help communities understand the relationship between waste generation, greenhouse gas emissions, and environmental pollution. Through waste reduction, recycling, and resource recovery, communities can reduce emissions while using resources more efficiently.



In addition, the university presents village water supply quality assessment results and discusses the installation of solar-powered systems for village water-pumping meters. Using environmental and energy information in this way supports community decision-making and helps identify practical adaptation and low-carbon infrastructure options.

Another programme provides knowledge and technology transfer on producing bio-fermented liquid from waste generated by community fishing activities. The approach transforms organic waste that could otherwise generate greenhouse gases into a useful agricultural product, reducing waste and pollution while promoting resource circulation within the community.



The university also organizes a practical workshop entitled “Enhancing the Capacity of Entrepreneurs and Community Enterprises to Support a Low-Carbon Society through Greenhouse Gas Emission Reduction.” The programme develops the capacity of Ranong Local Community Entrepreneurs to incorporate greenhouse gas reduction into business practices and prepare for emerging climate-related standards and regulations.

These programmes use local problems and available information as a basis for diagnostics, allowing learning activities and solutions to respond to actual community needs. Knowledge transfer and practical activities support development by turning climate knowledge into applicable technologies and practices, while community participation strengthens engagement. The success of these activities is measured through improvements among participants and participant satisfaction, with satisfaction scores exceeding 90%, providing evidence of the effectiveness and outcomes of the programmes.

Local Climate Awareness Campaign

Walailak University also implements the “Energy Awareness Campaign” to promote awareness of energy efficiency and climate change at the community level. The campaign encourages people to reduce unnecessary energy consumption and increase the use of renewable energy in everyday life and tourism-related activities.



The campaign communicates the relationship between energy consumption, greenhouse gas emissions, and climate change, encouraging practical behavioral changes that can contribute to mitigation and impact reduction while strengthening community adaptation and preparedness for future climate risks.

Through community communication and participation, the campaign creates opportunities for people to understand climate-related risks, discuss local challenges, and adopt more sustainable energy practices. Feedback and observations from implementation can help identify areas requiring further action, supporting diagnostics and continuous development of future climate education activities. Participation from local stakeholders strengthens engagement, while campaign activities and outcomes provide a basis for measurement and evaluation.

Together, the university's local education programmes and climate awareness campaign provide complementary approaches to local climate education. The programmes focus on developing knowledge, skills, technologies, and practical solutions, while the campaign promotes broader awareness and behavioral change among members of the Ban Laem Community and Ranong local community enterprises. These programmes and campaigns help improve understanding of climate change risks and impacts through mitigation, adaptation, impact reduction, and preparedness at the local level.

INFORMING AND SUPPORTING GOVERNMENT FOR CLIMATE CHANGE DISASTER RISK EARLY WARNING AND MONITORING

Walailak University plays an active role in informing and supporting local and regional governments by providing knowledge, data, technologies, and collaborative planning to strengthen climate change disasters and risk early warning and monitoring. Through collaboration with government agencies at both levels, the university helps strengthen risk assessment, preparedness, adaptation, and coordinated disaster response.

Local Level

At the local level, Walailak University works with government agencies in Nakhon Si Thammarat Province to inform and support information and develop collaborative approaches for strengthening the province's capacity to respond and adapt to the impacts of climate change. The collaboration focuses on sharing knowledge and information that can support government agencies in assessing local risks, developing preparedness measures, and strengthening coordinated responses to climate-related hazards.





The university also supports the Nakhon Si Thammarat Provincial Office of Disaster Prevention and Mitigation by informing and supporting knowledge and information on a low-cost, real-time landslide disaster early warning network system. This technology provides a practical mechanism for monitoring landslide risks and supporting timely decision-making. Access to real-time information enables relevant agencies to better assess changing conditions and strengthen their capacity to issue early warnings and prepare appropriate responses.

This local-level collaboration uses information on actual risks and local conditions as a basis for diagnostics, helping identify vulnerabilities and areas requiring stronger preparedness measures. The transfer of knowledge and early warning technology supports development by strengthening local disaster monitoring and response capabilities. At the same time, continuous collaboration with government agencies promotes engagement among Nakhon Si Thammarat Provincial Office of Disaster Prevention and Mitigation, while information from monitoring and implementation provides a basis for measurement, evaluation, and improvement of local disaster preparedness.

Regional Level



At the regional level, Walailak University collaborates with key agencies including Disaster Prevention and Mitigation Regional Center 12 in Songkhla, Disaster Prevention and Mitigation Regional Center 18 in Phuket, and meteorological agencies to support joint disaster preparedness and response planning for Southern Thailand.

The collaboration facilitates the exchange of knowledge, information, and operational approaches among agencies responsible for disaster management and meteorological monitoring. Joint planning strengthens the ability of agencies to consider risks that may extend across provincial boundaries and to coordinate preparedness and response measures at a broader regional scale.



The regional approach supports diagnostics by bringing together information and experiences from different areas to better understand interconnected disaster risks. It contributes to development through the improvement of coordinated regional preparedness and response strategies. Regular collaboration strengthens engagement among government agencies and knowledge institutions, while information and lessons generated through joint planning can support measurement and evaluation of preparedness and the continuous improvement of regional disaster risk management. After the collaboration, a network of academics in southern Thailand has been established to promote collaboration and personnel exchanges for knowledge transfer, enabling communities to understand risks, respond, adapt, and recover.

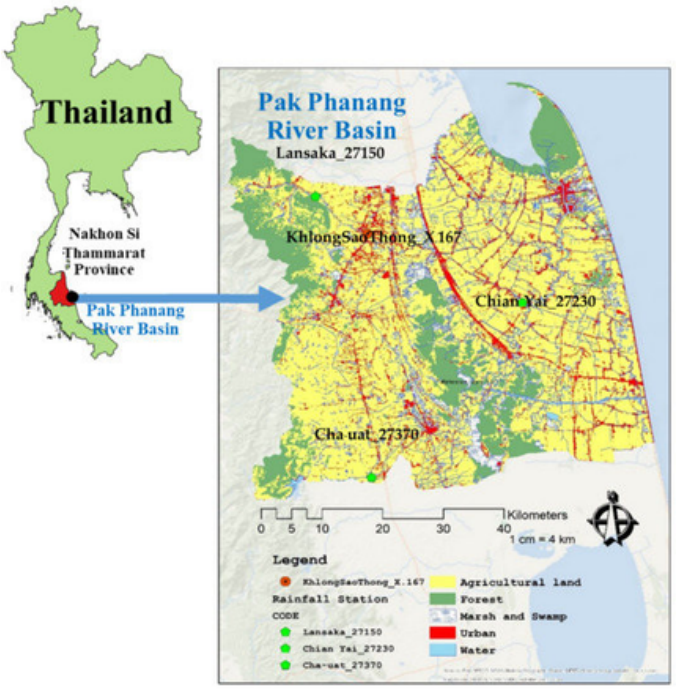
Conclusion

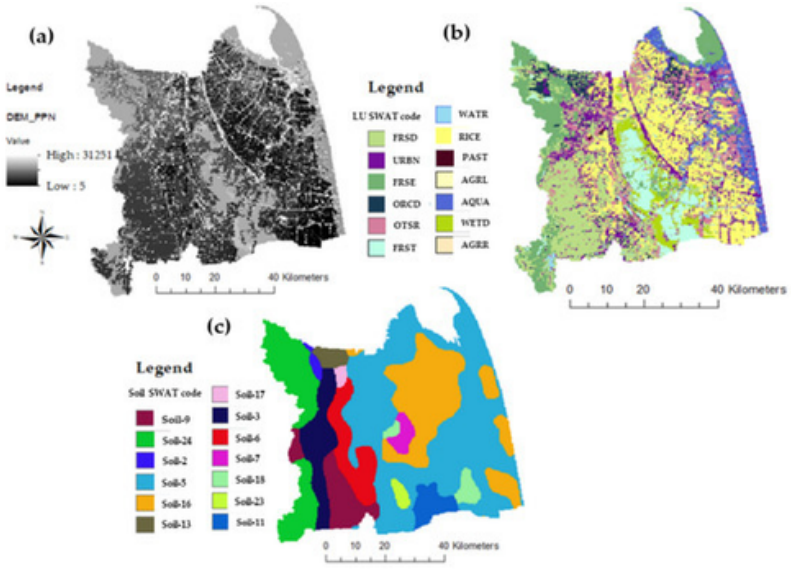
Overall, Walailak University's collaboration with government agencies demonstrates practical inform and support for local and regional governments in climate change disasters or risk early warning and monitoring. By combining evidence, knowledge transfer, technology, collaborative planning, and continuous evaluation, the university contributes to stronger local and regional capacity to anticipate, prepare for, and respond to climate-related disaster risks.

RESEARCH ON RUNOFF CHANGES IN THE PAK PHANANG BASIN FOR CLIMATE CHANGE ADAPTATION UNDER SDG 13

Climate change is one of the most significant challenges affecting natural resources, ecosystems, agriculture, and community livelihoods. Southern Thailand is particularly vulnerable to climate-related risks, including intense rainfall, flooding, drought, and fluctuations in water availability. Research on future runoff changes in the Pak Phanang Basin therefore plays an important role in supporting Sustainable Development Goal 13 (SDG 13): Climate Action. By applying scientific data and climate modeling, the research provides insights into potential future changes in climate and water resources, supporting government agencies, local communities, and farmers in developing appropriate adaptation and risk management strategies.

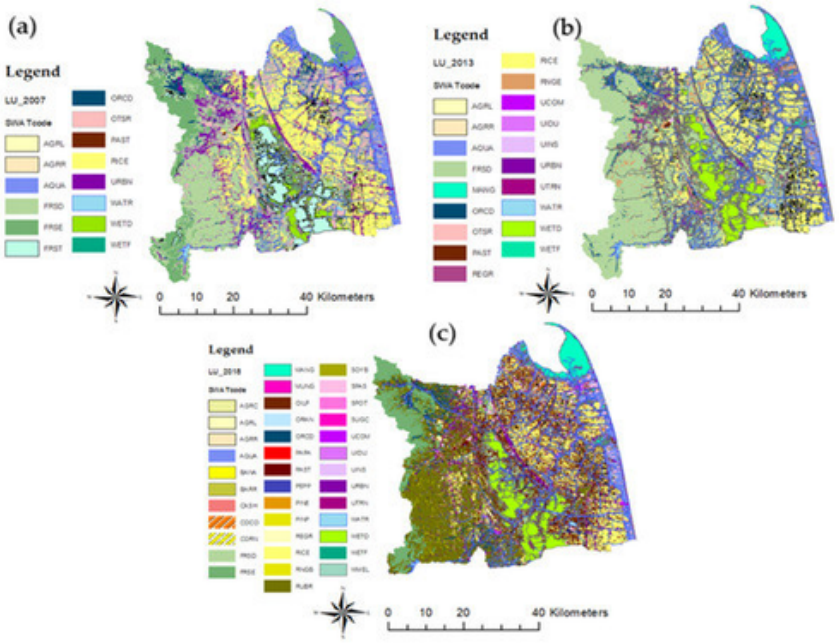
The study projected future climate and runoff conditions for approximately 2025, 2055, and 2085 under three greenhouse gas emission scenarios: RCP2.6, RCP4.5, and RCP8.5. These scenarios represent low, moderate, and high levels of greenhouse gas emissions, respectively. The results indicate that changes in greenhouse gas concentrations are associated with variations in runoff in the Pak Phanang Basin. These findings highlight the importance of understanding how climate change may affect water systems over different time periods and demonstrate the role of scientific research in assessing climate-related risks. Such evidence is essential for developing informed policies and adaptation measures in line with the objectives of SDG 13.



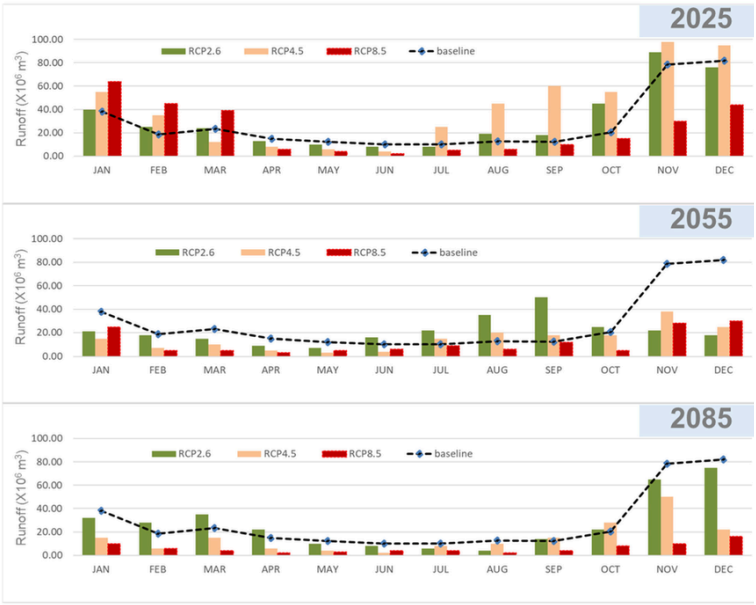


The projections further indicate that the basin may experience different types of climate-related risks over time. In the short term, around 2025, rainfall and runoff are projected to increase above the baseline average, potentially increasing the risk of waterlogging and flooding in low-lying areas. Such conditions may negatively affect agricultural production, particularly crops such as rice and watermelon. In the medium and long term, particularly around 2055 and 2085, runoff is projected to decline substantially,

potentially reaching approximately 50% below the baseline average across the scenarios examined. This trend could increase the risks of drought and water shortages, with potential consequences for agricultural productivity, food security, and the livelihoods of communities dependent on local water resources.



To address these potential impacts, the research proposes adaptation approaches that can be implemented at the local level. In the short term, improving water management in low-lying areas and developing effective drainage systems can help reduce the impacts of flooding and waterlogging on agricultural production. In the medium and long term, promoting agroforestry systems can strengthen the resilience of agricultural areas to drought by improving soil moisture retention, reducing water loss through evaporation, and supporting more sustainable management of land and water resources. The study also emphasizes the importance of conserving and restoring upstream forests. A conservation scenario involving an increase in protected forest areas to 25% highlights the important role of forests in regulating runoff and maintaining the hydrological balance of the basin.



The research therefore serves not only as a tool for projecting future changes in water availability but also as a scientific basis for climate adaptation, water resource management, and spatial planning. By identifying potential risks in advance, the findings can support government and local communities in developing water management, agricultural adaptation, ecosystem conservation, and more effective land-use planning. The research also highlights the importance of integrating climate projections into long-term decision-making, enabling stakeholders to prepare for increasing flood risks in the short term and potential water shortages in the future. These approaches directly support SDG 13, particularly on strengthening resilience and adaptive capacity to climate-related hazards and natural disasters. More broadly, the study demonstrates how scientific knowledge, climate modeling, and local adaptation measures can be integrated to support evidence-based decision-making and sustainable resource management. Also, the study can strength the resilience of the Pak Phanang Basin, agricultural communities, and ecosystems in southern Thailand.