



**Project Establishment:
Atmospheric Pollution and Climate Change Research Unit (APCC)**

Background and Significance:

Currently, air pollution, greenhouse gas emissions, and climate change significantly impact life, society, the economy, the environment, and public health. Greenhouse gases contribute to global warming and lead to climate change, affecting environmental factors such as size, frequency, and distribution. Changes in temperature, humidity, evaporation, cloud formation, rainfall, storms, and dust particles all have consequences, creating imbalances such as floods, droughts, epidemics, food insecurity, and natural disasters.

The variability in weather conditions also has substantial economic and social repercussions. For example, in 2011, Thailand faced severe flooding, resulting in approximately 2,757,236 acres of damaged areas. This led to a decline in the Gross Domestic Product (GDP) by 3.1-3.4%, with a total economic loss of 346,000 million Baht. Additionally, the ongoing drought crisis in 2016 has affected agriculture, a primary occupation in Thailand, causing water shortages for both consumption and agricultural use.

Despite these challenges, Thailand lacks sufficient understanding and knowledge regarding air pollution and climate change. Effective and sustainable solutions require crucial knowledge, including atmospheric science, the nature and causes of climate change, the circulation and exchange of energy, water balance, greenhouse gas emissions, the impact of climate change, adaptation, and appropriate and efficient greenhouse gas reduction strategies.

Therefore, the establishment of the Atmospheric Pollution and Climate Change Research Unit (APCC) aims to provide a systematic approach to managing and solving air pollution issues, smog problems, and utilizing knowledge for comprehensive and sustainable planning in the face of climate change. This knowledge will be invaluable for relevant organizations to cope with environmental changes effectively and use resources judiciously.



Objectives:

1. To enhance academic and research capabilities within the Atmospheric Pollution and Climate Change Research Unit under the College of Energy and Environment.
2. To produce high-quality research outcomes in the fields of air pollution and climate change for the benefit of the country.
3. To disseminate knowledge and research findings on air pollution and climate change to the local community, fostering comprehensive and sustainable development planning.

Vision:

To be the leading research unit in the country, producing high-quality research at national and international levels to generate new knowledge in addressing air pollution and haze issues, striving for a clean air city, reducing greenhouse gas emissions for a low-carbon society, and enhancing the country's capacity to efficiently and sustainably adapt to climate change.

Missions:

1. Produce research outcomes in the fields of air pollution and climate change specific to the local context, Thailand, and the Southeast Asian region.
2. Serve as a central hub for managing comprehensive knowledge and disseminating academic achievements for practical applications.
3. Provide training and establish a network of researchers in the fields of air pollution and climate change in the country.
4. Foster the development of new researchers in the areas of air pollution and climate change for the country.

Anticipated Benefits:

- Research outcomes in air pollution contribute to providing relevant agencies with effective and sustainable solutions for addressing air pollution, haze, and indoor air pollution.



- Research in climate change helps relevant organizations develop strategies to enhance the country's ability to cope with the impacts of climate change, natural disasters, and adapt efficiently and sustainably.
- Enhances the country's capacity to reduce greenhouse gas emissions based on research and development efforts, aiding in combating global warming and climate change, aligning with international agreements.
- Acts as a support and development center for local and Thai research, increasing research output to help the country address air pollution and climate change issues promptly and effectively.
- Develops researchers and personnel in the fields of air pollution and climate change, enhancing the country's capabilities with knowledgeable and qualified individuals to address air pollution issues and cope with the impacts of climate change and local natural disasters effectively.
- Serves as a central hub for collaborative research in air pollution and climate change for Thailand and the Southeast Asian region.
- Acts as a dissemination center, providing training and utilizing knowledge in air pollution and climate change for the development of local personnel and the country in a sustainable and comprehensive manner.

Symbols



Meaning of APCC Symbol "Balanced Transformation":



Research Details of Research Groups:

1. Atmospheric Chemistry and Climate Model Laboratory (ACCM):

- Emission inventory
- Air pollution meteorology (Observation and Model)
- Climate change and climate variations (Observation & Model)
- Dispersion of smog/pollution in Upper Southeast Asia
- Interaction of air pollution and climate change

2. Micrometeorology Laboratory (MiLab):

- Micro meteorology
- Long-term heat, water vapor, and carbon dioxide fluxes observation
- Carbon cycle

3. Air Pollution and Greenhouse Gas Mitigation Laboratory (APGM):

- Greenhouse gas (GHG) inventory
- GHG mitigation
- Carbon footprint
- LCA, MFA
- GHG and Energy
- Smog mitigation
- Air pollution control
- Indoor air quality
- VOC control

4. Climate Change Impact and Adaptation Laboratory (CCIA):

- Impact of Climate change
- Climate change adaptation



Consultation/Research Network with External Research Units:

1. National Astronomical Research Institute of Thailand (NARIT)
2. Associate Professor Dr. Jiemjai Kreasuwun
Former Head of Atmospheric Physics Research Unit, Department of Physics,
Faculty of Science, Chiang Mai University
3. Associate Professor Dr. Amnat Chidthaisong
The Joint Graduate School of Energy and Environment (JGSEE)
4. Atsamon Limsaku, Ph., D.
Climate Change Research Group, Environmental Research and Training Center,
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5. Sukrit Kirtsaeng, Ph., D.
Expert Meteorologist, Meteorology Division, Thai Meteorological Department
6. Office of Water Management and Hydrology, Royal Irrigation Department
7. Dr.Cindy Bruyere
Regional Climate Section, Mesoscale & Microscale Meteorology, National Center
for Atmospheric Research (NCAR)
8. Dr.Mary Barth
Chemistry Modeling Section, Atmospheric Chemistry Observation & modeling
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