

SOMPOKE KINGKAEW

สมโภช กิ่งแก้ว

CEO, Clean Air and Climate as a Service (CACaaS) Co., Ltd.

Keystone Thammasat, A814, Klong Luang, Pathum Thani 12120, Thailand

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EDUCATION

Ph.D. Candidate in Environmental Engineering and Management

2015-2023 **Asian Institute of Technology (AIT)**, Thailand. **CGPA: 3.92/4.00**. Coursework focused on Advanced Remote Sensing, Advanced Applications and Spatial Methods in GIS, and Advanced Digital Mapping. Special Study: “Development of Near Real-Time Emission Estimation for Northern Thailand”. Ph.D. Dissertation: “Estimation of Biomass Open Burning Emissions for Air Quality Forecast during Haze Pollution in Northern Thailand”. (Resigned in November).

M.Sc. (The Most Outstanding) in Environmental Engineering and Management

2011-2013 (Environmental Technology and Management)
Asian Institute of Technology (AIT), Thailand. **CGPA: 3.94/4.00**. Coursework focused on Air Pollution Engineering and Management, Air Pollution Modeling and Applications, Design of air Pollution Control System, The Science of Climate Change and Co-benefit, Environmental Chemistry and Laboratory, Environmental Impact Assessment, and Environmental Quality Management. Master Thesis: “Application of Photochemical Smog Modeling System for Ozone Air Quality Management in Bangkok Metropolitan Region (BMR) under Transport Fuel Scenarios”.

B.Sc. (The Most Outstanding of First-Class Honors) in Public Health

2007-2011 (Environmental Health Science)
Faculty of Public Health, **Mahidol University**, Bangkok, Thailand. **CGPA: 3.74/4.00**. Coursework focused on Air Pollution Control and Management, Environmental Health Engineering Survey and Practice, Sanitation Abatement and Control, Environmental Epidemiology and Toxicology, and Principle of Environmental Impact Assessment. Senior Project: “Application of the AAMA Community Noise Modeling on Traffic Noise Level Estimation in Different Residential Areas of Bangkok Vicinity”.

PROFESSIONAL AND TEACHING EXPERIENCE

- Sep 2024 – Present **Chief Executive Officer (CEO)** of
Clean Air and Climate as a Service (CACaaS) Co., Ltd.
- Oct 2023 – Aug 2024 **Principal Investigator (PI), Collaborating Center for Clean Air
and Climate Change (CCCACC), Thammasat University,**
Thailand. **Senior Editor**, Hub of Talent for Air Pollution and
Climate (HTAPC), Newsletter and Website.
Reviewer: Nature Springer, Thai Journal (Int. ThaiJo), etc.
- Oct 2015 – Sep 2023 **Full-time Lecturer, Thammasat University** (Rangsit Center)
Instructed in the coursework of
- Air Pollution Management and Control
 - Environmental Health Engineering
 - Modeling for Environmental and Occupational Health
 - GIS and Database Applications in Environmental Health
Information Systems.
- Founder**, Collaborating Center for Clean Air and Climate
Change (CCCACC), Thammasat University.
- Jun 2013 – Mar 2015 **Research Associate, Asian Institute of Technology (AIT)**
- Mar – May 2010 **Intern, TEAM Consulting**, Bangkok, Thailand.

INTERESTED RESEARCH AREAS

- AI-powered near real-time environmental data service platform
- Air quality and climate modeling (e.g., WRF-Chem, WRF-CAMx, MPAS, CMIP6)
- Atmospheric remote sensing and GIS with near real-time web-based applications
- Disaster and severe climate extreme event mitigations and adaptations
- Environmental health informatics and decision supporting system for
environmental management and administration

TECHNICAL SKILLS

- Numerical Modeling: WRF, WRF-Chem, WRF-CAMx, MPAS
- Programming Language: R, Python, Unix, Fortran, HTML, NCL, CDO, NCO
- Operating System: Linux Server, Windows Server, MacOS System, AWS
- Generative AI Platforms: ChatGPT OpenAI (with self configuration), Gemini, Copilot
- Other Tools: PowerBI, WordPress, LINE Developer, Looker, Google AppScript
- Intermediate Server System Automation and Maintenance

ACADEMIC ADVISING EXPERIENCE

- Kantachai Pajjityotee (2022-Present), Ph.D. Candidate at Thammasat University.
- Sasina Phasukkam and Fontip Songphram (2021). Protection efficiency of surgical mask on roadside mold and PM_{2.5} exposure using a designed closed-box manikin experiment.
- Siriluk Chairungruengsin and Kalyakorn Pongpikul (2021). Estimation of particulate matter emissions in construction sites using low-cost sensors and mini-volume and personal environmental monitoring air samplers.
- Diwatthanaphong S., Seesoddee T., and Suwanrerak S. (2019). Roadside fine particulate matter and its bounded heavy metals in Bangkok and Pathumthani.
- Kantachai Pajjityotee (Ph.D. Candidate at Thammasat University) and Satita Rachachan (2019). Fine particulate matter concentrations and size distributions during the post monsoon in northern Bangkok Metropolitan Region, Thailand
- Kanittha Chommanee and Kantachai Pajjityotee (2019). Health risk assessment of particulate matter exposure from different means of public transport in Bangkok, Thailand (Poster presentation in the 2nd National Environmental Conference).
- Kantachai Pajjityotee, Chanpen Sitprasert and Wissuta Woothisen (2018). Thunderstorm Risk Mapping in Thailand (Received the best poster presentation award in the 1st National Environmental Conference in climate change section).
- Racha Samermirt (Ph.D. Candidate at Kyoto University) and Rachaya Intarawichai (2017). Health effects of biomass open burning emission on residing students in a university campus of Thailand.

PAST AND CURRENT RESEARCH PROJECTS

An experienced Principal Investigator (PI) for over 10 projects and Co-Principal Investigator (Co-PI) for more than 7 projects within the past five years.

Sep 24-Sep25 [PI]	Air Quality Data Center System for Bangkok (Funding: BMA).
Apr 24-Sep 24 [PI]	Scoping review: Thailand National Emission Inventory. (Funding: HTAPC/NRCT).
Mar 23-Mar 24 [PI]	Development of thunderstorm and rainfall risk prediction system considering the effects of aerosol-cloud interactions in Thailand using WRF-Chem simulations (Funding: National Research Council of Thailand).

Mar 22-Aug 23 [PI]	Development of air quality management data platform for Bangkok Metropolitan Administration (BMA) (Funding: BMA).
Jul 21-Aug 23 [PI]:	Development of PM _{2.5} assimilative capacity forecasting system for effectively reducing PM _{2.5} emission from open burning activities at local administrative levels in Thailand (Funding: National Research Council of Thailand).
Apr 23-Apr 24 [Co-PI]	Evaluation of the implemented measures for PM _{2.5} reduction and development of the future measures (Funding: National Research Council of Thailand).
July 22-Nov 23 [Co-PI]	New roadmap for Free Haze ASEAN (Funding: ASEAN).
Jul 22-Nov 23 [Co-PI]	Prediction of short-term health impacts from PM _{2.5} pollution in Bangkok (Funding: Thai Health Organization).
May 21-Aug 23 [Co-PI]:	Contribution of Inside and Outside-city Air Pollution Sources to the PM _{2.5} Concentration of the Mitigation Measures of the Transport Sector in Bangkok (Funding: National Research Council of Thailand).
2021-2024 [Co-PI]:	e-Asia Project: Health Impacts of Climate Change in Thailand: Current Impacts and Its Implication (Funding: National Research Council of Thailand).
Nov 21-Nov 22 [Co-PI]	Identification of PM Sources in Na Phra Lan Pollution Control Zone, Saraburi Province (Funding: Pollution Control Department of Thailand).
Jul-Sep 20 [PI]:	Compilation of Emission Factors for Crop Residue Open Burning (Funding: Pollution Control Department).
Jul-Aug 20 [PI]:	Automated WRF Processing (Funding: Pollution Control Department of Thailand).
May-Aug 20 [PI]:	The Study of Infectious Waste Management in Thailand and Recommendations on Framework of Management Policy (Funding: Department of Health, Ministry of Public Health).
Jan-Aug 20 [PI]:	Development of Emission Inventory for Transport Sector in Thailand under Scenarios of Alternative National PM _{2.5} Management Policy (Funding: Thailand Development Research Institute (TDRI)).

2019-2020 [PI]:	Development of Air Quality Data Management System for Bangkok Metropolitan Administration (Funding: Sithiporn Associates Co., Ltd.).
2018 [Co-PI]:	Reducing Mercury Emission from Coal Combustion in the Energy Sector in Thailand (Funding: UN Environment).
2012-2014 [RA]:	Study of Ground-level Ozone in Bangkok Metropolitan Region by Advanced Mathematical Modeling for Air Quality Management. (Funding: PTT Public Co., Ltd.).

SELECTED CONFERENCE PRESENTATIONS:

- **Kingkaew, S.**, Pajityotee, K., Kamkon, R., Saphankaew, P., Kajonpetch, P., Kaewwongsa, N., Kingkaew., K., Wangwongwatana, S., Winijkul, E., Kirtsaeng, S., & Sriyotha, P. (2024). Development of a Thunderstorm and Rainfall Risk Forecasting System for Thailand: Considering the Effects of Aerosol-Cloud Interactions Using WRF-Chem. In 2024 APARC Reanalysis Intercomparison (A-RIP) Planning Workshop, Boulder, CO, USA.
- **Kingkaew, S.**, Kim Oanh, N. T., Winijkul E. & Pajityotee, K. (2023). Development of top-down FRP-based biomass fire emission inventory for PM_{2.5} air quality modeling using WRF-Chem modeling system in northern Thailand. In the 20th Global Emission Initiative (GEIA) Conference: Towards mitigating air pollutant and greenhouse gas emissions, Brussels, Belgium.
- **Kingkaew, S.**, Pajityotee, K., & Wangwongwatana. S. (2023). Performance of Next Five-day PM_{2.5} Air Quality Forecasting using WRF-Chem Modeling System in Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) Workshop, Dhaka, Bangladesh.
- **Kingkaew, S.**, Kajonpet P., Pajityotee, K., Wangwongwatana, S., Winijkul, E. & Kingkaew, K. (2023). Development of PM_{2.5} assimilative capacity forecasting system for effectively reducing PM_{2.5} emission from biomass burning at local administrative levels in Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) Workshop, Dhaka, Bangladesh.
- Pajityotee, K. & **Kingkaew, S.** (2023). Estimation of Semi-real-time Bottom-up Traffic Emissions Using GPS Traffic Probe Data for PM_{2.5} Simulation using WRF-Chem Modeling in Bangkok, Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) Workshop, Dhaka, Bangladesh.

- Saphankaew, P., Kamkon, R. & **Kingkaew, S.** (2023). Near Real-time Retrieval of Ground-level PM_{2.5} Concentrations from Different Five MODIS Aerosol Optical Depth Products Over Bangkok, Thailand. In the 5th Atmospheric Composition and the Asian Monsoon (ACAM) workshop, Dhaka, Bangladesh.
- Diwatthanaphong S., Seesoddee T., Suwanrerkerk S., Pajityotee K. & **Kingkaew S.** (2019). Roadside Fine Particulate Matter and Its Bounded Heavy Metals in Bangkok and Pathumthani, Thailand. In National Conference on Air Quality in Thailand: PM_{2.5}.
- **Kingkaew, S.**, Pajityotee, K. & Eaktasang, N. (2019). Development of a next-day prediction for spatial PM_{2.5} distribution in Bangkok Metropolitan Region, Thailand. In TU-KU-MU-NAVY Conference 2019, Thammasat University, Pathumthani.
- Pajityotee, K., Rachachan, S. & **Kingkaew, S.** (2019). Fine particulate matter concentrations and size distributions during the post monsoon in northern Bangkok Metropolitan Region, Thailand. In the 2nd National Environmental Conference, Mahasarakham, Thailand.
- Chommanee, K., Pajityotee, K. & **Kingkaew, S.** (2019). Health risk assessment of particulate matter exposure from different means of public transport in Bangkok, Thailand. In the 2nd National Environmental Conference, Mahasarakham, Thailand.
- **Kingkaew, S.** & Eaktasang, N. (2018). Contribution of Transboundary Emissions of Biomass Open Burning to Haze Pollution in Bangkok Metropolitan Region, Thailand. In The 10th Better Air Quality Conference 2018, Kuching, Malaysia.
- Pajityotee, K., Sithprasert, C., Wootisen, W. & **Kingkaew S.** (2018). Thunderstorm Risk Mapping in Thailand. National Environmental Conference on Environment, Energy, and Health 2018, 76-77.
- **Kingkaew, S.** (2017). Variations of PM_{2.5}-to-PM₁₀ ratios in Bangkok Metropolitan Region, Thailand [Poster]. In The Third Workshop on Atmospheric Composition and Asian Monsoon, Guangzhou, China.
- Permadi D.A., Kim Oanh, N.T., **Kingkaew, S.** & Chatchupong, T. (2016). Photochemical smog modeling for ozone air quality management in Bangkok Metropolitan Region [Poster]. In The International Global Atmospheric Chemistry (IGAC) Project 2016 Science Conference, CO, USA.
- **Kingkaew, S.**, Kim Oanh, N. T. & Permadi, D. A. (2015). Development of a high spatial resolution emission inventory and application of ozone air quality simulation in Bangkok Metropolitan Region, Thailand [Poster]. In The Second Workshop on Atmospheric Composition and the Asian Summer Monsoon (ACAM), Bangkok, Thailand.

- Chatchupong, T., **Kingkaew, S.**, Permadi, D.A. & Kim Oanh, N.T. (2014). Ozone air quality management in Bangkok Metropolitan Region, Thailand: PTT scientifically perspective strategies and plan. In The Air and Waste Management Association's Annual Conference and Exhibition, AWMA, CA, USA. 2, pp. 1345-1349.

REPORT AND BOOK CHAPTERS:

- **Kingkaew, S.**, Kajonpetch, P., Kingkaew., K., Paijityotee, K., Kamkon, R., Saphankaew, P., Kaewwongsa, N., Wangwongwatana, S. & Winijkul, E. (2024). *Development of PM_{2.5} Assimilative Capacity Forecasting System for Effectively Reducing PM_{2.5} Emission from Open Burning Activities at Local Administrative Levels in Thailand*. National Research Council of Thailand.
- Winijkul, E., **Kingkaew, S.** & Paijityotee, K. (2023). *Contribution of Inside and Outside-city Air Pollution Sources to the PM_{2.5} Concentration of the Mitigation Measures of the Transport Sector in Bangkok*. National Research Council of Thailand.
- **Kingkaew, S.**, Paijityotee, K., Kamkon, R., Saphankaew, P., Kajonpetch, P., Kingkaew., K., & Wangwongwatana, S. (2023). *Development of Air Quality Management Data Platform for Bangkok Metropolitan Administration*. CCCACC, Thammasat University.
- Tangkitvanich, S., Thampanishvong, K., Israngkura Na Ayutthaya, A., Pongpiachan, S., Attavanich, W., Jarungratanapong, R., **Kingkaew, S.**, Bhumiwat, P., Tanmanthong, S., & Vichitanan, A. (2021). *Policy Options of PM_{2.5} Emission Control Scenarios in On-road Transport Sectors, Thailand*. Thailand Development Research Institute (TDRI), presented to the Thai Automotive Industry Association.
- Watchalayann, P., Soonthornchaikul, N., Laokiat, L., Leelapaiboon, S., Eaktasang, N., Wongsoonthornchai, M., Thitanuwat, B. & **Kingkaew, S.** (2018). *Final Report Reducing Mercury Emission from Coal Combustion in the Energy Sector in Thailand: A UN Environment Report*. UN environment: Chemicals and Wastes Branch.
- Kim Oanh, N.T., Pongkiatkul, P., **Kingkaew, S.** & Surapipith, V. (2015). Chapter 2: Air quality management in Bangkok Metropolitan Region, Thailand. In Kim Oanh, N.T. (Eds.), *Air Pollution Research Network for Improving Air Quality in Asian Developing Countries: Compilation of Findings*. NARENCA, ISBN: 978-604-904-410-6, pp. 19-40.
- Kim Oanh, N.T., Permadi, D.A., **Kingkaew, S.**, Chatchupong, T. & Pongprueksa, P. (2015). *Study of Ground-level Ozone in Bangkok Metropolitan Region by Advanced Mathematical Modeling for Air Quality Management*. PTT Public Co., Ltd.

INVITED TALKS:

- Aug 2024. **MHESI Fair 2024**, Bangkok. *Air Quality Forecasting in Thailand.*
- Jun 2022. **Thailand National Research Council Fair 2022.** *Experience Sharing in Environmental and Natural Resources Research in Thailand.*
- Mar 2021. **Thai PBS News.** *PM_{2.5} Disaster: Advance Forecasting and Development of Mobile Application.*
- Mar 2021. Class of Master of Environmental Engineering, Kasetsart University. *ENSO and Air Quality Situation in Thailand.*
- Feb 2021. AI Center, AIT. *Industry Transformation with Big Data & AI: Leverage Big Data & AI to Make Optimal Operational Decisions.*
- Mar 2020. **Khu khot Municipality, Pathumthani.** *Air Quality and COVID-19: Situation and Prevention at Administrative Level.*
- Mar 2020. **Electricity Generating Authority of Thailand (EGATT).** *What to know about PM_{2.5}: Stituation and Coping.*
- Dec 2020. **Bangkok Metropolitan Administration.** *Emission Inventory Development in Bangkok Workshop.*
- Dec 2019. **Environmental Impact Assessment Division, MoPH.** *Climate Change and Health Effects of Air Pollution.*
- Nov 2019. **Bangkok Metropolitan Administration.** *PM_{2.5} Air Quality in Bangkok.*
- Dec 2016. Undergraduation Class of Faculty of Public Health, **Valaya Alongkorn Rajabhat University.** *Introduction of Air Pollution Toxicology.*

KEY DEVELOPED PROTOTYPES:

- **Active Fire Emission Rapid Dataset (AFERD):** Near real-time active biomass fire emission dataset for air quality modeling and forecasting
- **Thailand Anthropogenic Emission Processor (TAEMIP):** Fortran-based emission processor for CAMx and CMAQ air quality modeling
- **Carbon Bond Emission Processor (CBEP):** Fortran-based emission format processor for CAMx air quality modeling
- **Nong Fang Kaow System:** PM_{2.5} assimilative capacity forecasting system for application of prescribed biomass open burning administration system using WRF-Box forecasting system with LINE ChatBot application
- **Na Pha Yu System:** Thunderstorm and rainfall risk forecasting system using WRF-Chem forecasting system with LINE ChatBot application
- **AKAT.ai:** ChatGPT powered weather forecast for Bangkok and Chiang Mai

- **AirBKK.ai:** AI-Powered Bangkok Air Quality Database System
- **EMISS.ai:** AI-Powered Bangkok Air Pollutant Emission Inventory
- **Emergency Response Learning Tools:** Available on <https://sompoke.com>

AFFILIATED PROFESSIONAL MEMBERS AND COMMUNITIES

- Earth System Predictability Across Timescales (**ESPAT**): 2024-Present
- APARC Reanalysis Intercomparison (**A-RIP**): 2024-Present
- Global Emissions Initiative (**GEIA**): 2020-Present
- Atmospheric Composition and the Asian monsoons (**ACAM/IGAC**): 2015-Present
- Air & Waste Management Association (**AWMA**): 2012-2015

AWARDS AND HONORS

- Sep 2019 Received the “**First Runner-up**” in Entrepreneurship Poster Competition, AIT.
- Aug 2011 Received **Thai Royal Government and AIT Scholarship** pursued Ph.D. at AIT.
- May 2013 Received “**The Robert B. Banks Prize**” Represented the Most Outstanding Student in Environmental Engineering and Management (ETM), AIT.
- Aug 2011 Received **Thai Royal Government Scholarship** pursued Master at AIT.
- Jul 2011 **The Most Outstanding Student** of Faculty of Public Health, Mahidol University.
- Nov 2009 **The Most Outstanding Student Prize**” in Public Health from Prof.Tab Neelaniti’s Foundation, Bangkok, Thailand.