KYUNGMIN LEE

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EDUCATION

PhD., Energy and Environmental Policy (Expected Aug 2025)
University of Delaware, USA

Dissertation: *The Impact of Human Behaviors and the Built Environment on Energy Use and Heat in Cities*
Committee: Gregory Dobler (Chair), A.R. Siders, Thomas Powers, Kalim Shah
Focus: AI, remote sensing, energy, privacy, policy

M.C.P., Environmental Studies (2018)
Seoul National University, South Korea

B.A., Economics (2014)
Sungshin Women's University, South Korea

PUBLICATIONS

∗equal contribution, †corresponding authors

Peer Reviewed Journal Articles

3. **Lee, K.**, Yun, S.J.[†], & Park, S.A. (2025) Varied Drivers for Reducing CO2 Emissions in Countries with Legislated Carbon Neutrality Targets: A Kaya Identity Clustering Analysis. *Environment, Development and Sustainability*. (Accepted. Link is forthcoming.)
   - Awarded the Best Student Paper Award from the NECoPA 2023 Fall Conference.
   - Awarded the 2022 Excellence Research Award from the Korea Safety Health and Environment Foundation.

2. Arjunan, P., Dobler, G., **Lee, K.**, Miller, C., Biljecki, F., & Poolla, K.[†] (2021, November). Operational characteristics of residential air conditioners with temporally granular remote thermographic imaging. In *Proceedings of the 8th ACM international conference on systems for energy-efficient buildings, cities, and transportation* (pp.184-187). https://doi.org/10.1145/3486611.3486659

1. **Lee, K.**, & Yun, S.J.[†] (2018). Positive Effects and Problematic Conditions of Adopting the Benefit Sharing Mechanism in Renewable Energy Projects: Focusing on the Case of Onshore Wind Farms in Jeju Island. *Space & Environment*: Vol.65. (pp.227~270). doi: https://doi.org/10.19097/kaser.2018.28.3.227
   - Featured in the *Monthly Electrical Technology & Information* 2019 January [CrossRef]

Papers Under Review
2. **Lee, K.**, Yun, S.J.[†], & Myeong, J.Y. Proposing a Value-Sharing Mechanism for Wind Power: Impact of Benefit-sharing and Community Engagement on Acceptance and Environmental Awareness. *Energy Research and Social Science* (Under review)
1. **Lee, K**[∗†], Nathanael, W. B.[∗], Park, Y.[∗], Jeung, J.[∗] Artificial Neural Network Analysis on District-Level Air Quality and Subjective Happiness in South Korea. *Environmental Impact Assessment Review* (Under review)

Work in Progress

5. **Lee, K.**, & Dobler, G. [†] A Novel Approach to Assessing the Efficacy of Policy-driven Urban Energy Demand Reduction via Proximal Infrared Remote Sensing.

4. **Lee, K.**, Powers, T., & Dobler, G. [†] Privacy-preserving Spatio-temporal Data Aggregation for Energy-End Use in City.

3. **Lee, K.**, & Dobler, G. [†] Urban Heat Island Effect and Structural Form of City Using Proximal Remote Sensing.

2. **Lee, K**.[†*], Chotalia, S. [*], Quispe, D. [*], Hustse, V., Kaam, S., Optimizing Carbon Emissions and Cost Reductions for Household Energy Demand Using Machine Learning.

1. **Lee, K.** Computational Energy and Climate Policy Review Using AI and Governance Approach.

Policy Reports

4. Cho, H., Lim, Y., Kim, S., Jeong, H., & **Lee, K.** (2019) Technical Assistance for the Development of an Urban Adaptation Plan for Kurunegala Project, D4.1 Report on the Results of Climate Change Risk and Vulnerability Assessment. CTCN Requests No. 2018000009 Vol 3. UN Climate Technology Centre and Network, & Korea Environment Institute.

3. Cho, H., Rubio, C., Jeong, H., **Lee, K.**, & Odawa, S. (2019) Technical Assistance for the Development of an Urban Adaptation Plan for Kurunegala Project, D4.2 Climate Change Risk Assessment Guidelines. CTCN Requests No. 2018000009 Vol 4. UN Climate Technology Centre and Network, & Korea Environment Institute.

2. Kim, G., & **Lee, K.** (2016). A Comparative Study of Humanitarian Programs for Climate Refugees. *Enerzine Focus*: Vol.69 Energy Climate Policy Institute; Republic of Korea.

1. Kim, T., Maeng, J., Park, J., & **Lee, K.** (2014). A Study on Environmental Assessment Guideline for Site Selection of Offshore Wind Farm Project. Korea Environment Institute.

PRESENTATIONS AND INVITED LECTURES

Conference Panel Paper/Poster Presentations

2025
- Revisiting Easterlin Paradox: Main Drivers of Sustainability for Subjective Happiness in South Korea 2020-2023. *Public Management Research Conference (PMRC).* Poster. June 2025. (Accepted)
- Did Finance and Engagement Increase Acceptance and Environmental Awareness? *American Society for Public Administration (ASPA).* Washington DC. Panel Presentation. March 2025. (Accepted)

2024
- A Novel Approach to Assessing the Efficacy of Policy-driven Urban Energy Demand Reduction via Proximal Infrared Remote Sensing. *Conference on Neural Information Processing Systems (NeurIPS) 2024 Workshop on Tackling Climate Change with Machine Learning.* Vancouver, Canada. Poster. December 2024.
- Insight to Action: Optimizing Carbon Emissions and Cost Reductions for Household Energy Demand Using Machine Learning. *Conference on Neural Information Processing Systems (NeurIPS) 2024 Workshop on Tackling Climate Change with Machine Learning.* Vancouver, Canada. Poster. December 2024.
- Behavioral Metrics and the Limits of Aggregation for Anonymization and Privacy Preservation Policy. *Association for Public Policy Analysis & Management (APPAM).* National Harbor, Maryland, USA. Panel Paper. November 2024.
- Monitoring HVAC Use Behavior in Buildings and Energy Policy Using Proximal Infrared Images. *Association for Public Policy Analysis & Management (APPAM).* National Harbor, Maryland, USA. Poster. November 2024.
- Did Financial Benefit-sharing and Community Engagement Increase Residential Acceptance of Windmills and Environmental Protection Awareness? *Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA).* Washington DC, USA. Panel Paper. November 2024.

- Monitoring HVAC Use and Behavioral Metrics for Energy and Privacy Policy Using Proximal Infrared Images. *Chungnam National University Conference of Advanced Technology (CCAT)*. Virtual Presentation. Panel Paper. November 2024.
- Proposing a Value-Sharing Mechanism for Wind Power: Impact of Benefit-sharing and Community Engagement on Acceptance and Environmental Awareness. *Northeast Conference on Public Administration (NECoPA)*. New York City, USA. Panel Paper. November 2024.
- Analyzing Benefit-Sharing Mechanisms for Wind Farms in Jeju Island: A Framework and Survey. *Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA)-Asia*. Seoul, South Korea. Poster. June 2024.
- Privacy-Preserving Spatio-Temporal Data Aggregation for Energy End Use in City. *Urban Association Affairs (UAA)*. New York City, USA. Panel Paper. April 2024.

2023
- A Novel Approach to Assessing the Efficacy of Policy-driven Urban Energy Demand Reduction via Proximal Infrared Remote Sensing. *Association for Public Policy Analysis & Management (APPAM)*. Atlanta, Georgia, USA. Panel Paper. November 2023.
- Drivers of CO2 Emissions Trends in Countries That Have Legislated Carbon Neutrality Targets. *Northeast Conference on Public Administration (NECoPA)*. Virtual Presentation. Panel Paper. November 2023.

2022
- An Exploratory Study on Carbon Neutrality Monitoring Models and Scenarios for the Establishment of a Sustainability Assessment System: A Comparison of Korea and Countries Enacted Legally Binding Agreements. *Korea Safety, Health, and Environment Foundation*, Virtual Presentation. Panel Paper. November 2022.

2018
- An Influence of the Benefit Sharing Mechanism to the Local Acceptance and Environmental Awareness: Focusing on the Case of Onshore Wind Farms in Jeju Island. *Bio-resources, Energy, Environment, and Materials Technology International Conference*. Hongcheon, South Korea. Poster. June 2018.
- An Exploratory Study on Positive Effects of and Problematic Conditions of Adopting the Benefit Sharing Mechanism: Focusing on the Case of Onshore Wind Farms in Jeju Island. *Korea Environmental Policy and Administration Society*. Seoul, South Korea. Panel Paper. February 2018.

2016
- A Study on Impacts from Price Subsidy and Tax Policy of EVs in South Korea. *Korea Environmental Economics Association International Conference*. Seoul, South Korea. Panel Paper. June 2016.

Invited Lectures / Guest Speakers
2024
- Novel Approach to Assessing the Efficacy of Policy-driven Urban Energy Demand Reduction via Proximal Infrared Remote Sensing. *Principles of Urban Data Science (SPPA720). Biden School of Public Policy and Administration. University of Delaware*. September 2024.

2023
- Computational Social Science for Energy and Environmental Policy. *Department of Public Administration. Chungnam National University*. October 2023.
- Data-Driven Policy Making For Disaster Management. *Department of Public Administration. Chungnam National University*. April 2023.

2021
- Overview of Data Science and Machine Learning Tools in the Energy and Environmental Policy Field. *Department of Public Administration. Chungnam National University*. November 2021.

2020
- A Case Study of Machine Learning Applications in Energy and Environmental Policy. *Department of Public Administration, Chungnam National University*. October 2020.

Symposiums
2024
- Detection of Building Energy End-Use Via Proximal Infrared Remote Sensing and Computer Vision. *UD DARWIN Symposium*. February 2024.

2023
- Detection of Building Energy End-Use Via Proximal Infrared Remote Sensing and

Computer Vision. *UD Data Science Symposium*. September 2023.
2021   • Extraction of Air Conditioner Unit Indicators from Proximal Infrared Remote Sensing of Buildings. *UD Data Science Symposium*. November 2021.

Keynote Address
2023   • Data-Driven Policymaking for Energy and Environmental Policy. *Harvard Data Science Initative*. December 2023.
2022   • An Exploratory Study on Carbon Neutrality Monitoring and Scenario Evaluation: Comparative Analysis of Korea and Countries that Enacted Carbon Neutrality. *Naioth Debriefing Conference*. November 2022.

HONORS AND AWARDS

Scholarships & Fellowships
2023   University of Delaware, Doctoral Fellowship for Excellence 2023–2024 (~$30,000)
2022   University of Delaware, Summer Doctoral Fellowship ($4,500)
2019-23 University of Delaware, Tuition & Assistantships
2015-16 Seoul National University, Merit-based & Work-Study Scholarships
2011-13 Sungshin Women's University, Merit-based Scholarships

Grants & Awards
2024   Korean Association for Policy Studies (KAPS) - Association for Public Policy Analysis & Management (APPAM) Third Place Award ($50)
         UD Travel Grant Awards ($3,000)
2023   Northeast Conference on Public Administration (NECoPA) Best Student Paper Award ($140)
2022   Korea Safety Health and Environment Foundation, Environmental Research Forum, Excellence Research Award ($250)
2015   Korea Energy Climate Policy Institute Research Grant Program Competition Award ($1,550)

Government & International Recognitions
2024   Climate Change AI In-Person Summer School ($1000)
2022   Aspen Institute, Future Leaders Climate Summit Cohort (Travel Award)
2016   Ministry of Environment of Korea & Korea Environment Corporation, Global Environmental Leaders Program, UN Internship Fellowship Award (~$6,000)
2016   Korea Meteorological Administration, International Meteorological Expert Program, UN Internship Fellowship Award (~$3,600)
2014   Korea National Assembly Climate Change Forum, Climate Change Academy, Excellence Award (Travel Award, UNFCCC COP20 Observer)

TEACHING EXPERIENCE

University of Delaware, Teaching Assistant   Aug. 2019 – Dec. 2022
Undergraduate Level Courses (2019-2022)

Crafting Public Policy (UAPP225)
Non-Governmental Actors: Interest Groups   Spring 2022
Environmental and Energy Policy   Spring 2021
Policy Implementation and Regulatory Rule-Making   Spring 2020

Introduction to Energy and Environmental Policy (ENEP250)
Global Environmental Law and Policy/Climate Policy/Seminar Fall 2022
Study Team Workshop   Spring 2022
Environmental Law and Policy   Fall 2020

Political Economy of the Environment (ENEP410)
Global Capitalism and the Environment   Fall 2021

Environmental Sustainability: Political and Economic Analysis (ENEP410)
Global Financing: Climate Change and the Least Developed Countries   Fall 2019

WORK EXPERIENCE

Research/Teaching Assistant, University of Delaware
Aug 2019 – Present | Delaware, USA
- Lead applied research integrating AI (neural networks and computer vision) and proximal remote sensing (infrared camera imagery) to inform data-driven policy for IoT-based energy delivery systems and energy efficiency initiatives.
- Develop AI-based privacy-preserving models (multilayer perceptrons) for managing energy data (smart meters and remote sensing) and enhancing the cybersecurity of infrastructure.
- Conduct evidence-based policy research by applying machine learning (random forest classifier) to satellite and camera imagery to suggest data-driven urban heat island mitigation strategies.
- Collaborate on research with science/engineering teams at the University of California, Berkeley; the National University of Singapore; and the Berkeley Education Alliance for Research in Singapore (BEAR) to analyze energy use patterns using remote thermographic imaging.
- Deliver multiple guest lectures on data-driven policy design and manage approximately 30 students in undergraduate energy and environmental policy classes.

Research Assistant, Korea Environment Institute
Apr 2019 – May 2019 | Sejong, South Korea
- Co-authored technical reports for the UNFCCC Climate Technology Centre Network (CTCN) Project: Technical Assistance for the Development of a Climate Smart City in Kurunegala, Sri Lanka.
- Prepared technical reports and policy briefings for senior officials and international stakeholders to support climate adaptation planning.

International Affairs Specialist, Korea Marine Environment Management Corporation
Jun 2018 – Sep 2018 | Seoul, South Korea
- Assisted the UNDP/GEF Yellow Sea Large Marine Ecosystem (YSLME) Phase II Project: Regional Cooperation for Sustainable Use of the Yellow Sea in China, South and North Korea.
- Developed concept notes and project documents on regional cooperation frameworks for marine conservation.
- Provided management support for Ministry of Ocean and Fisheries and related government and civil entities.

Program Support Intern, UNEP
Mar 2017 – Aug 2017 | Geneva, Switzerland
- Managed pipeline project database and drafted/prepared donor agreement documents for the Green Growth Knowledge Platform (GGKP).
- Assisted the Behavioral Insights Committee in conducting research for the report: *Changing Behaviours, Changing Policy: Evidence on Behavioral Insights for Green Growth.*

Environmental Affairs Intern, UNESCAP-ENEA
Sep 2016 – Feb 2017 | Songdo, South Korea
- Supported research project regarding transboundary air pollution platforms toward development of North-East Asian Sub-regional Program for Environmental Cooperation (NEASPEC).
- Led establishment of the G-Tower Intern Network and managed drafting of the Handbook.

Research Assistant, Seoul National University
Sep 2015 – Aug 2016 | Seoul, South Korea
- Supported research for regional development and related projects for the Seoul National University Asia Center (SNUAC) Southeast Asia Center.

- Drafted documents outlining management for water security, climate change and recycling for the development of SAMSUNG Engineering's Environmental Education Program.
- Advanced Energy Living Lab program for the Green Technology Center (GTC)'s Smart Green City project focusing on finance and community development.

Research Intern, Korea Environment Institute
Aug-Dec, 2014 | Sejong, South Korea
- Performed analytic research for selection of offshore wind farm sites using GIS and sustainability data at the Environmental Assessment Division.
- Assisted administrative management of the public research institute.

SERVICE ACTIVITIES

Journal Review
Quality & Quantity (Q&Q) 2025
Policy Studies Journal (PSJ) 2023

Conference Service
American Society for Public Administration (ASPA) Section on Professional and Organizational Development (SPOD), Board Member at Large, 2025-2027
Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA)-Asia, Session Moderator, June 2024
Association for Public Policy Analysis and Management (APPAM) Data Science Community, Member, 2023-2024

Department and University Service
UD Climate Change Hub, Climate Fellow, 2023-Present
UD Data Science Institute, Graduate Fellow, 2021-Present
UD Computational Social Science Association, Acting President, 2022-2023
UD Biden School Student Association, Secretary, 2021-2022
UD Korean Graduate Student Association, Officer, 2021-2022
UD Energy and Environmental Policy Student Association, Alumni Chair, 2020-2021

Community Service
UD Center for Global Programs & Services, Korean Culture Night, Volunteer, 2024
NAIOTH, Research & Thesis Writing Training Program Mentor, 2023-Present
Annual Delaware Korean Festival, Volunteer, 2021
BigWave - Korean Youth Climate Change Network, Co-founder & Steering Committee, 2016-2019

MEMBERSHIP & TRAINING

Association for Public Policy Analysis and Management (APPAM), Public Management Research Association (PMRA), Urban Affairs Association (UAA), American Society for Public Administration (ASPA), Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA).

Summer Institute in Computational Social Science (SICSS)-Korea 2024, Korea Advanced Institute of Science and Technology (KAIST) and KDI School of Public Policy and Management
Climate Change AI In-Person Summer School 2024, Mila-Québec AI Institute

LANGUAGES

English (Fluent), **Korean** (Native), **French** (Basic)

SKILLS

Programming & Tools: Python (Main), R, STATA, SPSS, ArcGIS, LaTeX
Artificial Intelligence / Data Science: Neural Networks, Object Detection
Quantitative Methods: Geospatial Analysis, Statistics
Qualitative Methods: Survey Design, In-depth Interviews

REFERENCES

(Academic Advisor)
Prof. Gregory Dobler
Associate Professor
University of Delaware
Biden School of Public Policy and Administration
Department of Physics and Astronomy
Data Science Institute
272 Graham Hall
Newark, DE 19716
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(Computational Social Science Association Advisor)
Prof. Benjamin Bagozzi
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University of Delaware
College of Political Science and International Relations
405 Smith Hall
18 Amstel Ave
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(Dissertation Committee Member)
Prof. A.R. Siders
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