Kyuil KWAK

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EDUCATION

Mar 2022 - **KOREA University**
Ph.D. Student in Energy&Environment Economics and Policy (Advisor: Prof. JongRoul Woo)

- *Keywords:* Energy Efficiency, Economic Assessment of Energy&Environment, Electricity Market, Innovation policy

Mar 2018 -Aug 2020 **KOREA University**
Master of Atmospheric Chemistry (Advisor: Prof. Meehye Lee)

- Thesis Paper: Source Appointment of $PM_{2.5}$ Emission Ratio at Socheongcho Ocean Research Station from 2014 to 2019 (Master's Thesis ; Google Drive Link)
- *Keywords:* Atmospheric Chemistry, $PM_{2.5}$, BC, Greenhouse Gas, Source Appointment, Air Quality, North-East Asia Background Observation, Long-term Effect

Mar 2010 -Aug 2017 **HONGIK University**
Bachelor of Mechanical Engineering

- Grad. Proj: The Evaluation of Crashworthiness of Vehicle Parts using Computational Analysis
- *Keywords:* Vehicle, Impact Efficiency Analysis, Front Collision Simulation, Impact Energy Absorption, Crash-Box (Bumper), Design Optimization

SKILLS

- Programming Skills: **R, STATA, Python, Q-GIS, PMF, MATLAB, ANSYS-Autodyn, CAD-2D, CATIA**
- Instrumentation: **H_2O_2, HONO** (HPLC System), **$PM_{2.5}$, BC, O_3, OC, EC** (Sunset Inc.) **CO, CO_2, CH_4** (CRDS Method),
- Language: Korean, English

WORK EXPERIENCE

Oct 2020 - Feb 2022 **The Seoul Institute**
Researcher (Safety and Environment Research Team)

- Carry out research on various environmental policies to support Seoul City Hall: $PM_{2.5}$ Emission Inventory Modeling, Air Quality Modeling

Mar 2018 -Aug 2020 **Korea University**
Research Assistant, Teaching Assistant

- R.A: Lead a research project in Ocean Research Station as a Project Manager
- T.A: Instruct undergraduate laboratory sessions of Earth Science

Sep 2017 -Dec 2017 **National Institute of Forest Science, Korea**
Researcher (Wood Engineering Division)

- Participate on advanced wood resources treatment, development physical · chemical processing technology to utilize wood efficiency.

Jul 2016 -Dec 2016 **Korea Automotive Technology Institute**
Research Assistant (High-Pressure Fuel Pump Development Team)

- Assist in the diesel engine's fuel pump research and experiment for certifications.

Mar 2016 -Aug 2017 **Hongik University**
Research Assistant

- Conduct computational simulation (ANSYS-Autodyn) on improving impact energy absorption of thin-walled structures in vehicle's bumper.

Aug 2013 -June 2015 **KOREA ARMY**
Landmine Reconnaissance

- Honorable Discharge (Sergeant)

RESEARCH PROJECTS

Jun 2022 -Dec 2029 **Development of an Integrated Industry Model for Transition to Carbon Neutrality**
Ministry of Environment, Korea

- Comparison and conceptual design of the global industrial Sector (steel, cement, petrochemicals) Bottom-up model
- Analysis of Greenhouse Gas reduction and economic ripple effect through integrated model

Jun 2022 -Dec 2022 **Market Segmentation Analysis and Suggestion of Program Design/Operational Method for Implementing Behavior Change Program**
Korea Energy Economics Institute (KEEI)

- Define and conduct surveys to establish market segmentation measures and assess energy consumption savings of Korea District Heating Corporation
- Deriving the priority of introducing behavior change program and designing cost-effective program operation plan (Using discrete choice model)

May 2021 -Dec 2022 **A Development of Seoul-CAPSS and Emission Inventory Map**
Seoul City-Hall

- A development of Seoul-CAPSS (Clean Air Policy Support System) by calculate emission of eight air pollutants (CO, NOx, SOx, TSP, PM_{10}, $PM_{2.5}$, VOCs, NH_3)
- Speciate the source-based profiles, emission source that provide the chemical composition of air pollutants (VOCs, $PM_{2.5}$)

Nov 2020 -Dec 2021 **A Project to Improve the Precision of Emission Inventory with Air Pollutants Database**
Seoul City-Hall

- A survey on small-scale business and commercial facilities in Seoul, Korea.
- Establishment of strategies for responding to customized emission facilities in Seoul and future management policy.

Jun 2020 -Jul 2021 **A Study of Emission Inventory Evaluation using Air Quality Modeling**
Seoul City-Hall

- Analysis of air pollutants by emission source and evaluation of emissions by gas profile, PM profile.
- Establishing environmental policies for air quality management and climate change.

Mar 2018 -Dec 2020 **Construction of Ocean Research Stations and their Application Studies**
The Ministry of Oceans and Fisheries, Korea

- Lead project (Project Manager); In charge of all atmospheric instruments, Ocean onsite fieldwork quarterly, Produce and manipulate atmospheric datasets.
- Participate in publishing research outcomes; research articles and conference presentations
- Monitor air pollutants; $PM_{2.5}$, BC, CO, CO_2, CH_4 from North-East Asia (China, Siberia, Mongolia) continental background in the Socheongcho Ocean Research Station (S-ORS)
- Analyze the long-term observation data; Emission Ratio, Source Regions, Combustion Types
- The Ministry of Oceans and Fisheries (Korea) has built a multi-purpose Ocean Research Station in Socheongcho, Yellow Sea at the edge of the territorial sea, to monitor the oceans and atmosphere conditions in real time. (Site description of S-ORS; Youtube Clip)

Jun 2019 -Dec 2019 **A Study on the Cause and Restoration of Forest Damage near Young-Poong Metal Smelter in Seokpo**
Korea Forest Service

- Measure air pollutants variables: **SO_2, NOx, VOCs (BTEX)**, HCl, HNO_3, H_2SO_4, NH_3 in Seokpo, Korea
- Investigate industry emission from metal smelter facilities and evaluate the damage on local areas.

Mar 2018 -Dec 2019 **Construction and Improvement of Air Quality Modeling System based on the Measurement**
National Institute of Environmental Research, Korea

- Measure air pollutants variables: **H_2O_2, OC, EC, O_3**, NOx, SO_2, $PM_{2.5}$, HONO, HNO_3 in Seoul, Korea
- Analyze the characteristic of pollutant in Metropolitan and chemical reaction mechanism of O3

Mar 2016 -Feb 2017 **Improvement of Impact Energy Absorption in Vehicle-Part**
Korea Testing Laboratory

- Conduct computational analysis on Impact Simulation using ANSYS, CATIA, 2D Auto CAD
- Improve impact energy absorption of thin-walled structures using computational analysis and design

PUBLICATIONS

1) **Kyuil Kwak,** Taeyoon Kim, Joongha Ahn, JongRoul Woo* (2022) Public acceptance of the hydrogen fueling station in South Korea: a discrete choice experiment approach. ***(In Progress)***
2) Siwon Choi, **Kyuil Kwak**, Soyoung Yang, Sesil Lim, JongRoul Woo* (2022) Effects of policy instruments on electric scooter adoption in Jakarta, Indonesia: A discrete choice experiment approach. ***(In Progress)***

AWARDS AND GRANTS

2022 **Scholarship for Teaching/Research Assistant**
Graduate School of Energy and Environment, Korea University

2018, 2019 **Scholarship for Teaching/Research Assistant**
Dept. of Earth and Environmental Science, Korea University

Aug 2016 **6th Student Creative Design Competition**
Listed as Finalist, Mechanical Design Contest

- Design Title: 「The Design of Crash-Box in Bumper to Improve Front Collision Performance」
- Host: Korean Society of Mechanical Engineers

CONFERENCE AND WORKSHOP EXPERIENCE

Oct 2019 **2019 Korean Society of Oceanography (KSOCEAN)**
Poster presentation

- 「 The Observation of $PM_{2.5}$, BC, CO at S-ORS in Yellow-Sea from 2014 to 2019」

Sep 2019 **2019 Korean Society for Atmospheric Environment Conference**
Poster presentation

- 「Distribution and Characteristic of $PM_{2.5}$ and Emission Ratio at S-ORS」

Aug 2018 **2018 Korean Society of Oceanography (KSOCEAN)**
Poster presentation

- 「Distributions and Source Apportionment of $PM_{2.5}$, BC, and CO at Socheongcho Ocean Research Station in the Yellow Sea」

Aug 2018 **2018 Korean Society for Atmospheric Environment Conference**
Poster presentation

- 「 Preliminary results of distribution characteristics of Photochemical Indicative Species in Seoul summer, 2018」