Juin Yau Lim

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💡 ***Passionate sustainable practitioner that seek solutions with modern approaches***

Main Focusses

- Artificial intelligence guided system design.
- Renewable energy systems design and network optimization.
- Process system engineering and industrial resource recovery.
- Circular economy integration and risk mitigation on a given system.
- Wastewater treatment plant modeling and operation.
- Air pollution system upgrade and refinement.
- Treatment targeting municipal solid waste & hazardous waste.

Professional Appointments

Korea University, South Korea March. 2023 ~ March. 2024

Research Professor, Dept. of Life Sciences,

- Led and conducted research topics aligned with the expertise in the group (4 first authored & 4 co-authored).
- Provide research guidance to post-graduate students in the group and initiate research according to each interest.
- Conduct classes and workshops among post-graduate and undergraduate students.

Postdoctoral Fellow, School of Business (*accum.*)

- Aimed to focus on analyzing the ESG performance of top 200 companies in South Korea.
- Engage interdisciplinary research under ESG theme between School of Business and Dept of Psychology by conducting workshops on possible usage of life cycle assessment.

Education

Ph.D. in Applied Environmental Science & Engineering Feb 2023

Kyung Hee University, South Korea

- Dissertation: "***Comprehensive guidance on the improvement of nationwide renewable energy penetration considering overall sustainability alongside with system reliability: Power-to-X, Microalgae Biorefinery, and Hydrogen***"
- Supervisor: Prof. Yoo Chang Kyoo
- CGPA: 4.0/4.3

M.Eng. in Chemical & Environmental Engineering June 2018

University of Nottingham, Malaysia

- Dissertation: "***Fertilizer Formulation in Oil Palm Plantation with Life Cycle Assessment and P-graph Optimization***"
- Supervisor: Prof. Lam Hon Loong
- CGPA: 3.7/4.0

Industrial Experiences

Greenverse Sdn. Bhd. [Research Engineer, Hybrid] June 2023 ~ till date

- Lead research initiatives on cutting-edge technologies in hazardous waste management and publish research findings in reputable journals representing Greenverse.
- Participate in the commencement (i.e, Environmental Impact Assessment reporting to local authority) of a large-scale integrated hazardous waste plant in East Coast of Peninsular Malaysia.
- Provide thought leadership on guiding strategic direction of research projects by integrating latest scientific findings with analysis and optimizing the current waste management process.

Nottingham GreenTech [Project Engineer Trainee] June 2017 ~ Sept. 2017

- Amend technical drawing (PFD, PID, Isometric) according to plant site.
- Ensure proper operation for the Integrated Anaerobic Aerobic Bioreactor Plant.
- Perform and schedule service and maintenance for the plant. (Equipment and process operation)

BeChem Technologies [Project Engineer Trainee] June 2016 – Sept. 2016

- Performed technical drawing (PFD, P&ID, Plant Layout, & Equipment Drawing) on AutoCAD.
- Performed on-site checking and hands-on maintenance service on equipment.
- Coordinate at new plant site setup and preparation of Operation & Maintenance Manual.

Industrial Projects

BKT company, South Korea. Sept. 2020 ~ Oct. 2022.

- Development of modern nitrogen recovery wastewater treatment plant based on two-stage partial nitrification - Anammox process.

Samsung Display, South Korea. May 2021 – Dec. 2021

- Assess the performance & analyze reaction kinetics and pathway of combustion chamber under vary operating conditions.

Samsung Electronics, South Korea. May 2020 – Dec. 2020

- Proposing optimal operating conditions for burning chamber and scrubber in compliance of air discharge limits for the semiconductor industry.

Teaching Experiences

1. Conducted courses & workshops related to theoretical and hands-on experience.
    - Life cycle assessment (LCA)
    - P-graph hands-on workshop
    - Reaction Mechanism Generation (RMG)
    - Modeling, optimization, and statistical analysis.
2. Educational class for undergraduate students:
    - Matlab, Python, P-graph, RMG, GAMS, Wastewater Treatment

Awards & Scholarship

- Postdoctoral Fellowship from Korea University, South Korea, 2023 ~ 2024
- Brain Korea 21+ program scholarship, South Korea, 2019 ~ 2023
- President Scholarship, South Korea, 2019 ~ 2021
- Journal Publication Scholarship, Kyung Hee University, South Korea (2 times recipient)
- High Achievers Scholarship, Uni. of Nottingham, Malaysia, 2014

Skills

Language

- ***Native***: English and Chinese
- ***Fluent***: Malay, Cantonese, Hokkien, and Hakka
- ***Intermediate***: Korean

Computing skills

- ***Programming***: MATLAB, Python, GAMS, and P-graph
- ***Simulation***: Aspen HYSYS, Aspen Plus, AutoCAD, Simapro, OpenLCA, and GPS-X
- ***Microsoft Office***: Word, Excel, and Powerpoint

Others

1. **Academic**
    - ***Youth Editorial Board*** *(June 2023 – till date).* Biochar, Springer. Impact Factor: 12.7 (2022).
    - ***Editorial Board*** (*March 2024 - till date*). Applied Science and Engineering Progress
    - ***Reviewer*** *(actively available).* More than 40 articles reviewed || Chemical Engineering Journal, Applied Energy, Energy, Trends in Analytical Chemistry, Journal of Cleaner Production & etc.

2. **Conference (Host)**
    - ***Chair of the Local Organizing Committee, (2023).*** *15th Japan-China-Korea (JCK) Forum; Co-hosting with 6th Global Conference: ESG Management & Sustainability. 28 to 30 November 2023. Korea University, South Korea.*
    - ***Organizing Committee, (2023).*** *2023 Global ESG Forum: Pursuing Sustainability through ESG. 26 to 29 June 2023. National University of Singapore, Singapore.*

Portfolio: Publications and Conferences

Journal Articles & Book Chapter

* **Underlined & bolded** indicates the authorship position; * indicates authors contributed equally

Submitted & In Review

1. **Lim, J.Y.**[+], Loy, A.C.M.[+], How, B.S., Sonne, C., Chang, S.X., Ok, Y.S., 202x., Enhancing Future in the Agricultural Industry through Sustainable Digitalization. *(Submitted)*
2. Wang, M.M.K.[+], **Lim, J.Y.**[+], Chan, Y.J., Lam, H.L., 202x. Navigating the path to sustainable hazardous waste management for a resilient future projecting Malaysia with smart and innovative solutions. *(Under Review)*
3. Cho, Y.[+], **Lim, J.Y.**[+], Igalabithana, A.D., Hwang, G.W., Masek, O., Ok, Y.S., 202x. AI-guided investigation of biochar's efficacy in Pb immobilization for remediation of post-mining contaminated agricultural land. *(Under Review)*
4. Senadheera, S.S. [+], Withana, P.A. [+], **Lim, J.Y.** [+], Scott, C.X., Wang, F., You, S.M, Rhee, J.H., Ok, Y.S., 202x. Carbon Negative Biochar Systems Contribute to Sustainable Urban Green Infrastructure: A Bibliometric Analysis. *(Submitted)*
5. Cho, Y., Withana, P.A, Rhee, J.H., Lim, ST, **Lim, J.Y.**, Park S., Ok, Ys., 202x. Achieving the sustainable waste management of medical plastic packaging using a life cycle assessment approach. *(Under Review)*
6. Lin, Z.Y., **Lim, J.Y.**, Oh, JM, 202x, Innovative interpretable AI-guided water quality evaluation with risk adversarial analysis in river streams considering spatial-temporal effects. *(Under Review)*
7. Lin, Z.Y., Lee, K.H., **Lim, J.Y**., Kim J.H., Eun, B., Lee, S.J., Park, J.Y., Oh, JM, 202x, Spatial and Temporal Effect of Industrial Effluent on the Dissolved Organic Matter Quality across Riverine. *(Under Review)*

Accepted & Published

1. Yuan, X.Z., Manu, S., **Lim, J.Y.**, Javier, P.R., Wang, X.N., Ok, Y.S., 202x. Active Learning based Guided Synthesis of Engineered Biochar for CO2 Capture. *ACS ES&T*
2. Yuan, X.Z, Li, J., **Lim, J.Y.**, Ashkan, Z., Daniel, A., Wang, Y., Wang, X.N., Ok, Y.S., 2023. Machine learning for heavy metal removal from water: recent advances and challenges. *ACS ES&T Water*
3. Lyu, H.H.[+], **Lim, J.Y.**[+], Zhang, Q.[+], Senadheera, S., Zhang, C.C., Huang, Q.L., Ok, Y.S. 2024, Conversion of organic solid waste into energy and functional materials using biochar catalyst: bibliometric analysis, research progress, and directions. *Applied Catalysis B: Environmental*. 340, 123223.
4. **Lim, J.Y.**, Teng, S.Y., Loy, A.C.M, How, B.S., Heo, S., Jansen, J., Show, P.L., Yoo, C.K., 2023. Interpretable artificial intelligence guided configuration of sustainable coal-fire flue gas treatment under best available technology set. *Environmental Pollution.* 122335.
5. Lo, S.L.Y, How, B.S., Teng, S.Y., **Lim, J.Y.**, Loy, A.C.M, Lam, H.L., Sunarso, J., 2023. A novel hybrid method for constructing resilient microalgae supply chain: Integration of n-1 contingency analysis with stochastic modelling. *Journal of Cleaner Production*. 417, 137939.

6. Loy, A.C.M[+], **Lim, J.Y**[+], How, B.S., Yiin, C.L., Lock, S.M.S, Lim, L.G., Alhamzi, H., Yoo, C., 2023. Rethinking of the future sustainable paradigm roadmap for plastic waste management: A multi-nation scale outlook compendium. *Science of The Total Environment.* 881, 163458.
7. Foong, S.Y., Chan, Y.H., Yiin, C.L., Lock, S.S.M., Loy, A.C.M., **Lim, J.Y.**, Yek, P.N.Y., Wan, Mahari W.A., Liew, R.K., Peng, W., Tabatabaei, M., Aghbashlo, M., Lam, S.S. 2023. Sustainable CO2 capture via adsorption by chitosan-baased functional biomaterial: A review on recent advances, challenges, and future directions. *Renewable and Sustainable Energy Reviews*. 181, 113342.
8. Heo, S.[+]**, Lim, J.Y.**[+], Nguyen, H., Vilela, P., Safder, U., Woo, T., Kim, S., Oh, T., Yoo, C., 2023. End-to-end autonomous and resilient operability strategy of full-scale PN-SBR system: From influent augmentation to AI-aided optimal control and scheduling. *Journal of Water Process Engineering*. 53, 103694.
9. Loy, A.C.M, Kong, K.G.H, **Lim, J.Y**, How, B.S., 2023. Frontier of Digitalization in Biomass-to-X Supply Chain: Opportunity or Threats?. *Journal of Bioresources and Bioproducts*. 8, 101-107.
10. Sahl, A. Bin, Loy, A.C.M., **Lim, J.Y.**, Orosz, Á., Friedler, F., How, B.S., 2023. Exploring N-best solution space for heat integrated hydrogen regeneration network using sequential graph-theoretic approach. *International Journal Hydrogen Energy*. 48, 4943–4959.
11. **Lim, J.Y.**, Teng, S.Y., How, B.S., Nam, K., Heo, S., Máša, V., Stehlík, P., Yoo, C.K., 2022. From microalgae to bioenergy: Identifying optimally integrated biorefinery pathways and harvest scheduling under uncertainties in predicted climate. *Renewable and Sustainable Energy Reviews.* 168, 112865.
12. **Lim, J.Y.** and How BS, 2022. A Comprehensive Guidance on Transitioning Toward Sustainable Hydrogen Network from Localized Renewable Energy System: Case study of South Korea. *Optimization for Energy Systems and Supply Chains*, CRC Press, 73-92.
13. Vilela, P., Safder, U., Heo, S., Nguyen, H.-T., **Lim, J.Y.**, Nam, K., Oh, T.-S., Yoo, C., 2022. Dynamic calibration of process-wide partial-nitritation modeling with airlift granular for nitrogen removal in a full-scale wastewater treatment plant. *Chemosphere.* 305, 135411.
14. Kong, K.G.H., **Lim, J.Y.**, Leong, W.D., Ng, W.P.Q., Teng, S.Y., Sunarso, J., How, B.S., 2022. Fuzzy optimization for peer-to-peer (P2P) multi-period renewable energy trading planning. *Journal of Cleaner Production*. 368, 133122.
15. Heo, S., **Lim, J.Y.**, Chang, R., Shim, Y., Ifaei, P., Yoo, C., 2022. Non-Gaussian multivariate statistical monitoring of spatio-temporal wind speed frequencies to improve wind power quality in South Korea. *Journal of Environmental Management*. 318, 115516.
16. Yap, T.L., Loy, A.C.M., Chin, B.L.F., **Lim, J.Y.**, Alhamzi, H., Chai, Y.H., Yiin, C.L., Cheah, K.W., Wee, M.X.J., Lam, M.K., 2022. Synergistic effects of catalytic co-pyrolysis Chlorella vulgaris and polyethylene mixtures using artificial neuron network: Thermodynamic and empirical kinetic analyses. *Journal of Environmental Chemical Engineering*. 10, 107391.
17. Woo, T., Nam, K., Heo, S., **Lim, J.Y.**, Kim, S., Yoo, C., 2022. Predictive maintenance system for membrane replacement time detection using AI-based functional profile monitoring: Application to a full-scale MBR plant. *Journal of Membrane Science*. 649, 120400.
18. **Lim, J.Y.**, Loy, A.C.M., Alhazmi, H., Fui, B.C.L., Cheah, K.W., Taylor, M.J., Kyriakou, G., Yoo, C.K., 2022. Machine learning–assisted CO2 utilization in the catalytic dry reforming of

hydrocarbons: Reaction pathways and multicriteria optimization analyses. *International Journal of Energy Research*. 46, 6277–6291.

19. Peter, A.P., Tan, X., **Lim, J.Y.**, Chew, K.W., Koyande, A.K., Show, P.L., 2022. Environmental analysis of Chlorella vulgaris cultivation in large scale closed system under waste nutrient source. *Chemical Engineering Journal*. 433, 134254.
20. Kong, K.G.H., How, B.S., **Lim, J.Y.**, Leong, W.D., Teng, S.Y., Ng, W.P.Q., Moser, I., Sunarso, J., 2022. Shaving electric bills with renewables? A multi-period pinch-based methodology for energy planning. *Energy* 239, 122320.
21. **Lim, J.Y.**, Orosz, A., How, B.S., Friedler, F., Yoo, C., 2022. Reliability incorporated optimal process pathway selection for sustainable microalgae-based biorefinery system: P-graph approach, in: Yamashita, Y., Kano, *Computer Aided Chemical Engineering (Eds.)*, 14 International Symposium on Process Systems Engineering. Elsevier, pp. 217–222.
22. Safder, U. [+], **Lim, J.Y.** [+], How, B.S., Ifaei, P., Heo, S., Yoo, C., 2022. Optimal configuration and economic analysis of PRO-retrofitted industrial networks for sustainable energy production and material recovery considering uncertainties: Bioethanol and sugar mill case study. *Renewable Energy* 182, 797–816.
23. How, B.S., Orosz, A., Teng, S.Y., **Lim, J.Y.**, Friedler, F., 2021. Heat Integrated Water Regeneration Network Synthesis via Graph-Theoretic Sequential Method. *Chemical Engineering Transactions*. 88, 49–54.
24. Affery, A.P., Tan, J.X., Ong, I.Y.B., **Lim, J.Y.**, Yoo, C., How, B.S., Ling, G.H.T., Foo, D.C.Y., 2021. Optimal planning of inter-plant hydrogen integration (IPHI) in eco-industrial park with P-graph and game theory analyses. *Process Safety and Environmental Protection*. 155, 197–218.
25. Loy, A.C.M., **Lim, J.Y.**[+], How, B.S., Yoo, C.K., 2021. Blockchain as a frontier in biotechnology and bioenergy applications. *Trends in Biotechnology*. 40 (3), 225-258.
26. Lo, S.L.Y., Kong, K.G.H., How, B.S., **Lim, J.Y.**, Show, P.L., Sunarso, J., 2021. Techno-economic evaluation of microalgae-based supply chain: Review on recent approaches, in: *IOP Conference Series: Materials Science and Engineering*. IOP Publishing, p. 12026.
27. Rhee, G.[+], **Lim, J.Y.**[+], Hwangbo, S., Yoo, C., 2021. Evaluation of an integrated microalgae-based biorefinery process and energy-recovery system from livestock manure using a superstructure model. *Journal of Cleaner Production*. 293, 125325.
28. Heo, S., Nam, K., Tariq, S., **Lim, J.Y.**, Park, J., Yoo, C., 2021. A hybrid machine learning–based multi-objective supervisory control strategy of a full-scale wastewater treatment for cost-effective and sustainable operation under varying influent conditions. *Journal of Cleaner Production*. 291.
29. **Lim, J.Y.**, How, B.S., Teng, S.Y., Leong, W.D., Tang, J.P., Lam, H.L., Yoo, C.K., 2021. Multi-objective lifecycle optimization for oil palm fertilizer formulation: A hybrid P-graph and TOPSIS approach. *Resources, Conservation and Recycling*. 166, 105357.
30. **Lim, J.Y.**, Safder, U., How, B.S., Ifaei, P., Yoo, C.K., 2021. Nationwide sustainable renewable energy and Power-to-X deployment planning in South Korea assisted with forecasting model. *Applied Energy.* 283, 116302.
31. **Lim, J.Y.**, How, B.S., Rhee, G., Hwangbo, S., Yoo, C.K., 2020. Transitioning of localized renewable energy system towards sustainable hydrogen development planning: P-graph approach. *Applied Energy*. 263, 114635.

International Conferences

- **Juin Yau Lim**, Wai Yin Wong, SangYoun Kim, ChangKyoo Yoo*, Generative AI-assisted functional design of PEMFC flow field channel for the flooding issue, pp.72 , Poster Presentation, DaNang, Vietnam (Feb 2024).
- **Juin Yau Lim**, Unleashing potential of renewable energy from different aspects and highlighting current industrial practice of waste management. Oral Presentation (co-chair session & plenary speaker), Seoul, South Korea (Nov 2023)
- **Juin Yau Lim**, Akos Orosz, Bing Shen How, Ferenc Friedler, ChangKyoo Yoo*. Reliability incorporated optimal process pathway selection for sustainable microalgae-based biorefinery system: P-graph approach. 14th International Symposium on Process System Engineering -PSE 2021+, Kyoto, Japan (June 2022).
- **Juin Yau Lim**, Roberto J. Chang Silva, ChangKyoo Yoo*. An effective guidance of deploying solar and wind energy with multiperiod optimization model considering the geospatial characteristics: A case study of South Korea. 6th Postgraduate Colloquium for Environmental Research 2022 (POCER 2022), Physical poster presentation, Langkawi, Malaysia (June 2022).
- **Juin Yau Lim**, Jeongin Kim, SungKu Heo, KiJeon Nam, ChangKyoo Yoo*, Data-Driven Process Integration on Identifying Best Available Technology for Sustainable Air Pollution Controls Aided by P-graph Superstructure Optimization. PRES21, 24th Conference on Process Integration, Modelling, and Optimisation for Energy Saving and Pollution Reduction. Oral presentation, Brno, Czech Republic (Oct 2021).
- **Juin Yau Lim**[+], Soonho Hwangbo[+], KiJeon Nam and ChangKyoo Yoo*, Guidance and sustainable platform to design combined microalgae biorefinery-biogas-hydrogen networks towards nationwide green energy deployment, 12th International Conference on Applied Energy (ICAE2020), pp. 116, Oral presentation, Bangkok / Virtual, (Dec. 2020)
- **Juin Yau Lim**, KiJeon Nam, ChangKyoo Yoo*, Circular economy assessment towards optimal process configuration of microalgae-based bio-refinery system with consideration of risk analysis and redundancy allocation: P-graph approach. PRES20, 23rd Conference on Process Integration, Modelling, and Optimisation for Energy Saving and Pollution Reduction. pp 21, Oral presentation, Xi'an, China (Aug 2020).

References

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Appendices

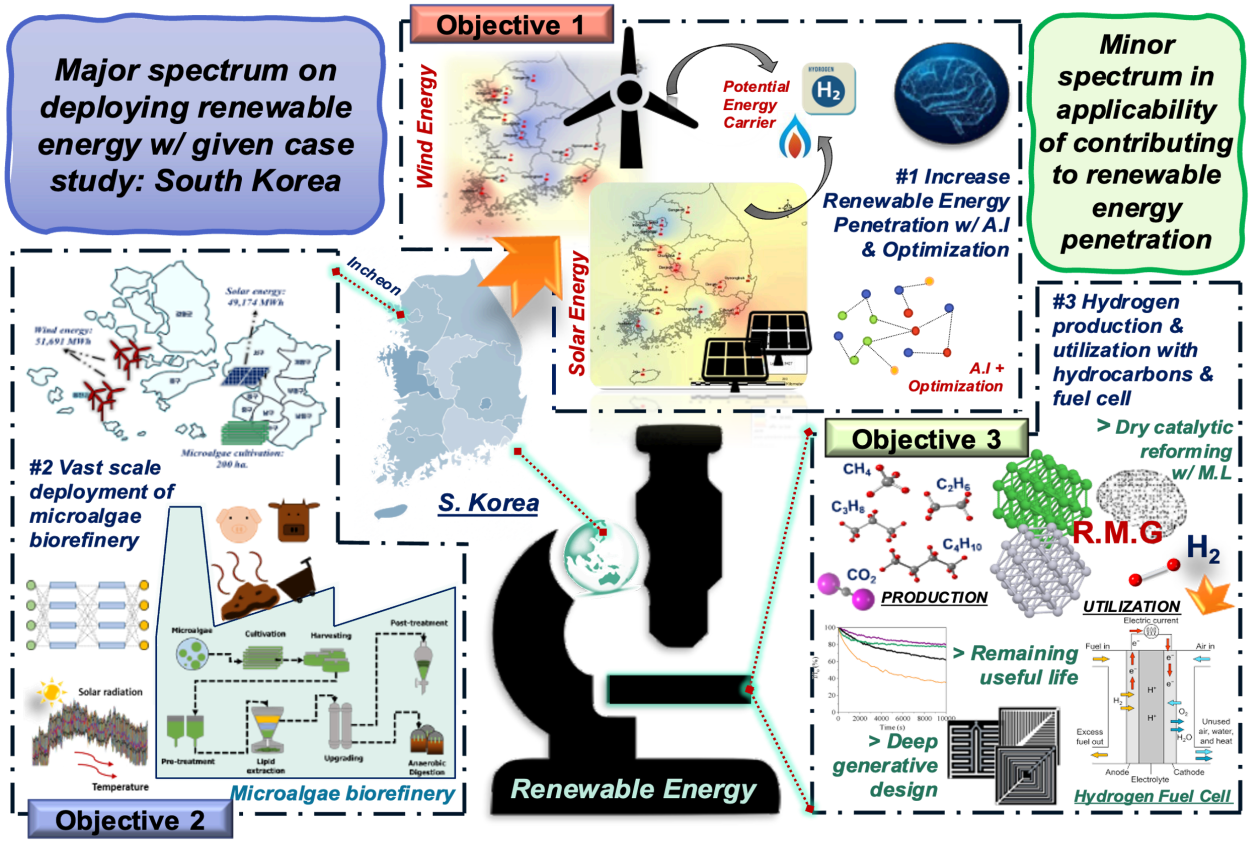

Fig. A1. Research framework overview for the PhD dissertation covering the expansion of renewable energy penetration at different spectrum.