Dr. Tsai Chi Kuo

I. Research Innovations

Since 1997, Dr. Kuo has published approximately 90 papers in SCI/SSCI journals. From 2020 to 2024. Dr. Kuo was recognized in Stanford University's Scopus list of "**World's Top 2%** Scientists" [TOP 2%] for paper influence, including the career-long scientific impact rankings (1960-2023) and the 2023 single-year scientific impact ranking. The applicant was also listed in the **ScholarGPS Top 0.05%** [GPS0.05%] with 6,186 citations excluding self-citations, and an H-Index of 41 (as of July 15, 2025).

Dr. Kuo’ s research is primarily in Business and Management, with a focus on Manufacturing, Recycling, Cleaner Production, Energy, Supply Chain, and the Circular Economy. The research centers on sustainable development and digitalization, leading to international efforts in greenhouse gas reduction. The representative works listed in Appendix 1 describe two main themes: "**Using Industrial 4.0 Big Data to Drive Corporate Transformation Towards a Value Chain**" and "**Optimizing Economic and Environmental Benefits.**"

II. Research Awards

(1) National Taiwan University of Science and Technology Outstanding Research Award (2023-2026)
(2) National Taiwan University of Science and Technology Excellent Research Award (2021-2022)

(3) National Taiwan University of Science and Technology Excellent Teaching Award (2025)

(4) Co-convener of the "NSTC Taiwan Net-Zero Technology Program Promotion Task Force: Humanities and Social Sciences Domain" (2025-2028)

(5) Recipient of the 2021 Chinese Institute of Industrial Engineers (CIIE) Medal for Academic Contribution in Industrial Engineering (maximum of 2 recipients per year), for bringing sustainability into the field of industrial engineering, emphasizing sustainable engineering and management, and publishing a dedicated book.

(6) Co-convener of the "MOST Department of Natural Sciences and Sustainable Development: Sustainability Domain in Earth Sciences" (2020-2021)

(7) Review committee member for the "MOST Department of Natural Sciences and Sustainable Development: Sustainability Domain in Earth Sciences" (2018-2020)

III. Industrial Collaborations

IV. Research Contributions

Focusing on "Green Design and Logistics Systems" and "Carbon Emissions Management," I have received grants from the National Science and Technology Council (NSTC) every year, serving as the principal investigator for multi-year and integrated projects.

My industry-academia collaboration funding totals approximately 63.6 million NTD, with the last five years alone accounting for 40.5 million NTD as a result of increased focus on ESG (Environmental, Social, and Governance) issues. These projects have involved a wide range of industries, including high-tech semiconductor and DRAM manufacturers, semiconductor packaging and testing companies, solar panel firms, chemical companies, and management consulting firms. The goal is to enhance Taiwan's industry-wide ESG ratings and foundational carbon auditing technologies, supporting corporate sustainability transformation.

The following sections detail how these projects have contributed to the value and competitiveness of Taiwan's industries, as well as their economic and social impact.

- Do corporate social responsibility practices improve financial performance? A case study of airline companies, Journal of Cleaner Production, Q1, 2021 [pdf].
- Impacts on the ESG and financial performances of companies in the manufacturing industry based on the climate change related risks, Journal of Cleaner Production, Q1, 2022 [pdf]。
- A hierarchical framework for assessing corporate sustainability performance using a hybrid fuzzy synthetic method-DEMATEL, Technological Forecasting and Social Change, Q1, 2019 [pdf].
- Reliability evaluation of an aggregate battery energy storage system in microgrids under dynamic operation, Energy Reports, Q1, 2022 [pdf].
- A collaborative data-driven analytics of material resource management in smart supply chain by using a hybrid Industry 3.5 strategy, Resource Conservation and Recycling, Q1, 2021 [pdf].
- Biofuels for vehicles in Taiwan: Using system dynamics modeling to evaluate government subsidy policies, Resource Conservation and Recycling, Q1, 2019 [pdf].
- Supporting sustainable product service systems: A product selling and leasing design model, Resource Conservation and Recycling, Q1, 2019 [pdf].
- Design for sustainable behavior strategies: Impact of persuasive technology on energy usage, Journal of Cleaner Production, Q1, 2020 [pdf].
- Product service system transition method: building firm's core competence of enterprise, International Journal of Production Research, Q1, 2019 [pdf].
- The circular economy of LCD panel shipping in a packaging logistics system, Resource Conservation and Recycling, Q1, 2019 [pdf].

- Integrating Robust Design Criteria and Axiomatic Design Principles to Support Sustainable Product Development, International Journal of Precision Engineering and Manufacturing –Green Technology, Q1, 2019 [pdf].
- Assessing environmental impacts of nanoscale semi-conductor manufacturing from the life cycle assessment perspective, Resource Conservation and Recycling, Q1, 2022 [pdf].
- Toward a circular economy: A system dynamic model of recycling framework for aseptic paper packaging waste in Indonesia, Journal of Cleaner Production, Q1, 2021 [pdf]
- Industry 4.0 enabling manufacturing competitiveness: Delivery performance improvement based on theory of constraints, Journal of Manufacturing Systems, Q1, 2021 [pdf].
- Reliability evaluation of an aggregate power conversion unit in the off-grid PV-battery-based DC microgrid from local energy communities under dynamic and transient operation, Energy Reports, Q1 · 2022 [pdf].

V. Social Impacts

[2024-07-12]

臺科大辦MITT產學技術論壇 推動產學合作及永續發展

[2024-07-11]

臺科大與臺灣永續能源研究基金會合作開辦「企業永續管理師證照培訓班」 培養永續金融人才


WellMedia
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然後永續的校園環境


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Sustainable technology management Lab.
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因為以溫度而言
TVBS NEWS
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