Syllabus of Record

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Program: CET Taiwan
Course Code / Title: (TP/ENVR 310) Sustainability Transition in the Time of Climate Crisis: The Taiwan Case
Contact Hours: 45
Recommended Credits: 3
Primary Discipline / Suggested Cross Listings: Environmental Studies / Asian Studies, Public Policy
Language of Instruction: English
Prerequisites / Requirements: None

Description

This course combines theoretical frameworks of sustainability transition with practical applications, using Taiwan as a case study. Students analyze emission profiles, climate risks, and adaptation strategies while learning to use interactive tools such as the 2050 calculator and energy policy simulator. Through a mix of lectures, discussions, and hands-on activities, students develop skills in climate action design and data analysis of emissions drivers. Key topics include: planetary boundaries, sectoral mitigation pathways, just transition principles, and climate outreach strategies. The course emphasizes both global perspectives and local applications, helping students understand how theoretical concepts translate to real-world policy and action. Through group projects, essays, and regular discussions of current climate news, students gain a comprehensive understanding of the challenges and opportunities in achieving a sustainable, low-carbon future.

Objectives

Through this course, students:

- Develop a deeper understanding of the history and future development of the climate crisis.
- Learn about the underlying theoretical frameworks of sustainability transition research.
- Learn about the procedure to design climate scenarios and their application in policy-making and financial decisions.
- Conduct preliminary data analysis on emissions drivers' identification and climate performance benchmarking.
- Master the basics of climate action design.

Course Requirements

Students are expected to attend each class as outlined in the CET Attendance Policy. Active participation in the classroom is essential. Students are to read all assigned materials before each class session and come prepared to participate thoughtfully in discussions.

- **Participation:** Participation is not merely attendance; students must actively engage in discussions by contributing insights, asking questions, and responding to peers' comments. This includes being prepared to discuss the assigned readings and participate actively in gaming and model practice. There will be around 50 pages of reading per week.

Class Participation Grading Rubric

	A – 90-100% Exemplary	B – 80-89% Proficient	C – 70-79% Developing	D – 60-69% Unacceptable	F – 0-59% Missing
Frequency of class participation	Actively contributes 2+ times per meeting	Actively contributes at least 1 time per meeting	Actively contributes at least half of the time during term	Actively contributes less than half of the time during term	Does not contribute
Quality of class participation *	Contribution is always thoughtful, accurate, and constructive, frequently interacting with peers	Contribution is mostly thoughtful, accurate, and constructive, usually interacting with peers	Contribution is somewhat thoughtful, accurate, and constructive, sometimes interacting with peers	Contribution is rarely thoughtful, accurate, and constructive, rarely interacting with peers	Does not contribute or interact with peers
Level of class preparation	Always fully prepared and on task	Mostly prepared and on task	Somewhat prepared and on task	Rarely prepared and on task	Consistently unprepared and not on task

- **Midterm Paper**: Students write an essay of 1,200 words on a specific climate risk (heatwave, flooding, etc.) affecting Taiwan and examine Taiwan's climate risk and adaptation strategy specific to that threat. The paper should include an introduction and rationale of the chosen risk, an analysis of the risk, current adaptation strategies, a critical assessment of these strategies, and a recommended action plan. This paper is graded based on content quality, research & evidence, analysis & critical thinking, and writing quality.

- **Podcast and News Critique:** Each student will give one 7-minute oral presentation to share their perspective and critique of an article or podcast (in English) that has been assigned by the instructor. The purpose of this assignment is to let the students interact with each other and react to the real-time development of sustainability issues. The short talk should include background information of the podcast and the news story, the major arguments and takeaways from the article/podcast, and opinions from different stakeholders. This will be graded based on the quality of the presentations and response to the questions raised by classmates. Each student will do one 7-minute talk per semester, and the order will be assigned at the beginning of the semester.

- **Final Group Work** Students will form small groups (3-5 students) to study the climate action required to decarbonize a specific sector, industry, or city by 2050, consistent with Taiwan's net-zero ambitions. Each group needs to give a 25-30 minute presentation with visual aids (slides, videos, handouts, etc.). There is no need to submit a written report. The presentation

should include an emission profile, reduction targets, mitigation measures, barriers, and action designs. The final group work will be graded based on the presentation's content, cooperation with the group, and response to the questions raised by the classmates.

Grading

The final grade is determined as follows:

- Participation 15%
- Midterm Paper 30%
- Podcast and News Critique 15%
- Final Group Work 40%
  - Presentation: 30%
  - Question & Answer: 10%

Readings

Axsen, J., Plötz, P. & Wolinetz, M. Crafting strong, integrated policy mixes for deep CO2 mitigation in road transport. Nat. Clim. Chang. 10, 809–818 (2020). https://doi.org/10.1038/s41558-020-0877-

Bashmakov, I.A. et al, 2022: Industry. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.013

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Breyer, C., Khalili, S., Bogdanov, D., Ram, M., Oyewo, A. S., Aghahosseini, A., Gulagi, A., Solomon, A. A., Keiner, D., Lopez, G., Ostergaard, P. A., Lund, H., Mathiesen, B. V., Jacobson, M. Z., Victoria, M., Teske, S., Pregger, T., Fthenakis, V., Raugei, M., ... Sovacool, B. K. (2022). On the History and Future of 100% Renewable Energy Systems Research. IEEE Access, 10, 78176-78218. Article 9837910. https://doi.org/10.1109/ACCESS.2022.3193402

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CDP (2021). Transparency to Transformation: A Chain Reaction, CDP Global Supply Chain Report 2020. https://www.cdp.net/en/research/global-reports/transparency-to-transformation Retrieval Date: 2021/02/11.

Chancel, L., Bothe, P., Voituriez, T. (2023) Climate Inequality Report 2023, World Inequality Lab Study 2023/1

Chao, Chia-Wei and Kuei-Tien Chou, 2020. “Governing the Climate-Driven Systemic Risk in Taiwan – Challenges and Perspective” in Climate Change Governance in Asia, eds. by Kuei Tien Chou, Dowan Ku, Koichi Hasegawa and Shu Fen Kao. New York: Routledge.

Climate Outreach. 2024. Talking climate on the doorstep. https://climateoutreach.org/reports/talking-climate-on-the-doorstep/

Creutzig, F., Niamir, L., Bai, X. et al. Demand-side solutions to climate change mitigation consistent with high levels of well-being. Nat. Clim. Chang. 12, 36–46 (2022). https://doi.org/10.1038/s41558-021-01219-y

D. G. Victor, F. W. Geels, S. Sharpe, Accelerating the Low Carbon Transition: The Case for Stronger, More Targeted and Coordinated International Action(Energy Transition Commission, 2019).

D. Rosenbloom, J. Markard, F. W. Geels, L. Fuenfschilling, Why carbon pricing is not sufficient to mitigate climate change—and how "sustainability transition policy" can help. Proc. Natl. Acad. Sci. U.S.A. 117, 8664–8668 (2020).

Dubash, N.K., et al., 2022: National and sub-national policies and institutions. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.015

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Geels F, Kern F and Clark W (2023) System transitions research and sustainable development: Challenges, progress, and prospects, Proceedings of the National Academy of Sciences, 120:47, Online publication date: 21-Nov-2023.

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Hebinck, A., Diercks, G., von Wirth, T. et al. An actionable understanding of societal transitions: the X-curve framework. Sustain Sci 17, 1009–1021 (2022). https://doi.org/10.1007/s11625-021-01084-w

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IEA (2021), Empowering Cities for a Net Zero Future: Unlocking resilient, smart, sustainable urban energy systems, OECD Publishing, Paris, https://doi.org/10.1787/7a222c8b-en.

IEA (2021). Net Zero by 2050, IEA, Paris https://www.iea.org/reports/net-zero-by-2050

Independent Group of Scientists appointed by the Secretary-General (2023). "Global Sustainable Development Report 2023". United Nations. New York.

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IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. In Press.

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P. J. Newell, F. W. Geels, B. K. Sovacool, Navigating tensions between rapid and just low-carbon transitions. Environ. Res. Lett. 17, 041006 (2022).

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Outline of Course Content

Topic 1: Planetary Boundaries and Sustainability Transitions
- Introduction of Anthropocene and planetary boundaries Basic elements of transition.

Topic 2: Status of climate change and basic principles of net-zero emissions

Topic 3: Emissions Trends and Drivers
- Global Emission Profile
- Emission Profile of Taiwan

Topic 4: Climate Scenarios and Pathways
- Scenarios used by IPCC and global energy outlook
- Applications of scenario and pathways
- Imagine the future through scenarios and pathways

Topic 5: Sectoral Mitigation Pathways and Measures
- Energy system to achieve net-zero
- Demand side solution to achieve net-zero

Topic 6: Climate Adaptation
- Global climate policy
- Climate Policy of Taiwan

Topic 7: Theoretical Framework of Sustainability Transitions
- Analyzing Transition Dynamics with Multi-Level Perspective
- Facilitating action plan through transition management

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Topic 8: Policy and Action

- Climate actions in Cities and Communities
- Climate actions in Daily Life

Topic 9: Just Transition

- Justice consideration in climate change research
- The policies and measures to implement just transition

Topic 10: Climate Outreach and Engagement

- Opinion Survey
- Media framing