

Energy Policy

Instructor: Dr. Esther Haerim Heo (esther.heo1@snu.ac.kr)

Hours: By Appointment

Description

This course aims to examine key issues in energy and climate policies through a political economy lens. It will provide an introduction to the main sources of energy, such as coal, oil, gas, renewables, and others; the different uses of energy including power systems, industry and transportation. This course will touch upon economic aspects of energy policy both domestically as well as from an international trade perspective. This course also looks into international energy and climate agreements and how they are translated into national policies as well as the different perspectives between developed and developing countries. Through group presentations, lectures and discussions, this course aims to develop abilities to critically assess and discuss energy policy, draw conclusions from research, and make evaluations from different perspectives in the field while learning from peers through discussion and collaboration.

In this course, we will tackle questions such as the following:

- What are current energy trends and how have policies responded to such trends?
- What policies are needed to overcome the structural barriers to energy transition?
- How are different governments responding to climate change through their energy and trade policies?
- What is the impact of energy policies on the competitiveness of industry and how should they respond to climate change?
- How is sustainable development relevant to discussions on energy and climate?

Guest Lectures

2-3 guest lectures will be delivered by experts looking into the renewable energy policy, national energy and climate policy as well as carbon pricing and emissions trading system policies. (Topic and date of guest lectures subject to change)

Class Structure and Assignments

This is an English-taught class. Each class will consist of 1) a lecture, 2) a presentation by students, followed by 3) class discussions.

- Class attendance and Discussion (30%)
 - Engagement: Students are expected to come to class having read the assigned materials and to be engaged in class through discussions, asking questions, and responding to other students' questions. (20%)
 - Attendance: Students are expected to attend class and attendance marks will be based according to SNU attendance guidance policies. (10%)
- Presentation (30%): Students will choose a topic to present and lead discussions. Depending on the size of the class, presentations may be prepared individually, in partners or as a group.

- Final Paper/Project (40%): Students should submit a final paper on a topic of choice on energy policy that has been covered during the course. Evaluation criteria include mechanics and writing style, structure, accuracy, and analysis. Further details of this final paper will be shared during the class.

Tentative Class Schedule (Reading list may be updated)

Date	Topic	Readings
Week 1	Introduction to Energy and Climate Change	<p>IEA World Energy Outlook Executive Summary and Key Findings https://www.iea.org/reports/world-energy-outlook-2023</p> <p>IPCC Sixth Assessment Report: Summary for Policy Makers https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf</p>
Week 2	Coal, Oil and Gas (Methane)	<p>E3G No New Coal by 2021: The collapse of the global coal pipeline https://www.e3g.org/wp-content/uploads/No-New-Coal-by-2021-the-collapse-of-the-global-pipeline.pdf</p> <p>Tong, D., Zhang, Q., Zheng, Y., Caldeira, K., Shearer, C., Hong, C., Qin, Y. and Davis, S.J., 2019. Committed emissions from existing energy infrastructure jeopardize 1.5 °C climate target. <i>Nature</i>, 572(7769), pp.373-377.</p> <p>Nunez, C. Can Natural Gas Be a Bridge to Clean Energy? National Geographic https://www.nationalgeographic.com/environment/article/can-natural-gas-be-a-bridge-to-clean-energy#close</p> <p>A New Global Gas Order? (Part 1): The Outlook to 2030 after the Energy Crisis https://a9w7k6q9.stackpathcdn.com/wpcms/wp-content/uploads/2023/07/NG-184-A-New-Global-Gas-Order-Part-1.pdf</p> <p>https://www.govinfo.gov/content/pkg/ERP-2006/pdf/ERP-2006-chapter11.pdf</p>
Week 3	Wind, Solar, Hydropower, Geothermal	<p>Rosslowe, C. Wind and solar deployment in the EU. Ember https://ember-climate.org/insights/commentary/eu-wind-and-solar-deployment/</p> <p>IEA. Renewables 2022: Analysis and forecast to 2027 https://iea.blob.core.windows.net/assets/ada7af90-e280-46c4-a577-df2e4fb44254/Renewables2022.pdf</p> <p>The changing role of hydropower: Challenges and opportunities</p>

		<p>https://www.irena.org/Publications/2023/Feb/The-changing-role-of-hydropower-Challenges-and-opportunities</p> <p>IEEFA. Asia Pacific Renewable Supply Chain Opportunity https://ieefa.org/resources/asia-pacific-renewable-supply-chain-opportunity</p>
Week 4	Hydrogen, Nuclear, Biomass, Critical Minerals	<p>IRENA. Geopolitics of the Energy Transformation The Hydrogen Factor https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jan/IRENA_Geopolitics_Hydrogen_2022.pdf</p> <p>Sterman et al. 2022. Does wood bioenergy help or harm the climate? <i>Bulletin of the Atomic Scientists</i>, 78:3, 128–138 https://www.tandfonline.com/doi/epdf/10.1080/00963402.2022.2062933?needAccess=true</p> <p>Howarth, R. & Jacobson, M. (2021) How green is blue hydrogen? <i>Energy Science & Engineering</i> https://doi.org/10.1002/ese3.956</p> <p>Ember, Global Electricity Review 2023 - Nuclear (p104-109) https://ember-climate.org/insights/research/global-electricity-review-2023/#supporting-material</p>
Week 5	Power Systems	<p>Systems Change Lab, State of Climate Action 2022, Chapter 2 Power. DOI https://doi.org/10.46830/wrirpt.22.00028</p> <p>https://files.wri.org/d8/s3fs-public/2022-10/state-of-climate-action-2022.pdf?VersionId=sfihZTSIzbzenOLt565PIXldO2L5jTLg</p> <p>Ember, Global Electricity Review 2023 https://ember-climate.org/insights/research/global-electricity-review-2023/#supporting-material</p> <p>(Suggested) David G. Victor (Editor), Thomas C. Heller (Editor) <i>The Political Economy of Power Sector Reform: The Experiences of Five Major Developing Countries</i> https://doi.org/10.1017/CBO9780511493287</p>
Week 6	Energy and Industry	<p>15 Insights on the Global Steel Transformation. Agora Energiewende https://www.agora-energiewende.de/en/publications/15-insights-on-the-global-steel-transformation-1/</p> <p>1.5C Steel: decarbonising the steel sector in Paris-compatible pathways. E3G</p>

		<p>https://www.e3g.org/wp-content/uploads/1.5C-Steel-Report_E3G-PNNL-1.pdf</p> <p>Johanna Lehne and Felix Preston. Making Concrete Change Innovation in Low-carbon Cement and Concrete. Chatham House https://www.chathamhouse.org/sites/default/files/publications/2018-06-13-making-concrete-change-cement-lehne-preston-final.pdf</p> <p>IEA. The Future of Petrochemicals: Towards a more sustainable chemical industry https://www.iea.org/reports/the-future-of-petrochemicals</p> <p>Serpell, Chu and Paren. (2021) BALANCING ACT CAN PETROCHEMICALS BE BOTH EMISSIONS FREE AND ZERO-WASTE? https://kleinmanenergy.upenn.edu/wp-content/uploads/2021/02/Balancing-Act-Petrochemicals.pdf</p>
Week 7	Energy and Transportation	<p>Bruegel. (Analysis) The struggle to cut emissions from international aviation and shipping https://www.bruegel.org/analysis/struggle-cut-emissions-international-aviation-and-shipping</p> <p>Arijit Sen and Josh Miller VISION 2050: UPDATE ON THE GLOBAL ZERO-EMISSION VEHICLE TRANSITION IN 2023. International Council on Clean Transportation https://theicct.org/wp-content/uploads/2023/09/Global-ZEV-update_final.pdf</p> <p>Transportation and Environment. The impact of FuelEU Maritime on European shipping. https://www.transportenvironment.org/wp-content/uploads/2023/07/FuelEU-Maritime-Impact-Assessment-July-2023.pdf</p> <p>(Suggested) An “All-In” Pathway to 2030: Transportation Sector Emissions Reductions Potential. University of Maryland https://cgs.umd.edu/research-impact/publications/all-pathway-2030-transportation-sector-emissions-reductions-potential</p>
Week 8	Midterm	
Week 9	Energy Markets, Finance and Trade	<p>IEA. Renewable Energy Market Update Outlook for 2023 and 2024 https://www.iea.org/reports/renewable-energy-market-update-june-2023</p> <p>IEA. World Energy Investment 2024 https://www.iea.org/reports/world-energy-investment-2024</p>

		<p>IEEFA. Global LNG Outlook 2024-2028 https://ieefa.org/resources/global-lng-outlook-2024-2028</p>
Week 10	Global Climate and Energy Agreements	<p>United Nations Framework Convention on Climate Change. 2015. Adoption of the Paris Agreement. December 12.</p> <p>https://www.brookings.edu/articles/the-paris-agreement-and-its-future/</p>
Week 11	NDCs, Domestic Energy and Industrial Policies	<p>NDC Synthesis Report https://unfccc.int/ndc-synthesis-report-2022</p> <p>https://direct.mit.edu/glep/article/21/4/1/107853/Green-Industrial-Policy-and-the-Global</p> <p>Industrial Policy, Trade, and Clean Energy Supply Chains. CISC https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/210224_Ladislav_Industrial_Policy.pdf?VersionId=0bV3kZ69MS.bhuj62bsk0ibFQ159crvv</p>
Week 12	US, EU Energy Policies and Trade	<p>Bruegel. Rebooting the European Union's Net Zero Industry Act. https://www.bruegel.org/policy-brief/rebooting-european-unions-net-zero-industry-act</p> <p>Emissions and energy impacts of the Inflation Reduction Act</p> <p>https://www.science.org/doi/10.1126/science.adg3781 DOI: 10.1126/science.adg3781</p> <p>https://www.energypolicy.columbia.edu/publications/the-ira-and-the-us-battery-supply-chain-one-year-on/</p> <p>https://www.bruegel.org/policy-brief/climate-versus-trade-reconciling-international-subsidy-rules-industrial</p>
Week 13	Energy Policies in other Countries (Korea, China, India etc)	<p>The Oxford Institute of Energy Studies. Guide to Chinese Climate Policy 2022</p> <p>https://chineseclimatepolicy.oxfordenergy.org/wp-content/uploads/2022/11/Guide-to-Chinese-Climate-Policy-2022.pdf</p> <p>Kim et Al, (2022). Integrated Assessment Modeling of Korea's 2050 Carbon Neutrality Technology Pathways. Energy and Climate Change. Volume 3, December 2022. https://doi.org/10.1016/j.egycc.2022.100075</p>

Week 14	Economics of Energy Policy: Carbon Pricing and Emissions Trading Systems	<p>World Trade Report 2022. Climate change and international trade. Section D. Carbon pricing and international trade https://www.wto.org/english/res_e/booksp_e/wtr22_e/wtr22_ch4_e.pdf</p> <p>How to Fix a Broke ETS. Plan 1.5 https://www.plan15.org/post/how-to-fix-a-broken-ets-a-korean-case-study</p>
Week 15	Energy Security, Energy Equity, Just Transition	<p>Tracking SDG7: The Energy Progress Report 2023. https://trackingsdg7.esmap.org/</p> <p>World Resources Institute. Working Paper. Just transitions in the oil and gas sector: Considerations for addressing impacts on workers and communities in middle-income countries. https://files.wri.org/d8/s3fs-public/2023-01/just-transitions-oil-gas-sector.pdf?VersionId=jZEr3RLHhUaUJmLXAY3Jho71hZ2scfqQ</p>
Week 16	Finals	

Suggested Readings:

***The Energy System: Technology, Economics, Markets, and Policy*, Travis Bradford, 2018. MIT Press.**

***Understanding Environmental Policy*, Steven Cohen, 2014. Columbia University Press**

***The Quest: Energy, Security, and the Remaking of the Modern World*, Daniel Yergin, 2011. Penguin Press**