



Climate Change in an Energy Insecure World

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**Study group dates: October 5, October 19, October 26, November 2, November 9
10:00-11:30am in the McKinney Conference room (353) at 111 Thayer.**

Overview:

Artificial intelligence (AI), data centers, reduced energy poverty, and climate change adaptation — cooling more air, pumping more water, and rebuilding more infrastructure — are projected to grow the world's energy appetite to new heights. This demand is rising at a time when energy conflict is raging and fuel prices are high and volatile.

We've been here before. In the 1970s, back-to-back oil supply shocks created energy insecurity that upended global economies. In May 1980, oil hit \$160 per barrel in real terms. Energy efficiency breakthroughs resulted. So did the search for more energy supplies—including oil and gas. After bottoming out in the late 1990s at their lowest levels since the post-World War II era, oil prices surged to \$211 per barrel (in real terms) by 2008 due to a confluence of circumstances, including a surge in energy demand in emerging markets, stagnant global production, geopolitical tensions, and a weakening dollar. High prices spurred investment and innovation that led to fracking and horizontal drilling, breakthroughs that unlocked new supplies of oil and gas and made America the world's largest producer. By 2020, oil prices had plummeted again to \$25 per barrel. Russia's invasion of Ukraine in 2022 then pushed the price to \$129 per barrel. By 2025, a barrel was priced at half that amount, until the US attacked Iran in early 2026. Today, oil and gas prices have again surged and are highly volatile, creating energy insecurity.

Geopolitical and economic conditions are central to driving energy supply and demand, which in turn influences energy security. Amid these dynamics, oil and gas production and consumption continue to supply energy markets, accelerating climate change.

As the planet continues to heat up, scientists now expect Earth's temperature to surpass the agreed-upon 1.5°C safety threshold as soon as 2027. Climate change is no longer a problem for future generations. It is our crisis to manage—now. As the planet heats up, climate change is increasingly unleashing superstorms, historic floods, wildfires, relentless heat, and infectious diseases. These devastating climate impacts will demand still more energy for adaptation and resilience.

Objective:

The goal of this study group is to discuss the complex interactions and tenuous balance between energy, economic, and climate security. Understanding these intersecting security goals requires dynamic thinking and a lens with multiple perspectives: technological, financial, and policy. We will discuss why it has proven hard to transition away from oil and gas—and what near-term strategies can better balance energy and climate goals.

Whatever sector you choose to work in following your time at Brown—public, private, or nonprofit—understanding how climate change influences the global energy sector (and vice versa) will sharpen your understanding of real-world market dynamics.

The following is a short overview and reading/podcast list for each session.

Session 1: Energy Markets Amid Booms and Busts (October 5)

Energy markets have been volatile, especially over the past 50 years. The whiplash of energy booms and busts cuts both ways: motivating the search for energy alternatives while further locking in fossil fuel supplies. Petroleum has woven itself into nearly every aspect of modern life since its rise in the late 19th century. These resources show up in the fuel in our cars and trains, the heat in our homes, the pavement in our roads, the rubber in our tires, the tiles on our roofs, and the chemicals that make our clothes, makeup, paint, and medicines. Together, we will investigate the durability of oil and gas in global markets and discuss what “off oil and gas” might mean in practical terms.

- Analyze the price of oil (global) and gas (US)
 - *Macrotrends (global oil)*, <https://www.macrotrends.net/1369/crude-oil-price-history-chart>
 - *Macrotrends (US natural gas)*, <https://www.macrotrends.net/2478/natural-gas-prices-historical-chart>
 - *Trading Economics (EU)*, <https://tradingeconomics.com/commodity/eu-natural-gas>

- *Federal Reserve Bank (LNG Asia)*,
<https://fred.stlouisfed.org/series/PNGASJPUSDM>
- Deborah Gordon, *No Standard Oil*, <https://www.amazon.com/No-Standard-Oil-Petroleum-ENDOWMENT/dp/0190069473>
 - Introduction
- Christian Wallace, Texas Monthly podcast, *Boomtown*:
<https://www.texasmonthly.com/podcasts/series/boomtown/>
 - Chapter 2 (The Rise of the Permian); Chapter 3 (Dust to Dust), Chapter 9 (A Dark Horizon), Chapter 11 (The Last Frontier), and Episode 12 (The One-Two Punch)

Session 2: Carbon Emissions and Climate Change (October 19)

Carbon dioxide (CO₂) is formed from burning all fossil fuels. This long-lived gas remains in the atmosphere for hundreds of years, forming a warming blanket around Earth. CO₂ has been the primary focus of climate action since the 1990s, with models looking out to the year 2100. Methane, the primary component of natural gas, is a fast-acting climate pollutant by contrast. This simple hydrocarbon persists in the atmosphere for about a decade, but warms the planet more than 80-times as powerfully as carbon dioxide over a 20-year period. Unprecedented action is now possible with new satellite detection and ground-based monitoring. Policymaking has focused in recent years on mitigating methane via the [Global Methane Pledge](#), [Oil and Gas Decarbonization Charter](#), and the [Angera Declaration](#) for Methane Action.

- Analyze global atmospheric methane trends
 - NASA Earth Observations, <https://science.nasa.gov/earth/explore/earth-indicators/methane/>
- United Nations Secretary General, *Call to Action on Methane*,
https://www.un.org/sites/un2.un.org/files/unsg_call_action_methane_by-2030_publication.pdf
- RMI, *Two Carbon Co-conspirators Need to Be Stopped to Tackle Climate Change*:
<https://rmi.org/two-carbon-co-conspirators-need-to-be-stopped-to-tackle-climate-change/>
- Deborah Gordon, *No Standard Oil*, <https://www.amazon.com/No-Standard-Oil-Petroleum-ENDOWMENT/dp/0190069473>
 - Afterword

Session 3: Differentiating Oil and Gas Emissions (October 26)

Equivalent barrels of oil and gas have wide-ranging emissions and highly variable energy waste. In other words, the CO₂ emissions intensity of producing one barrel oil equivalent (BOE) of oil and gas can be ten times more than another BOE, whereas the methane emissions intensity can range by a factor of 100. In a warming and energy-hungry world, these differences are large enough to matter. Investors, insurers, policy makers, tech companies, and competing firms need data to differentiate oil and gas so they can make smarter private and public decisions.

- Analyze emissions from equivalent barrels of oil and gas
 - Oil Climate Index plus Gas (OCI+), <https://ociplus.rmi.org/>
- International Energy Agency, *World Energy Outlook 2018*, https://iea.blob.core.windows.net/assets/77ecf96c-5f4b-4d0d-9d93-d81b938217cb/World_Energy_Outlook_2018.pdf
 - Chapter 11: Innovation and the Environmental Performance of Oil and Gas Supply
- RMI, *Know Your Oil and Gas*, <https://rmi.org/resources/kyog/>
 - Key findings and Oil and Gas Reality Check
 - Remainder of report (optional)

Session 4: Understanding the Energy Players (November 2)

Governments, companies, and civil society actors all play a role in shaping our energy future. Supplying energy is a complex global affair. The Middle East continues to play a starring role, and Russia's influence cannot be denied. However, since the shale oil and gas revolution, America is once again squarely in the mix. Yet no single country (e.g., the US) or company (e.g., ExxonMobil) has full control. The broad network of energy players underpins stability in oil and gas markets. While oil once dominated the field, today gas is increasingly taking center stage.

- Daniel Yergin, *The New Map: Energy, Climate, and the Clash of Nations*, <https://www.danielyergin.com/books/thenewmap>
 - Introduction, Chapter 8, Russia's Map, and Maps of the Middle East
- Deborah Gordon, *No Standard Oil*, <https://www.amazon.com/No-Standard-Oil-Petroleum-ENDOWMENT/dp/0190069473>
 - Chapters 5, 6, and 7 (optional)
- Bethany McLean, *SaudiAmerica: The Truth About Fracking and How It's Changing the World*, <https://www.amazon.com/Saudi-America-Truth-Fracking-Changing/dp/0999745441>
 - Optional

Session 5: Managing Energy Abundance Amid Climate Change: Sum of 2% solutions
(November 9)

Supplying energy is a massive undertaking that is dominated by fossil fuels, including oil and gas. Yet climate solutions are more nuanced and challenging than you might think. Aspirations to get off fossil fuels and readily transition to a clean energy future proliferate. Achieving these goals is where the real work begins. To close out this study group, together we will drill down on what lies ahead: mitigation, which entails reverse-engineering dominant oil and gas supply chains and aligning markets around less emissions-intensive barrels; adaptation, which will increase energy demands; and geoengineering efforts to counteract global warming.

- Deborah Gordon, *No Standard Oil*, <https://www.amazon.com/No-Standard-Oil-Petroleum-ENDOWMENT/dp/0190069473>
 - Chapter 8
- Daniel Yergin, *The New Map: Energy, Climate, and the Clash of Nations*, <https://www.danielyergin.com/books/thenewmap>
 - Climate Map (Chapters 41-46)
 - Conclusion (optional)
 - Epilogue (optional)

About the Instructor

Gordon is a senior principal in RMI's Climate Intelligence Program, where she leads the Oil and Gas Solutions Initiative. Gordon also serves as a senior fellow at the Watson School of International and Public Affairs at Brown University. Her research spearheaded the development of the Oil Climate Index plus Gas (OCI+), a first-of-its-kind analytic tool that compares the life-cycle climate impact of global oil and gas resources. The OCI+ is the topic of Gordon's recent book, *No Standard Oil* (Oxford University Press, paperback release, 2025). Trained as a chemical engineer and policy analyst, Gordon is the former director of the Energy and Climate Program at the Carnegie Endowment for International Peace. She began her career with Chevron and directed the Energy Policy Program at the Union of Concerned Scientists. Gordon has taught at the Yale School of the Environment and Brown University. She is a stakeholder in NASA's Carbon Monitoring System, has testified before Congress, and served on National Academy of Sciences panels. Gordon has co-authored articles in numerous academic journals and is regularly featured and quoted in media outlets. She is the author of three books and numerous journal articles and book chapters.