

ENERGY & INTERNATIONAL SECURITY

Drs. Adam N. Stulberg & Elizabeth Sherwood-Randall
Habersham 203
(404) 385-0090
adam.stulberg@inta.gatech.edu
lsr@gatech.edu
Virtual Office Hours: Mon. 4-6pm & by appointment

INTA 3042
Fall 2020
Weds. 5:00-8:00pm
Hybrid/Habersham G-17

DESCRIPTION & OBJECTIVES

This course examines issues at the intersection of national energy security/sustainability and international conflict/cooperation. Is oil or natural gas import dependence a foreign policy liability or cause for war? In energy a domain ripe for gray zone or hybrid warfare? Or, do globalization and the interdependence of energy markets favor international cooperation and peace? More specifically, can supplier states such as Saudi Arabia and Russia use hydrocarbon exports as energy weapons? Or, will low oil prices, as well as the promise of U.S. natural gas exports lock in a strategic pivot away from the Persian Gulf and reinvigorate America's global leverage, if not "dominance," especially amid growing local demand across the Middle East and East Asia? Will this give grist to future U.S. energy sanctions on Russia, Iran, Venezuela and other strategic rivals, or stoke instability across the Middle East and Eurasia? Are the U.S. and China doomed to compete for access to global energy supply? Will there be a nuclear energy renaissance, and if so, will it increase the likelihood of weapons proliferation and/or regional conflict? Similarly, do innovations that ease distribution of renewable energy, promote local sustainability, and fuse energy with information systems reduce risks of resource wars or lower barriers to cross-border conflict? Can energy innovation provide a competitive advantage for U.S. grand strategy?

Students are introduced to major theoretical and policy analytical lenses used to examine critical geopolitical and geoeconomic issues associated with national pursuits of energy security and sustainability. The above questions and others will be probed by dissecting the complex interaction between resource endowments, technologies/innovation, economics, politics, power, and strategy in the oil, natural gas, nuclear, and alternative energy sectors; and by analyzing the implications for broader themes and concepts of security and statecraft in international relations. Accordingly, the course is structured around historical and comparative analysis of core issues in each sector that cut across different states and regions related to resource scarcity, market dynamics, trade vulnerability, corporate behavior, policymaking, national welfare and threat perceptions, and strategic interaction.

Learning Outcomes

Students will demonstrate proficiency at critiquing alternative explanations for international energy competition/conflict/war and assessing systematically the respective

policies, institutions, and technologies adopted to bolster energy security and sustainability by different actors across the international system. In studying energy systems across different sectors, they also will acquire knowledge about the relationship between science, technology, and international affairs, more broadly. In addition, students will enhance their professional development by learning to communicate effectively in applying critical analysis for generating concrete policy recommendations on international security issues at the nexus of energy resources, technologies/infrastructure, trading, governance, and sustainable social systems at the national, and global levels.

COURSE MODALITY & FORMAT

This semester the course will be offered in hybrid "touch point" mode, with a few lectures/discussions delivered in-class (as possible) and the others delivered remotely/synchronously & asynchronously. For occasional in-class sessions, we will convene in small groups (w/masks & observing social distancing) during the scheduled period, with rotating participation (as possible) and remote access for others. That said, all lectures and materials will be available remotely throughout the semester and students will be required to participate in-class or online during all synchronous lectures and activities (exceptions for accommodations and upon instructor approval). Updated announcements will be posted in CANVAS Announcements throughout the semester.

The dedicated course period will consist of synchronous lectures (recorded), discussion and in-class interactive activities. There will be occasional guest speakers (virtual, recorded) during these sessions. These in-class activities will be augmented by weekly reading, assignments, documentaries and other materials in between class sessions. As per GT guidelines, face masks will be required for everyone, all the time, and irrespective of social distancing for all course-related physical interaction. In addition, there will be explicit entry-exit and seating protocols for any classroom attendance. For more on GT mask protocol, guidelines, and enforcement, see <https://hr.gatech.edu/face-coverings>. Health accommodations will be respected upon notification.

COURSE REQUIREMENTS & GRADING

Students are expected to complete the required weekly reading and other assignments before each class, and to contribute actively to all in-class discussions/activities. Most classes will begin with a lecture on the designated topic, and conclude with a structured discussion/activity of a major theoretical puzzle and attendant policy debate. Accordingly, students will be required to post answers to in-class quizzes and assignments by midnight following the conclusion of the respective class, as well as to engage in limited chats and other informal discussion threads in between classes.

Students will take an in-class exam on **September 16th**. This will consist of short answer identifications of key terms and concepts drawn from the lectures, reading, and other material covered in Module 1.

During the course of Module 2, each student will develop a short policy memo in which they make recommendations for bilateral U.S. engagement with a country of their choosing to advance shared climate and clean energy transition goals. Each student will present his/her analysis and recommendations during the third class in the module (**October 7th**).

At the end of Module 3, each student will be responsible for drafting one short (3-4 pages, double-spaced) critical review of official and/or expert commentary on the international security implications of the changing energy landscape or related climate developments. This can include presentations on campus (e.g. public talks, in-class guest lectures), government statements, expert blogs or other on-line commentary, articles in policy journals/outlets, etc. The review should consist at least of a brief summary of the main argument of the targeted commentary, and an analytical and empirical critique. Critical reviews can be turned in at the student's discretion **on or before November 4th**.

Each student will participate in a dynamic course policy simulation that will take place during the November 11th and 18th class periods (Module 4). The specific scenario and format of the simulation will be discussed in class. As part of the preparation, each student will be required to write a short background paper (3-4 pages, double-spaced) and contribute to drafting a group policy position paper (7 pages, double-spaced). For the first background paper each student will summarize the policy issues at stake from the respective national perspective. This should be augmented by identifying the specific issues of concern to the institutional or corporate actor played by the student on the national team. The second paper will be collectively written by respective national/transnational/corporate teams, laying out the initial policy positions and objectives for the designated scenario. Both papers will be due at the onset of the simulation on **November 11th**. Each student will participate actively in all group problem-solving and deliberative exercises during the two-day policy simulation.

Finally, students are required to write a policy memo (8-10 pages) on a topic at the intersection of energy and national security relevant to a theme covered during the course. Examples can include:

- (1) How should the United States respond to continuing Russian energy pressure on Central and Eastern European countries?
- (2) How should the United States prepare for and respond to a potential blockage of sea lanes in the Straits of Malacca?
- (3) What should the United States do about the challenges affecting the nuclear power industry and how can this advance nonproliferation goals?
- (4) What are the greatest challenges at the intersection of emerging energy technologies and national security and how can the United States meet them?
- (5) Another related topic of choice with approval from instructors.

The memo will be addressed to the U.S. National Security Advisor and will: (1) succinctly frame the issue for consideration, putting it into a broader context and offering clarity about why it is important that it be addressed promptly; (2) set forth a range of policy options (optimally between three and five) for addressing the issue and discuss the pros and cons of each options; (3) make a recommendation for Presidential action among those options. The idea is not to do extensive additional research but to use the readings and class discussions as a foundation for this endeavor. A summary of the project must be submitted to Professors Stulberg and Sherwood-Randall no later than **November 18th**. The final paper must be submitted by **December 7th at 6 pm**. No late papers will be accepted.

Grading

Class Engagement/Weekly Quizzes/Threads	15%
Module 1 In-class Exam	10%
Module 2 Policy Memo	15%
Module 3 Critical Essay	15%
Simulation	25%
Indiv paper	5%
Group paper	10%
Participation	10%
Final Paper	20%

READING

(Available for Purchase at GT Barnes & Noble Bookstore)

Meghan O’Sullivan, *Windfall: How the New Energy Abundance Upends Global Politics and Strengthens America’s Power* (New York: Simon & Schuster, 2017);

Per Hogselius, *Energy and Geopolitics* (New York: Routledge, 2019);

Charles Ferguson, *Nuclear Energy: What Everyone Needs to Know* (New York: Oxford University Press, 2011); and

*Charles L. Glaser and Rosemary A. Kelanic, eds., *Crude Strategy: Rethinking the U.S. Military Commitment to Defense Persian Gulf Oil* (Washington, DC: Georgetown University Press, 2016);

*Steve A. Yetiv, *Myths of the Oil Boom: American National Security in a Global Energy Market* (New York: Oxford University Press, 2015);

*Jan Kalicki and David L. Goldwyn, *Energy and Security: Strategies for a World in Transition*, 2nd Edition (Baltimore: The Johns Hopkins University Press, 2013).

* Peter Fox-Penner, *Power After Carbon: Building a Clean, Resilient Grid* (Harvard University Press, 2020):

*Recommended

USEFUL LINKS

Baker Institute, Energy Forum Research, <http://www.rice.edu/energy/research/>
Atlantic Council (Eurasian Energy Futures Initiative),
<http://www.atlanticcouncil.org/programs/dinu-patriciu-eurasia-center/eurasian-energy-futures>
BP Energy Outlook, <https://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html>
CIA “The World Fact Book”, <https://www.cia.gov/library/publications/the-world-factbook/index.html>
Council on Foreign Relations, (Energy and Environment; Geopolitics of Energy)
<http://www.cfr.org/publication/20511/energyenvironment.html?breadcrumb=%2Fissue%2F17%2Fenergyenvironment>
<https://www.cfr.org/geopolitics-energy>
Energy Information Agency – Country Analysis Briefs. <http://www.eia.doe.gov/cabs/>
ExxonMobil, Outlook for Energy, <https://corporate.exxonmobil.com/Energy-and-environment/Looking-forward/Outlook-for-Energy>
Cambridge Energy Resource Associates,
<http://www.cera.com/aspx/cda/public1/home/home.aspx>
Energy Policy Research Foundation, Inc., http://eprinc.org/?page_id=58
MIT Energy Initiative, <http://energy.mit.edu/>
Harvard University, Belfer Center, Energy Technology Innovation Policy
http://belfercenter.ksg.harvard.edu/project/10/energy_technology_innovation_policy.html
Harvard University, Belfer Center, The Geopolitics of Energy Project
http://belfercenter.ksg.harvard.edu/project/68/geopolitics_of_energy_project.html
Intergovernmental Panel on Climate Change, <https://www.ipcc.ch/about/>
International Energy Agency: <http://www.iea.org/>
Center for New American Security (Energy, Economics, & Security),
<https://www.cnas.org/research/energy-economics-and-security>
Center for Strategic and International Studies (Energy & Geopolitics),
<https://www.csis.org/topics/energy-sustainability/energy-geopolitics>
Oil Drum Blog: <http://www.theoil Drum.com/>
Columbia University/SIPA Center on Global Energy Policy,
<http://energypolicy.columbia.edu/>
Oxford Institute for Energy Studies, <http://www.oxfordenergy.org/research.shtml>
Nuclear Threat Initiative, <https://www.nti.org/>
Stanford University, Precourt Center for Energy Research, <http://pie.stanford.edu/>
White House Blog: Energy and the Environment:
<http://www.whitehouse.gov/blog/issues/Energy-%2526-Environment>
World Bank Energy:
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTENERGY2/0,,menuPK:4114636~pagePK:149018~piPK:149093~theSitePK:4114200,00.html>
LexisNexis accesses hundreds of energy sources: Platts, Oil and Gas Journal, Petroleum Economist, among many others.

DECORUM & INTEGRITY

Learning together requires that everyone must feel welcome and able to trust others in the class. A central aim of the course is to encourage students to think and be critical. Accordingly, all students are expected to exchange freely ideas while respecting the opinions of each other. Similarly, each student must recognize that academic dishonesty (such as cheating on a test/quiz or plagiarism on a paper) completely undermines the mission of this course, is surprisingly easy to detect, and is taken very seriously by the Institute. Do not be tempted to take a short cut to complete an assignment— consult the GT honor code/Honor Advisory Council <http://www.policylibrary.gatech.edu/student-affairs/academic-honor-code> -- if there are any questions.

All synchronous lectures and discussions will be recorded, unless otherwise noted by the professors. Students must turn off cell phones, pagers, and other electronic devices that could be distracting during all synchronous activities.

COURSE SCHEDULE

MODULE 1: ENERGY FUNDAMENTALS & IR SECURITY

Aug. 19: Introduction: Energy Systems, National Security & Geopolitics

Reading:

Global Energy Institute, *International Index of Energy Security Risk* (peruse)

https://www.globalenergyinstitute.org/sites/default/files/IESRI-Report_2020_4_20_20.pdf

IEA, “World Energy Outlook, 2019,” Executive Summary

<https://iea.blob.core.windows.net/assets/1f6bf453-3317-4799-ae7b-9cc6429c81d8/English-WEO-2019-ES.pdf>

EIA, International Energy Outlook 2019,”

<https://www.eia.gov/outlooks/ieo/pdf/ieo2019.pdf>

BP Energy Future vs. Exxon Outlook for Energy 2019 (peruse)/CANVAS Module 1

Aug 26: Energy Basics (Oil, Natural Gas, and the Nuclear Fuel Cycle)

Reading:

EIA, “Energy Explained,” (“What is Energy” thru “Secondary Resources”), <https://www.eia.gov/energyexplained/>

Michelle Melton, Annie Hudson, and Sarah Ladislav, “Energy 101: Introduction to Oil,” [https://csis-website-](https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/150910_oil.pdf)

[prod.s3.amazonaws.com/s3fs-](https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/150910_oil.pdf)
[public/legacy_files/files/publication/150910_oil.pdf](https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/150910_oil.pdf)

“Energy 101: Introduction to Natural Gas,”

[https://csis-website-prod.s3.amazonaws.com/s3fs-](https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/Natural_Gas_101.pdf)
[public/legacy_files/files/publication/Natural_Gas_101.pdf](https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/Natural_Gas_101.pdf)

“Alternative Energy: Historical Time-Line” (peruse)

[http://alternativeenergy.procon.org/view.resource.php?resourceID=](http://alternativeenergy.procon.org/view.resource.php?resourceID=002475)
[002475](http://alternativeenergy.procon.org/view.resource.php?resourceID=002475)

Hogselius, Chps. 1-2;

Ferguson, Chps, 1-5, 7, 8;

Recommended:

*The World Bank Group, “The Petroleum Sector Value Chain,” (2009)/CANVAS Module 1

Sept. 2: Hydrocarbon Century & Geopolitics: From “King Coal” to the Rise of “Big Oil” & OPEC

Reading:

Price-Smith, Chp. 1/CANVAS;

James D. Hamilton, “Historical Oil Shocks,” unpublished draft (February 2011), http://econweb.ucsd.edu/~jhamilton/oil_history.pdf

Kalicki & Goldwyn, Chp. 3/CANVAS.

Brian C. Black, “Exxon’s Rex Tillerson & the Rise of Big Oil in American Politics,” *The Conversation* (January 31, 2017).
<http://theconversation.com/exxons-rex-tillerson-and-the-rise-of-big-oil-in-american-politics-70260>

O’Sullivan, Chp. 1

“The Prize,” Parts 5&6/CANVAS Module 1

Recommended:

*Watch “The Prize” Parts 1, 2, 4 & 7.

*Roger Stern, “Oil Scarcity Ideology in US Foreign Policy, 1908-97,” *Security Studies* 25:2 (2016), pp. 214-257. (Library: e-journals).

Sept. 9: Energy Markets, Prices, Peaks, and Curses

Reading:

Hogselius, Chp. 4

Klare, Chp. 1 (CANVAS).

“President Donald J. Trump is Unleashing American Energy Dominance,” (May 14, 2019)

<https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unleashing-american-energy-dominance/>

“President Donald J. Trump Has Unleashed American Producers and Restored our Energy Dominance,” (July 29, 2020)

<https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unleashed-american-producers-restored-energy-dominance/>

O’Sullivan, Chp. 2

Campbell-Lynch Debate, *Oil & Gas Journal*, 14 July 2003 (CANVAS).

Michael Ross, “Does Oil Hinder Democracy,” *World Politics* 53 (April 2001), pp. 325-61 (CANVAS)

EIA, “What Drives Crude Oil Prices: Overview,” (From spot prices-Demand OECD), <https://www.eia.gov/finance/markets/crudeoil/>

EIA, “What Drives Petroleum Product Prices: Overview,” (From price balance), <https://www.eia.gov/finance/markets/products/>

Recommended Reading:

- *Robert McNally, “Crude Volatility,” Chps. 9 & 10/CANVAS
- *Andre Mansson, “A Resource Curse for Renewables?: Conflict and Cooperation in the Renewable Energy Sector,” *Energy Research & Social Science* (2015) (CANVAS).
- *Benjamin K. Sovacool and Marilyn Brown, “Competing Dimensions on Energy Security: An International Perspective,” GT/IAC Public Policy Working Paper #45 (13 January 2009)/CANVAS
- *Jason Bordoff, “The American Energy Superpower: Why Dominance is About More than Just Production,” *Foreign Affairs* (July 6, 2017)/CANVAS.

Sept 16: Energy & IR Security Nexus

Guest Speaker: Peter Harrell, Adjunct Senior Fellow, Center for a New American Security

Reading:

- Hogselius, Chp. 3 (peruse), 5-7.
- O’Sullivan, Chps. 5-6
- David Victor and Rebuttals, “What Resource Wars?,” *The National Interest*, Nov/Dec 2007 and Jan/Feb, 2008/CANVAS;
- Eugene Gholz, “The Strait Dope: Why Iran Can’t Cut off Your Oil,” *Foreign Policy* (Sept/Oct. 2009)
http://www.foreignpolicy.com/articles/2009/08/12/the_strait_dope
- Bud Coote, Impact of Sanctions on Russia’s Energy Sector,” Atlantic Council/Global Energy Center (March 2018),
https://www.atlanticcouncil.org/images/publications/Impact_of_Sanctions_on_Russia_s_Energy_Sector_web.pdf
- Jeff D. Colgan, “Fueling the Fire: Pathways from Oil to War,” *International Security* 38:2 (Fall 2013), pp. 147-189/CANVAS
- Peter Toft, Arash Duero, Arunas Bieliauskas, “Terrorist Targeting and Energy Security,” *Energy Policy* 38 (2010), pp. 4411-4421/CANVAS.
- Michael Ross, “Blood Barrels,” *Foreign Affairs*, May/June 2008/CANVAS.

Recommended Reading:

- *Glaser & Kelanic, Chps. 3 & 5;
- *Kenneth A. Schultz, “Mapping Interstate Territorial Conflict: A New Data Set and Applications,” *Journal of Conflict Resolution* (2015)/CANVAS

- *Llewelyn Hughes and Austin Long, “Is There an Oil Weapon?: Security Implications of Changes in the Structure of the Oil Market,” *International Security* 39:3 (Winter 2014/15), pp. 152-189/CANVAS.
- *Steve A. Yetiv, *The Petroleum Triangle: Oil, Globalization, and Terror* (Ithaca: Cornell University Press, 2011), Chp. 6/CANVAS.
- *ICSR Report, “Caliphate in Decline: An Estimate of Islamic State’s Financial Fortunes,” *ICSR Kings College* (2017), <http://icsr.info/wp-content/uploads/2017/02/ICSR-Report-Caliphate-in-Decline-An-Estimate-of-Islamic-States-Financial-Fortunes.pdf>. (peruse)
- *Ferguson, Chp. 6

MODULE 2: CLIMATE CHANGE AT THE NEXUS OF U.S. ENERGY AND NATIONAL SECURITY POLICY (LSR)

Sept. 23: Energy, Climate & National Security Policymaking

Reading:

- Barack Obama, “Presidential Policy Directive 1,” The White House February 13, 2009 <https://fas.org/irp/offdocs/ppd/ppd-1.pdf>
- “The National Laboratories: US Powerhouses of Science and Technology,” <https://nationallabs.org>
- Sara R (Rose) Rinfret, Denise L. Scheberle, and Michelle C. Pautz, *Public Policy: A Concise Introduction* (Washington, DC: Congressional Quarterly Press, 2018), Chp. 10/CANVAS.

Sept. 30: Climate Change and its Emergence as a National Security Issue

Guest Speaker: Dr. Kim Cobb, Georgia Power Chair and ADVANCE Professor, School of Earth and Atmospheric Sciences, GT

Reading:

- Leon Fuerth, “National Security, Energy, Climate Change: New Paradigm; New Strategy; New Governance,” in Jan H. Kalicki and David L. Goldwyn (eds.), *Energy and Security: Strategies for a World in Transition* (Johns Hopkins University Press, 2013), Chapter 22 pp. 499-512/CANVAS.

Fox-Penner, Chp. 5 (The Fragmented Future)
Department of Defense 2014 Climate Change Adaptation Roadmap
https://www.acq.osd.mil/eie/downloads/CCARprint_wForward_e.pdf

Report on Effects of a Changing Climate to the Department of Defense
2019 <https://media.defense.gov/2019/Jan/29/2002084200/-1/-1/1/CLIMATE-CHANGE-REPORT-2019.PDF>

Special Report: Global Warming of 1.5 by the Intergovernmental Panel on Climate Change: <https://www.ipcc.ch/sr15/download/>

Recommended Reading:

*O’Sullivan, Chps. 4 & 11

*Glaser & Kelanic, Chp. 1/CANVAS).

Oct. 7: Simulation: National Security Council Meeting on Bilateral Climate Change Initiatives

Sarah Ladislaw and Nikos Tsafos, *Race to the Top* (Washington, DC, CSIS, July 2020),
https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/200706_SRF_RacetotheTop_WEB_v2%20FINAL.pdf

MODULE 3: ENERGY & STRATEGIC INTERACTION

Oct. 14: Eurasian & Asian Energy Pivots

Reading:

O’Sullivan, Chps. 8-10.

German Marshall Fund “Illicit Influence: The Energy Weapon,” Report from the Alliance for Securing Democracy & C4ADS,
https://d2llho1jqyw8vm.cloudfront.net/wp-content/uploads/2019/04/Illicit-Influence-Pt-2_Preview-PDF.pdf

Tatiana Mitrova and Vitaly Yermakov, *Russia’s Energy Strategy-2035: Struggling to Remain Relevant* (Paris: IFRI, December 2019)/CANVAS

Maria Snegovaya, “What Factors Contribute to the Aggressive Foreign Policy of Russian Leaders,” *Problems of Post-Communism* 67:1 (2020)/CANVAS

- Steve Levine, "The End of the Great Game," *The New Republic*, October 5, 2010 <https://newrepublic.com/article/78168/obama-central-asia-great-game>
- Richard Morningstar et al., "Issue Brief: European Energy Security and Transatlantic Cooperation: A Current Assessment," *The Atlantic Council Global Energy Center*, June 2019
https://www.atlanticcouncil.org/images/publications/European_Energy_Security_and_Transatlantic_Cooperation.pdf
- Janet Xuanli Liao, "China's Energy Diplomacy Towards Central Asia and the Implications on Its 'Belt and Road Initiative'," *The Pacific Review* (2020)/CANVAS
- Jeffrey Ball, "Grow Green China Inc.: How China's Epic Push for Cleaner Energy Creates Economic Opportunity for the West," *Brookings Paper* 8, May 2019/CANVAS
- European Commission, European Energy Security Strategy, *Communication from the Commission to the European Parliament and the Council*, May 28, 2014, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0330&from=EN>

Recommended Reading:

- *Morena Skalamera, "Explaining the 2014 Sino-Russian Gas Breakthrough: The Primacy of Domestic Politics," *Europe Asia Studies* 70:1 (2018), pp. 90-107/CANVAS
- *Jonna Nyman, "Red Storm Ahead: Securitization of Energy in US-China Relations," *Millenium* 43:1 (2014), pp. 43-65/CANVAS
- * Samir Tata, "Deconstructing China's Energy Security Strategy," *The Diplomat.com* (January 14, 2017), <https://thediplomat.com/2017/01/deconstructing-chinas-energy-security-strategy/>
- *Chia-yi Lee, "China's Energy Diplomacy: Does Chinese Foreign Policy Favor Oil-Producing Countries?" *Foreign Policy Analysis* 14:4 (October 2019)/CANVAS

Oct. 21: Changing Nuclear Landscape: Implications for Energy & International Security

Guest Speaker: Daniel Poneman, Senior Fellow with the Belfer Center (Harvard Univ) and President and Chief Executive Officer of Centrus Energy Corp. He previously served as Acting Secretary of Energy and as Deputy Secretary of Energy.

Reading:

Ferguson, Chps. 3-5;

Laura S. H. Holgate and Sagatom Saha, “America Must Lead on Nuclear Energy to Maintain National Security,” *The Washington Quarterly* 41:2 (2018)/CANVAS

“The U.S. Nuclear Energy Enterprise: A Key National Security Enabler,” A Special Report by the Energy Futures Initiative (August 2017), http://www.energyfuels.com/wp-content/uploads/2018/01/2018.01.16-Exhibits-to-Petition_Part2.pdf

Nicola de Blasio and Richard Nephew, *The Geopolitics of Nuclear Power and Technology* (Center on Global energy Policy, March 2017), <http://energypolicy.columbia.edu/sites/default/files/The%20Geopolitics%20of%20Nuclear%20Power%20and%20Technology%20033017.pdf>

Pierre Goldschmidt, “Multilateral Nuclear Fuel Supply Guarantees & Spent Fuel Management: What are the Priorities?” *Daedalus* (Winter 2010), pp. 7-19. (library: e-journals);

Jane Nakano, *The Changing Geopolitics of Nuclear Energy: A Look at the United States, Russia, and China* (Washington, DC, CSIS 2020), https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/200416_Nakano_NuclearEnergy_UPDATED%20FINAL.pdf?heOTjmYgA_5HxCUbVIZ2PGedzzQNg24v

Recommended Reading:

*Christoph Bluth, Matthew Kroenig, Renssleear Lee, William C. Sailor, and Matthew Fuhrmann, “Civilian Nuclear Cooperation and the Proliferation of Nuclear Weapons,” *International Security* 35:1 (Summer 2010) (library: e-journals).

*Nicholas Miller, “Why Nuclear Energy Programs Rarely Lead to Proliferation,” *International Security* 42:2 (Fall 2017) (library: e-journals).

*Adam N. Stulberg, “Internationalization of the Fuel Cycle and the Nuclear Energy Renaissance: Confronting the Credible Commitment Problem,” in Adam N. Stulberg and Matthew Fuhrmann, eds., *The Nuclear Renaissance and International Security* (Stanford: Stanford University Press, 2013) (CANVAS).

*Eliza Gheorghe, “Proliferation and the Logic of the Nuclear Market,” *International Security* 43:4 (Spring 2019)/CANVAS

*“Final Report,” Investigation Committee on the Accident at the Fukushima Nuclear Power Station, Executive Summary/CANVAS, peruse.

Oct. 28 Geopolitics & the Age of Natural Gas & Energy Networks

Reading:

O’Sullivan, Chps. 3, Section 2; Conclusion

Grigas, Chps. 2.

Adam N. Stulberg, “Eurasia’s Pipeline Tangle,” *Russia in Global Affairs* (24 September 2011)

http://eng.globalaffairs.ru/person/p_2445

Alan Riley, “Nord Stream 2: A Pipeline Dividing Europe?” *Center for European Policy Analysis* (June 29, 2019),

<https://www.cepa.org/a-pipeline-dividing-europe>

Jonathan Elkind and Tim Boersma, Talking Past Each Other: Transatlantic Perspectives on European Gas Security, *Columbia SIPA: Center on Global Energy Policy*, May 2018 (CANVAS)

Recommended Reading:

*Pierre Noel, “Nord Stream II and Europe’s Strategic Autonomy,” *Survival* 61:6 (December 2019-January 2020)/CANVAS

*Kalicki & Goldwyn, Chp. 8.

*Adam N. Stulberg, “Natural Gas and the Russia-Ukraine Crisis: Strategic Restraint and the Emerging Europe-Eurasia Gas Network,” *Energy Research & Social Science* 24 (February 2017), pp. 71-85. (CANVAS).

*Tatiana Mitrova, *The Geopolitics of Russian Natural Gas* (February 24, 2014),

<http://belfercenter.ksg.harvard.edu/files/MO-CES-pub-GeoGasGCC-102513.pdf>.

*Jessica Jewell, Marta Vetier, Daniel Garcia-Cabrera, “The International Technological Nuclear Cooperation Landscape: A New Dataset and Network Analysis,” *Energy Policy* 128 (May 2019)/CANVAS

Nov. 4: Contemporary Energy Technology & Energy Security Challenges

Guest Speaker: Professor Matthew Realff, School of Chemical and Biomolecular Engineering.

Reading:

International Renewable Energy Agency/Global Commission on the Geopolitics of Energy Transformation, *A New World: The Geopolitics of the Energy Transformation* (2019), http://geopoliticsofrenewables.org/assets/geopolitics/Reports/wp-content/uploads/2019/01/Global_commission_renewable_energy_2019.pdf

David Victor and Kassia Yanosek, “The Next Energy Revolution: Promise and Peril of High Technology Innovation,” *Foreign Affairs*, July/August 2017 (library: e-journals)

Center for Naval Analyses, “Advanced Energy and National Security,” 2017 https://www.cna.org/CNA_files/PDF/IRM-2017-U-015512.pdf

[Report on Advancing the Landscape of Clean Energy Innovation, EFI/IHS Markit, February: https://ihsmarkit.com/Info/0219/clean-energy-innovation.html](https://www.effi.com/~/media/Files/Reports/Report_on_Advancing_the_Landscape_of_Clean_Energy_Innovation_EFI_IHS_Markit_February_2019.pdf)

Recommended Reading:

- *Wolfram Lacher and Dennis Kumetat, “The Security of Energy Infrastructure and Supply in North Africa: Hydrocarbons and Renewable Energies in Comparative Perspective,” *Energy Policy* 39 (2011), pp. 4466-4478/CANVAS
- *Meghan O’Sullivan, Indra Overland, and David Sandalow, “The Geopolitics of Renewable Energy,” Working Paper CGEP/Belfer-NUPI (June 2017), <https://energypolicy.columbia.edu/sites/default/files/CGEPTheGeopoliticsOfRenewables.pdf>
- *Varun Sivaram, *Taming the Sun: Innovations to Harness Solar Energy and Save the Planet*. MIT University Press, 2018.

MODULE 4: IN-CLASS SIMULATION

Nov. 11:	In-Class Simulation 1 (TBA)
Nov. 18:	In-Class Simulation 2 (TBA)
Nov. 25	NO CLASS: THANKSGIVING HOLIDAY
Dec. 7:	FINAL POLICY MEMOS DUE 6:00PM