

Undergraduate Thesis Prospectus

The Effect of Government Lockdown Strategies on the Environment and Economy

(technical research project in Systems Engineering)

Climate Politics in the Trump Administration

(sociotechnical research project)

by

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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## **General Research Problem**

*How do governments balance environmental protection, public safety, and economic development?*

Governments are responsible for providing national security, health, prosperity, and happiness to the citizens of their nation. However, increasing economic globalization and rapid urbanization leaves citizens vulnerable to infectious diseases and environmental hazards transcending national borders. *Global health security*, a concept evolving over the past 30 years, recognizes how health is shaped by the connections of people and goods, social and environmental consequences of the global economic order, and the international spread of infectious diseases (Bouskill & Smith, 2019). While attempting to maintain power and promote economic prosperity in an increasingly competitive global market, policymakers must include global health security as part of their national security measures. Embedded in this concept is sustainable economic growth, which requires sustainable consumption and production patterns and use of natural resources (United Nations, 2015). Influences in the policy-making process continue to change in light of new information regarding social and environmental determinants of health. The way governments decide to balance and prioritize these competing interests reveals whose voices are amplified and represented in policy.

## **The effects of government lockdown strategies in response to the COVID-19 pandemic on the environment and economy**

*How have government decisions surrounding lockdown restrictions in response to the COVID-19 pandemic effected the environment and economy?*

Led by my capstone advisor Venkataraman Lakshmi, a Professor of Engineering Systems and Environment, my four teammates including Eric Jess, Shivani Das, Reese Bowling, Zach Dedas, and I strive to answer this question using data analysis.

What started as a “viral pneumonia” reported from the Wuhan Municipal Health Commission in early January 2020 would soon provide the ultimate test to governments worldwide: protecting the health of their citizens while maintaining the power of their nation. This unprecedented scenario led many countries to pursue lockdown strategies to combat the spread of the virus, which include stay-at-home orders, curfews, and mandated business-operation hours (WHO, 2020). These restrictions determine the extent to which production from key economic sectors will fall and consequently, how changes in production will impact the environment.

The COVID-19 pandemic forced governments to make swift decisions that would directly impact citizen’s every day lives, from their employment to social habits. Factors impacting these decisions comprise of country culture, history, and public trust in authority. South Koreans, for example, were especially quick to cooperate with Korean public health officials and abide by mandated social distance practices because similar measures were taken following a Middle East Respiratory Syndrome outbreak in 2015, a six-month period in which Koreans lived in fear and \$2.8 billion was lost in revenue (Ardane Labs, 2020). The cooperation and participation of the public is crucial to the success of lockdown measurements, which requires the trust of public health officials.

COVID-19 pandemic strategies used in South Korea, China, Japan, New Zealand, and Australia were assessed in my team’s analysis. Lockdown restrictions in China, South Korea, and Japan have been strict, moderate, and more lenient, with current Government Response

Stringency Indexes (GRSI) of 81, 55, and 35 respectively (Oxford University, 2020). These three countries are also close in geographical proximity and have similar economic characteristics that can function as control variables, which is particularly important in identifying the causal effects of different response strategies. Because climate change is occurring at a different rate in the southern hemisphere (Friedman, 2013), Australia and New Zealand are included in our analysis to explore the environmental effects of lockdown measures in different climates. With economic and environmental data from all five countries, the goal is to assess how lockdown stringency affects the key economic sectors of manufacturing, agriculture, and transportation and ultimately how production changes in these sectors affect air and water pollution levels.

Economic data from crucial sectors for each country will be primarily collected through available finance databases. Specifically, we are interested in changes of 2020 production levels compared to previous years. Collection of environmental data includes air pollution imagery from NASA satellites and water quality tests from specific regions. Data consolidation and statistical testing will be conducted using RStudio along with visualizations created using Tableau to provide statistical evidence connecting lockdown restrictions with effects on the economy and environment for each country. Comparative analysis between the various stringencies of lockdown measures and their consequences can provide a great resource for future policy makers who are faced with the challenge of effectively responding to a pandemic while balancing the interests of citizen's health, the economy, and natural resources. Hopefully, further research will be done on other countries' responses to COVID and their effects to extend the application of this resource beyond just these five countries.

### **Climate politics in the Trump administration**

*How have U.S. environmentalists and industry groups competed to advance their political agendas during the Trump administration?*

Since 2017, President Trump and his administration have reversed President Obama's environmental legacy. Trump has rescinded initiatives under the Clean Air Act and has asked Congress to reduce the budget of the Environmental Protection Agency (EPA). The president's most recent EPA budget proposal for 2021 is 26 percent less than last year's. Trump favors greater U.S. fossil fuel production, including coal (OMB, 2020). However, environmentalists expect EPA to regulate high-polluting industries. For example, the fossil fuel industry pollutes water and is implicated in the 429,000 asthma-related trips to U.S. emergency rooms each year (Greenpeace, 2020). While industry reaps the benefits of recent deregulation, environmentalists have resorted to publicity and litigation.

Researchers have attributed environmental deregulation under the Trump administration to the influence of wealthy donors, think tanks, and industry coalitions. In targeting EPA, the Trump administration has applied the methods of the Reagan and G.W. Bush administrations: deregulation, budget and staff cuts, and undermining science-based policy. In his first nine months as Trump's first EPA administrator, Scott Pruitt, a former coal lobbyist, reduced the agency's workforce to its lowest level since 1989 and pursued only 39 percent of the civil penalties from polluters that the Obama administration had sought over the equivalent period (Fredrickson et al., 2018). Comprehensive studies of interest group lobbying have found that groups, particularly business-oriented, engage in substantial administrative lobbying relative to legislative lobbying. This implies that interest groups believe administrative agencies possess discretionary authority over some, if not all, policies they care about. Furthermore, business groups dominating both administrative and legislative lobbying may imply that business groups

are simply more capable of procuring resources for sustained lobbying practices (Boehmke et al., 2013). In contrast, environmental advocacies have relied mainly on litigation and publicity to promote sustainable policy based on scientific evidence, free of financial and political conflicts of interest (Reed et al., 2020). Recently some have found opportunities in *intersectionality*, by associating environmental values with the values typical of social movements in race, gender, and sexuality. For example, the Sierra Club, the Natural Resources Defense Council (NRDC), and 350.org joined with four million Americans in the Women’s March on Washington in January 2017, on the day after President Trump’s inauguration. This march, and the second People’s Climate March of April 2017, were focal points of opposition to the Trump administration’s neglect of environmental protection (Hestres & Nisbet, 2018). Lobbying strategies have been widely transparent during the Trump administration, yet further exploration is necessary to assess how policymakers are persuaded by competing interests and how those interests are specifically translated into policy.

The Trump administration has opened environment policy to the influence of the fossil fuel and chemical industries, directly or through the think tanks they fund, to the exclusion of climate activists. Under the Trump administration, EPA has had an open door to the fossil fuel industry’s lobbyists. Scott Pruitt, for example, had sued the EPA fourteen times while serving as Oklahoma’s Attorney General prior to his appointment, describing himself as a “leading advocate against the EPA’s activist agenda” (Pruitt, 2017).

Trump’s second EPA Administrator, Andrew Wheeler, was a former lobbyist for coal producer Murray Energy (Gill, 2020). The American Petroleum Institute (API) has welcomed environmental deregulation under Trump’s EPA, and praised Wheeler’s appointment for his industry experience and understanding, in the words of API’s CEO, “the important role that

natural gas and oil plays in the daily life of every American” (Gerard, 2018). The American Coal Council applauded the Trump administration’s effort to repeal the Clean Power Plan, happily reporting “America’s rich energy sources are being valued once again” (Headley, 2017).

Lobbying is not cheap: in 2018, groups representing industries in energy and natural resources spent over \$300 million on lobbying; the oil and gas sector spent \$125 million (CRP, 2020). The energy sector has succeeded in such efforts by characterizing the regulations they oppose as unnecessary and costly.

But environmental advocacies have fought back. NRDC, an international nonprofit of 3 million members, sues corporations to protect clean air and water; it has filed over 100 lawsuits against the Trump administration (Thompson, 2020). Earthjustice, an environmental law nonprofit, is committed to fighting the “continued weakening of regulation requirements” after winning several lawsuits against EPA in 2019 (Cmar, 2020). Environmentalist groups have criticized Trump’s EPA appointed nominees: “Having Scott Pruitt in charge of the US EPA is like putting an arsonist in charge of fighting fires,” stated Michael Brune, executive director of the Sierra Club (2018). These advocacies strive to limit pollution from the very industries the Trump administration favors, and have sued EPA for the failing to protect of air quality.

Some for-profit companies lobby for stricter environmental standards. For companies in the renewable energy sector or that market energy-efficient systems, such standards can confer a competitive advantage (Cai). With the help of Republican majorities in Congress, until 2019 in both chambers and since then in the Senate alone, the Trump administration has favored industry over environment. According to Reibstein (2017), the purpose of the democratic system is to find the balance of interests, rights and perspectives that can inspire public trust. Cronyism and

lobbying, however, induce distrust, such as environmentalists' distrust of the Trump administration.

## References

- Ardane Labs. (2020, June 30). Emerging COVID-19 success story: South Korea learned the lessons of MERS. <https://ourworldindata.org/covid-exemplar-south-korea>
- Budget FY2021, Budget Message of the President, Office of Management and Budget. (2020). *Budget Message of the President* (pp. 97-100). OMB.
- Boehmke, F., Gailmard, S., & Patty, J. (2013). Business as usual: Interest group access and representation across policy-making venues. *Journal of Public Policy*, 33(1), 3-33. JSTOR
- Cai, D., & Li, J. (2020). Pollution for Sale: Firms' Characteristics and Lobbying Outcome. *Environmental and Resource Economics*, 77(3), 539-564. JSTOR
- CRI (2020). Center for Responsive Politics. Lobbying by industry. <https://www.opensecrets.org/federal-lobbying/industries>
- Earthjustice. (2020, November 2). *Stopping the EPA's Attack on Clean Water Protections* [Press release]. <https://earthjustice.org/from-the-experts/2020-november/stopping-the-epas-attack-on-clean-water-protections>
- Fredrickson, L., Sellers, C., Dillon, L., Ohayon, J., Shapiro, N., Sullivan, M., . . . Wylie, S. (2018, April). History of US Presidential Assaults on Modern Environmental Health Protection. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5922215/>
- Friedman, A., Hwang, Y., Chiang, J., & Frierson, D. (2013, August 01). Interhemispheric Temperature Asymmetry over the Twentieth Century and in Future Projections. [ametsoc.org](http://ametsoc.org)
- Gerard, J. (2018, April 11). API calls on U.S. Senate to approve Andrew Wheeler's nomination to EPA. American Petroleum Institute. <https://www.api.org/news-policy-and-issues/news/2018/04/11/api-calls-on-us-senate-to-approve-andrew-wheeler-nomination-to-epa>
- Gill, T. M. (2020). Reaching the Boiling Point: Energy and Climate Policy Under the Trump Administration. In *The future of U.S. Empire in the Americas: The Trump administration and beyond*. New York, NY: Routledge.
- Headley, T. (2017). ACC News Press Release: President Trump Delivers on Another Campaign Promise. American Coal Council. <https://www.americancoalcouncil.org/news/337977/President-Trump-Delivers-on-Another-Campaign-Promise.htm>
- Hestres, L., & Nisbet, M. (2018). Environmental Advocacy at the Dawn of the Trump Era: Assessing Strategies for the Preservation of Progress. [researchgate.net](http://researchgate.net)

- Oxford University. (2020). Coronavirus Government Response Tracker. <https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker>
- Pruitt, S. (2017). About the Attorney General. Oklahoma Office of the Attorney General. [https://web.archive.org/web/20170108114336/https://www.ok.gov/oag/Media/About\\_the\\_AG/](https://web.archive.org/web/20170108114336/https://www.ok.gov/oag/Media/About_the_AG/)
- Reed, G., Kelly, M., Goldman, G., Carter, J., & Robinson-Dorn, M. (2020). (Rep.). Union of Concerned Scientists. doi:10.2307/resrep26332. JSTOR
- Reibstein, R. (2017). A more ethical chemistry. *Current Opinion in Green and Sustainable Chemistry*, 8, 36-44. doi:10.1016/j.cogsc.2017.09.004
- Schleeter, R. (2020, February 12). New research: Air pollution from fossil fuels costs the world \$8 billion every day. Greenpeace. <https://www.greenpeace.org/usa/news/new-research-air-pollution-from-fossil-fuels-costs-the-world-8-billion-every-day/>
- Sierra Club. (2018, July 5). *Sierra Club Statement on Pruitt Resignation: It's About Time* [Press release]. <https://www.sierraclub.org/press-releases/2018/07/sierra-club-statement-pruitt-resignation-it-s-about-time>
- Thomson, V. E., Huelsman, K., & Ong, D. (2018). Coal-fired power plant regulatory rollback in the United States: Implications for local and regional public health. *Energy Policy*, 123, 558-568. doi:10.1016/j.enpol.2018.09.022
- WHO Coronavirus Disease (COVID-19) Dashboard [Chart]. (2020). In *WHO Health Emergency Dashboard*. People's Republic of China: World Health Organization.