

July 8, 2021

Attorney General Maura Healey
1 Ashburton Place, 20th Floor
Boston, MA 02108

Dear Attorney General Healey,

My name is Ploy Achakulwisut, I am a scientist at the U.S. Center of the Stockholm Environment Institute (SEI), and a Harvard alumna. I write to share with you some findings based on my and my colleagues' research on fossil fuels and climate change. I am not a legal expert, but I hope that these insights may help to inform your consideration of Fossil Fuel Divest Harvard's complaint, submitted to your office, that the Harvard Corporation has failed to comply with its fiduciary duty under state laws by continuing to invest in the fossil fuel industry. For full disclosure, during my time as a graduate student at Harvard, I was involved with the fossil fuel divestment campaigns at Harvard and MIT between 2013 and 2017. I received no financial support to write this letter.

Background

I obtained my M.A. and Ph.D. degrees in Earth and Planetary Sciences from Harvard University in 2018. My Ph.D. research, as well as my subsequent postdoctoral research at the George Washington University, was focused on understanding the air pollution and health impacts of climate change. In April 2019, I joined SEI, an international non-profit research and policy organization with U.S. offices in California, Massachusetts, and Washington state. SEI conducts research and engages with decision-makers on energy, water, and climate policy to develop solutions for a sustainable future for all. SEI U.S. is a research affiliate of Tufts University.

I am a co-author and lead analyst of SEI's *Production Gap Report* series, published in collaboration with the *United Nations Environment Programme* and other leading research institutions, which describes how fossil fuel production must be phased down to meet climate goals.^{1,2} The *Production Gap Report* and other research conducted within SEI's *Initiative on Fossil Fuels and Climate Change* have helped to inform several climate litigation cases, including the *Milieudefensie et al. v. Royal Dutch Shell plc.*³ and the *Juliana et al. v. United States of America*⁴ cases. I am also a working group member of the 2020 and 2021 U.S. Policy Brief of the *Lancet Countdown on Health and Climate Change.*⁵

Summary of key points

In the following sections, I discuss three key points based on SEI research that I've contributed to as well as research by other experts in the field:

- (1) To stay on track to limiting global warming to 1.5°C or 2°C, global coal, oil, and gas production and use will have to start declining as soon as possible, and no later than 2030. However, projections of global fossil fuel production under current economic trends and without new policy interventions are vastly higher than levels consistent with the Paris Agreement's goals.

¹ SEI, IISD, ODI, Climate Analytics, CICERO, & UNEP. (2019). The Production Gap Report 2019.

<http://productiongap.org/2019report>

² SEI, IISD, ODI, E3G, & UNEP. (2020). The Production Gap: Special Report 2020. <http://productiongap.org/2020report>

³ See verdict issues on 26 May 2021: <https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBDHA:2021:5339>

⁴ See Declaration of Peter A. Erickson: <http://climatecasechart.com/climate-change-litigation/case/juliana-v-united-states/>

⁵ <https://www.lancetcountdownus.org/2020-lancet-countdown-u-s-brief/>

- (2) Supply-side climate policies and actions, such as fossil fuel divestment, can help to avoid locking in carbon-intensive infrastructure, limiting financial risks, and help to promote sociopolitical coherence towards transitioning away from fossil fuels.
- (3) Besides being the leading source of greenhouse gas emissions and human-caused climate change, the production and combustion of fossil fuels also harms human health and the environment due to air, water, and hazardous waste pollution.

Fossil fuel production must wind down to meet the Paris Agreement's goals

Coal, oil, and gas remain the world's dominant sources of energy, accounting for 84% of total primary energy supply.⁶ These fuels are, by far, the largest contributor to global climate change, accounting for over 75% of global greenhouse gas (GHG) emissions and close to 90% of all carbon dioxide (CO₂) emissions.⁷

By necessity, reaching net zero emissions therefore requires dramatic reductions in fossil fuel extraction and burning. According to our *Production Gap Report* analysis, which relies on the mitigation scenarios compiled by the Intergovernmental Panel on Climate Change (IPCC) for their *Special Report on Global Warming of 1.5°C*, global fossil fuel production and use will have to start declining as soon as possible, and no later than 2030, for us to stay on track to limit warming to 1.5°C and 2°C. Specifically, global coal production needs to decline by around 70%, and oil and gas by around 30% each, between now and 2030 to limit warming to 1.5°C. These cuts would need to be even larger if carbon dioxide removal methods are not ultimately developed at scale.⁸

Furthermore, according to detailed analysis for the energy sector presented in the International Energy Agency's *Net Zero by 2050* report, their modeled pathway for limiting warming to 1.5°C finds no need for investment in new fossil fuel supply beyond projects already committed in 2021.⁹ That is, there are no new coal mines and no new oil and gas fields developed after 2021.

In 2020, Harvard president Lawrence Bacow stated that "Harvard's endowment should be a leader in shaping pathways to a sustainable future."¹⁰ However, by continuing to invest in the fossil fuel industry, the Harvard Corporation continues to support a pathway that is vastly misaligned with the ambitions of the Paris Agreement. As detailed in one of our recent studies, global fossil fuel production under current economic trends and without new policy interventions is expected to be much higher than levels consistent with the Paris Agreement's goals.¹¹ By 2030, global coal, oil, and gas production is projected to be 200%, 64%, and 69% larger, respectively, than the levels consistent with the 1.5°C-warming pathway. This is partly because major oil and gas companies continue to invest in and sanction new fossil fuel supply projects¹²: in 2018, these companies approved \$50 billion of investments in new projects that undermine climate goals and risk shareholder returns.¹³

⁶ IEA. (2021). *Net Zero by 2050: A Roadmap for the Global Energy Sector*. International Energy Agency. <https://www.iea.org/reports/net-zero-by-2050>

⁷ SEI, IISD, ODI, Climate Analytics, CICERO, & UNEP. (2019). *The Production Gap Report 2019*. <http://productiongap.org/2019report> (see p. 8)

⁸ SEI, IISD, ODI, E3G, & UNEP. (2020). *The Production Gap: Special Report 2020*. <http://productiongap.org/2020report>

⁹ IEA. (2021). *Net Zero by 2050: A Roadmap for the Global Energy Sector*. International Energy Agency. <https://www.iea.org/reports/net-zero-by-2050>

¹⁰ Lawrence Bacow, A message from the President on climate change, Harvard University Office of the President (Apr. 21, 2020). <https://www.harvard.edu/president/news/2020/message-from-president-bacow-on-climate-change/>

¹¹ Achakulwisut, P., & Erickson, P. (2021). Trends in fossil fuel extraction: Implications for a shared effort to align fossil fuel production with climate limits. Stockholm Environment Institute. <https://www.sei.org/publications/trends-in-fossil-fuel-extraction/>

¹² <https://carbontracker.org/oil-majors-net-zero-plans-still-far-from-paris-targets/>

¹³ Grant, A., & Coffin, M. (2019). *Breaking the Habit: Why none of the large oil companies are "Paris-aligned", and what they need to do to get there*. Carbon Tracker Initiative. <https://carbontracker.org/reports/breaking-the-habit/>

Supply-side action can help to achieve climate goals

Supply-side climate policies and actions that aim to restrict the extraction of fossil fuels, such as divestment, can complement demand-side actions and help to facilitate the urgently needed transition away from our current fossil fuel-intensive economy.¹⁴

For example, actions targeted at winding down fossil fuel supply can help to avoid “carbon lock-in” – the tendency for certain carbon-intensive technological systems to persist over time and crowd out alternatives, owing to a combination of linked technical, economic, and institutional factors. Other benefits include helping to limit financial risks from asset devaluation and stranding in the face of global decarbonization efforts, and promoting social and political coherence towards transitioning away from fossil fuel dependence.

Through fossil fuel divestment campaigns, civil society groups and investors have placed social, political, and economic pressure on governments and companies to move away from supporting fossil fuel production.¹⁵ To date, around \$15 trillion in fossil fuel divestment pledges have been made by over 58,000 individuals and 1,300 institutions.¹⁶ With an estimated \$838 million invested in fossil fuel stocks,¹⁷ divestment is one powerful climate action the Harvard Corporation can take to support the transition away from fossil fuels.

Fossil fuel production and use harm human health and the environment

As summarized in the 2020 *Lancet Countdown on health and climate change*, intensifying extreme weather events and other climate impacts are already causing death, suffering, and displacement today, with the most vulnerable and marginalized bearing the brunt of our fossil fuel-driven society.¹⁸ For example, in the past two decades in the US, heat-related mortality for older persons has almost doubled, reaching a record high of 19,000 deaths in 2018, while exposure to high wildfire risk is also on the rise.¹⁹

Besides being the largest contributor to the global climate crisis and its devastating public health impacts, air pollution from the production, distribution, and burning of fossil fuels is also causing premature deaths and illnesses worldwide. For example, a recent Harvard study estimated that air pollution from burning fossil fuels leads to around 9 million premature deaths each year globally, including more than 350,000 deaths for the US alone.²⁰ A study that I led in 2019 found that 4 million new cases of asthma in children worldwide are attributable to traffic pollution each year, accounting for 240,000 new cases in the US and around 25% of new cases in the Boston area.²¹

¹⁴ See, e.g., (1) Green, F., & Denniss, R. (2018). Cutting with both arms of the scissors: The economic and political case for restrictive supply-side climate policies. *Climatic Change*, 150, 73–87. <https://doi.org/10.1007/s10584-018-2162-x>; (2) Piggot, G. (2018). The influence of social movements on policies that constrain fossil fuel supply. *Climate Policy*. <https://doi.org/10.1080/14693062.2017.1394255>

¹⁵ Healy, N., & Barry, J. (2017). Politicizing energy justice and energy system transitions: Fossil fuel divestment and a “just transition.” *Energy Policy*, 108, 451–459. <https://doi.org/10.1016/j.enpol.2017.06.014>

¹⁶ Fossil Free. (2021). Divestment commitments. <https://gofossilfree.org/commitments/>

¹⁷ Based on Fossil Fuel Divest Harvard’s estimate. <https://divestharvard.medium.com/harvards-fossil-fuel-investments-are-illegal-alleges-complaint-5bbc0b03274a>

¹⁸ Watts, N., et al. (2021). The 2020 report of The Lancet Countdown on health and climate change: Responding to converging crises. *The Lancet*, 397(10269), 129–170. [https://doi.org/10.1016/S0140-6736\(20\)32290-X](https://doi.org/10.1016/S0140-6736(20)32290-X)

¹⁹ Lancet Countdown on Health and Climate Change: Policy Brief for the US. (2020). <https://www.lancetcountdownus.org/2020-lancet-countdown-u-s-brief/>

²⁰ Vohra, K., Vodonos, A., Schwartz, J., Marais, E. A., Sulprizio, M. P., & Mickley, L. J. (2021). Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem. *Environmental Research*, 195, 110754. <https://doi.org/10.1016/j.envres.2021.110754>

²¹ Achakulwisut, P., Brauer, M., Hystad, P., & Anenberg, S. C. (2019). Global, national, and urban burdens of paediatric asthma incidence attributable to ambient NO₂ pollution: Estimates from global datasets. *The Lancet Planetary Health*, 0(0). [https://doi.org/10.1016/S2542-5196\(19\)30046-4](https://doi.org/10.1016/S2542-5196(19)30046-4)

The extraction and distribution of fossil fuels can also be a significant source of local and regional air, water, and hazardous waste pollution. For example, a growing number of epidemiological studies have begun to link exposure to air pollutants emitted from oil and gas extraction to asthma exacerbation, higher hospitalization rates, and adverse pregnancy and birth outcomes.²² It is worth noting that the oil industry appears to have known as early as 1980 that its own workers and their children may be experiencing cancer and birth defects,²³ from exposure to air pollution and radioactive waste.²⁴ Additionally, fossil fuel extraction is associated with human rights violations,²⁵ as well as environmental degradation and biodiversity loss.²⁶

The Harvard Corporation's continued investments in fossil fuels are helping to support and legitimize an industry whose products are the source of millions of premature deaths worldwide each year.

Finally, on a personal note, as someone who received their training in climate science at Harvard University, I find it irresponsible that the University is knowingly investing in companies that have and continue to systematically undermine climate science, delay climate action, and personally attack climate scientists, including Harvard's own scholars.²⁷

Thank you for your consideration of these comments.

Sincerely,



Ploy Pattanun Achakulwisut, Ph.D.

Scientist, Stockholm Environment Institute, U.S. Center, Somerville, MA

ploy@sei.org

²² See, e.g., (1) Epstein, A. C. (2017). The Human Health Implications of Oil and Natural Gas Development. In *Advances in Chemical Pollution, Environmental Management and Protection* (Vol. 1, pp. 113–145). Elsevier and Academic Press. <https://doi.org/10.1016/bs.apmp.2017.08.002>; (2) Garcia-Gonzales, D. A., Shonkoff, S. B. C., Hays, J., & Jerrett, M. (2019). Hazardous Air Pollutants Associated with Upstream Oil and Natural Gas Development: A Critical Synthesis of Current Peer-Reviewed Literature. *Annual Review of Public Health*, 40(1), 283–304. <https://doi.org/10.1146/annurev-publhealth-040218-043715>; (3) Gorski, I., & Schwartz, B. S. (2019). Environmental Health Concerns From Unconventional Natural Gas Development. *Oxford Research Encyclopedia of Global Public Health*. <https://doi.org/10.1093/acrefore/9780190632366.013.44>

²³ Milman, O. (2021, March 18). Oil firms knew decades ago fossil fuels posed grave health risks, files reveal. *The Guardian*. <https://www.theguardian.com/environment/2021/mar/18/oil-industry-fossil-fuels-air-pollution-documents>

²⁴ Nobel, J. (2020, January 21). America's Radioactive Secret. *Rolling Stone*.

<https://www.rollingstone.com/politics/politics-features/oil-gas-fracking-radioactive-investigation-937389/>

²⁵ Healy, N., Stephens, J. C., & Malin, S. A. (2019). Embodied energy injustices: Unveiling and politicizing the transboundary harms of fossil fuel extractivism and fossil fuel supply chains. *Energy Research & Social Science*, 48, 219–234. <https://doi.org/10.1016/j.erss.2018.09.016>

²⁶ Harfoot, M. B. J., Tittensor, D. P., Knight, S., Arnell, A. P., Blyth, S., Brooks, S., Butchart, S. H. M., Hutton, J., Jones, M. I., Kapos, V., Scharlemann, J. P. W., & Burgess, N. D. (2018). Present and future biodiversity risks from fossil fuel exploitation. *Conservation Letters*, 11(4), e12448. <https://doi.org/10.1111/conl.12448>

²⁷ See, e.g., (1) Supran, G., & Oreskes, N. (2017). Assessing ExxonMobil's climate change communications (1977–2014). *Environmental Research Letters*, 12(8), 084019. <https://doi.org/10.1088/1748-9326/aa815f>; (2) Supran, G., & Oreskes, N. (2021). Rhetoric and frame analysis of ExxonMobil's climate change communications. *One Earth*, 4(5), 696–719. <https://doi.org/10.1016/j.oneear.2021.04.014>; (3) Supran, G., & Oreskes, N. (2020). ExxonMobil misled the public about the climate crisis. Now they're trying to silence critics. *The Guardian*.

<https://www.theguardian.com/commentisfree/2020/oct/16/exxonmobil-misled-the-public-about-the-climate-crisis-now-theyre-trying-to-silence-critics>; (4) <https://www.channel4.com/news/revealed-exxonmobils-lobbying-war-on-climate-change-legislation>