

An Economist's Case for Restrictive Supply Side Policies

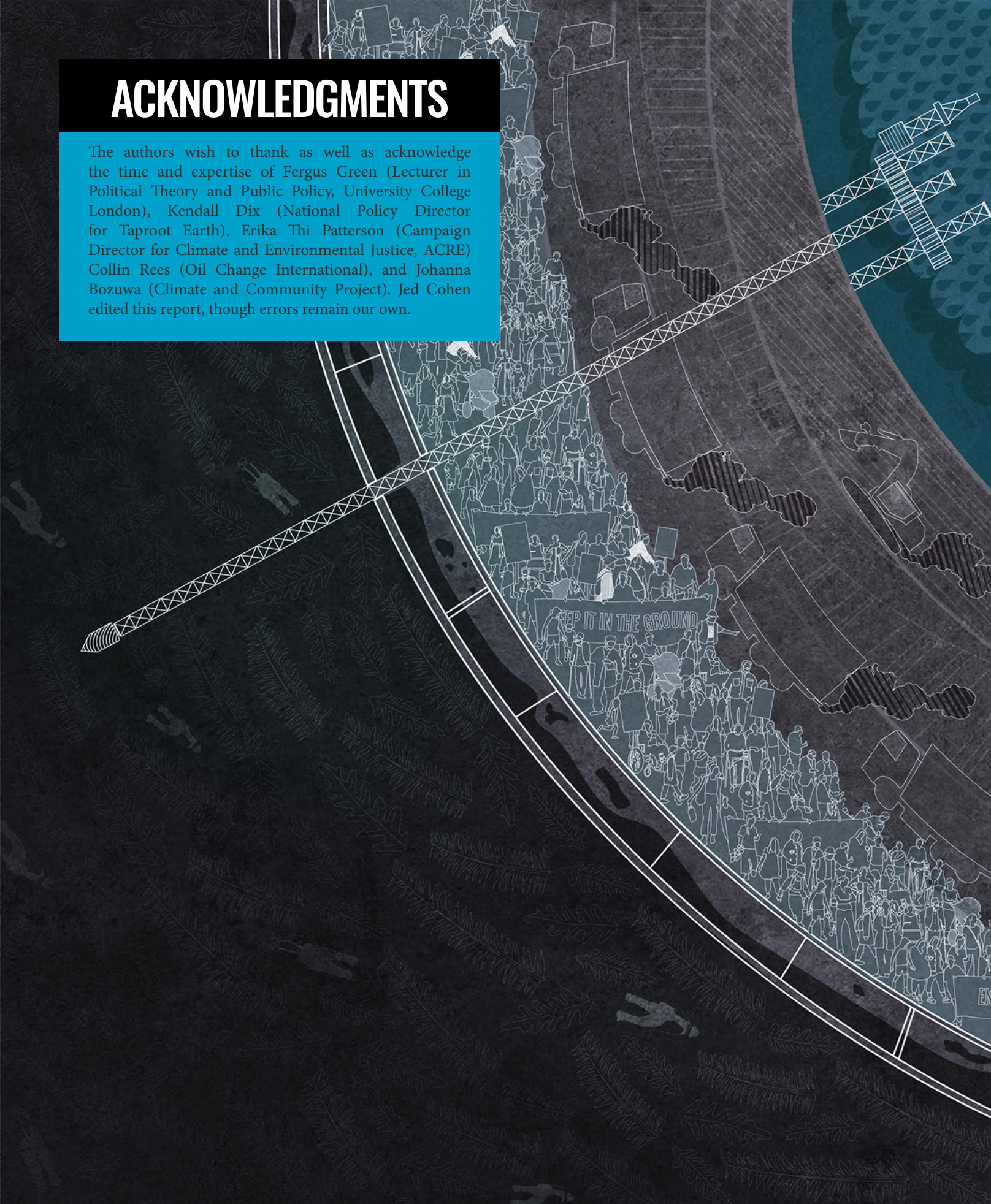
**Ten Policies to Manage the Fossil Fuel
Transition**

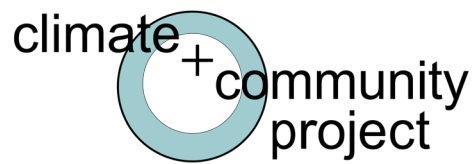
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An Economist's Case for Restrictive Supply Side Policies: Ten Policies to Manage the Fossil Fuel Transition

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Climate and Community Project is a progressive climate policy think tank that mobilizes a network of leading academic and movement researchers in developing cutting-edge research at the climate-inequality nexus. We've produced multiple research briefs alongside movement and political partners including the Green New Deal for Public Schools, and High Roads to Resilience, and Achieving Zero Emissions with More Mobility and Less Mining.

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GLOSSARY

Carbon leakages: Describes the potential incentivization of actors in other nations to increase fossil-fuel consumption as domestic US demand declines and prices fall.

Carbon lock-in: The theory that once fossil-fuel infrastructure is built, it will “lock in”—or guarantee—a certain amount of additional carbon emissions.

Carbon pricing: Refers to the use of market mechanisms to pass the cost of emitting onto emitters through higher prices.

Demand-side policies: Either restrictive (carbon tax, mandatory carbon emission standards) or supportive (energy efficiency investments, consumer subsidies) policies that incentivize the uptake of clean energy.

Greenhouse gasses: Gasses that trap heat in the atmosphere and warm the planet. The most prominent greenhouse gas is carbon dioxide, a byproduct of the burning of fossil fuels like coal, oil, and gas.

Inflation Reduction Act (IRA): A landmark 2022 climate bill that invested \$369 billion in climate-related projects, financing, and incentives. Environmental-justice and progressive advocates critiqued the bill for its “all of the above” approach to energy policy, an approach that allows for the continued use of fossil fuels as well as fossil-fuel leasing on public lands.

Jevons (or Green) Paradox: The paradox that people may increase consumption as energy becomes cheaper or more abundant.

Managed transition: The phasing-out of fossil fuel use and extraction in a way that values workers, communities, the environment, and the economy.

Montreal Protocol: A global agreement instituted in 1987 to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances, including chlorofluorocarbons and halons.

Organization of the Petroleum Exporting Countries (OPEC): Cartel of 13 countries that represents about 44 percent of global oil production. Current OPEC members include Algeria, Angola, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, the Republic of the Congo, Saudi Arabia, the United Arab Emirates, and Venezuela.

Supply-side policies: Either restrictive (reducing subsidies, supply ban) or supportive (R&D subsidies, provision of renewable energy) policies that halt or limit the production of fossil fuels.

EXECUTIVE SUMMARY

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Economists' decades-long commitment to the market for climate action is unviable, and any purely demand-side solution to the climate crisis could result in the unmanaged transition of the fossil fuel industry that deepens inequality, uncertainty, and environmental exploitation.

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Until the rise of the Green New Deal, economists' favored response to the climate crisis was some form of carbon pricing—leveraging the market to produce positive climate outcomes. With the Green New Deal came a more investment-forward strategy, one that has helped usher in a huge expansion of renewable energy and other clean technologies. The gains heralded by the Green New Deal are real and significant; however, like carbon pricing, the emissions-reduction policies most commonly associated with the Green New Deal—subsidies, tax credits, financing, and funding—are largely supportive policies aimed at increasing demand for clean and renewable energy.

Focusing on demand leaves out the flipside of the coin: supply-side action. Heretofore, policymakers have been hesitant to employ restrictive supply-side policies—in other words, explicitly phasing out the supply of fossil fuels—on the theory that increasing the demand for clean energy will crowd fossil fuels out of the marketplace. Implicit in this strategy is the assumption that fossil fuel firms will voluntarily close their doors as they get pushed out and exit the market in an orderly fashion. They will not. Without discrete restrictive supply-side planning and policy, the end of fossil fuels will be a chaotic collapse where workers, communities, and the environment suffer.

In this report, we explain the economic rationale—and climate necessity—of deploying restrictive supply-side policies to actively wind down fossil fuel extraction. Levers like bans, restrictions, or phaseouts are not new; in fact, history shows that products can go quickly from commonplace to banned. In the last four decades, the United States has outlawed lead paint, phased out asbestos, and curtailed tobacco marketing and sales. Similar policies can be used for fossil fuels; indeed, comparable policies are in place in other countries and at the state level. The International Energy Agency has made it clear: If the planet is to remain habitable, fossil fuel extraction must end. Restrictive supply-side interventions can provide crucial support for demand-side policies by:

Guaranteeing Emission Reduction. Whereas the outcomes of demand-side policies are largely uncertain, supply-side policies guarantee that fossil fuels are not extracted and burned, thereby ensuring climate targets are achieved.

Stopping International Carbon Leaks. Given that the US is a net exporter of fossil fuels, increasing domestic US demand for clean energy (and, ipso facto, reducing domestic demand for fossil fuels) either will not affect, or may even increase, exports. In fact, a reduction in domestic demand may lower

the price of fossil fuels internationally and incentivize international actors to increase fossil fuel consumption.

Alleviating Carbon Lock-In. Demand-side policies do not prohibit the construction of new fossil fuel infrastructure, creating the potential for stranded infrastructure, workers, and communities. Instituting effective supply-side policies can provide market certainty that fossil fuels cannot be developed.

Common sense climate policy should address the supply and demand sides in tandem and with equal ambition. Coordination between supply- and demand-side policy is crucial for a just, managed, and full transition. Ratcheting down fossil fuels in step with the ramp up of clean energy can balance the transition, lowering the possibility of price hikes or energy scarcity. By coupling supply- and demand-side action, policymakers can provide a just transition for workers and frontline communities, curtail emissions, and mobilize resources in an efficient manner.

TEN SUPPLY-SIDE CLIMATE POLICY STRATEGIES

The recently passed Inflation Reduction Act of 2022 invested a massive amount of money into demand-side climate policies. What it lacked was restrictive supply-side climate action. (In fact, parts of the bill expanded fossil fuel extraction.) Below, we provide ten complementary supply-side policy strategies crucial to achieving the United States' decarbonization goals:

1. End fossil fuel subsidies. The US government provides nearly \$15 billion dollars a year in subsidies to fossil fuel companies. Repealing existing fossil fuel subsidies is a straightforward measure to curtail supply, limit the profitability of fossil fuel firms, and even the playing field.

2. Ban new leases and permits for fossil fuel extraction on federal lands and in federal waters. One fifth of US emissions come from fossil fuel extraction on public lands. The US government should ban all new leases.

3. Reject all new fossil fuel infrastructure. Banning all new fossil fuel infrastructure projects is a crucial way to stop fossil fuel expansion on public and private lands. While a nationwide ban is ideal, state and local governments can also implement regional bans.

4. Activate local and regional climate actors to build fossil-fuel-free zones. Fossil-fuel-free zones can end all extraction, production, transportation, and use of fossil fuels in a geographic region. This not only stops new

extraction but ends existing fossil fuel infrastructure.

5. Tax windfall profits. Reining in the excess profits of oil and gas companies can ensure that they do not benefit from future disruptions in the energy market or from the potential of higher prices as the transition advances.

6. Implement a carbon cap and dividend. A well-designed carbon cap and dividend can be an important policy instrument for winding down the industry while protecting the income of low- and middle-income people.

7. Require climate-related financial risk disclosure. The Securities and Exchange Commission should require public companies to account for the effects of the climate crisis on their assets and to publicly disclose that exposure.

8. Monitor, enforce, and fix all methane leakages. The annual methane emissions threshold established by the Environmental Protection Agency—currently 5,000 metric tons—should be lowered to cover additional polluting facilities and penalties should be applied to the industry more comprehensively to address unintentional leakage and intentional flaring (fossil gas venting).

9. Ban oil and fossil gas exports. The United States is one of the top exporters of oil and fossil gas. A ban on oil and fossil gas exports will limit available fossil fuels for combustion globally.

10. Nationalize the fossil fuel industry. Public ownership could prove a powerful lifeline for the more than 1 million workers that will face the threat of unemployment and underemployment as fossil fuels are phased out. Public ownership would also ease the transition for the communities dependent on those jobs as well as ensure the proper cleanup of fossil fuel sites.

Economists' decades-long commitment to the market for climate action is unviable, and any purely demand-side solution to the climate crisis could result in an unmanaged transition that deepens inequality, uncertainty, and environmental exploitation. This is avoidable. **By coordinating demand-side investments that bring the future energy system into view with restrictive supply-side action to wind down fossil fuels,** the United States can secure rapid decarbonization in a way that protects the health and economic security of those on the frontline of the transition.

INTRODUCTION

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If the United States is to meet its climate obligations and decarbonize the economy in an orderly fashion, restrictive supply-side policies that curtail fossil fuel extraction and support workers and communities must play a role.

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In 2022, Congress passed the Inflation Reduction Act (IRA), the United States' first landmark climate bill. The legislation represented a marked departure from decades of environmental policy discussion that focused on carbon pricing and other austerity measures. Rather than force consumers to tighten their belts to curb greenhouse gas emissions, the IRA invested hundreds of billions of dollars in the economy to spur the deployment of renewable energy and the electrification of transportation and housing, two crucial sectors for decarbonization.¹

The recent shift to an investment-led decarbonization policy approach is a tremendous step forward. Thanks in large part to the rise of the Green New Deal, the Democratic party has moved past the false trade-off between a clean environment and job creation and toward an understanding of the energy transition as an *opportunity*: to not only protect the environment but also create millions of new, well-paying, union jobs.

However, the IRA's \$369 billion in climate provisions—with more available with the creation of a new green bank—constitute a mere fraction of what is necessary for the United States to meet its obligations under the Paris Agreement (recently rejoined by President Biden).² **Achieving a rapid and complete transition away from fossil fuels, one that limits warming to 1.5°C to 2°C as stipulated by the Paris Agreement and that prioritizes equity, health, and justice for frontline and fossil-fuel dependent communities, will require more than spending—it will require a managed transition through which fossil fuel use and extraction are appropriately phased out in tandem.** To adequately manage the decline in fossil fuel use, policymakers need to broaden the scope of climate actions. Critically, they need to start utilizing a key piece of the climate policy framework that has been largely left on the sidelines: *restrictive supply side policy*.

To date, restrictive supply-side interventions—limiting or halting the exploration, extraction, and transportation of fossil fuels and developing transition policies for workers and frontline communities affected by changes in fossil fuel supply—have effectively been

1. Patrick Bigger et al., “Inflation Reduction Act: The Good, The Bad, The Ugly,” Climate and Community Project, 2022. https://www.climateandcommunity.org/_files/ugd/d6378b_f05b177ba6b142aaa50ca7111a91f08b.pdf.

2. White House, “President Biden Announces the Build Back Better Framework,” October 28, 2021, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/10/28/president-biden-announces-the-build-back-better-framework>.

off the table. Instead, policymakers have assumed that policies suppressing fossil-fuel demand (a tax on greenhouse gas emissions, energy efficiency investments, electrification), coupled with policies supporting the supply of clean energy through development and deployment (government subsidies and tax credits for renewables, direct investment for clean energy, loan guarantees), would be sufficient to facilitate a transition away from fossil fuels. The IRA embodies this approach, relying primarily on carrots (investments) to facilitate decarbonization.

The math shows, however, that demand-side measures to decarbonize the economy are insufficient. In Fall 2021, the International Energy Agency—which was created 1974 to ensure “the security of the oil supply”—released a report analyzing strategies for achieving net-zero emissions within the energy sector by 2050. Their conclusions were clear: “There is no need for investment in new fossil fuel supply in our net zero pathway.” For emissions to be reduced sufficiently to meet climate targets, there can be “no new oil and gas fields approved” and “no new coal mines or mine extensions.”³ The Intergovernmental Panel on Climate Change echoed these findings, stating that addressing the climate crisis requires no new fossil fuel infrastructure—in short, no new supply.⁴

Given that emissions from already-developed fossil fuel infrastructure are incompatible with a pathway limiting warming to 1.5°C, it is critical that policymakers think twice before allowing any additional fossil fuel supply to be brought online. In fact, researchers have found that limiting warming to 1.5°C would require leaving nearly *40 percent of already-developed fossil fuel reserves unextracted*. This means that governments will not only have to cease issuing new field and mine licenses but also decommission some already-developed sites.⁵

Yet when fossil-fuel supply-side issues have arisen in the policy discourse recently, the conversations have primarily been about *expanding* existing supply. In Summer 2022, for example, as gasoline prices exceeded \$5.00 per gallon, President Biden asked the Organization of the Petroleum Exporting Countries (OPEC) to open the taps; called on fossil fuel companies holding permits to drill on public lands to rapidly expand operations (or face fines); expanded auctions of public lands and waters for extractive purposes (after promising on the campaign trail to halt such leases and initially signing an executive order to this effect); and altered the rules of the Strategic Petroleum Reserve to essentially set a floor under the price of oil, thereby encouraging more new extraction by implicitly subsidizing oil producers and ensuring their profits are guaranteed.⁶

The IRA, too, includes some supply-side measures. But rather than restrictive policies to curtail fossil fuel use, the bill includes provisions that would bolster fossil fuel supply. By mandating that oil and gas extraction leases for public lands be made available if leases for renewables are permitted, the IRA embraced an “all of the above” energy strategy in clear defiance of climate goals.

These efforts to expand supply have been driven by volatility in the energy sector as a result of Russia’s invasion of Ukraine. Not only have high energy prices contributed significantly to inflation—and thus macroeconomic instability—they have caused hardship for people struggling to heat and cool their homes and keep the lights on. **This crisis indeed necessitates a coordinated response, but an increase in fossil fuel extraction is not a sustainable solution.** For one, new extraction would not have come online fast enough to provide relief in the moment (indeed, energy prices have already come down to pre-crisis levels). For another, as

3. International Energy Agency, “Net Zero by 2050: A Roadmap for the Global Energy Sector,” October 2021, https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroBy2050-ARoadmapfortheGlobalEnergySector_CORR.pdf.

4. Intergovernmental Panel on Climate Change, “Working Group III Contribution to the Sixth Assessment Report (AR6),” 2022, https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_TechnicalSummary.pdf.

5. SEI, IISD, ODI, E3G, and UNEP, “The Production Gap Report 2021: Governments’ Planned Fossil Fuel Production Remains Dangerously Out of Sync with Paris Agreement Limits, 2021, https://productiongap.org/wp-content/uploads/2021/11/PGR2021_web_rev.pdf; Kelly Trout et al., “Existing Fossil Fuel Extraction Would Warm the World beyond 1.5°C,” *Environmental Research Letters* 17, no. 6 (May 2022): 064010, <https://doi.org/10.1088/1748-9326/ac6228>.

6. White House, “Fact Sheet: Department of Energy Releases New Notice of Sale as Gasoline Prices Continue to Fall,” July 26, 2022, <https://www.whitehouse.gov/briefing-room/statements-releases/2022/07/26/fact-sheet-department-of-energy-releases-new-notice-of-sale-as-gasoline-prices-continue-to-fall/>.

we discuss further below, new extraction will result in substantial carbon lock-in, perpetuating path dependency and creating additional obstacles to decarbonization. In short, the calls to increase fossil fuel supply are at odds with climate pledges and the globe's shared climate reality.⁷

If the United States is to meet its climate obligations and decarbonize the economy in an orderly fashion, restrictive supply-side policies that curtail fossil fuel extraction and support workers and communities must play a role.⁸ Research suggests that, without an intentional phaseout plan, fossil fuel use—and emissions—will continue indefinitely.⁹ Further, when parts of the fossil fuel sector are pushed to extinction, the repercussions are likely to be rapid and chaotic, leaving workers and fossil fuel communities at the bottom of the coal-ash heap with woefully insufficient funds to clean the social, economic, and environmental mess up.¹⁰

7. The instability in energy prices over the past year has largely arisen from an unmanaged energy sector and reflects an overreliance on volatile fossil fuels. While the long-term plan to counter this instability must include both investments in clean and renewable alternatives and a phaseout of oil, gas, and coal, short-term measures could be taken now to provide relief. For example, an effective strategy could include policies to curtail energy demand (which should provide substantial price relief given that the supply curve is relatively inelastic); support remote working (which substantially reduces miles traveled); provide a fare holiday for all public transportation, with the national government picking up the cost; encourage carpooling; and reduce the national speed limit, as was done by President Carter. See Paul Williams, Yakov Feygin, Chirag Lala, and Mitch Green, "Cooling Oil Consumption to Ease Price Pressures," Center for Public Enterprise, June 17, 2022, <https://static1.squarespace.com/static/622cca56a2f5926affd807c6/t/62ac99f83643483700f4dce/1655478777064/Cooling+oil+consumption+to+ease+price+pressures.pdf>.

8. For work detailing a just transition for workers, see J. Mijin Cha, Dimitris Stevis, Todd E. Vachon, Vivian Price, Maria Brescia-Weiler, "A Green New Deal for All: The Centrality of a Worker and Community-Led Just Transition in the US," *Political Geography* 95 (2022): 102594, <https://doi.org/10.1016/j.polgeo.2022.102594>; and Robert Pollin and Brian Callaci, "The Economics of Just Transition: A Framework for Supporting Fossil Fuel-Dependent Workers and Communities in the United States," *Labor Studies Journal* 44, no. 2 (2022): 93–138, <https://doi.org/10.1177/0160449X18787051>.

9. Richard York, "Why Petroleum Did Not Save the Whales," *Socius* 3 (2017): 2378023117739217, <https://doi.org/10.1177/2378023117739217>; Hans-Werner Sinn, *The Green Paradox: A Supply-Side Approach to Global Warming* (Boston: MIT Press, 2012).

In this report, we explain the economic rationale and climate necessity of engaging with supply-side policies that will wind down fossil fuel extraction in time to meet climate targets and do so in a managed way. First, we review the supply-side policies that have been utilized to date, demonstrating that these have often been powerful tools in meeting agreed-upon ends. Then, we explore the economic case for supply-side policies and their role as a part of a sound climate framework and an equitable transition. We argue that supply-side policies are complementary to demand-side policies and should not be understood as a substitute for green investments or other levers that can reduce demand for fossil fuels. The economic case for supply-side fossil-fuel policies is not one sided; rather, it takes the fundamental economic insight that addressing supply and demand together strengthens policy interventions. Finally, we offer examples of restrictive supply-side policies that legislators should consider to help meet climate targets and protect the communities that will be most affected by the transition to a decarbonized economy.

10. This can be observed in the collapse of the coal industry, which has utilized bankruptcy as a way to shed obligations to workers, communities, and environment cleanup.

RESTRICTIVE SUPPLY-SIDE POLICIES IN ACTION

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Restrictive supply-side policies that manage, phase out, and at times outright ban certain practices have long been recognized as legitimate policy tools to manage and protect public health, natural resources, and the environment.

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Restrictive supply-side policies that manage, phase out, and at times outright ban certain practices have long been recognized as legitimate policy tools to manage and protect public health, natural resources, and the environment. In the past four decades, lead paint and lead gasoline have been banned, asbestos and chlorofluorocarbons (CFCs) phased out, and tobacco-product marketing and sales strictly regulated. History shows that products can go fairly quickly from commonplace to banned. Moreover, many of these campaigns have utilized a range of policy tools to achieve desired ends, pairing supply- and demand-side approaches that build on one another.

Restrictions on use, for example, have proven valuable in protecting resources that are vulnerable to overexploitation, such as marine waters. Policymakers utilize a range of regulatory, supply-side approaches—licenses, quotas, and seasonally limited activity—to manage fisheries. Although overfishing remains a crisis, the Maine lobster industry offers a model of effective, participant-driven supply-side restrictions. In Maine, restrictive policies that consider worker well-being, commercial fairness, and the long-term viability of the market align multiple stakeholders to create a self-enforcing regime of effective regulation that places strict limits on the supply side.¹¹ And yet these advances will be for naught if the globe continues to warm. Rising ocean temperatures, coastal flooding, and extreme weather already threaten an industry that accounts for 40,000 jobs and more than half a billion dollars in yearly revenue.¹²

While the fishing industry often relies on quotas or limiting use to seasonal periods, outright bans have also been effective. Tobacco regulation utilizes supply-side policies, including bans on underage sales, advertising, and sponsorships. By 2009, more than 100 countries had banned tobacco advertising, promotions,

11. J. M. Acheson, “The Politics of Managing the Maine Lobster Industry: 1860 to the Present,” *Human Ecology* 25 (1997): 3–27, <https://doi.org/10.1023/A:1021979718461>. These policies have also had some drawbacks, including limiting entry for new fishermen and generating substantial wealth inequality within the industry. Care must be taken to design systems that do not financialize management of the common resource.

12. Blair J. W. Greenan et al., “Climate Change Vulnerability of American Lobster Fishing Communities in Atlantic Canada,” *Frontiers in Marine Science* 6 (2019), <https://doi.org/10.3389/fmars.2019.00579>; Madeline Greene, Mae Sefransky, Christopher Wang, and Loren McClenachan, “Diversifying Maine’s Coastal Economy: A Transition from Fishing to Kelp Aquaculture?” *Spire: The Maine Journal of Conservation and Sustainability* (2020), <https://umaine.edu/spire/2020/03/19/kelp/>.

or sponsorships as a supply-side measure to prevent the spread of tobacco use.¹³ Smoking is prohibited in many public places as well as near hospitals and schools under municipal regulation. These supply-side interventions are understood to complement restrictive demand-side policies, such as taxes and public health warnings, with an “all of the above” approach being seen as essential for combatting the harm associated with smoking.¹⁴

Restrictive supply-side action has been taken cross-nationally as well as at the local, state, and federal levels. The Montreal Protocol, for example, established in 1987 and updated nine times (most recently in 2016), commits signatories to the phaseout of ozone-depleting chemicals. The treaty stipulates that participating nations must address new scientific knowledge in future decisions about chemical uses, a provision that—along with the agreement’s firm timelines for banning chemicals—has catalyzed a wave of research into effective substitutes. Moreover, the protocol provided a framework for cooperative action that could be used again when the need arose—for example when it was discovered that hydrofluorocarbons, developed to replace ozone-depleting CFCs, had a potent greenhouse effect and also needed to be phased out.

The Montreal Protocol has proven to be an exemplar of international cooperation thanks, in part, to its

pairing of shared goals with differentiated responsibility. The Montreal framework acknowledges that the global commons has been disproportionately exploited and polluted by high-income countries and establishes a multilateral fund to assist low-income countries in financing the transition to new technologies.¹⁵ Basing policy on scientific findings, establishing clear bans, and weighing historical harm and ability to pay are all aspects of the Montreal Protocol that light the way for current climate efforts.

When it comes to fossil fuels, some countries and localities have already adopted supply-side policies to restrict extraction. France, Ireland, and New Zealand, for example, have all passed laws banning fossil fuel extraction; the Beyond Oil and Gas Alliance, co-led by France and Denmark and comprising 10 governments, is committed to the phaseout of oil and gas; and in the United States, California has passed legislation to limit where extraction can take place and will ban the sale of new gas cars by 2035.¹⁶

Not only are supply-side actions effective, they are administratively simpler. Given the limited number of large-scale producers, enforcing supply-side bans on fossil fuel extraction is a more straightforward task than policing countless downstream users, and bans may deter actors from attempting to game the system, as has been the case in the European emissions trading system.¹⁷ Other researchers highlight the fact that fossil fuel production

13. Lisa Henriksen, “Comprehensive Tobacco Marketing Restrictions: Promotion, Packaging, Price and Place,” *Tobacco Control* 21, no. 2 (2012): 147–53, <https://tobaccocontrol.bmj.com/content/21/2/147>.

14. David Levy, An-Tsun Huang, Joshua Havumaki, and Rafael Meza, “The Role of Public Policies in Reducing Smoking Prevalence: Results from the Michigan SimSmoke Tobacco Policy Simulation Model,” *Cancer Causes Control* 27, no. 5 (2016): 615–25, <https://doi.org/10.1007/s10552-016-0735-4>.

15. Multilateral Fund for Implementing the Montreal Protocol, “Homepage,” accessed February 2023, <http://www.multilateralfund.org/default.aspx>.

16. France became the first country to pass legislation banning any new fossil fuel extraction (by 2040), including prohibiting awarding any new permits to extract fossil fuels and disallowing any renewal of existing licenses past 2040. See *Agence France-Presse*, “France Bans Fracking and Oil Extraction in All of Its Territories,” *The Guardian*, December 20, 2017, <https://www.theguardian.com/environment/2017/dec/20/france-bans-fracking-and-oil-extraction-in-all-of-its-territories>. Ireland followed suit with a similar law in 2021 (see Department of the Environment, Climate and Communications, “Government to Introduce Legislation to Ban New Oil and Natural Gas Exploration and Extraction,” February 2, 2021, <https://www.gov.ie/en/press-release/ee960-government-to-introduce-legislation-to-ban-new-oil-and-natural-gas-exploration-and-extraction/>.) In 2018, New Zealand banned any new permitting for fossil fuel exploration and extraction, though it allowed current licenses to remain active until they expire (see Parliamentary Commissioner for the Environment, “Restricting the Production of Fossil Fuels in Aotearoa New Zealand,” 2018, <https://www.pce.parliament.nz/media/197015/restricting-the-production-of-fossil-fuels-in-aotearoa-new-zealand-faqs.pdf>). And, in August 2022, the California Air Resources Board voted to require that all new cars and light trucks sold in 2035 be zero emissions (see Russ Mitchell, “California Bans the Sale of New Gas-Powered Cars by 2035,” *Los Angeles Times*, August 25, 2022, <https://www.latimes.com/business/story/2022-08-25/california-ban-gasoline-mandate-zero-emission-2035>). For more information on the Beyond Oil and Gas Alliance, see Beyond Oil and Gas Alliance, “Who We are,” <https://beyondoilandgasalliance.org/who-we-are/>.

infrastructure is more easily observed by regulators—and therefore easier to police—than consumption.¹⁸

According to the Fossil Fuel Cuts Database, which provides the most comprehensive review of restrictive supply-side measures currently in force, most supply-side initiatives have taken place in countries with limited economic dependence on fossil fuel production and exports (with the exception of Canada, Norway, and US states). The database indicates not only that restrictive supply-side policies are more prevalent than previously thought, but also that they are becoming more common for jurisdictions to adopt. The rise in restrictive supply-side policies especially over the past decade show that supply-side interventions take many forms and are adaptable to different actors and economic situations.¹⁹

17. Fergus Green and Richard Denniss, “Cutting with Both Arms of the Scissors: The Economic and Political Case for Restrictive Supply-Side Climate Policies,” *Climatic Change* 150 (2018): 73–87, <https://doi.org/10.1007/s10584-018-2162-x>.

18. Fergus Green and Declan Kuch, “Counting Carbon or Counting Coal? Anchoring Climate Governance in Fossil Fuel-Based Accountability Frameworks,” *Global Environmental Politics* 22, no. 4 (2022): 48–69, https://doi.org/10.1162/glep_a_00654.

19. Nicolas Gaulin and Philippe Le Billon, “Climate Change and Fossil Fuel Production Cuts: Assessing Global Supply-Side Constraints and Policy Implications,” *Climate Policy* 20, no. 8 (2020): 888–901, <https://doi.org/10.1080/14693062.2020.1725409>.

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THE ECONOMIC CASE FOR RESTRICTIVE SUPPLY-SIDE POLICIES

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Neither demand side policies, such as carbon pricing, nor investments in green alternative energy provide a guaranteed amount of emissions reductions.

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The scale of the energy transition facing the United States is enormous. While currently the United States is substantially below the peak levels reached in 2005, emissions have to come down quickly to bring the country in line with its stated climate goals. To reach net zero, emissions will need to decline 8 percent per year from now until 2050.²⁰ Although, over the past decade, the rapid reduction in costs for renewables and storage has sparked a nearly fifty-fold increase in solar energy alone, the United States is not replacing fossil fuels with clean or renewable energy rapidly enough to meet a 1.5 to 2°C pathway.²¹

Despite economists' dreams, there is no single energy policy that can fully transform US energy production. For decades, neoclassical economists have posited carbon pricing as a silver bullet, arguing that a higher price tag on emissions would make the true cost of fossil fuel use clear and incentivize reductions in a smooth, decentralized manner.²² But economists have spent decades calculating fees and debating the range of social costs that should be included while largely ignoring key issues like the role of environmental regulation, the need for public investment (especially when markets are thin and technology still in early development), and the potential

20. In fact, these declines would only cut 90 percent of emissions. We assume land management techniques and negative emissions technology will account for the other 10 percent.

21. Solar still accounts for only 3 percent of total US energy generation while fossil fuels make up over 60 percent of US energy production. See U.S. Energy Information Administration, "What Is U.S. Electricity Generation by Energy Source?" 2021, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>; Drew DeSilver, "Renewable Energy Is Growing Fast in the U.S., but Fossil Fuels Still Dominate," Pew Research Center, January 15, 2020, <https://www.pewresearch.org/fact-tank/2020/01/15/renewable-energy-is-growing-fast-in-the-u-s-but-fossil-fuels-still-dominate/>.

22. Perhaps the clearest example of this thinking is the letter from the Climate Leadership Council, signed by thousands of economists, which argued in favor of a minor carbon price that would replace existing environmental regulations. Further, the letter called for providing fossil fuel companies with immunity from litigation pertaining to environmental and health harms associated with pollution. The magnitude of carbon pricing called for is in line with suggestions by William Nordhaus, whose numbers would result in temperature increases of 3.5°C above pre-industrial levels by 2100 and more thereafter. See Climate Leadership Council, "Economists' Statement on Carbon Dividends," January 17, 2019, <https://clccouncil.org/economists-statement/>; William Nordhaus, "Revisiting the Social Cost of Carbon," *Proceedings of the National Academy of Science* 114, no. 7 (2017): 1518–1523, <https://doi.org/10.1073/pnas.1609244114>.

Table 1: The Climate Policy Toolkit

	Supply-side	Demand-side
Restrictive	<i>Restrictive supply-side policies</i>	<i>Restrictive demand-side policies</i>
	Reduce/eliminate fossil fuel subsidies	Carbon tax/cap
	Fossil fuel supply tax (historic emissions)	Mandatory CO2 emissions standards such as CAFE and clean energy standards
	Fossil fuel supply ban/moratorium	
	Set-back regulations for extraction	
Supportive (of substitutes)	<i>Supportive supply-side climate policies</i>	<i>Supportive demand-side climate policies</i>
	Direct government provision of low-carbon infrastructure	Consumer subsidies for energy-efficient or emissions-free substitutes
	Research and development subsidies	Government procurement policies
	Renewable energy feed-in tariffs	Education campaigns
	Public investment in clean supply chains	

Table 1. The Climate Policy Toolkit, adapted from Green and Denniss 2018.

of catastrophic damages associated with climate change.²³ Price signals alone, especially the fairly small ones proposed by most economists and policymakers via a carbon tax, are far from sufficient to meet agreed upon climate goals.²⁴

To date, essentially all of the policy action to reduce emissions has targeted the demand side. This is true of carbon pricing, which seeks to lower demand through higher prices, and of increased investment, which is intended to reduce demand for fossil fuels through increasing efficiency, subsidizing renewables, and incentivizing electrification. These policies undoubtedly have an important role to play in phasing out reliance on fossil fuels; for instance, the electric vehicle tax credits, coupled with government-backed loans to electric vehicle manufacturers, were instrumental in creating a more robust market for electric vehicles.²⁵ Indeed, demand-side policy ensures that people will have viable alternatives—

carbon-free public transportation, electric vehicles—when restrictive supply-side policies are enacted. But they simply are not sufficient in the absence of those restrictive policies.

Table 1, adapted from Green and Denniss (2018), provides a framework through which we can understand various types of climate policies. On the supply side, one finds restrictive policies to reduce the use of fossil fuels, such as a ban on permits for new extraction, as well as supportive policies to increase the supply of green alternatives, such as government subsidies for continued research and development for energy storage technologies. On the demand side of the equation, there are restrictive policies, such as a carbon tax, as well as policies geared to increase demand for green alternatives, such as tax credits for electric vehicles, home heat pumps, and energy efficiency investments. In this report, we focus on the top left quadrant: restrictive supply-side measures.

23. The integrated assessment models used to calculate carbon pricing are sensitive to the modelers' assumptions, such as economic impact of climate change or updating the social cost of carbon to include the effects of particulate matter. (See Nicholas Stern and Joseph Stiglitz, "The Social Cost of Carbon, Risk, Distribution, Market Failures: An Alternative Approach," National Bureau of Economic Research, Working Paper No. 28472, 2022, <https://www.nber.org/papers/w28472>; Kevin Rennert et al., "Comprehensive Evidence Implies a Higher Social Cost of CO2," *Nature*, September 1, 2022, <https://doi.org/10.1038/s41586-022-05224-9>.)

24. For a more in-depth discussion of how the price mechanism can complement other measures, including public investments and climate regulations, see Mark Paul, Anders Fremstad, and J. W. Mason, "Decarbonizing the US Economy: Pathways Toward a Green New Deal," Roosevelt Institute, June 11, 2019, <https://rooseveltinstitute.org/publications/decarbonizing-us-economy-toward-a-green-new-deal/>.

25. These loans to manufacturers should be understood as a supportive supply-side measure.

In the current climate policy discussion, restrictive supply-side policy has been marginalized. In what follows, we examine in more detail how (1) demand policies alone are insufficient, (2) supply and demand policies are complementary, and (3) actionable supply-side policies are within reach.

LIMITS OF DEMAND-SIDE POLICIES

Demand-side policies aim to reduce domestic consumption of fossil fuels. They range from policies that make clean technology cheaper to policies that aim to ensure people pay the full price of burning fossil fuels, accounting for both the negative health impacts and the negative impacts on the planet as a whole.

But focusing on domestic consumption of fossil fuels misses half of the picture. The United States is the world's largest extractor of fossil fuels. Even if the United States stopped burning fossil fuels domestically, it would still extract and sell them on the international market, thereby continuing to act as a major contributor to the climate crisis. Given the United States' role in the global fossil fuel economy, it is not clear that reducing greenhouse gas emissions by one unit domestically would result in a net global reduction of one unit; at least some of the oil, coal, and gas that would otherwise have been used domestically will be sold and burned abroad. Researchers refer to this problem as *carbon leakages*. **As domestic demand is reduced—akin to a shift in the demand curve inwards—the price of fossil fuels, which are internationally traded commodities, may decline, thus incentivizing actors in other nations to increase their consumption of fossil fuels.**

Estimates suggest that up to *half* of reduced domestic demand of oil would be exported and burned overseas.²⁶ International leakage, therefore, if left unaddressed, will undercut hard-won emissions reduction at home. Although there would be health benefits realized locally with the reduction in combustion of fossil fuels—a crucial win for environmental justice—the

planetary benefits from reducing emissions would not be fully realized unless extraction were reduced in tandem through restrictive supply-side measures.²⁷

In fact, international leakage can plague the design of both demand- *and* supply-side policies. For example, if an exporter of fossil fuels like the United States ceases extraction, other exporting countries could increase production to take advantage of a supply crunch and the resulting rise in prices. **From a domestic standpoint, only supply and demand policies administered in concert can curb international leakages and deliver the full net emissions reductions that the United States has promised.**

Beyond carbon leakages, demand-side policies utilized in isolation face other challenges to achieving decarbonization goals. One primary hurdle is uncertainty: **Neither demand-side policies, such as carbon pricing, nor investments in green alternative energy production provide a guaranteed amount of emissions reductions.** For example, economists and energy modelers can estimate the emissions reductions of a \$50/ton tax on CO₂ emissions or a \$7,500 EV tax rebate, but there is a large degree of *uncertainty* at play, and forecasters do not have a firm-enough grip on the future to guarantee that demand-side policies will meet emissions targets. (Below, we discuss restrictive supply-side measures that can indeed provide a greater degree of certainty.)

Another major challenge at play is *carbon lock-in*. Carbon lock-in is the theory that once fossil fuel infrastructure is built, it will “lock in” —or guarantee—a certain amount of additional carbon emissions. For example, if a new gas plant is brought online, that decision will essentially “lock in” emissions for decades to come—at least until (and often beyond) initial investments are recovered.

Carbon lock-in means decisions made now will cast shadows over future generations. Historically, the lifetime of a coal plant is 50 years, while many new gas plants can be expected to run for 40 years—well past the

26. Peter Erickson and Michael Lazarus, “How Limiting Oil Production Could Help California Meet Its Climate Goals,” Stockholm Environmental Institute, 2018, <https://www.sei.org/wp-content/uploads/2018/03/sei-2018-db-california-oil2.pdf>; Tim Donaghy, “Real Climate Leadership: Why the Next President Must Prioritize a Fossil Fuel Phase Out,” *Greenpeace Reports*, June 9, 2019, www.greenpeace.org/usa/reports/fossil-fuel-phaseout; Brian Priest, “Partners, Not Rivals: Supply- and Demand-Side Policies Pursued in Parallel can Mitigate or Eliminate Leakage,” *Resources for the Future*, April 15, 2022, <https://www.resources.org/common-resources/partners-not-rivals-supply-and-demand-side-policies-pursued-in-parallel-can-mitigate-or-eliminate-leakage/>.

27. One study found that tighter emissions regulations in the United States generated \$3 in air-pollution health benefits and \$5 in climate-damage reductions for every \$1 spent on meeting existing state renewable energy requirements (See Ryan Wiser et al., “Assessing the Costs and Benefits of US Renewable Portfolio Standards,” *Environmental Research Letters* 12, no. 9 (2017): 94023. <https://iopscience.iop.org/article/10.1088/1748-9326/aa87bd/meta>; K. Vohra, A. Vodonos, J. Schwartz, E. A. Marais, M. P. Sulprizio, and L. J. Mickley, “Global Mortality from Outdoor Fine Particle Pollution Generated by Fossil Fuel Combustion: Results from GEOS-Chem” *Environmental Research* 195 (2021), 110754, <https://doi.org/10.1016/j.envres.2021.110754>).

date by which the United States has committed to achieving net zero.²⁸ Fossil fuel projects are often kept online even when alternative energy sources may be cheaper to run. Since fossil fuel infrastructure requires such large, upfront investments (fixed costs), producers will operate plants as long as daily operational costs (marginal costs) are covered by the market price of fuel, even if that price drops due to reduced demand or cheaper alternative fuels.²⁹ **In five years, a new fossil fuel pipeline may be totally unprofitable to build, but if it already exists, it will likely continue to be operated.** Thus, supply-side policy cannot be limited to ceasing to license new fields and mines; it will require decommissioning some already-developed sites.

RESTRICTIVE SUPPLY-SIDE POLICIES AND DEMAND-SIDE POLICIES TO SPUR THE GREEN ECONOMY COMPLEMENT ONE ANOTHER

As we have argued, demand-side policies have limitations in terms of fully meeting climate obligations and doing so in a just manner. **To mitigate these weaknesses, restrictive supply-side policies—policies that limit the exploration, extraction, and transportation of fossil fuels—can be deployed to complement demand-side policies. Importantly, these two sets of policies should not be understood as either/or but rather as complements that strengthen the effectiveness of each.**

Among supply-side policy's many benefits, arguably the most important is that they can actually guarantee that fossil fuels are not extracted and burned; thus, they can be deployed to better ensure climate targets are binding and achieved. For example, if the United States wants to remain within a certain carbon budget—an allowable amount of emissions—for a given year, or perhaps until it reaches net zero, then supply-side policies would be a crucial part of achieving that goal.

Like all policies, supply-side policy has limitations and challenges. One of the largest concerns is that, if used in isolation, restrictive supply-side policies will increase the price of fossil fuels. This is true—a shift in the supply curve through bans on certain types of extraction would, *ceteris paribus*, result in higher prices paid by consumers. And while some indeed advocate for substantially higher energy prices—especially in the United States, where prices tend to be far lower than in other high-income nations for goods such as gasoline—this could prove problematic

for those whose energy costs comprise a large portion of the household budget, predominantly low-income people and people of color. Furthermore, for many, measures to quickly reduce energy consumption in response to higher prices simply do not exist: People cannot will public transit into existence; or affordable electric vehicles; or denser, walkable neighborhoods into existence on their own—these alternatives require policy and planning.

Another concern is that supply-side policies will contribute to excessive profits for firms that are able to continue with extraction. If restrictive supply-side policies limit some, but not all, extractive and transportation-related activities, the firms able to continue with extraction will be able to charge artificially high prices and reap excessive profits. In this scenario, the direct financial costs associated with supply-side policies would be captured by the domestic or—more likely—international fossil fuel firms that are allowed to continue operating. This could entail geopolitical consequences, as domestic supply-side measures that do not address leakages could result in superprofits accruing to overseas producers such as OPEC and Russia. Indeed, accounting for the international context in which global energy markets operate requires that a sound foreign policy strategy is inseparable from supply-side policies.

However, many of the limitations associated with either demand- or supply-side policies can be overcome through policy design that leverages the complementary nature of the two, remedying many of the challenges either set of policies would face if utilized alone. For example, if supply and demand are reduced in tandem as the United States pursues a true path to net zero, there is no reason to expect higher prices, thus no reason to expect problems associated with excessive profits.

A complementary reduction in production and consumption will mitigate leakages as well. In this scenario, a reduction in demand will not signal international producers to increase extraction, because the price effect will be neutralized by lower volumes of fossil fuels on international markets thanks to the reduction in domestic supply. Figure 1 illustrates the relationship between demand and supply policies when coordinated.

When one adopts a dynamic view of the economy, the importance of restrictive supply-side policies—and their

28. Ryna Yiyun Cui et al., “Quantifying Operational Lifetimes for Coal Power Plants under the Paris Goals,” *Nature Communications* 10, no. 1 (October 18, 2019): 4759, <https://doi.org/10.1038/s41467-019-12618-3>.

29. Moreover, even if a fossil fuel operation goes bankrupt—perhaps because new, cheaper sources of energy arrive on the market—a new owner purchasing the costly infrastructure at a deep discount will continue to extract fuel so long as marginal costs are covered. So, even if the energy landscape renders an extraction operation economically inefficient, fossil fuel production sites remain locked in.

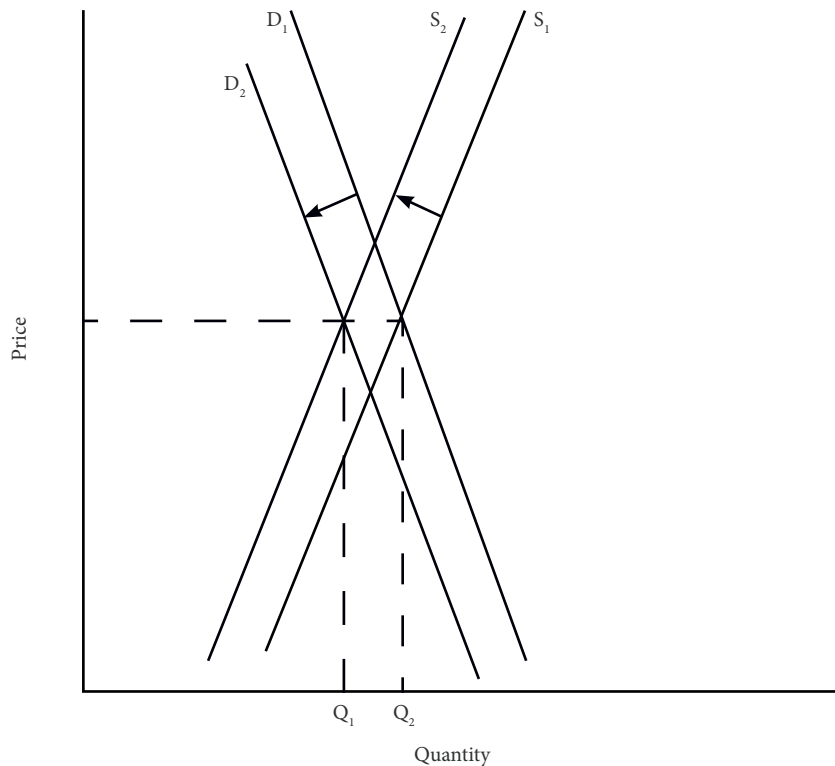


Figure 1. Shifts in the Supply and Demand Curves for Fossil Fuels. Figure 1 depicts how a shift in both the supply and demand curves would reduce the quantity of fossil fuels while keeping prices stable. A shift in the supply curve alone would result in both a smaller reduction in quantity and higher prices paid by consumers. When paired with a shift in the demand curve through complementary policies, however, the reduction in quantity can be amplified and prices held relatively constant.

complementary nature vis-à-vis demand-side policies—is even more robust. For example, supply-side policies have proven important in spurring innovation; once there is a policy environment with clear policy certainty, firms invest in research and development to meet the moment and maintain profitability.³⁰ Furthermore, as Richard York’s investigation of the historic rise in fossil fuels as a substitution for whale oil has shown, simply expanding renewables (or energy substitutes) will be insufficient to eliminate fossil fuel use, as people may increase consumption as energy becomes cheaper or more abundant (a phenomenon known as the Jevons or green paradox).

Outright bans on supply are essential to realizing benefits from technological innovation—in this case, from policies that increase the deployment of clean and renewable technology. Together, supply- and demand-side policies can reduce emissions from both a consumption and extraction standpoint and do so in ways that minimize the shortfalls of using either policy in isolation.

30. Mariana Mazzucato, *Mission Economy* (New York: Harper, 2021); Stefan Ambec, Mark A. Cohen, Stewart Elgie, and Paul Lanoie, “The Porter Hypothesis at 20,” *Resources for the Future*, 2011, <https://media.rff.org/documents/RFF-DP-11-01.pdf>.

ACTIONABLE SUPPLY-SIDE POLICIES

1. End Fossil Fuel subsidies.
2. Ban new leases and permits on federal lands.
3. Reject all new fossil fuel infrastructure.
4. Build local fossil-free zones.
5. Tax windfall profits.
6. Enact a Carbon Cap and Dividend.
7. Disclose climate-related financial risk.
8. Monitor, fix, and enforce methane leaks.
9. Ban fossil fuel exports.
10. Nationalize the fossil fuel industry.

Winding down fossil fuel extraction is an urgent challenge. Policy tools therefore should be tailored to short-, medium-, and long-term projects, actionable at the local, state, and federal levels. From ceasing to subsidize fossil fuels to building up renewables, supply-side policies should both limit new and existing fossil fuel extraction (restrictive supply-side measures) and support the development of substitutes (supportive supply-side measures). While supportive supply-side policies for green alternatives have seen substantial policy action to date—ranging from tax credits to public procurement—restrictive measures to limit fossil fuel supply remain elusive in the United States.

To date, thousands of supply-side actions have been undertaken by national and subnational governments, nongovernmental organizations, and climate activists.³¹ **While not intended to be a comprehensive list, below we provide a brief overview of restrictive supply-side actions that could be undertaken in tandem with supportive policies to facilitate a managed transition away from fossil fuels.** (We do not explore demand-side interventions, since those levers are more broadly understood and have been implemented via the 2022 Inflation Reduction Act—although at still insufficient levels.)

1. End fossil fuel subsidies. Currently, the US Government provides nearly \$15 billion dollars a year in subsidies to fossil fuel companies.³² This money is a direct handout to the very firms that fuel climate change, and the result is substantial increases in extraction—and thus emissions—in the United States. Research estimates that ending fossil fuel subsidies would yield sizable declines in extraction, especially for yet-to-be developed reserves, across the United States.³³ Repealing existing fossil fuel subsidies is a straightforward measure

31. Nicolas Gaulin and Philippe Le Billon, “Climate Change and Fossil Fuel Production Cuts.”

32. Price of Oil, “Subsidies Identified in the Sanders/Ellison *End Polluter Welfare Act*,” 2012, <http://priceofoil.org/content/uploads/2012/05/SandersSummaryFinal.pdf>. Alternative ways to calculate subsidies that include the broader social costs associated with combusting fossil fuels put the number far higher. For example, the International Monetary Fund values global fossil fuel subsidies at \$5.9 trillion, or 6.8 percent of global GDP (International Monetary Fund, “Fossil Fuel Subsidies,” accessed February 2023, <https://www.imf.org/en/Topics/climate-change/energy-subsidies>).

33. Peter Erickson, Adrian Down, Michael Lazarus, and Doug Koplou, “Effect of Subsidies to Fossil Fuel Companies on United States Crude Oil Production,” *Nature Energy* 2, no. 11 (2017): 891–98, <https://doi.org/10.1038/s41560-017-0009-8>.

to curtail supply, limit the profitability of fossil fuel firms, ensure fairer prices are paid for fossil fuels, and even the playing field with renewable energy production.

To date, numerous measures have been taken to curtail fossil fuel subsidies. Starting in 2009, President Obama worked with Organization for Economic Cooperation and Development partners to cut fossil fuel subsidies; however, after identifying \$8.7 billion in annual subsidies suitable for elimination, progress stalled, and the proposed cuts were never brought to fruition. More recently, President Biden directed federal agencies to eliminate direct fossil fuel subsidies where legally possible and to work with the Office of Management and Budget to strike all fossil fuel subsidies from any future budget request to Congress.³⁴ But ending fossil fuel subsidies will require legislation from Congress. Numerous bills have been introduced to eliminate handouts to fossil fuel firms, with the most comprehensive being the End Pollution Welfare Act (H. R. 2102 and S. 1167), which would rescind subsidies for fossil fuel extraction, prohibit taxpayer-funded fossil fuel research and development, and update royalty and lease rates to eliminate the below-market prices that currently subsidize new fossil fuel projects.³⁵

2. Ban new leases and permits for fossil fuel extraction on federal lands and in federal waters. Public lands and waters are meant for the enjoyment and benefit of all, yet today they are being leased to fossil fuel firms at extraordinary low rates. Emissions resulting from the extraction of fossil fuels on public lands account for roughly one fifth of US greenhouse gas emissions.³⁶ These actions degrade public lands and pose a major risk to public health and climate stability.

34. White House, “Executive Order on Tackling the Climate Crisis at Home and Abroad,” January 27, 2021, <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>.

35. US Congress, “H.R. 2102 End Polluter Welfare Act of 2021,” March 19, 2021, <https://www.congress.gov/bill/117th-congress/house-bill/2102>; US Congress, “S 1167 End Polluter Welfare Act of 2021,” April 15, 2021, <https://www.congress.gov/bill/117th-congress/senate-bill/1167>. Other bills have also been introduced, including the End Oil and Gas Tax Subsidies Act (H. R. 2184), which would eliminate 11 tax subsidies, including tax credits for continuing to operate marginal wells, the intangible drilling costs deduction (costs related to preparing sites and drilling that have no salvageable value) and percentage depletion; and the Ending Taxpayer Welfare for Oil and Gas Companies Act (H. R. 1517), which would onshore rental rates and royalty rates for extracting on federal land (see US Congress, “H. R. 2184 End Oil and Gas Tax Subsidies,” March 26, 2021, <https://www.congress.gov/bill/117th-congress/house-bill/2184>; US Congress, “H. R. 1517 - Ending Taxpayer Welfare for Oil and Gas Companies Act of 2021,” March 2, 2021, <https://www.congress.gov/bill/117th-congress/house-bill/1517>).

Given that climate models show that no new extraction can occur if climate goals are to be met, the United States should immediately halt all new permits and leases for extraction on federal lands and in federal waterways. Halting new extraction would have a sizable impact on emissions, reducing global CO₂ emissions by millions of tons annually.³⁷ In fact, President Biden promised to do just this on the campaign trail, and followed through with Executive Order 14008, which paused oil and gas leasing on public lands and ordered the Department of the Interior to undertake a comprehensive review of the program. Importantly, the review was directed to include potential climate impacts for new extraction. Although there are ongoing court cases to decide whether the administration can legally pause all leasing, the administration has reversed course nevertheless and restarted leases for oil and gas extraction on public lands, a move that was in direct conflict with the President’s campaign promises and environmental goals. This action was undertaken despite the fact that any new drilling will lock in additional emissions and will not have any meaningful impact on energy prices in the near term. Since the passage of the IRA, the situation has been complicated further, as the legislation requires the leasing of public land and water for fossil fuels extraction if public lands are to be leased for renewables, thus preserving a future for fossil fuels. (It may be possible for the administration to lease land to fossil fuel firms while refusing to issue permits for extraction.)

As called for in his previous executive order, the President should immediately halt all new permits on public lands. Legislative action, such as the passage of the Keep It in the Ground Act (S. 1115), should also

36. Matthew Merrill et al., “Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2000–2014,” United States Geological Survey, November 23, 2018. <https://doi.org/10.3133/sir20185131>.

37. Erickson and Lazarus, “Would Constraining US Fossil Fuel Production Affect Global CO₂ Emissions?”

be adopted. The act would ban new leases for fossil fuel extraction on public lands and waters, helping to prevent lock-in which will only deepen the current crisis.³⁸

3. Reject all new fossil fuel infrastructure. Halting new extraction on public lands is an important first step to constrain fossil fuel supply and minimize leakages, lock-in, and stranded assets as policymakers work toward a comprehensive approach to meet climate targets. Halting new extraction on public lands can, moreover, deliver immediate health benefits to frontline and indigenous communities.³⁹ However, a ban on public land leasing is far from sufficient. As scientists have made clear, no new extraction can be undertaken if climate goals are to be achieved; therefore, policymakers must consider banning all new fossil fuel infrastructure projects.⁴⁰ Disallowing fossil fuel infrastructure projects in the name of climate change, public health, and protecting ecosystems has already happened: in 2016, when President Obama and Canadian Prime Minister Justin Trudeau agreed to place the Arctic in a no-drill zone; and in 2021, when President Biden revoked permits for the Keystone XL pipeline.⁴¹

To complement policies aimed at reducing demand for fossil fuels through green investments and regulations, the government should reject all new fossil fuel infrastructure. In the absence of a universal ban, Biden should strengthen guidelines and regulations pertaining to the permitting of all new infrastructure by, for example, directing that all infrastructure be evaluated according to a climate test and rejecting projects not in line with emission reduction goals.⁴²

38. US Congress, “S.1115 Keep it in the Ground Act of 2021,” April 14, 2021, <https://www.congress.gov/bill/117th-congress/senate-bill/1115>.

39. Jessica Lau, “Fossil Fuel Extraction Is Harming Indigenous Communities, Say Experts,” Harvard T. H. Chan School of Public Health, April 20, 2022, <https://www.hsph.harvard.edu/news/features/fossil-fuel-extraction-harming-indigenous-communities/>.

40. Dan Tong, et al., “Committed emissions from existing energy infrastructure jeopardize 1.5°C climate target,” *Nature* 572 (2019): 373-377, <https://doi.org/10.1038/s41586-019-1364-3>; Christopher J. Smith, et al., “Current fossil fuel infrastructure does not yet commit us to 1.5°C warming,” *Nature Communications* 10, no. 101 (2019), <https://doi.org/10.1038/s41467-018-07999-w>.

41. White House, “Presidential Memorandum -- Withdrawal of Certain Areas off the Atlantic Coast on the Outer Continental Shelf from Mineral Leasing,” December 16, 2020, <https://obamawhitehouse.archives.gov/the-press-office/2016/12/20/presidential-memorandum-withdrawal-certain-areas-atlantic-coast-outer>. White House, “Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,” January 20, 2021, <https://www.whitehouse>.

While a nationwide ban would ideally be undertaken at the federal level, state and local governments can begin to implement local bans on new infrastructure immediately. For example, cities like Portland, Oregon, have already banned new fossil fuel infrastructure, while others, such as Petaluma, California, have banned all new gas stations. Other jurisdictions have passed, or are considering, weaker forms of fossil fuel infrastructure bans, including setbacks which mandate a certain quantity of distance between extractive activities and residential or vulnerable communities. In October 2021, California governor Gavin Newsom announced a new draft rule that would require all newly constructed oil and gas extraction sites to be located at least 3,200 feet from California homes, schools, and public parks.⁴³ However, these protections will not address the estimated 3 million Californians who live next to existing oil and gas wells, which will be allowed to continue operating.⁴⁴

4. Activate local and regional climate actors to build fossil-fuel-free zones. Supply-side policies need not exclusively be implemented from the top down. Instead, they can be bottom-up, instituted at local, state, or regional levels. The policy idea of “fossil-fuel-free zones” is based on creating geographic areas in which the extraction, production, transportation, and use of fossil fuels is prohibited. Modeled on measures of building efficiency, these zones can start modestly—a no-coal-production zone, for example—and can be built upon. Fossil-fuel-free zones can be small, created by local actors to build consensus at a micro level around a single neighborhood, city, or even building, e.g., a school. The modularity and

[gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/](https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/).

42. Kassie Siegel and Jean Su, “Legal Authority for Presidential Executive Action on Climate,” Center for Biological Diversity, December 2019, <https://climatepresident.org/Legal-Authority-for-Presidential-Climate-Action.pdf>.

43. Office of the Governor Gavin Newsom, “California Moves to Prevent New Oil Drilling Near Communities, Expand Health Protections,” October 21, 2021, <https://www.gov.ca.gov/2021/10/21/california-moves-to-prevent-new-oil-drilling-near-communities-expand-health-protections-2/>.

44. Taryn Luna, “California Lawmakers OK Buffer Zones between New Oil Wells and Homes, Schools,” *Los Angeles Times*, August 31, 2022, <https://www.latimes.com/california/story/2022-08-31/california-lawmakers-ok-buffer-zones-between-new-oil-wells-and-homes-schools>.

scalability of fossil-fuel-free zones may also make them an adaptive policy tool, like nuclear-weapons-free zones, to build partnerships, cooperation, and shared norms across borders and geographic regions. Funneling climate activism into initiatives like establishing fossil-fuel-free zones, moreover, acknowledges the combined strength of considering both supply- and demand-side policies: Establishing fossil-gas-supply-free zones or coal-use-free zones can be part of more comprehensive wind-down pathways. This approach has been facing pushback in states with conservative legislatures, however, where representatives have moved to pass preemption laws that limit the ability of localities to create fossil-fuel-free zones.⁴⁵

5. Tax windfall profits (Big Oil Windfall Profits Act & Taxing Big Oil Profiteers Act). High gas prices can be a policy roadblock in the United States, where gas is perhaps the most visible price in the economy and an important component of consumer spending. In Fall 2022, pre-Labor Day retail gas prices in the United States were the highest they had been since 2014.⁴⁶ Although prices have since come down substantially, uncertainty in energy markets remains. Further, as the energy transition ramps up, it is expected that additional market concentration will occur, and fossil fuel firms that do continue operating will have the ability to generate excess profits by utilizing pricing power (in essence, this would be a direct transfer from consumers to shareholders). This creates an opportunity for Congress to act by passing regulatory measures to rein in the excess profits of oil and gas companies, ensuring that they do not benefit from future disruptions in the energy market or from higher prices as the transition advances. Such a measure is of particular importance when it comes to the use of restrictive supply-side policies, which can result in higher prices received by producers and, in turn, higher profits.

The Taxing Big Oil Profiteers Act would increase excess-profit tax rates that incentivize big oil companies to keep gas prices artificially high. For oil and gas companies with more than \$1 billion in annual revenue, the Act would increase the corporate tax rate to 21 percent on excess profits (defined as returns above 10 percent on expenses). The bill would levy a 25 percent excise tax on stock buybacks and close tax loopholes that allow companies to understate their

45. Fergus Green, “Fossil Free Zones: A Proposal,” *Climate Policy* 22, nos. 9–10 (2022): 1356–1362, <https://doi.org/10.1080/14693062.2022.2118657>. For more on Fossil Free Zones, see Leave It in the Ground, “About Us,” accessed February 2023, <https://www.leave-it-in-the-ground.org/about/>.

46. US Energy Information Administration, “Pre-Labor Day Retail Gasoline Prices Are the Highest in the United States since 2014,” September 2, 2022, <https://www.eia.gov/todayinenergy/detail.php?id=53699>.

profits.⁴⁷ Some have proposed that the revenue be rebated back to people in the United States in order to protect consumer purchasing power and combat inequality.⁴⁸

6. Carbon cap and dividend. A hotly debated policy for decades, a carbon cap, if well designed, can be an important policy instrument for winding down the fossil fuel industry in a timely manner; and, when coupled with an equal per-capita dividend, it can protect the income of low- and middle-income people. In its simplest form, a carbon cap sets a hard ceiling on the total amount of emissions produced on an annual basis (it would require eliminating carbon offsets, which have proven notoriously ineffective). To meet emissions targets, the cap would then be reduced on an annual basis—by roughly 8 percent a year, for example—in order to meet current net-zero goals. All fossil fuel extracting and importing firms would have to obtain permits through the program. As fewer and fewer permits are offered, more fossil fuel firms will have to shut down extraction in order to comply. Over time, fewer and fewer fossil fuels would be allowed onto the market, thus limiting the supply of fossil fuels available for combustion.

In order to protect the purchasing power of consumers, the revenue raised from the program (through governmental auctioning of permits—there would be no free allocation of permits whatsoever) would be rebated back to the people. In short, everyone would get a monthly check (or balance increase on a public checking account). The net economic impacts would be progressive, with the majority of US households having more money in their pockets and cleaner air to breathe. Environmental justice concerns, often pertaining to hot spots of pollution, could be addressed in close consultation with environmental justice groups and through provisions (like a ban on permit trading) to ensure reductions occur in and around frontline communities. Though carbon caps are not often included in wind-down conversations, the establishment of clear limits on emissions will force fossil fuel production to contract; thus, they should be understood as a supply-side intervention.⁴⁹

7. Climate-related financial risk disclosure. Even the world’s prominent central bankers openly worry that the global financial system is highly vulnerable to climate-

47. United States Committee on Finance, “Wyden Unveils Taxing Big Oil Profiteers Act,” August 12, 2022, <https://www.finance.senate.gov/chairemans-news/wyden-unveils-taxing-big-oil-profiteers-act>.

48. Sean Hanlon and Trevor Higgins, “As Energy Prices Skyrocket, Congress Must Return the Oil and Gas Industry’s Windfall Profits to the American People,” Center for American Progress, April 6, 2022, <https://www.americanprogress.org/article/as-energy-prices-skyrocket-congress-must-return-the-oil-and-gas-industrys-windfall-profits-to-the-american-people>.

related losses.⁵⁰ Climate-related destruction threatens asset prices and destabilizes insurance networks, with the possibility that some fire- and flood-prone areas may become uninsurable altogether (as may be the case in Florida following Hurricane Ian). The insurance system, designed for intermittent and occasional—not frequent and systemic—losses, will struggle and potentially collapse as it absorbs climate-related losses. Insurance is not an isolated industry; rather, insurers are major investors in the money markets and banks that make up the global financial system.⁵¹ What makes climate-related financial risk systemic is the interlocking nature of market prices, asset valuation, insurance, and banking practices; the scale of climate-related risk requires a new approach to regulatory oversight, supervision, and disclosure requirements for banks, insurers, and other private companies.⁵²

Disclosing how the climate crisis may affect current assets and future revenue streams is not required of publicly traded companies. The Climate Risk Disclosure Act, proposed by Sen. Elizabeth Warren and Rep. Sean Casten would change this by empowering the Securities and Exchange Commission (SEC) to require public companies to account for the effects of the climate crisis on their assets and to publicly disclose that exposure.⁵³ SEC guidelines would provide the public access to information about the company’s fossil fuel–related assets, total emissions related to its activity, how its assets’ valuation would be affected by possible global warming pathways, and the company’s strategies for mitigating its risk exposure.⁵⁴ Given that a majority of people in the United States want the federal government to enact climate-related financial safeguards and want greater transparency about climate-affected

investment from big companies, delivering clear information to investors can potentially reward companies that are leading in decarbonizing their portfolios and accelerate a transition away from fossil fuels.⁵⁵ Disclosures are, however, just a first step; regulators can also consider placing limits to phase out the financing of future fossil fuel investments.

8. Monitor, enforce, and fix all methane leakages.

Policies can be developed to clean up the supply side so that per-unit energy production and transportation is less emissions intensive. To target methane leaks and incentivize the reduction of methane production, the Inflation Reduction Act included the first direct federal fee on greenhouse gas emissions in the form of a charge on methane emissions. The methane emissions charge begins at \$900 per metric ton of methane and increases to up to \$1,500 after two years.⁵⁶ By levying a tax on methane suppliers associated with methane leaks, the IRA’s provisions aim not at producing consumer-facing price signals like a traditional carbon tax but instead are geared to raise the cost for suppliers engaging in dirty production practices, nudging them to clean up their acts and reduce leaks.

Putting a fee on methane emissions will have powerful short-term climate effects, as methane traps 80 times more heat during the first two decades after its release than a comparable amount of carbon dioxide (though methane has a shorter atmospheric life: 8–12 years as opposed to 300–1,000 years for CO₂).⁵⁷ While this is a step in the right direction, the methane emissions charge should be strengthened, broadened in scope, and enforced with robust monitoring. The current regulation only applies to facilities emitting above 5,000 metric tons

49. For an in-depth study of the economic impacts of such a policy, see Anders Fremstad and Mark Paul, “The Impact of a Carbon Tax on Inequality,” *Ecological Economics* 163 (2019): 88–97, <https://doi.org/10.1016/j.ecolecon.2019.04.016>; for important work looking at the environmental justice dimensions of a carbon cap program, see Manuel Pastor et al., “Up in the Air: Revisiting Equity Dimensions of California’s Cap-and-Trade System,” USC Dornsife Equity Research Institute, February 2022, https://dornsife.usc.edu/assets/sites/1411/docs/CAP_and_TRADE_Updated_2020_v02152022_FINAL.pdf. It should be noted, however, that what we recommend here is not a cap-and-trade program but rather a firm carbon cap, where all permits are auctioned and no trading is permitted.

50. Mark Carney, “Breaking the Tragedy of the Horizon—Climate Change and Financial Instability,” speech given at Lloyd’s of London, September 29, 2015, <https://www.bankofengland.co.uk/-/media/boe/files/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability.pdf>; Lael Brainard, “Financial Stability Implications of Climate Change,” speech at Ceres 2021 Conference, March 23, 2021, <https://www.federalreserve.gov/newsevents/speech/brainard20210323a.htm>.

51. Adam Tooze, “Why Central Banks Need to Step up on Global Warming,” *Foreign Policy*, July 20, 2019, <https://foreignpolicy.com/2019/07/20/why-central-banks-need-to-step-up-on-global-warming/>.

52. Yevgeny Shrago and David Arkush, “Looking over the Horizon: The Case for Climate-Related Risk Supervision of Banks,” Roosevelt Institute, June 6, 2022, <https://rooseveltinstitute.org/publications/prioritizing-climate-related-risk-supervision-of-banks/>.

53. Note that companies that may be exposed to disproportionate risk may not be companies that have a particularly large carbon footprint.

54. Office of Senator Elizabeth Warren, “The Climate Risk Disclosure Act of 2021,” <https://www.warren.senate.gov/newsroom/press-releases/warren-casten-colleagues-reintroduce-bill-requiring-public-companies-to-disclose-climate-related-risks>.

55. Data for Progress, “Memo: Voters Support Climate Finance Reforms,” April 12, 2021, <https://www.dataforprogress.org/memos/voters-support-climate-financial-reforms>.

of CO₂-equivalent methane and excludes all fossil gas distribution facilities. These are both significant exemptions. The annual emissions threshold for required Environmental Protection Agency emissions (currently 5,000 metric tons) should be lowered, and penalties should be applied to the industry more comprehensively to address unintentional leakage and intentional flaring (fossil gas venting) in all aspects of production, pressing, transmission, and storage.

9. Ban oil and fossil gas exports. Currently, the United States is one of the top exporters of oil and fossil gas globally. Indeed, over 3 million barrels of oil are currently exported a day. But this has not always been the case. In fact, the United States had a ban on oil exports for 40 years, a ban that was lifted in 2015 when Republicans cut a deal with Democrats that repealed the ban in exchange for renewing tax credits for solar and wind energy.

Members of Congress and the White House are once again considering a ban on oil and fossil gas exports to protect consumers in the United States and to limit, crucially, the amount of fossil fuels for combustion globally. As discussed above, the United States could drastically reduce its consumption of fossil fuels and still exacerbate the climate crisis by continuing to extract and export fossil fuels—so-called carbon leakages. To address the issue of carbon leakages, Senators Markey, Merkley, Wyden, and Sanders have reintroduced the Block All New Oil Exports Act, a measure that would reinstate the ban on exporting US crude oil and fossil gas.⁵⁸

10. Nationalize the fossil fuel industry. The nationalization of industries in times of crisis— and in the public interest—has a long history in the United States.⁵⁹ The fossil fuel industry should be no exception. Currently, the industry poses an existential threat to the very stability of the planet, yet it continues to operate with the goal of maximizing short-term payouts to shareholders, a goal in direct conflict with the United States’ climate commitments. Maximizing returns is

indeed what private corporations do—which is precisely why the nationalization of the entire industry is essential.

For one, nationalization would neutralize, once and for all, the industry’s efforts to fight policies to address the climate crisis, thereby defeating what has proven to be a major barrier to climate action. Further, public ownership could prove a powerful lifeline for the more than 1 million workers in the industry that will face the threat of unemployment and underemployment as the industry shrinks. Nationalization would also aid the communities dependent on those jobs and facilitate the proper cleanup of fossil fuel sites. While a plan to nationalize the industry has not been seriously debated on Capitol Hill, it is a policy measure that meets the moment.⁶⁰

56. US Congress, “H. R. 5376 Inflation Reduction Act of 2022,” August 16, 2022, <https://www.congress.gov/bill/117th-congress/house-bill/5376?r=1&s=2>.

57. Alan Bus, “The Atmosphere: Getting a Handle on Carbon Dioxide,” NASA, October 9, 2019, <https://climate.nasa.gov/news/2915/the-atmosphere-getting-a-handle-on-carbon-dioxide/>.

58. Office of Senator Ed Markey, “Senators Markey, Merkley, Wyden, and Sanders Reintroduce Legislation to Ban U.S. Oil Exports,” April 23, 2021, <https://www.markey.senate.gov/news/press-releases/senators-markey-merkley-wyden-and-sanders-reintroduce-legislation-to-ban-us-oil-exports>.

59. Thomas M. Hanna, “A History of Nationalization in the United States, 1917–2009,” Next Systems Project, 2019, https://thenextsystem.org/sites/default/files/2019-09/A_History_of_Nationalization_in_the_US-Hanna-NSP.pdf.

60. For a more in-depth discussion of nationalization, see Mark Paul, Carla Santos Skandier, and Rory Renzy, “Out of Time: The Case for Nationalizing the Fossil Fuel Industry,” People’s Policy Project, 2020, <https://www.peoplespolicyproject.org/wp-content/uploads/2020/06/OutOfTime.pdf>; and Fergus Green and Ingrid Robeynes, “On the Merits and Limits of Nationalising the Fossil Fuel Industry,” *Royal Institute of Philosophy Supplement* 91 (2022): 53–80. https://discovery.ucl.ac.uk/id/eprint/10146601/1/Green_Green_Robeyns_Open%20Access.pdf.

ENACTING PATHWAYS FOR A MANAGED DECLINE

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A managed and orderly decline of the fossil fuel industry is essential not only to achieve rapid decarbonization but also to protect the health and economic security of fossil fuel workers and frontline communities.

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A managed and orderly decline of the fossil fuel industry is essential not only to achieve rapid decarbonization but also to protect the health and economic security of fossil fuel workers and frontline communities. Managing the decline, rather than assuming markets will efficiently lead to the best possible outcomes—which they will not—is crucial to both limit potential financial instability from the collapse of the industry and prioritize environmental justice concerns. When policymakers consider the various pathways to wind down the fossil fuel industry, there may indeed be competing interests at play. Here, we discuss three pathways that can be prioritized to varying degrees during the fossil fuel phaseout, all of which overlap in some areas.

1. Prioritize Emissions Reductions

When policymakers work to chart out pathways for decarbonization, one potential framework is to start with the dirtiest fuels and plants—those that emit the most greenhouse gasses per unit of energy or production.⁶¹ This was part of the thinking behind the Sierra Club’s successful Beyond Coal campaign, an effort that has drastically improved local air quality and assisted in reducing greenhouse gas emissions as coal plants are replaced with renewables or lower-emissions options.⁶² By prioritizing emission reductions, policymakers fast track the transition, ensuring emissions are reduced as quickly as possible. This approach may, however, put emissions reduction ahead of other concerns—those pertaining to environmental justice, employment, and economic efficiency, for example—as well as engage strategies that at times split the environmental movement, such as the use of nuclear power.⁶³

2. Prioritize Economic Efficiency and Cost Minimization

Traditionally, economists focus on the least costly pathway to achieve a desired outcome. In many instances, this is precisely the line of thinking that leads to the neglect of environmental justice concerns. Examples include

61. Emily Grubert, “Fossil Electricity Retirement Deadlines for a Just Transition,” *Science* 370 (2020) 1171–1173.

62. Sierra Club, “Success Stories: Big Wins Mean Cleaner Communities,” <https://coal.sierraclub.org/the-campaign/success-stories>

63. Divides over nuclear have diminished in recent years, with more actors in the environmental movement embracing the idea that nuclear plants should remain online until fossil fuel plants are shuttered. Discussions about decommissioning nuclear plants would commence thereafter.

California's failure to address pollution hot spots in its cap-and-trade program, or the erroneous idea that pollution in low-income neighborhoods or nations should be less of a priority than pollution in high-income neighborhoods or nations. This is the kind of approach that led Lawrence Summers, the then-president of the World Bank, to quip in 1992 that "the economic logic of dumping a load of toxic waste in the lowest wage country is impeccable."⁶⁴

Although we should reject criteria that rely exclusively on traditionally narrow notions of economic efficiency, this does not mean efficiency as a guiding concept should be abandoned in its entirety, especially once co-benefits and other externalities are accounted for.⁶⁵ For instance, building renewables in suitable areas and constructing high-voltage transmission lines to move energy efficiently are certainly going to be an important component of the transition. Similarly, deploying efficient technologies—for example, heat pumps rather than baseboard electric heating—is an important part of making the transition affordable. Accounting for efficiency means fewer resources needed for the transition and lower costs for consumers. Policymakers should account for efficiency during their decision-making process but should be wary of relying exclusively on what models (be they economic, energy, or integrated-assessment) find to be the most efficient pathway forward, as these models all too frequently exclude environmental- and economic-justice concerns as well as political feasibility.

3. Prioritize Health, Equity, and Just Transitions for Workers and Frontline Communities

Historically, communities with a greater degree of political capital—often wealthier and whiter communities—have been able to avoid the siting of polluting activities in

their localities. The result has been a disproportionate pollution burden placed on low-income communities and communities of color. These inequities are compounded by the fact that these communities do not reap the primary benefits from the well-paying jobs that may be created by polluters; instead, employers tend to bypass local populations while placing heavily emitting industries in communities lowers property values and contributes to poor health outcomes.⁶⁶ In order to help rectify the historic wrong of forcing health hazards on frontline communities, policymakers should prioritize health and equity concerns in any phaseout pathway, and do so in ways that directly consult environmental justice communities and incorporate their input.

This means that regulators may prioritize the phasing out of polluting activities in communities that have faced injustices under the current fossil fuel extractive economy. Such actions are already underway across scales of government, ranging from states prioritizing setbacks for vulnerable communities to President Biden's signing of Executive Order 14008, which establishes the "goal that 40 percent of the overall benefits of certain federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution."⁶⁷ Further, policymakers may want to ensure workers in the industry are properly taken care of, be it through early retirement or guaranteed employment utilizing their skills in other industries.⁶⁸

64. *New York Times*, "Furor on Memo at World Bank," February 7, 1992, <https://timesmachine.nytimes.com/timesmachine/1992/02/07/923992.html?pageNumber=80>.

65. Importantly, traditional notions of efficiency, when applied to climate policy, have been woefully incomplete, as they tend to ignore many aspects that should be accounted for, such as co-benefits. For a look at how to incorporate co-benefits into climate policy, see James K. Boyce and Manuel Pastor, "Clearing the Air: Incorporating Air Quality and Environmental Justice into Climate Policy," *Climatic Change* 120, no. 4 (2013): 801–814, <https://doi.org/10.1007/s10584-013-0832-2>.

66. Michael Ash and James K. Boyce, "Racial Disparities in Pollution Exposure and Employment at US Industrial Facilities," *Proceedings of the National Academy of Sciences* 115, no. 42 (2018): 10636–10641, <https://doi.org/10.1073/pnas.1721640115>; J. Currie, L. Davis, M. Greenstone, and R. Walker, "Environmental Health Risks and Housing Values:

Evidence from 1,600 Toxic Plant Openings and Closings," *American Economic Review* 105, no. 2 (2015): 678–709, <https://doi.org/10.1257/aer.20121656>.

67. White House, "Justice40: A Whole-of-Government Initiative," 2022, <https://www.whitehouse.gov/environmentaljustice/justice40>. For more on achieving the goals outlined in the Justice40 initiative, see Daniel Aldana Cohen et al., "Securing Climate Justice Federally: A Political Economy Approach to Targeted Investments, Environmental Justice," <https://www.liebertpub.com/doi/full/10.1089/env.2022.0047>.

68. For a brief historic overview of workers willingly embracing the destruction of their jobs in order to protect the greater good, see Brian Callaci and Mark Paul, "Memo: A Brief History of Worker Displacement," Data for Progress, December 10, 2019, <https://www.dataforprogress.org/memos/a-history-of-worker-displacement>.

CONCLUSION

The task ahead is monumental. In a relatively short period of time, a great deal of the economy—people’s jobs, their homes, and nation’s collective infrastructure—will have to be transformed to limit the reach of the climate catastrophe and live up to the promise of clean air, water, and land for all. Transitions are notoriously hard. For decades, economists have simply retorted that the market will take care of it. But that is not the case. **The fallout of an unmanaged transition, catalyzed by the exclusion of restrictive supply side policies that provide an increased degree of planning and policy certainty will produce a landscape even more riddled with inequality, uncertainty, and environmental exploitation.**

This outcome is avoidable, but—as we have sought to show in this report—restrictive supply-side policies must be part of the policy discussion. Uncomfortable conversations will need to be had, coalitions challenged, rethought, and reformed. Shutting down fossil fuel production sites means those specific jobs—often well-paying, though dangerous—will no longer be available. Tangible alternatives must be thought out and developed if workers are to be protected and persuaded by such actions. These challenges must be met head-on. Simply put, supply-side interventions are the nation’s only hope at limiting warming to 1.5°C.

Policymakers have recently embraced supportive demand-side policies (and to a lesser, but important, extent, some supportive supply-side policies) as the path forward, and indeed, a massive buildout of the green alternatives the nation desperately needs is essential. But the other side of the equation, the restrictive supply-side, cannot be sidelined. Unfortunately, most politicians have been unwilling to have these hard conversations and have failed to embrace the legislation needed to actually deliver on their promises. Such inaction—or worse, action that increases the supply of fossil fuels—seriously imperils the United States’ chances of achieving emissions goals.

This was made clear by none other than John Kerry, the US special presidential envoy for climate, who dissented from the Administration’s position of expanding fossil fuel supply. At the *TIME* 100 Summit, held in New York in June 2022, Kerry declared that building any new fossil fuel infrastructure “would be absolutely disastrous” and that it was essential to “push back hard” against any

efforts to build additional fossil fuel infrastructure.⁶⁹ While Kerry’s comments demonstrate that he is taking the issue seriously, it appears that he has not substantially influenced the administration—or the Democratic party more broadly—on the issue. At least not yet.

Fortunately, smart and actionable restrictive supply-side policies exist. Indeed, many have already been introduced in Congress. And if they are deployed in tandem with policies to boost energy efficiency and clean and renewable energy, they will help ensure a just and full transition away from fossil fuels.

69. Alejandro de la Garza, “John Kerry: ‘We Have to Push Back Hard’ on Efforts to Build New Fossil Fuel Infrastructure in Response to Rising Gas Prices,” *Time*, June 7, 2022, <https://time.com/6184946/john-kerry-2022-time100-summit/>.