June 17, 2022

U.S. Securities and Exchange Commission
100 F Street, NE
Washington, DC 20549

Attention: Chairman Gensler
Re: The Enhancement and Standardization of Climate-Related Disclosures for Investors. File No: S7- 10-22

Dear Chair Gensler and Honorable Commissioners:

We welcome the opportunity to comment on the SEC's recent proposed rule that would require U.S. publicly-listed companies to provide certain climate-related information in their registration statements and annual reports.[1]

We support accelerating the global deployment of low carbon technologies in a way that is consistent with achieving global net zero greenhouse gas emissions in the second half of this century.[2] Mapping out an effective strategy necessitates a firm knowledge of the global economy and its energy requirements, as well as an understanding of political economy – how countries are managed or governed and how they interact within the global system.[3]

We also support transparency and corporate efforts to disclose publicly their actions to address climate risks. In 2020, 92% of S&P companies published sustainability reports.[4] We encourage continued efforts by companies – public and private – to provide such information.

Over the last several years, however, there has been a growing movement encouraging SEC regulatory intervention into non-material climate disclosure. Many of those advocating for such action do so with the goal of limiting or starving capital from publicly-traded American fossil fuel companies.[5] It has been widely reported that "fossil fuel companies stand to lose" from the SEC proposal.[6] While this result may seem consistent with climate mitigation goals to the uninformed, we hold serious concerns that the proposed rule would result in the unintended

[1] Securities and Exchange Commission. "The Enhancement and Standardization of Climate-Related Disclosures for Investors," 17 CFR 210, 229, 232, 239, and 249 at https://www.sec.gov/rules/proposed/2022/33-11042.pdf.
[2] See Paris Agreement, Article 2 and 4 at https://unfccc.int/sites/default/files/english_paris_agreement.pdf.
[3] Banks, George David and Rebecca Lorenzen. "Why U.S. Climate Policy Must Focus on Addressing Global Emissions, "CRES Forum, February 4, 2022 at https://cresforum.org/wp-content/uploads/2022/02/CRES-White-Paper-vol-1-US-Climate-Global-Emissions-Feb-4-2022-1.pdf.
[4] Governance & Accountability Institute. "92% of S&P 500® Companies and 70% of Russell 1000® Companies Published Sustainability Reports in 2020, G&A Institute Research Shows," November 16, 2021, at https://www.globenewswire.com/news-release/2021/11/16/2335435/0/en/92-of-S-P-500-Companies-and-70-of-Russell-1000-Companies-Published-Sustainability-Reports-in-2020-G-A-Institute-Research-Shows.html
[5] Clifford, Catherine. ""Who stands to make and lose money if the SEC climate rule becomes law," CNBC, March 24, 2022, at https://www.cnbc.com/2022/03/23/sec-climate-rule-winners-and-losers.html
[6] Ibid.

consequence of actually increasing global emissions and related climate risks, while undermining U.S. economic and energy security. We therefore request that the SEC consider this scenario as it considers finalizing this rule.

SEC regulatory jurisdiction is constrained to a very limited subset of global market participants. If its action results in constrained capital or reduced competitiveness for U.S. firms, as alluded to in the proposed rule, it will bolster the strength of U.S. competitors, including state-owned enterprises that are often controlled by governments, a number of which are openly hostile to the United States. A reduction in market share domestically or globally by U.S. firms would likely result in a growth in global emissions as U.S. production – across all major sectors of the economy – has been found to be less carbon intensive, compared to most of the world's other major economies. U.S. manufactured products, for example, are 40% more carbon efficient than the world average.[7] Compared to two of its main geopolitical rivals, the United States is three times more carbon efficient than China and more than four times more carbon efficient than Russia.[8]

Climate risk is increased when the least carbon efficient producers of a demanded good or commodity is advantaged in the marketplace over the most carbon efficient producers. As in the case of the proposed rule, this fact is too often ignored in the pursuit of domestically-focused emissions reduction policies.

The Role of U.S. Fossil Fuels in Reducing Global Greenhouse Gas Emissions

According to an October 2021 analysis by the U.S. Energy Information Administration (EIA), global demand for oil and natural gas is expected to increase by about 50% by 2050, compared to 2020.[9] With global emissions forecast to increase because of population and economic growth, the global carbon budget associated with the Paris Agreement's 2-degree target will be exhausted several years before 2050.[10]

While hastening worldwide deployment of low carbon technology is crucial to avoid that happening, our policies must also aim at ensuring the most efficient producers meet demand – a strategy that would relieve pressure on the global carbon budget. If designed effectively, this approach could significantly reduce emissions and related climate risks. For illustrative purposes only, if the United States produced all of the goods it imports, global emissions would fall because of its relative carbon efficiency – an estimated 604 million tons of carbon dioxide or more than 10% of U.S. consumption-based emissions in 2018.[11]

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[7] Based on 2015 data. Rorke, Catrina and Greg Bertelsen. "America's Carbon Advantage," *Climate Leadership Council*, September 2020 at https://clcouncil.org/reports/americas-carbon-advantage.pdf.

[8] Ibid.

[9] U.S. "Energy Information Administration. International Energy Outlook 2021" October 6, 2021, at https://www.eia.gov/outlooks/ieo/

[10] Mercator Research Institute on Global Commons and Climate Change. "That's how fast the carbon clock is ticking," (accessed June 12, 2022) at https://www.mcc-berlin.net/en/research/co2-budget.html.

[11]

In the case of U.S. fossil fuels, multiple studies have determined that U.S. producers of oil and natural gas are among the most carbon efficient in the world.[12] For example, Russian-produced natural gas shipped by pipeline to Europe has approximately 41 percent higher life-cycle emissions (CO2 equivalent) than U.S. liquefied natural gas (LNG) shipped to the same destination, according to analysis from the U.S. Department of Energy (DOE).[13] Russian-produced natural gas shipped by pipeline to China has 47 percent higher life-cycle emissions than U.S. LNG exported to China.[14]

If the Biden administration's goal of delivering to the European Union an additional 15 bcm of LNG is met this year to help replace Russian natural gas,[15] emissions would be reduced by nearly 22 million metric tons of carbon dioxide equivalent ($mmtCO_2e$).[16] Meeting the 2030 goal would produce even greater global emissions reductions, potentially achieving cuts of 73 $mmtCO_2e$ – the equivalent of taking 16 million cars off the road.[17]

The overall GHG emissions benefits of using U.S. oil and gas instead of most foreign supply is even greater than what DOE initially found – its analysis did not account for fugitive methane emissions or flaring. While the United States is the second largest methane emitter from energy production, it is by far one of the best environment performers. The World Bank, for example, has found that only U.S. producers have successfully improved the flaring intensity of their oil production over the past decade, compared to the other top 10 flaring countries on a volume basis.[18] This finding is backed by the International Energy Agency (IEA), which tracks methane emissions from the energy sector. Compared to U.S. production, the IEA finds that the methane intensity of oil and gas production in Russia is 30% higher, Iran is 85% greater, and Venezuela is nearly 700% more.[19]

Rorke, Catrina. "The Case of Climate and Trade," Climate Leadership Council, May 2022 at Case for Climate and Trade.pdf (clcouncil.org).

[12] See Banks, George David and Rebecca Lorenzen. "U.S. Fossil Fuels Should Play a Crucial Role in Reducing Global Emissions," March 2022 at https://cresforum.org/wp-content/uploads/2022/03/U.S.-Fossil-Fuels-Should-Play-a-Crucial-Role-in-Reducing-Global-Emissions.pdf.

[13] Selina Roman-White et al., "Life Cycle GHG Perspective on Exporting LNG From the U.S. 2019 Update," *National Energy Technology Laboratory*, (September 2019). https://www.energy.gov/sites/prod/files/2019/09/f66/2019%20NETL%20LCA-GHG%20Report.pdf

[14] Ibid.

[15] See The White House. "Joint Statement between the United States and the European Commission on European Energy Security," March 25, 2022 at Joint Statement between the United States and the European Commission on European Energy Security | The White House.

[16] Byers, Dan. "The Energy Security and Emissions Twofer That Nobody Is Talking About," May 18, 2022, at https://www.realclearenergy.org/articles/2022/05/18/the_energy_security_and_emissions_twofer_that_nobody_is_talking_about_832870.html.

[17] Ibid.

[18] The World Bank. "2022 Global Gas Flaring Tracker Report," Global Gas Flaring Reduction Partnership, 2022 at 2022-Global-Gas-Flaring-Tracker-Report.pdf (worldbank.org).

[19] International Energy Agency. "Methane Tracker 2021," January 2021 at Methane Tracker 2021 – Analysis - IEA.

If the goal is to reduce global emissions, it makes little sense to pursue policies that keep U.S. fossil fuels in the ground while encouraging less efficient overseas producers to supply more oil and gas to the world market. Given the reality of increasing global demand for fossil fuels, high-performing countries, like the United States, should advance policies that reduce global emissions by maximizing their lower-emitting exports.

Conclusion

We staunchly support common sense policies based on facts to substantially cut global emissions. We are cognizant that not all actions deliver on that objective, however, regardless of intent. In this case, where valuations may decrease and cost of capital increase for carbon efficient producers, we believe it is highly likely that this proposed rule would unintentionally result in negative climate consequences. We therefore urge the SEC to do an exhaustive and transparent study to ensure its action will not result in higher global emissions and increased climate risk.

Pursuant to these comments, please see the following CRES Forum white papers attached:

- *Why U.S. Climate Policy Must Focus on Addressing Global Emissions*, and
- *U.S. Fossil Fuels Should Play a Crucial Role in Reducing Global Emissions*.

Sincerely,

George David Banks
CRES Forum Senior Policy Fellow

Marty Hall
CRES Forum Senior Policy Fellow

Why U.S. Climate Policy Must Focus on Addressing Global Emissions

CRESFORUM

Why U.S. Climate Policy Must Focus on Addressing Global Emissions

CRES Forum's "Understanding the Facts" Series, Vol. 1
February 4, 2022

Authored by: George David Banks
Rebecca Lorenzen

Reviewed by: Marty Hall
Charles Hernick
Ross Gillfillan
Phil Rossetti

This briefing paper is part of CRES Forum's **Understanding the Facts Series,** providing substantive background information on why and how conservatives should lead on climate change policy. The issues and approaches are rooted in CRES Forum's Conservative Climate Policy Directives. These directives were developed to help policymakers and the public better understand how policies can reduce greenhouse gas emissions while promoting U.S. prosperity and fostering economic growth for generations to come.

The CRES Conservative Climate Policy Directives are:

- Keep all options on the table to reduce emissions
- Lower costs, don't force prices up, unintentionally or by design
- Support American innovation
- Promote nature-based solutions
- Eliminate regulatory barriers
- Link foreign aid and trade to global emissions goals
- Encourage transparency and accountability
- Leverage public-private partnerships

THE U.S. IS DECARBONIZING

Between 2005[1] and 2020, annual global carbon dioxide (CO2) emissions grew by 5.8 gigatons (Gt) – a roughly 20% increase.[2] China accounted for about 92% of that growth.[3] In this period, the United States led the world in cutting CO2 emissions by far, falling 24% by 2020 and achieving more absolute ton reductions than the next several emissions reducing countries combined.[4] In contrast, China's CO2 emissions between 2005 and 2020 grew by 84%.[5] While U.S. emissions may go up or down on a year-

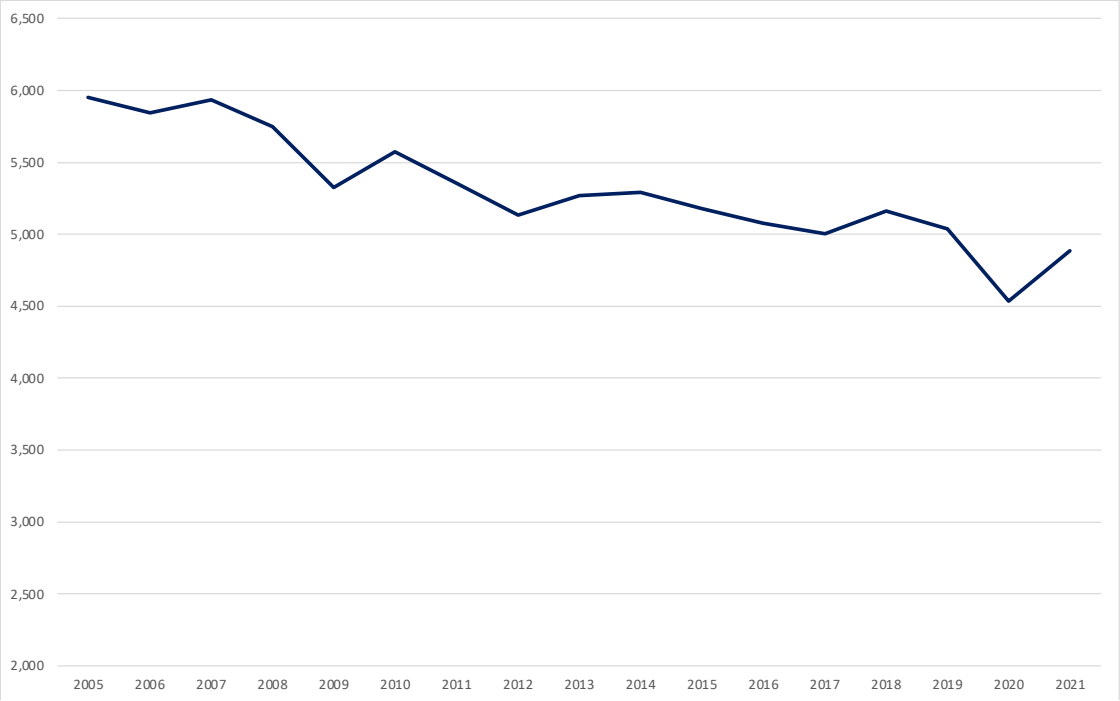

Figure 1: U.S. CO2 Emissions (MMt)
Source: Olivier and Peters, and EDGAR.

1 Not all countries use 2005 as a baseline. However, the Obama administration chose it in the initial U.S. pledge under the Paris Agreement because U.S. emissions had peaked that year.
2 Olivier, Jos and Jeroen Peters, "Trends in Global CO2 and Total Greenhouse Gas Emissions," PBL Netherlands Environmental Assessment Agency, 2020, https://www.pbl.nl/en/publications/trends-in-global-co2-and-total-greenhouse-gas-emissions-2020-report. For 2020 figures, source is data used by Olivier and Peters: European Commission Emissions Database for Global Atmospheric Research (EDGAR), https://edgar.jrc.ec.europa.eu/report_2021.
3 Ibid.
4 Ibid.
5 Ibid.

over-year basis, the U.S. economy is on a decarbonization trend – and on that trend without punitive federal regulation or a national price on carbon.[6,7]

U.S. CO2 emissions fell by 11% in 2020,[8] largely as a result of slow economic growth related to COVID-19. While increasing by roughly 6% in 2021,[9] U.S. emissions are still below pre-pandemic levels and are about 20% lower than in 2005. During 2022, the U.S. Energy Information Administration (EIA) expects U.S. CO2 emissions to continue to rebound and grow by nearly 2%, with high natural gas prices complicating the Biden administration's goal of reducing U.S. emissions by 50-52% by 2030, compared to 2005.[10] EIA forecasts that emissions will grow by only 0.5% in 2023 resulting in emissions that are still about 3% lower than pre-pandemic 2019 levels.[11]

THE DEVELOPING WORLD, LED BY CHINA, IS RESPONSIBLE FOR A GROWING SHARE OF EMISSIONS

A 2020 report published by the Climate Leadership Council (CLC) found that U.S. manufactured products are 40% more carbon efficient than the world average.[12] This finding shows the substantial progress made by the United States over the past decade as natural gas and renewables displaced coal generation. World Bank data from nearly ten years ago indicated that the U.S. economy was only 29% cleaner than the average upper-income nation, 34% cleaner than the next largest energy producer (i.e., Russia), and 46% cleaner than China.[13] Today, the average product made in China results in three times more carbon than if it were made in America.[14]

U.S. manufactured products are 40% more carbon efficient than the world average.

6 Data from Olivier and Peters (2020). See also U.S. Energy Information Administration (EIA), "EIA projects U.S. total annual carbon dioxide emissions to be lower in 2050," November 8, 2021, https://www.eia.gov/energyexplained/energy-and-the-environment/outlook-for-future-emissions.php.

7 The federal government has established a direct price for carbon emissions avoidance through the 45q tax credit and an indirect price signal through tax credits for renewable and zero-emissions technologies. Several states price carbon directly through cap-and-trade systems or indirectly through clean energy standards or renewable portfolio standards.

8 "Short-term energy outlook," EIA, October 13, 2021, https://www.eia.gov/outlooks/steo/..

9 "U.S. Economic Assumptions and Energy-Related Carbon Dioxide Emissions," EIA, 11 January 2022, https://www.eia.gov/outlooks/steo/report/renew_co2.php.

10 "Short-term energy outlook," EIA, January 11, 2022, https://www.eia.gov/outlooks/steo/. .

11 Ibid.

12 Rorke, Catrina and Greg Bertelson. "America's Carbon Advantage," Climate Leadership Council (CLC), September 2020 at https://clcouncil.org/reports/americas-carbon-advantage.pdf.

13 Comparison derived using World Bank data, "CO2 emissions (kg per 2011 PPP $ of GDP)," The World Bank. https://data.worldbank.org/indicator/EN.ATM.CO2E.PP.GD.KD

14 Rorke and Bertelson, *op. cit.*

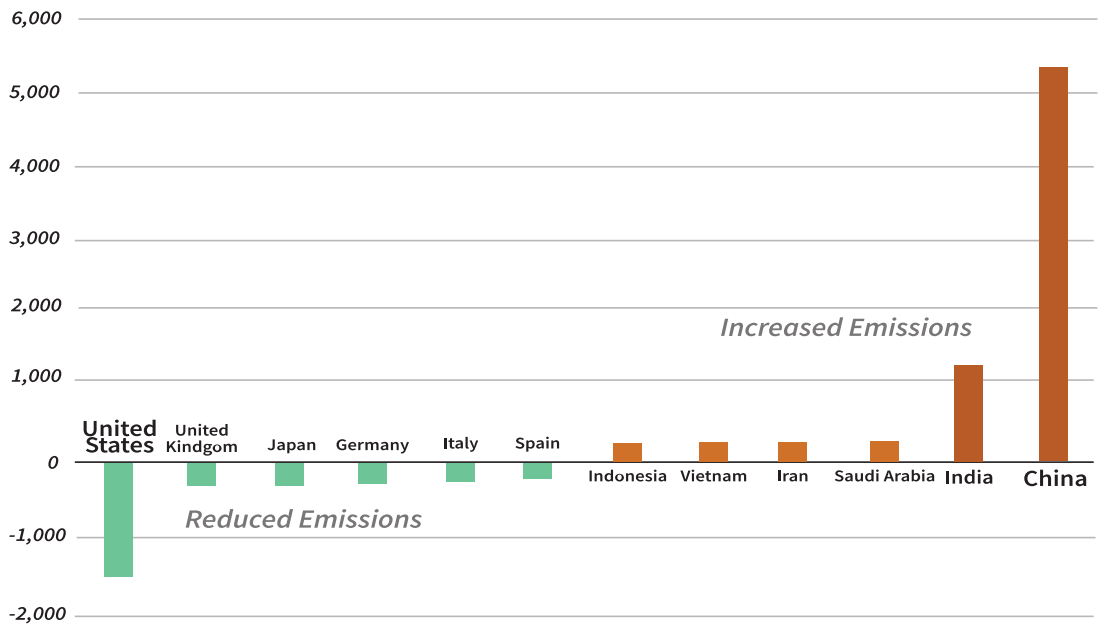

Figure 2: Change in yearly CO2 Emissions 2005 – 2020 (MMt)
Source: Olivier and Peters; EDGAR

China surpassed the United States as the largest absolute emitter around 2005.[15] Today, the level of Chinese emissions is more than twice that of the United States.[16] Total GHG emissions in China for 2020 were estimated to be around 13.8 GTCO2e, up 1.3% from 2019.[17] Given Beijing's pledge under the Paris Agreement to peak its emissions around or before 2030, we expect Chinese total GHG emissions are likely to reach roughly 14.5 gigatons in 2030, an increase of about 73% from 2005 levels.[18]

The U.S. share of global emissions will continue to decline sharply. When the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1994, the United States accounted for 23% of the world's CO2 emissions, compared to 13% for China.[19] In 2020, U.S. CO2 emissions totaled 13% of the global total, while Chinese emissions climbed to 32%.[20] As of 2019, China emitted more CO2 than all OECD countries combined.[21]

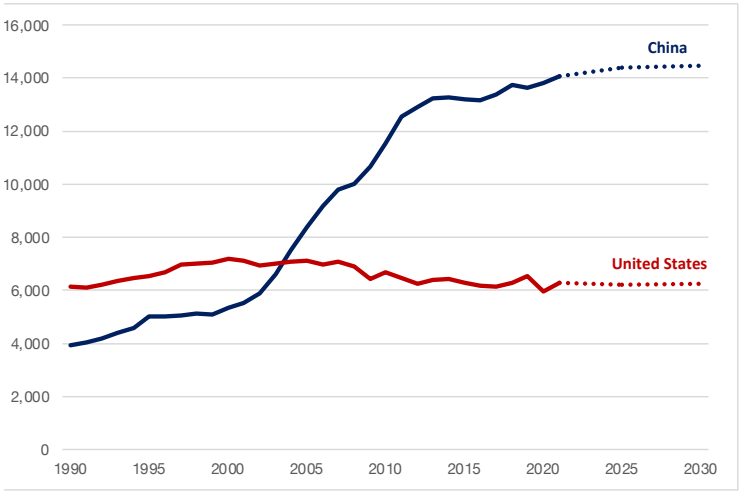

Figure 3: GHG yearly emissions comparing the U.S. and China (MMt)
Source: EDGAR; Projection data from Climate Action Tracker, https://climateactiontracker.org/

15 Olivier and Peters.
16 Ibid. .
17 "China," Climate Action Tracker, 2021, https://climateactiontracker.org/countries/china/
18 Ibid.
19 Source of data: EDGAR.
20 Ibid.
21 Kate Larsen, Hannah Pitt, Mikhail Grant, and Trevor Houser, "China's Greenhouse Gas Emissions Exceeded the Developed World for the First Time in 2019," Rhodium Group, May 6, 2021. https://rhg.com/research/chinas-emissions-surpass-developed-countries/

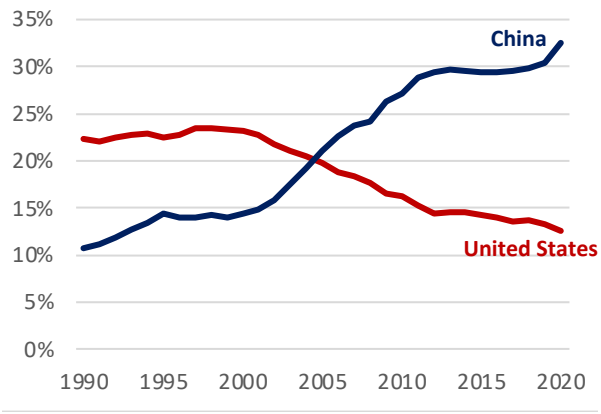

Figure 4: Global share of CO2 emissions, U.S. vs. China
Source: EDGAR

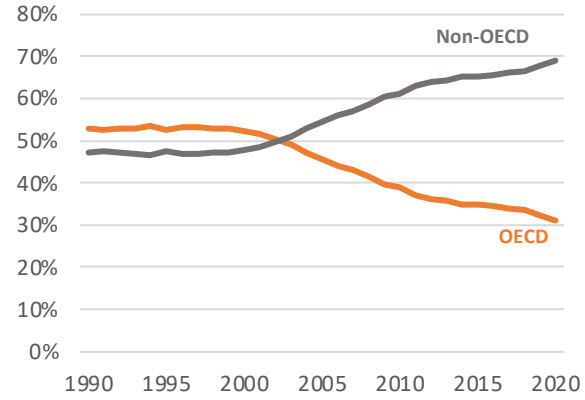

Figure 5: Global share of CO2 emissions, OECD vs. non-OECD
Source: EDGAR

Globally, non-OECD emissions are tracking a similar trend as China. Having outstripped OECD emissions in the early 2000s, non-OECD countries now represent 69% of global CO2 emissions, compared to 31% for OECD nations.[22]

CHINA'S ACTIONS AND POLICIES RUN COUNTER TO THE CONVENTIONAL WISDOM ON CLIMATE

In terms of historical, cumulative emissions since 1750, the United States is the largest contributor, accounting for a quarter of the world's total, followed by the EU-27 (17%) and China (14%).[23] Since the UNFCCC's formation, however, in 1994 (an indicator of when the world realized that global climate change was a problem that needed to be addressed), Chinese cumulative emissions have totaled 22% of the world's total, compared to 18% for the United States and 11% for the EU.[24] China's cumulative contribution to CO2 emissions since the UNFCCC's founding overtook the United States in 2013.[25]

U.S. and broader OECD responsibility will decline further as Chinese and large emerging economy (e.g., India and South Africa) emissions grow significantly over the coming decades. Given current trends, China is likely to surpass the United States as the largest historical, cumulative emitter since 1750 around 2040 – or earlier if the United States accelerates its decarbonization.[26]

This development is likely to realign international discussions on adaptation as Chinese and other non-OECD emissions become responsible for an increasing share of modern climate impacts, including those experienced in the United States. To avoid accountability, non-OECD economies are likely to maintain

22 Source of data: EDGAR
23 Source of data: Ritchie, Hannah and Max Roser, "CO2 emissions," Our World In Data, 2020, https://ourworldindata.org/co2-emissions.
24 Ibid.
25 Ibid.
26 Estimation based on current emissions trends and commitments.

the argument that their per capita emissions are lower than those of the United States, but such a position ignores a basic scientific fact: only absolute emissions are relevant to climate change.

Currently, China's domestic coal consumption accounts for 54% of the world's total, compared to the U.S. share of 6%.[27] Forecasts suggest a sharp decline in coal use in the United States and Europe as natural gas and renewables increase their penetration of the grid.[28] Demand for coal between now and 2030, however, is expected to increase substantially in parts of Asia Pacific, particularly in Southeast Asia where electricity demand is expected to grow by 70%.[29] As China continues to operate and build coal-fired power plants to meet those needs, it does so largely without any meaningful controls on carbon emissions.

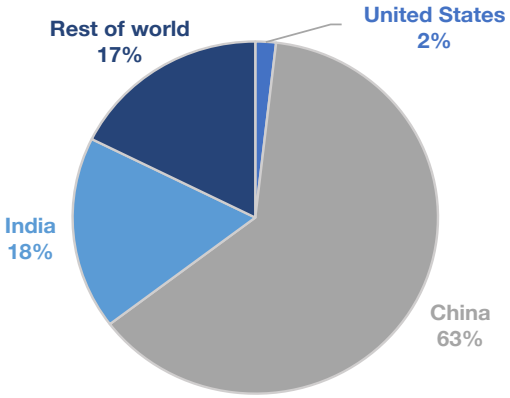

Figure 6: New coal plants built since 2010
Source: "Coal Plants by Country," Global Energy Monitor, https://globalenergymonitor.org/projects/global-coal-plant-tracker/

There are currently nearly 100 GW of new coal power plants under construction in China,[30] with an additional 163 GW announced and permitted.[31] According to press reports, the China Electricity Council, which represents the power sector, proposed greenlighting 290 GWs of new coal capacity — or more than the entire U.S. coal fleet.[32] Chinese COVID-related economic plans have only reinforced this trend.[33] While China has built many coal plants with efficient ultra-supercritical technology, these only represent 11% of the Chinese fleet, with 58% being less efficient, subcritical plants.[34] Even if China was not building new coal plants, it shouldn't be ignored that their existing coal fleet is responsible for 53 percent of the world's coal-fired power generation.[35]

China's responsibility for future global climate change is probably much higher than what its trajectory for territorial emissions suggests. While China has committed to halt financing coal-fired projects abroad without many details, it is financing 33.5 GW of foreign coal projects that are in either the construction or

27 "BP Statistical Review of World Energy," British Petroleum, 70th Edition, 2021, bp-stats-review-2021-full-report.
28 In 2021, U.S. coal use increased by 14% over the previous year because of higher natural gas prices but is expected to drop in 2022. See https://www.eia.gov/outlooks/steo/
29 Yukinori Hanada, Yuji Ohira, and Yuki Fukumoto, "Cheap Coal Swells in Southeast Asia, Foiling Global Green Push," Nikkei Asian Review, April 2019, https://asia.nikkei.com/Business/Energy/Cheap-coal-swells-in-Southeast-Asia-foiling-global-green-push
30 "Analysis: Will China build hundreds of new coal plants in the 2020s?", Carbon Brief, 24 March 2020, https://www.carbonbrief.org/analysis-will-china-build-hundreds-of-new-coal-plants-in-the-2020s.
31 "Coal Plants in China (MW)", Global Coal Plant Tracker, Global Energy Monitor, https://globalenergymonitor.org/projects/global-coal-plant-tracker/ and https://docs.google.com/spreadsheets/d/1mDLafuvyiLYezFmV6VXEnjlPcMy5QftwW4J2U3Qujk0/edit#gid=0.
32 David Stanway, "China bucking global shift from coal-fired power -environmental study," Reuters, March 27, 2019, https://www.reuters.com/article/china-environment-coal-idAFL3N21D0KE.
33 Hale, Thomas and Leslie Hook, "China Expands Coal Plant Capacity to Boost Post-Virus Economy," Financial Times, June 24, 2020. https://www.ft.com/content/cdcd8a02-81b5-48f1-a4a5-60a93a6ffa1e
34 Source of data: Global Energy Monitor, https://globalenergymonitor.org/projects/global-coal-plant-tracker/download-data/.
35 "China generated over half world's coal-fired power in 2020: study," Reuters, 28 March 2021, https://www.reuters.com/article/us-climate-change-china-coal/china-generated-over-half-worlds-coal-fired-power-in-2020-study-idUSKBN2BK0PZ.

planning stages.[36] In 2019, prior to the financing announcement, one quarter of all coal plants (102 GW) under development outside of China had committed or proposed funding from Chinese financial institutions and companies.[37]

Driven largely by China's substantial growth in emissions, even if all countries fulfill their latest Paris Agreement pledges, with some submitted shortly before COP26 in November 2021, global emissions growth will likely result in missing the Paris 2° Celsius target by 0.4 to 0.5 degrees.[38] China plans to spend over one trillion dollars on foreign infrastructure projects[39] to increase its geopolitical influence. Many of these projects are associated with high greenhouse gas emissions and will lock in emissions increases for decades.

China plans to spend over one trillion dollars on foreign infrastructure projects to increase its geopolitical influence. Many of these projects are associated with high greenhouse gas emissions and will lock in emissions increases for decades.

The failure of the international community to rein in the explosion of Chinese emissions has resulted in environmental advocacy demands for much more aggressive cuts for developed economies – net zero by 2050 or sooner as opposed to reaching the Paris goal of achieving global net zero in the second half of the century. Even if the United States and its allies reach net zero before 2050, this will not suffice to keep the global temperature increase below 2 degrees. If the world is to reach net zero by 2050, all major developed economies, including China, must drastically curtail their emissions.

Importantly, U.S. policymakers should not ignore that Chinese trade practices actively harm global innovation investments in clean energy. A 2020 Information Technology and Innovation Foundation (ITIF) report confirmed that if companies are concerned about intellectual property theft from Chinese firms, they will not invest as much in innovation.[40] Furthermore, the ITIF study found that Chinese practices of subsidizing its firms may reduce prices by shifting product costs to other parties, but unsubsidized competitors lose market share, sales, and the resources needed to invest in innovation.[41]

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36 Ilaria Mazzocco, "China's Commitment to Stop Overseas Financing of New Coal Plants in Perspective," 24 September 2021, Center for Strategic and International Studies, https://www.csis.org/analysis/chinas-commitment-stop-overseas-financing-new-coal-plants-perspective.
37 Melissa Brown and Tim Buckley, "IEEFA China: Lender of last resort for coal plants," Institute for Energy Economics and Financial Analysis, January 2019, http://ieefa.org/ieefa-china-lender-of-last-resort-for-coal-plants/.
38 "Addendum to the Emissions Gap Report 2021," United Nations Environment Program (UNEP). For the Emissions Gap Report 2021, see https://www.unep.org/resources/emissions-gap-report-2021. See also "Emissions Gap Report 2018," UNEP, 2018, https://www.unenvironment.org/resources/emissions-gap-report-2018.
39 Chatzky, Andrew and James McBride, "China's Massive Belt and Road Initiative," Council on Foreign Relations, Updated January 28, 2020. https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative
40 Atkinson, Robert D., "Innovation Drag: China's Economic Impact on Developed Nations," Information Technology & Innovation Foundation, (January 2020). https://itif.org/publications/2020/01/06/innovation-drag-chinas-economic-impact-developed-nations
41 Ibid.

U.S. policymakers should not ignore that Chinese trade practices actively harm global innovation investments in clean energy.

Reports by the United States Trade Representative have also highlighted harmful and unfair Chinese conduct such as joint venture requirements, whereby companies are forced to transfer their valuable technologies to joint ventures that they do not control in order to gain market access.[42] In sectors such as electric vehicle manufacturing, which have rapidly developed in recent years, technology transfer pressures have intensified.[43] The international community's refusal to enforce trade rules when it comes to China weakens the ability of true innovators in market economies to discover and deploy next-generation clean energy solutions.

42 Office of the United States Trade Representative, "Findings of the investigation into China's acts, policies, and practices related to technology transfer, intellectual property, and innovation Under section 301 of the trade act of 1974," 22 March 2018, https://ustr.gov/sites/default/files/Section%20301%20FINAL.PDF. See also United States Trade Representative, "2020 Report to Congress on China's WTO Compliance," January 2021, https://ustr.gov/sites/default/files/files/reports/2020/2020USTRReportCongressChinaWTOCompliance.pdf.
43 Ibid.

CONCLUSION

U.S. policies that do not recognize global facts will fail to address global emissions. Further, domestic policies that result in higher energy costs or more expensive production of goods are unlikely to be adopted overseas, therefore failing to reduce global emissions.

While the United States should maintain its leadership in reducing GHGs, any national climate policy should principally seek to advance innovation and technology that can economically address overseas emissions without offshoring U.S. jobs and emissions. In addition, any domestic policy should recognize the carbon efficiency of developing and producing resources and goods, compared to global competitors, particularly China and Russia.

Current proposals that focus on U.S-only territorial approaches do not address the larger challenge of overseas emissions. These policies result in diverting resources from the advancement of reliable, affordable, exportable, and low-carbon technologies and resources necessary to tackle global emissions. Reckless policies also risk imposing substantial costs on the U.S. economy and its competitiveness while producing no real climate benefit for the United States. These misguided approaches ignore the facts and increase global emissions.

U.S. climate policy should emphasize innovation at home and the export of technologies, resources, and services to accelerate the deployment of cleaner and economically viable low carbon energy systems overseas. Policymakers should seek openings to expand opportunities for innovation, particularly for breakthrough technologies that enhance U.S. competitiveness and strengthen economic security. The U.S. government should encourage other countries to eliminate barriers and disincentives to innovation and to the import of cleaner, more GHG efficient U.S. natural resources and manufactured products.

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"Understanding the Facts" analyzes the state, challenges and opportunities of U.S. climate policy from a conservative perspective. The series' insights and recommendations are rooted in the framework provided by the *CRES Conservative Climate Policy Directives*. These eight tenets apply core conservative principles to solutions addressing America's growing concern over climate change, so that policy makers can act responsibly, more effectively, and without sacrificing our long-held national ideals.

Climate policy from a conservative perspective leverages some of America's unique natural, political, economic, technological, and market-based advantages to solve global challenges without inflicting unnecessary harm on the American economy or our way of life. We evaluate how well a policy reflects this, and therefore it's likely longterm effectiveness, based on three primary criteria:

1. Reduce global emissions, not the American economy
2. Cut energy prices, not energy choices
3. Export American innovation, not American jobs

U.S. Fossil Fuels Should Play a Crucial Role in Reducing Global Emissions

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This briefing paper is part of CRES Forum's **Understanding the Facts Series**, providing substantive background information on why and how conservatives should lead on climate change policy. The issues and approaches are rooted in CRES Forum's Conservative Climate Policy Directives. These directives were developed to help policymakers and the public better understand how policies can reduce greenhouse gas emissions while promoting U.S. prosperity and fostering economic growth for generations to come.

The CRES Conservative Climate Policy Directives are:

- Keep all options on the table to reduce emissions
- Lower costs, don't force prices up, unintentionally or by design
- Support American innovation
- Promote nature-based solutions
- Eliminate regulatory barriers
- Link foreign aid and trade to global emissions goals
- Encourage transparency and accountability
- Leverage public-private partnerships

U.S. Fossil Fuels Should Play a Crucial Role in Reducing Global Emissions

KEY FINDINGS

Displacing foreign fossil fuels with cleaner U.S.-produced fossil fuels would produce global environmental benefits and bolster U.S. economic and national security. Often overlooked as a tool to reduce greenhouse gas (GHG) emissions, intra-fuel switching — an option acknowledged by the IPCC[1] — would encourage importers to shift from "dirtier" coal, natural gas, and oil to "cleaner" coal, natural gas, and oil, based on their life-cycle GHG footprints. In contrast to the traditional view of fossil fuel switching (e.g., coal to natural gas), intra-fuel switching does not typically require major changes to an economy's energy system, allowing more immediate emissions reductions at a relatively low cost.

Western nations that produce fossil fuels would likely benefit from this policy framework and gain global market share, given the fact that their consumers already place a high value on environmental quality and many corporations are making immediate investments and voluntary commitments to further reduce GHG emissions. Conversely, state-owned enterprises would likely suffer as importing markets choose fuels that are cleaner. Such an approach would drive efficiency gains across the global fossil fuel supply chain, encouraging industry to invest in advanced technologies and adopt best practices—such as measures that reduce methane emissions.

[1] Bruckner et al., "Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change," Chapter 7.5, Intergovernmental Panel on Climate Change, 2014, https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter7.pdf.

Global demand for fossil fuels is increasing for the foreseeable future

A well-informed climate strategy requires a firm understanding of how global energy demand impacts global greenhouse gas (GHG) emissions.[2] Worldwide energy demand is expected to rise considerably through 2050, with overall energy use increasing by 47 percent from 2020 levels.[3] Overall global fossil fuel use will rise 27 percent from today's levels by 2050. Fossil fuels will represent a lower share of the total energy mix from today's levels, which stand at 81 percent, but in 2050 they will still account for about 70 percent of total energy use: liquids (28 percent), natural gas (22 percent), and coal (20 percent).[4] Rapid growth in renewable technology is expected at 165 percent, but it is limited to only 26 percent of total energy use.[5]

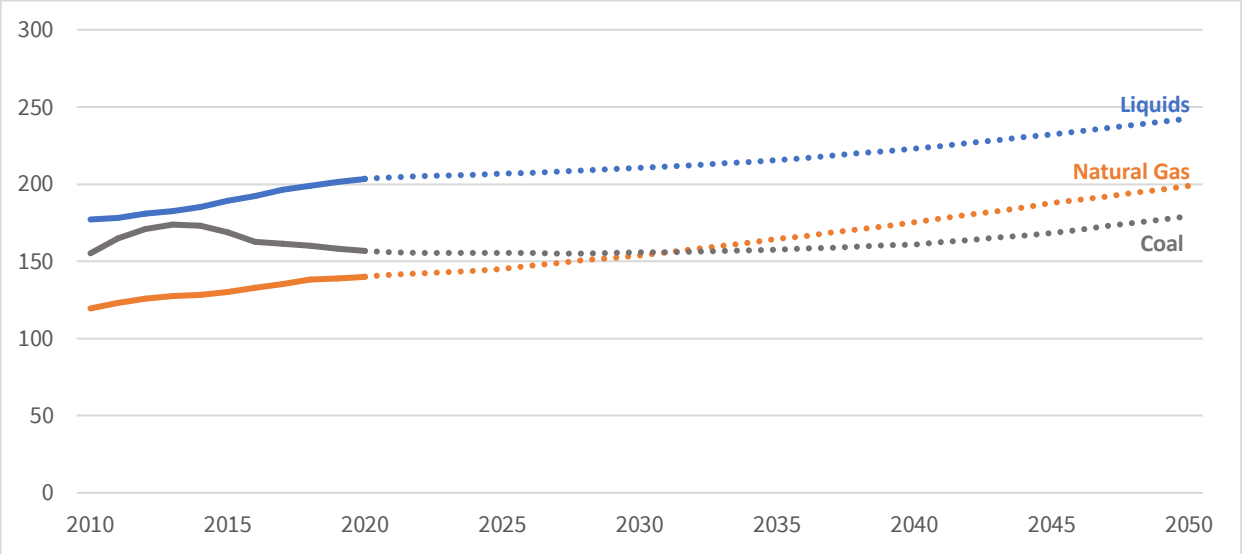

Figure 1: Projected global fossil fuel use (quad BTU)

Source of data: U.S. Energy Information Administration (EIA), "International Energy Outlook 2021," 2021, https://www.eia.gov/outlooks/aeo/data/browser/#/?id=1-IEO2021&&sourcekey=0.

Intra-fuel switching can reduce emissions

The IPCC suggests multiple opportunities to reduce energy sector GHG emissions. These include energy efficiency improvements and fugitive emission reductions in fuel extraction, energy conversion, transmission, and distribution systems; deployment of low-GHG energy supply technologies such as renewable energy, nuclear power, and CO2 capture and storage (CCS); and fossil

[2] Carbon dioxide (CO2) emissions are by far the largest contributor to global GHGs — 75 percent, compared to 17 percent for methane and 6 percent for nitrous oxide. HFCs, PFCs, and SF6 (fluorinated gases) account for the remaining 2 percent (with data from the World Resource Institute's ClimateWatch platform, https://www.climatewatchdata.org/data-explorer/historical-emissions?historical-emissions-data-sources=cait&historical-emissions-gases=all-ghg&historical-emissions-regions=All%20Selected&historical-emissions-sectors=total-including-lucf%2Ctotal-including-lucf&page=1). In the United States, CO2 accounted for 80 percent of the country's GHG emissions in 2019, followed by methane at 10 percent, 7 percent from nitrous oxide and 3 percent from fluorinated gases (with data from "Greenhouse Gas Inventory Data Explorer," Environmental Protection Agency (EPA), https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/gas/all).

[3] "International Energy Outlook 2021," U.S. Energy Information Administration, 2020, https://www.eia.gov/outlooks/ieo/.

[4] Ibid.

[5] Ibid.

fuel switching.[6]

Fossil fuel switching	Substituting high-emitting fossil fuels such as coal with fossil fuels that have a lower emissions profile, such as natural gas.
Intra-fuel switching	Within a fossil fuel type such as natural gas or coal, switching to a variety of the same fuel that has a lower emissions profile, depending on geographic origin, production process, or technologies utilized.
Carbon Capture, Utilization and Storage	Reducing the carbon footprint of the fossil fuel production process by capturing the CO2 emitted and storing or utilizing it either on- or off-site.
Efficiency	Modifying the way that fossil fuels are used, so that less fuel is needed to produce the same amount of energy, which reduces their carbon footprint.
Deployment of low-carbon energy technologies	Increasing the proportion of renewable, nuclear, or hydroelectric power production in the energy mix.

Table 1: Pathways to significantly reducing emissions from fossil fuels

While all the IPCC's recommendations are worth consideration, one suggestion has received scant attention: intra-fuel switching (i.e., using cleaner sources of coal, liquids, or natural gas from a GHG perspective).[7] To date, the policy debate on the benefits of fuel switching has almost entirely focused on replacing coal use with natural gas or renewables.[8] Conventional coal-to-gas fuel switching, for example, has delivered substantial low-cost climate benefits and is estimated to be responsible for around 65 percent of U.S. emissions reductions between 2005 and 2019.[9]

Unlike a conventional coal-to-gas shift, intra-fuel switching does not require an overhaul of a nation's energy system. Consequently, the policy can offer GHG reductions more quickly and at a lower cost for economies that face obstacles in securing alternative fuel supplies or are unable to quickly construct requisite infrastructure (e.g., terminals, pipelines, and power plants). Further, because reductions can be achieved earlier, the cumulative benefits may be comparable to alternative policies that may not be fully implemented for several years.

Economically advanced nations, like the United States, typically have lower GHG life-cycle emissions associated with their economic activity, including fossil fuel production.[10] Moreover, clean technologies and practices tend to be more widely adopted in market economies where the private sector has

[6] Bruckner et al., op. cit.
[7] Ibid.
[8] Ibid.
[9] "Electric power sector CO2 emissions drop as generation mix shifts from coal to natural gas," U.S. Energy Information Administration (EIA), 9 June 2021, https://www.eia.gov/todayinenergy/detail.php?id=48296.
[10] "Environmental Rule of Law: First Global Report," United Nations Environment Program, January 2019. https://www.unenvironment.org/resources/assessment/environmental-rule-law-first-global-report

stronger incentives to be more efficient — in contrast to many state-owned operations.[11] Intra-fuel switching should further incentivize industry to invest in technologies and practices that reduce life-cycle emissions in extraction, production, and transportation of fuels (e.g., addressing methane emissions).

Importantly, the GHG life-cycle emissions of coal, natural gas, and oil vary by supplier — often significantly. For example, Russian-produced natural gas shipped by pipeline to Europe has approximately 41 percent higher life-cycle emissions (CO2 equivalent) than U.S. liquefied natural gas (LNG) shipped to the same destination (Figure 2).[12] Russian-produced natural gas shipped by pipeline to China has 47 percent higher life-cycle emissions than U.S. LNG exported to China (Figure 2).[13] In addition, heavy oil produced in Venezuela has 50 percent higher life-cycle emissions than light oil produced in Wyoming (Figure 2).[14]

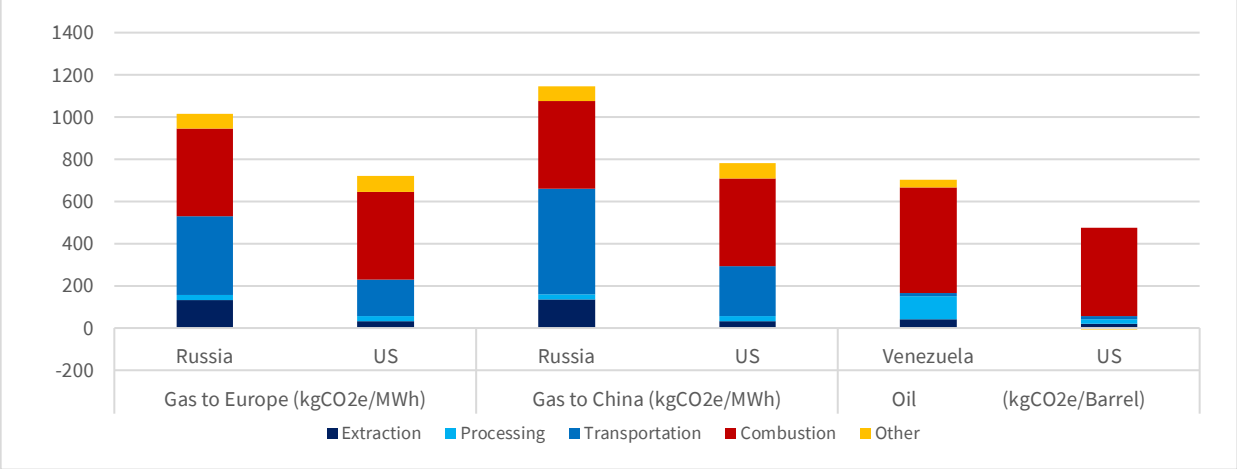

Figure 2: 20-year life-cycle emissions from fossil fuels, U.S. vs competitors

Source of data: Deborah Gordon et al., "Know Your Oil: Creating a Global Oil-Climate Index," Carnegie Endowment for International Peace, (March 2015). http://oci.carnegieendowment.org/ and Selina Roman-White et al., "Life Cycle GHG Perspective on Exporting LNG From the U.S. 2019 Update," National Energy Technology Laboratory, (September 2019). https://www.energy.gov/sites/prod/files/2019/09/f66/2019%20NETL%20LCA-GHG%20Report.pdf.

The potential emissions reductions from intra-fuel switching are significant. For example, if the European Union (EU) replaced its Russian natural gas for electricity production with U.S. natural gas, the associated global emissions would fall approximately 72 million metric tonnes annually.[15] For comparison, the EU estimates that it needs to reduce its emissions by 78 million metric tonnes each year to reach its 2030 targets.[16] In the case of China's projected imports of Russian gas via a recently completed pipeline, associated global emissions would be approximately 65 million metric tonnes

[11] Nick Loris, "Free Economies Are Clean Economies," Conservative Coalition for Climate Solutions, 2021, https://www.c3solutions.org/wp-content/uploads/2021/04/Free-Economies-are-Clean-Economies-4.pdf.
[12] Selina Roman-White et al., "Life Cycle GHG Perspective on Exporting LNG From the U.S. 2019 Update," National Energy Technology Laboratory, (September 2019). https://www.energy.gov/sites/prod/files/2019/09/f66/2019%20NETL%20LCA-GHG%20Report.pdf.
[13] Ibid.
[14] Deborah Gordon et al., "Know Your Oil: Creating a Global Oil-Climate Index," Carnegie Endowment for International Peace, March 2015, http://oci.carnegieendowment.org/.
[15] Assuming 35 percent of EU electricity generated from natural gas is sourced from Russia (244 million megawatt hours) and 297 kgCO2e lower life-cycle emissions per megawatt hour from U.S. supply.
[16] This estimate is linked to the EU's previous 2030 target – not its most recent. "Gas 2019," *International Energy Agency*, 2019, https://www.iea.org/reports/market-report-series-gas-2019.

higher annually than if China instead imported U.S. LNG.[17]

Comparable data related to thermal coal production is not as readily available, but evidence indicates that Chinese and other foreign coal is more emissions intensive than U.S. or Australian produced coal. Most coal mines in China are deep, and coal seams are highly impermeable, unlike those in the United States and Australia.[18] A simple comparison of coal mining emissions relative to production in 2015 indicates that Chinese and Russian coal mines, respectively, emitted 144 percent and 123 percent more methane per ton of coal produced than U.S. mines.[19] It should be noted that the global coal fleet increased by about 45 gigawatts (GW) in 2021, more than half of it driven by coal plant deployment in China.[20]

	Russia	China	Australia	U.S.	World
Methane from Coal Mining Activities (MtCO2e)	61.3	665.1	25.4	67.6	966.9
Coal Production (million tonnes oil equivalent)	184.5	1,827	275	455.2	3,830.1
Methane emissions per tonne of coal production (MtCO2e)	0.332	0.364	0.092	0.149	0.252
Mining Emissions Relative to U.S. Production	+123%	+144%	-38%	N/A	+69%

Table 2: Comparison of methane emissions relative to coal production, 2015

Source of data: Global Methane Initiative (GMI), https://www.globalmethane.org/methane-emissions-data.aspx, https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.globalmethane.org%2Fgmi-methane-data-epa.xlsx&wdOrigin=BROWSELINK; and BP Statistical Review of World Energy, July 2021, https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html.

Encouraging a race-to-the-top in climate performance

Understanding the climate impacts of *forgoing* intra-fuel switching, or promoting it in the wrong direction, could help avoid uninformed policies that increase global emissions. For example, opposition to pipelines in New York has led to increased fuel imports from Nigeria and natural gas imports from Russia.[21] As these energy sources have higher life-cycle emissions compared to U.S. energy supplies, anti-pipeline regulations in New York, which impede the flow of domestically produced natural gas, have resulted in higher GHG emissions.[22]

Nonetheless, promoting intra-fuel switching as a climate mitigation tool is likely to face hurdles, though

[17] Assuming a heat rate of 7,822 Btu per kilowatt hour (as reported by EIA), 38 billion cubic meters of natural gas delivered (1.34 trillion cubic feet), and 365 kgCO2e higher life-cycle emissions per megawatt hour.
[18] Scott Miller et al., "China's Coal Mine Methane Regulations Have Not Curbed Growing Emissions," *Nature Communications*, (January 2019). https://www.nature.com/articles/s41467-018-07891-7
[19] "BP Statistical Review of World Energy," *British Petroleum*, (2021). https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2021-full-report.pdf.
[20] Source of data: "New Coal-fired Capacity by Country," Global Energy Monitor, https://globalenergymonitor.org/projects/global-coal-plant-tracker/,
[21] Malik, Naureen, "Amid an Export Boom, the U.S. Is Still Importing Natural Gas," Bloomberg, (December 2018). https://www.bloomberg.com/news/articles/2018-12-27/amid-an-export-boom-the-u-s-is-still-importing-natural-gas
[22] Yudichak, John, "To help working class, Democrats must recognize value of low-cost energy," Lehigh Valley Live, (November 2019). https://www.lehighvalleylive.com/opinion/2019/11/to-help-working-class-democrats-must-recognize-value-of-low-cost-energy-opinion.html

they are not insurmountable. Aside from reporting, monitoring, and verification requirements for determining life-cycle footprint, countries would be more likely to increase intra-fuel switching if they received emissions reduction credit for doing so. This change in policy would necessitate revising the way the international community tracks emissions. Current accounting is generally based on the production of GHG emissions within a country's territory — and not consumption of GHG emissions embodied in imports, considering life-cycle emissions.

Example: Country X currently imports Country Y's natural gas, which is more GHG intensive but cheaper than natural gas from Country Z. Because of existing accounting rules, Country X has fewer incentives to fuel switch to the less GHG intensive feedstock from Country Z. However, if accounting includes consumption of emissions, including those embodied in imports, Country X would have more inducement to intra-fuel switch to Country Z's gas — action that would reduce Country X's total emissions.

Incumbent producers with relatively high life-cycle GHG emissions for their fossil fuels would likely reject intra-fuel switching or changes in emissions accounting. On the international scene, opponents would likely include those that lack adequate environmental standards and are heavily dependent on fossil fuel exports for government revenue. Many major oil producers, for example, consistently rank poorly in environmental performance.[23]

	Fuel Exports as % of Merchandise Exports, 2020	Crude Oil Exports, 2020 (in Billions of Dollars)	Yale Environmental Performance Index (EPI) Ranking, 2020 (out of 180)
Iraq	100% (2016)	$50.8	106
Venezuela	98% (2013)	$3	59
Algeria	96% (2017)	$7.4	84
Angola	95% (2019)	$20.2	158
Libya	95% (2018)	$5.6	123 (2018)
Kuwait	93%	$28.3	47
Nigeria	89%	$25.2	151
Azerbaijan	87%	$9.4	72
Qatar	82%	$12.8	122
Brunei	82%	$1.3	46
Sudan	82% (2011)	$0.3	130
Oman	75% (2018)	$15	110
UAE	71%	$47.9	42
Iran	69% (2018)	$1.3	67

[23] Hutt, Rosamond, "Which Economies are Most Reliant on Oil," World Economic Forum, (May 2016). https://www.weforum.org/agenda/2016/05/which-economies-are-most-reliant-on-oil/

Saudi Arabia	68%	$113.7	90
Kazakhstan	58%	$23.7	85
Russia	42%	$72.6	58
Norway	49%	$22.7	9
Canada	19%	$47.6	20
United States	13%	$50.3	24

Table 3: Comparison of value of crude oil exports, fuel export dependency, and environmental performance

Source of data: (1) World Bank, "Fuel exports (% of merchandise exports)," https://data.worldbank.org/indicator/TX.VAL.FUEL.ZS.UN, consulted 2 February 2022; (2) Daniel Workman, "Crude oil exports by country," https://www.worldstopexports.com/worlds-top-oil-exports-country/, consulted 2 February 2022; and (3) Yale 2020 Environmental Performance Index (EPI), https://epi.yale.edu/epi-results/2020/component/epi.

Besides the emissions benefits of intra-fuel switching, the geopolitics of fossil energy would shift in favor of Western suppliers. While centrally planned economies would certainly continue to play a major role in supplying the global economy with fossil fuels, economies with strong democratic institutions and relatively stringent environmental standards would likely become more important exporters. Significantly, allies and partners of the United States would grow less dependent on fossil fuel suppliers that use energy as a political weapon or benefit from energy revenues that ultimately fund aggressive military behavior or terrorism.

Conclusion

Widely ignored, intra-fuel switching provides economies a lower-cost option to reducing GHG emissions more immediately; most efforts would simply entail switching to cleaner suppliers in contrast to the infrastructure investment needed for conventional fuel switching (e.g., coal to natural gas). While emissions reductions flowing from intra-fuel switching have limits, policies that promote it would encourage industry, including state-owned enterprises, to invest in transformative technologies like carbon capture and storage and methane capture on a voluntary basis. These policies would also accelerate the adoption of best practices, such as energy efficiency improvements and addressing methane emissions. Accordingly, intra-fuel switching could have a significant indirect impact on decarbonization of the fossil fuel sector.

Like any policy, of course, winners and losers would emerge. In general, private sector energy producers are cleaner from a GHG perspective — the most efficient of them would be well poised to gain global market share. Producers in the United States, Australia, and Norway would particularly benefit from a change in the emissions accounting of fossil fuel emissions — one that captures consumption of life-cycle emissions and credits importers for buying less GHG intensive energy supplies. Losers would include industry and state-owned enterprises that have failed to adopt higher environmental standards, most of which are headquartered in centrally planned economies.

Ironically, policies aimed at curtailing fossil fuel production in nations that produce fossil fuels with the lowest life-cycle emission rates, such as the United States, could result in increased global emissions, as rapidly developing nations increase their energy imports from suppliers that have higher GHG

footprints. Sound climate policy should recognize that intra-fuel switching and further differentiation of fossil fuels in terms of environmental performance, as suggested by the IPCC, is an important tool in the overall effort to reduce global emissions. Given the reality of increasing global demand for fossil fuels, high-performing countries, like the United States, should advance policies that reduce global emissions by maximizing their lower-emitting exports. For their part, importing countries should implement policies that acknowledge the positive environmental impact of selecting cleaner producers when fossil fuels are purchased. And by doing so, it would open the door to a race to measurably reduce greenhouse gas emissions utilizing readily available technologies and methods.