

POLICY BRIEF

**RECOMMENDATIONS
FOR THE NEW
ADMINISTRATION**

Low-Carbon Fuels: How to Use U.S. Infrastructure and Exports to Deliver Cleaner Energy to the World

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This brief is part of a series of policy recommendations for President-elect Joe Biden's incoming administration. Focusing on a range of important issues facing the country, the briefs are intended to provide decision-makers with relevant and effective ideas for addressing domestic and foreign policy priorities. View the entire series at www.bakerinstitute.org/recommendations-2021.

As the incoming U.S. administration leads the United States back into the Paris Climate Accord, there can be little doubt that countries and their citizens around the world are demanding cleaner fuels, both for electric power generation and transportation. But the share of electric energy being produced by wind and solar is a small fraction of power consumption, and an even smaller percentage of energy used for transportation. Both the U.S. Energy Information Administration¹ and the International Energy Agency² forecast that other fuels will continue to be needed in the U.S. and worldwide for decades to come. But where will these fuels come from, and will they help or hinder the world in meeting the Paris climate goals?

In the absence of cleaner alternatives available at scale now, some countries are doubling down on building more coal plants, which are locking in the dirtiest of fuels for years to come. China, which is powered mostly by coal,³ has nearly 250 gigawatts (GW) of new coal-fired power plants now under construction or development, more than the entire existing coal power capacity of the United States.⁴ While this figure may

change when China issues its 14th five-year plan (FYP) in early 2021, China is already moving ahead with new coal-fired power outside of China. As part of its Belt and Road Initiative, China is building or planning more than 300 coal plants outside of China, including in Turkey, Vietnam, Indonesia, Bangladesh, Egypt, and the Philippines.⁵

TRIGGERING THE TRANS-ATLANTIC "GREEN GAS" WAR?

The U.S. can and should take a leadership role in producing and exporting cleaner fuels to the world, including biomethane (or renewable methane), hydrogen, biomass-based diesel fuels, and reduced-carbon liquefied natural gas (LNG). No country is better positioned than the United States to supply these cleaner fuels. Deploying existing U.S. infrastructure—including millions of miles of pipelines already carrying natural gas, hydrogen, biomethane, CO₂ and other commodities relevant for cleaner energy, numerous current and potential onshore and offshore sites for carbon capture, use and sequestration (CCUS),



The world is demanding cleaner fuels. The U.S. is uniquely positioned to take the lead in providing them.

Using its existing infrastructure and skilled workforce, the U.S. can reassert its leadership role not just in energy, but in providing the world with cleaner energy.

and scores of major energy processing and export facilities—and the deep human capital that already exists in the country's energy workforce, gives the United States a unique opportunity to provide cleaner fuels to the world. Re-asserting the United States as a leader, not just in energy, but in providing cleaner energy, is not just good for the climate and good for U.S. jobs, it can also be a means of promoting freedom and independence for those countries that would otherwise be forced to rely upon traditional fuels supplied by Russia, China, and other less-democratic countries.

However, the U.S. is at risk of losing its competitive edge and newfound role as an energy exporter in competition with Russia and others. LNG, which has helped make the U.S. a net energy exporter, has half the CO₂ of coal and could significantly help reduce CO₂ emissions by supplanting new coal-fired power plants in China and around the world. Yet concerns about withdrawal of the EPA rule governing methane emissions, together with a lack of action to ban or limit routine flaring of natural gas, have led some of our allies to turn toward purchasing natural gas and LNG from countries other than the U.S. In the past few months alone, Germany's Uniper has announced that it was backing away from plans to build a new import facility intended to receive LNG from the U.S. due to "lack of interest" by natural gas buyers who are currently served by Russia's Gazprom; France's Engie backed out of a pending contract to purchase LNG from a U.S. producer; and Ireland's three largest political parties withdrew their support for the Shannon LNG terminal, which was intended to receive LNG from the U.S.

These developments risk triggering a "trans-Atlantic green gas war." This is a war that the U.S. should want to fight and win, both for a cleaner climate and to protect U.S. jobs and geopolitical relationships. But to win, the U.S. needs to take concrete steps to make sure that energy exported from the U.S. is preferable to available alternatives, not just in price but also in carbon emissions and content.

U.S. EXPORTS OF CLEANER FUELS

There are several ways that the U.S. can use existing technology and existing energy infrastructure to produce and deliver cleaner fuels. One example is to capture biomethane (or renewable gas) from organic waste or landfills. The feedstock is fed into an anaerobic digestion reactor that produces biogas, which is then upgraded to biomethane and can be injected into the natural gas grid. SoCalGas has announced plans to deliver renewable gas as 5% of its natural gas stream in 2022, increasing to 30% by 2030.⁶ Biomass-based diesel fuels can also be produced from biomass,⁷ and can be blended with other fuels for transportation and heating. By using feedstock that would otherwise be wasted, both biomethane and biomass-based diesel lower the net carbon content of the fuels with which they are blended.

Hydrogen is another fuel that can be used on its own or as a "drop-in fuel" that can be blended with natural gas to lower the carbon content of the natural gas.⁸ SoCalGas has announced plans to blend hydrogen with its natural gas, with up to 20% of the gas stream consisting of hydrogen.⁹ Hydrogen blended with natural gas can be exported in an LNG cargo, or together with ammonia, another cooled liquid. Japan has announced plans to build a dedicated liquid hydrogen carrier.¹⁰ Whether the hydrogen is "green" (i.e., produced from water using wind and solar power), or "blue" (i.e., produced from natural gas with much of the carbon removed through CCUS), hydrogen has substantially less carbon than most other fuels. The U.S. Gulf Coast is replete with facilities for liquefying, storing, and loading gases onto vessels, though siting and financing new hydrogen interstate and export facilities would benefit from clarification of licensing and regulatory authority.

Lastly, natural gas can be produced with significant amounts of carbon eliminated through technological and operational improvements upstream and throughout the transportation and processing stages. Such steps would include restricting methane emissions and eliminating routine flaring.

Remaining carbon can be sequestered or used through CCUS, or can be offset through the purchase of carbon offsets. The result could be that LNG produced and exported from the U.S. would be as clean or cleaner than LNG produced anywhere else, and significantly cleaner than coal or oil.

KEY RECOMMENDATIONS

These fuels all have significantly lower carbon content (in some cases, zero) than many of the fuels they would compete with worldwide. Moreover, they can be produced and exported using technology and infrastructure that already exists. The Biden administration can have a material impact in encouraging industry to take the steps needed to make the U.S. the leader in producing and exporting these cleaner fuels. Some of the actions the new administration could take to make this happen include:

By Executive Authority:

1. Create a center of expertise (Center) in the federal government for carbon accounting. With participation by industry and academic representatives, the Center would develop a common set of measurement, reporting, and verification (MRV) standards to quantify greenhouse gas (GHG) emissions and reductions. Coordinate with other countries to ensure consistency in MRV standards. The Center would build on the January 27, 2021, executive order signed by President Biden to encourage climate-smart agricultural practices that produce verifiable carbon reductions and sequestrations,¹¹ and could be similar to that prescribed in the Greenhouse Gas Technical Assistance Provider and Third-Party Verifier Certification Program proposed in recent bipartisan legislation.
2. Jump-start adoption of MRV standards by requiring that all sellers of energy to the federal government provide an MRV statement of the carbon emissions and content of the energy provided. As a purchaser, the government may include such a requirement in its terms

of purchase without legislation. Once companies set up their internal systems to provide such an accounting, other purchasers may require the same data.

3. Adopt through the EPA methane emissions rules that reflect our climate obligations.
4. Prohibit routine flaring and venting (i.e., other than for emergency or safety purposes) on federal lands. Promote the World Bank's Zero Routine Flaring by 2030 Initiative and encourage states and companies to agree to follow those principles for non-federal leases.

By Legislation:

5. Adopt a carbon dividend/tax plan with a border adjustment mechanism. By pricing carbon, the U.S. would be incentivizing producers to invest in carbon reduction and offsetting mechanisms. A border adjustment would be necessary to protect U.S. producers and consumers from competition by other producers around the world whose products are not subject to a carbon tax.
6. Clarify the licensing and regulatory authority for hydrogen interstate pipelines and export facilities, and CO₂ interstate pipelines.
7. Expand tax benefits for investment in all forms of carbon abatement, including producing reduced-carbon fuels such as biomethane, biodiesel, hydrogen, and reduced carbon natural gas. Tax benefits could be similar to those for CCUS in Section 45Q of the Internal Revenue Code, which provides a credit per ton of carbon oxide that is captured and buried, used in enhanced oil recovery or utilized (e.g., in petrochemicals).

Countries and people around the world are demanding cleaner fuels now, not just decades from now. The United States is uniquely positioned to help meet these demands, and with meaningful actions from the new administration, can do so.

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