Industrial Innovation Initiative

a partnership between Great Plains Institute and World Resources Institute

Industry Policy Options for Inclusion in COVID-19 Economic Recovery Legislation

The Industrial Innovation Initiative (I^3) recommends the provisions outlined in the document below for inclusion in future congressional economic recovery legislation aimed at addressing the impacts of COVID-19 on key industrial sectors in the United States. These recommendations focus on fostering a robust recovery through federal investments that stimulate economic activity and create and maintain jobs in the near term, while putting American industry on a long-term path to deep emissions reductions, high-wage job retention and creation, technology leadership and economic competitiveness.

I^3 convenes key industry, NGO, and other stakeholders, together with state officials, to create new economic opportunities and drive emission reductions in key industrial sectors of Midwestern and Gulf Coast states that make up the Midcontinent region, home to the greatest concentration of industrial production in the U.S.

The proposed recommendations aim to advance the mission of I^3 to incentivize investment in low-carbon technologies, processes, products and markets within the industrial sector, prioritizing key areas for long-term emissions reductions, including:

- Low- and zero-carbon process heat (e.g. blue and green hydrogen and electrification);
- Carbon capture, transport, utilization and geologic storage;
- Energy efficiency and materials management; and
- Other innovative industrial applications and practices that can reduce emissions well below current best practices and establish pathways to decarbonize the industrial sector by midcentury.

I^3's priority recommendations are the following:

- Allow a direct pay option for energy efficiency, clean energy and industrial tax credits that help reduce industrial carbon emissions;
- Eliminate 45Q tax credit eligibility thresholds for industrial facilities and carbon utilization projects that deter technology innovation and emissions reductions;
- Authorize funds for a temporarily expanded DOE cost-share program for commercial-scale technology demonstrations, front-end engineering and design (FEED) studies, and saline geologic storage sites;
- Enhance financial support for early stage deployment of clean industrial technologies by removing barriers to the Title 17 DOE loan guarantee program, and revise eligibility criteria to include key industrial technologies;

- Lower the cost of investing in new production lines for designated clean technologies by renewing and expanding the Section 48C Advanced Manufacturing Tax Credit Program;
- Enhance technical assistance for the deployment of commercially available industrial decarbonization technologies through DOE's Better Buildings, Better Plants Initiative;
- Expand block grant funding for states to support industrial efficiency, with increased funds for states that establish programs that help build market demand for low-carbon products; and
- Augment investment in research, development and pre-commercial demonstration (RD&D) of innovative industrial emissions reduction technologies.

These recommendations would provide assistance for projects at all levels of development—from later stage research and development to commercial-scale deployment—so that innovation for breakthrough technologies and projects currently underway are not halted due to current financial challenges and market uncertainty. The recommendations also identify multiple established policies that should be expanded to provide additional resources and to include innovative technologies specifically related to reducing industrial emissions, including hard-to-decarbonize sectors long neglected by federal policy.

In crafting these recommendations, I^3 was guided by four criteria: 1) near-term potential to drive economic activity and preserve and create well-paying jobs; 2) support investment in and deployment of industrial technologies, processes and infrastructure that will reduce emissions and enhance competitiveness in a future low-carbon economy; 3) can be implemented quickly, relying on existing authority and avoiding the need for further rulemaking or guidance procedures, where possible; and 4) have prospects for broad bipartisan support.

Recommendations

Allow a direct pay option for clean energy and industrial tax credits that help reduce industrial carbon emissions.

Proposal: Allow project developers the option to receive a direct cash payment from the U.S. Treasury in lieu of monetizing clean energy and industrial tax credits that help foster industrial emissions reductions. This should apply to the following: Section 45Q for geologic storage and beneficial utilization of captured carbon; renewable electricity production under Section 45; and Section 48 investment tax credit for solar, power plants, combined heat and power, fuel cells, energy efficiency, and other energy and industrial technologies that support decarbonization of industrial sectors (includes the 48C Advanced Manufacturing Tax Credit recommended for reauthorization below).

Background

Direct pay offers project developers the option of a cash payment, which can be provided in the form of an estimated payment on the tax return of the taxpayer claiming the credit. Direct pay would reduce costs and expand the number of projects financed by avoiding the complexities, inefficiencies and additional costs required to monetize tax credits and secure private investment through tax equity transactions. A significant portion of tax credit value provided by the federal government to incentivize the development and deployment of clean energy and industrial technologies is lost to the many transaction costs of tax equity finance and to the financial margin demanded by tax equity investors to invest in projects. That margin can be particularly high for emerging, less commercialized energy and industrial technologies, which can create a significant barrier to financing the very technologies we most need to deploy.

In times of crisis, such as the current COVID-19 pandemic, direct pay offers the additional benefit of providing a near-term alternative to securing tax equity investment when such markets are severely constrained due to COVID-19. Clean energy and industrial projects are presently struggling to secure tax equity investment on favorable terms, and many face risk of cancellation due to delay and the potential of missing deadlines to qualify for tax credits. For example, the Clean Air Task Force recently identified 32 publicly-disclosed commercial-scale carbon capture and storage projects spanning multiple industries that are now under active development in response to the newly revamped 45Q tax credit. At little or no additional cost to the Treasury, direct pay would help these and other projects secure financing and move forward to construction despite the economic crisis, safeguarding urgently needed investment and jobs in the near-term, while ensuring the long-term environmental, technology and competitiveness benefits that will come from economy-wide deployment of these technologies. In addition, incorporating sound labor standards and enhanced utilization of domestically manufactured content into clean energy and industrial projects benefiting from direct pay can further help sustain and grow domestic energy, industrial and manufacturing sectors and the high-quality jobs associated with them.

There is growing bipartisan support in Congress for direct pay, and interest and momentum have increased in the wake of the COVID-19 crisis. Majority members of the House Ways and Means Committee introduced the Growing Renewable Energy and Efficiency Now (GREEN) Act, H.R. 7330, on June 25th. The GREEN Act provides a direct pay option for Sections 45, 45Q and 48 tax credit programs, available to all qualifying projects (based on the placed in service or beginning construction date, depending on the credit) for as long as that credit is authorized by Congress and for the full number of years allowed to claim the credit (in the case of Sections 45 and 45Q).

Eliminate 45Q tax credit eligibility thresholds for industrial facilities and carbon utilization projects that deter technology innovation and emissions reductions.

Proposal: Eliminate the minimum annual eligibility thresholds for qualifying industrial facilities and for carbon utilization projects, which are 100,000 and 25,000 metric tons of carbon dioxide (CO2)/carbon monoxide (CO), respectively.

Background

The original federal Section 45Q tax credit program restricted eligibility to facilities that capture 500,000 metric tons of CO_2 or more annually. In the legislation to reform and expand 45Q enacted in early 2018, some project eligibility thresholds were lowered to enable greater participation by industrial and direct air capture facilities and by carbon utilization projects, while the 500,000-ton threshold remained for electric power plants. 45Q was also expanded to apply to CO, in addition to CO_2.

Since the passage of the 45Q reform, it has become evident that even these lower thresholds limit the universe of facilities with opportunities to deploy commercial carbon capture and utilization and preclude early stage commercial demonstration of entire classes of carbon management technologies, especially in the emerging and exciting realm of carbon utilization to produce low and zero-carbon fuels, chemicals, concrete and other building products, advanced materials and other beneficial products from captured CO_2 and CO feedstocks.

For example, in the Midwestern and Gulf states alone, eliminating the 100,000 industrial facility threshold would result in an additional 1,470 industrial facilities (70 percent of the facilities in the region) being eligible for the 45Q incentive for implementing carbon capture technology. In addition, eliminating the 25,000-ton carbon utilization threshold would immediately expand opportunities to advance first-of-its-kind and earlier stage commercial demonstrations of carbon utilization technologies in a range of sectors.

The current thresholds in statute are a legacy of the original 45Q program and serve no obvious public policy purpose. Decisions about project scale should be left to developers and investors in carbon capture and utilization projects who seek to optimize the scale of their projects based on factors such as technology, markets, and incentive and regulatory policies and to design projects to be as large as feasible, while managing commercial, technology and other risk. Also, the cost and complexity of qualifying for, participating in, and complying with a tax credit program provide a practical disincentive to the development of very small projects.

Industrial facilities covered by this recommendation include all industrial and direct air capture facilities with potential to capture CO_2 or CO, other than electric generating units as defined by the 45Q statute.

Appropriate funds for a temporarily expanded DOE cost-share program for commercial-scale technology demonstrations, front-end engineering and design (FEED) studies, and saline geologic storage sites.

Proposal: Appropriate funds to support a robust and temporarily expanded DOE cost share program on an 80/20 federal/non-federal basis to finance the following:

- Commercial-scale demonstration of ($17.5 billion):
  - Industrial and power plant carbon capture, carbon utilization and direct air capture projects, especially prioritizing large-scale carbon capture and utilization demonstration projects in industrial sectors that have not received prior funding and that lack domestic commercial-scale demonstrations to date (e.g. steel and cement) and
  - Other innovative industrial technologies and processes beyond carbon capture;
- FEED studies for commercial-scale industrial and power plant emissions reduction projects to reduce industrial carbon emissions, prioritizing technologies and sectors that have not received prior funding and lack domestic commercial demonstrations to date ($1 billion); and
- Development of large-scale commercial saline geologic storage facilities and associated CO_2 transport infrastructure to serve as hubs for multiple carbon capture and utilization projects and industries in different regions ($2.5 billion).

Background

It requires long lead times to advance capital-intensive industrial technologies from concept to demonstration to commercialization, and there is very little federal policy support for first through fifth-of-a kind commercial demonstration of particular technologies. This makes it challenging, even in normal economic conditions, to attract private investment to scale up such technologies in the marketplace, creating what is often referred to as the “valley of death” for emerging technologies. To make matters worse, commercial demonstration of industrial technologies have not been prioritized relative to power and transportation.

As we seek to emerge from COVID-19 and the ensuing economic crisis, technology demonstration cost-share could create new jobs in significant numbers by enabling large projects to begin construction, while simultaneously proving out long-term commercial pathways to decarbonization. The Carbon Capture Coalition recently released preliminary analysis from the Rhodium Group showing that each carbon capture retrofit project at representative industrial facilities and power plants will generate hundreds to thousands of high-wage, high-skill jobs. FEED studies also make an important economic recovery contribution because they provide the third-party validation of project costs required for such jobs-intensive projects to be financed and

move forward, yet FEED studies are among the most challenging components of a project to pay for prior to financing.

Finally, industrial and power carbon capture projects will need long-term availability of large-scale saline geologic storage sites and CO_2 infrastructure, the near-term development of which can stimulate private investment and generate employment. Laying the groundwork for CO_2 transport and geologic storage hubs is essential to the development of a broader commercial carbon capture industry, which would support high-value jobs across entire regions and multiple industries adversely impacted by COVID-19, while also enabling longer-term carbon management at scale.

Enhance financial support for early stage deployment of clean industrial technologies by removing barriers to the Title 17 DOE loan guarantee program and revise eligibility criteria to include key industrial technologies.

Proposal: Help developers of industrial decarbonization projects access DOE loan guarantees under Title 17 by taking the following steps:

- Provide increased Title 17 administrative funds for two years to reduce application and third-party advisor fees for potential borrowers ($25 million);
- Cover the cost of credit subsidies for two years across all Title 17 technology areas to lessen or eliminate this cost burden for potential borrowers, thus helping to ensure near-term stimulus impact and ease closing costs for project developers, while encouraging them to navigate the program in a timely manner ($2.6 billion);
- Allow federal grants, including direct cash grants such as those made to support large-scale deployment from DOE's Offices of Fossil, Nuclear, and Renewable Energy and Energy Efficiency, to count toward developers' equity contributions for all projects;
- Make certain state financing entities eligible to use the program, similar to Section 1807 of the American Energy Innovation Act, S.2657;
- Remove the requirement in the 2009 Omnibus Appropriations Act that restricts project developers from receiving both a DOE loan and a federal grant;
- Eliminate the requirement for carbon capture, utilization and storage projects to employ new or significantly improved technologies, so existing commercial carbon capture technologies that are not widely deployed are included; and
- Amend Title 17 to clarify that industrial applications beyond carbon capture and efficiency that are identified in the introduction above are eligible for the program.

Background

The Title 17 Innovative Clean Energy Loan Guarantee Program was established under EPACT 2005. It aims to mitigate financing risks for first-of-a-kind projects by providing loan guarantees for up to 80 percent of the eligible cost of the project.

Unfortunately, multiple structural barriers currently exist in the Title 17 program, discouraging industry from utilizing the program. This includes high application fees, third-party advisor fees, credit subsidy costs, and restrictive project equity requirements. As a result, the program currently has more than $23 billion remaining in unutilized lending authority.

Application and third-party advisor fees for potential borrowers alone can easily exceed $2 million per project. Even larger are credit subsidy costs, which are calculated as the net cost to the government over the life of the loan. While Congress has appropriated funds to lessen or eliminate this cost burden for other government lending programs, they remain a significant barrier to accessing loan guarantees under Title 17.

In addition to addressing these and other structural barriers, Congress should ensure that innovative industrial projects can access the Title 17 loan guarantee program by revising the program's eligibility criteria to explicitly include the types of industrial technologies and processes described in the introduction above.

Lower the cost of investing in new production lines for designated clean technologies by renewing and expanding the Section 48C Advanced Manufacturing Tax Credit Program.

Proposal: Revive the now expired 48C Advanced Manufacturing Tax Credit program and expand eligibility to include facilities that manufacture industrial goods for innovative production processes that produce greenhouse gas emissions well below current best practices and expand eligible transportation fuels to also include fuels from carbon capture and utilization and waste-based sources. Qualifying 48C projects should also be eligible for direct pay, consistent with the first recommendation above. ($8.1 billion)

Background

The American Recovery and Reinvestment Act of 2009 included a tax credit for investments in manufacturing facilities for clean energy technologies to foster investment and job creation in clean energy manufacturing. 48C provided an investment tax credit for 30 percent of the capital expenditures for facilities that manufacture qualifying clean energy products to reequip, expand, or establish domestic clean energy, transportation and grid technology manufacturing facilities. Projects were assessed on the basis of commercial viability, job creation, innovation, speed to completion and potential to reduce emissions. Renewing 48C and expanding eligibility to

include capital expenditures for the production of low-carbon industrial goods would create a powerful incentive to invest in manufacturing here in the United States.

Enhance technical assistance for the deployment of commercially available industrial decarbonization technologies through DOE's Better Buildings, Better Plants Initiative.

Proposal: DOE should increase engagement, technical support, and scope of the Better Buildings, Better Plants Initiative by implementing the following:

- Identify sector-specific goals that define leadership by industry and drive energy efficiency improvements;
- Develop metrics with industry partners and other stakeholders for tracking and goal-setting that go beyond energy efficiency; and
- Track the participation within the program of the 500 largest manufacturing plants, and include increased linkages with CESMII smart manufacturing profiles for specific equipment ($145 million).

Background

The Better Buildings, Better Plants Initiative provides technical assistance and a voluntary leadership platform to help industry overcome the hurdles associated with deployment of commercially available energy efficiency and emissions reduction technologies and approaches. Better Plants currently focuses on energy efficiency, which provides clear, near-term opportunities for energy savings, emissions reductions, and green jobs. Currently, partners voluntarily set a goal to reduce energy intensity by 25 percent over a 10-year period across all U.S. operations, but many industries have already achieved significant efficiency gains, making this target infeasible in some circumstances. Therefore, creating tailored, sector-specific goals would enable more industry partners to engage with Better Plants, especially given the challenges likely in the years ahead throughout the economic recovery. The addition of metrics for greenhouse gas emissions tracking and goal setting to Better Plants will enable industry partners to begin collecting data as a starting point for future decisions around long-term emissions reduction efforts.

Tracking the participation of the 500 largest plants within Better Buildings, Better Plants will help drive increased energy savings while creating jobs. The largest plants tend to have the most technical know-how, equipment, and data, making them an important resource for understanding data and communication protocols for technology and equipment and enabling the development of smart manufacturing profiles for those technologies (via CESMII). These profiles can then be used by small and medium manufacturers to more quickly identify potential improvements in their plants.

Expand block grant funding for states to support industrial efficiency, with increased funds for states that establish programs to help build market demand for low-carbon products.

Proposal: Provide state grants to expand industrial efficiency support to manufacturers to cover the upfront costs of energy-efficient retrofits. Additional funding can be applied for by states contingent on the establishment of programs that help build market demand state-level for low-carbon products, such as Buy Clean programs or the development of state-level low-carbon procurement standards/goals ($3 billion).

Background

In 2009, ARRA provided states with funding through state energy programs for energy efficiency and renewable energy. To receive funds, states had to update building codes to a certain threshold. State energy offices received $3.1 billion in funding in 2009-2010 (approximately 60 times current annual appropriations) and were able to deliver projects quickly and effectively. Similarly, this recommendation could provide similar funding for industrial efficiency and allow states to compete for additional funding tied to a commitment to implement standards/programs for procurement of low-carbon products.

Augment investment in research, development and pre-commercial demonstration (RD&D) of innovative technologies for reducing industrial carbon emissions.

Proposal: Substantially augment RD&D funding across a range of industrial technologies with significant potential to achieve reductions in carbon emissions well below incumbent technologies and to provide viable pathways to longer-term decarbonization. Priority areas for investment should include: ($335 million)

- Alternative thermal heat technologies (such as hydrogen and beneficial electrification);
- Innovative industrial processes with smaller carbon footprints;
- Integration of carbon capture, use and storage with process heat, energy efficiency and materials management to reduce cost burdens;
- Next generation carbon capture technologies with higher efficiency and improved performance; and
- Scaling up breakthrough technologies and processes to enable viable low- and zero-carbon production pathways for key materials and to create lower-carbon products and intermediate materials using CO_2 and CO captured from industrial facilities, power plants and direct air capture.

Background

Federal RD&D investment has played a key role in innovation for clean energy and industrial technologies in the U.S. If our nation is to meet midcentury emissions reduction goals, sustain American technology leadership and maintain and grow our domestic industrial and jobs base, then the focus of federal technology innovation RD&D expenditure needs to expand to include and prioritize key industry sectors and difficult-to-eliminate industrial emissions. Pre-commercial demonstration of promising emerging industrial technologies is a particular need and, if structured properly, federal RD&D investments in this area can harmonize near-term COVID-19 economic recovery and job creation needs with longer-term emissions reduction and economic competitiveness objectives.

Participating Entities

The development of the listed policy recommendations by the Industrial Innovation Initiative was facilitated by Great Plains Institute and World Resources Institute, with input and involvement by the following participating entities.

- American Council for an Energy Efficient Economy
- ArcelorMittal
- Clean Air Task Force
- Dow
- Entergy
- Growth Energy
- LafargeHolcim
- LanzaTech
- Louisiana Department of Natural Resources
- Linde
- Minnesota Power
- National Wildlife Federation
- Oxy Low Carbon Ventures
- Pacific Ethanol
- Solidia
- The Nature Conservancy
- Third Way
- Wisconsin Office of Energy Innovation

The Industrial Innovation Initiative (I^3) is an ambitious coalition of key industrial and power companies, environmental and labor organizations, and state officials from Midwestern and Gulf Coast states. The initiative focuses on decarbonization solutions for the region's most important industrial sectors and seeks to accelerate adoption of those solutions through state, regional and federal policy. I^3 is co-convened by the Great Plains Institute (GPI) and the World Resources Institute (WRI).