

**BACK IN ACTION: RESTORING FEDERAL CLIMATE
LEADERSHIP**

**HOUSE SUBCOMMITTEE ON ENVIRONMENT AND
CLIMATE CHANGE, COMMITTEE ON ENERGY AND
COMMERCE**

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**COMMENTS FOR THE RECORD
OF**

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CLIMATE POLICY PRIORITIES FOR ENERGY-INTENSIVE-TRADE-EXPOSED INDUSTRIES

On behalf of the member companies of the Industrial Energy Consumers of America (IECA) we offer our support to the U.S. Congress and Biden Administration in addressing cost-effective policies to reduce greenhouse gas (GHG) emissions in the energy-intensive trade-exposed (EITE) manufacturing sector. Our member companies have extensive experience working on climate policy solutions in California, Washington, the Regional Greenhouse Gas Initiative (RGGI) states, Canada, and the European Union. We offer our learned experiences as you move forward.

The U.S. industrial sector is a significant climate and middle-class jobs success story. According to the U.S. Energy Information Administration (EIA) from 1990 to 2019, the industrial sector reduced energy intensity by 54 percent, while increasing gross output by 359 percent. Absolute GHG emissions were reduced by 16 percent, more than any sector of the U.S. economy. There are 13 million manufacturing workers, accounting for 8 percent of the entire workforce, which pays families sustaining wages and benefits that average over \$88,000 per year. U.S. manufacturing has one of the lowest carbon dioxide (CO₂)/value added intensity of any nation, about one-third of China's manufacturing sector.¹ That is why growing U.S. manufacturing output and displacing foreign production, reduces global GHG emissions.

Manufacturing is the engine for U.S. economic growth. Taken alone, manufacturing in the U.S. would be the seventh-largest economy in the world. For every \$1.00 spent in manufacturing, another \$2.74 is added to the U.S. economy. That is the highest multiplier effect of any economic sector. Manufacturers are also the country's biggest innovators, accounting for 61 percent of all private sector R&D investment. Moreover, EITE industries produce all of the raw materials needed for clean energy technologies.

In January 2020, Chairman Frank Pallone of the House Energy and Commerce Committee released the "Clean Future Act," which summarized the Committee's findings from hearings held in 2019. The information below is from Title V the Industrial Sector, and accurately describes the challenges of decarbonizing the manufacturing sector.²

"The U.S. industrial sector – one of the most technically and economically challenging sectors to decarbonize. In some cases, GHG emissions are unavoidable byproducts of industrial processes. In others, low-carbon alternatives are either prohibitively expensive or underdeveloped. Several industrial subsectors also compete in highly competitive global markets, and manufacturers may choose to relocate production overseas rather than invest in emissions mitigation technologies. These energy-intensive and trade-exposed (EITE) industries consequently face steep barriers to deep decarbonization. The Committee believes that industrial decarbonization will require both industry- and process-specific solutions, as well as cross-cutting measures. It is imperative that Congress and the Executive Branch put in place policy measures across all committee and agency jurisdictions to preserve the global competitiveness of EITE industries and manufacturers in the United States."

¹ Source: CO₂ Emissions from Fuel Combustion 2018, International Energy Agency (IEA) The World Bank, <http://data.worldbank.org/indicator/NV.IND.MANF.CD>

² "E&C Leaders Release Draft Clean Future Act Legislative Text to Achieve a 100 Percent Clean Economy," January 28, 2020, <https://energycommerce.house.gov/newsroom/press-releases/ec-leaders-release-draft-clean-future-act-legislative-text-to-achieve-a-100>

Chairman Pallone provides a clear picture of the challenges with decarbonizing EITE industries. These are very diverse industrial sectors and there is no silver bullet or one-size-fits all solution. Thoughtful, science-based, and cost-effective climate policies can support and boost U.S. economic growth, jobs, innovation and competitiveness, while achieving robust environmental goals. By contrast, poorly crafted climate policies can lead to unintended consequences, such as industrial GHG leakage, arbitrary winners and losers, diminished U.S. competitiveness, and the loss of well-paying American jobs.

We desire win-win policies. Win-win policies are actions that can potentially reduce or avoid GHG emissions and also increase U.S. competitiveness, investments, and jobs while ensuring reliability. We have identified seven areas to potentially reduce/avoid GHG emissions in manufacturing, all of which have either cost or regulatory barriers, which include: Produce or buy renewable electricity quantities to a level that does not jeopardize reliability, reuse/recycle manufacturing process waste heat for steam and/or electricity production; increase manufacturing process energy efficiency, increase demand response and building efficiency; increase recycling of energy intensive products; increase use of alternative fuels such as hydrogen; substitute existing fossil fuels with alternative low-carbon byproduct materials that would otherwise go into landfills; and carbon capture utilization and storage (CCUS).

Below is a list of win-win EITE climate policies that with removal of regulatory barriers and improved economics, could potentially benefit all manufacturing companies and help the U.S. to achieve its goals. Our policies would reduce U.S. and international GHG emissions, increase industrial competitiveness, investments, and jobs. We also encourage you to review our fourteen guidepost climate principles that explain how we are different and why we desire to reduce energy use and our limitations in doing so. We welcome the opportunity to assemble company representatives from each of the EITE sectors to discuss these proposed suggested policies.

EITE CLIMATE POLICY PRIORITIES

Win-win policies are actions that can potentially reduce or avoid GHG emissions and increase U.S. innovation, competitiveness, investments, and jobs while ensuring reliability. Manufacturing companies are self-motivated to improve energy efficiency to reduce costs and increase competitiveness. There are seven areas to potentially reduce/avoid GHG emissions in manufacturing, all of which have either cost or regulatory barriers that are site specific, which include:

- Produce or buy renewable electricity quantities to a level that does not jeopardize reliability
- Reuse/recycle manufacturing process waste heat for steam and/or electricity production
- Increase manufacturing process energy efficiency, demand response and building efficiency
- Increase recycling of energy intensive products
- Increase use of alternative fuels such as hydrogen
- Substitute existing fossil fuels with alternative low-carbon byproduct materials that would otherwise go into landfills
- Carbon capture utilization and storage (CCUS)

Purchase of Renewable Energy and Self-Generation of Power

Manufacturing companies consume about 25 percent of U.S. electricity. A new electricity market paradigm is needed that provides cost-effective opportunities for manufacturers to buy and/or self-generate larger quantities of less carbon intensive power for both captive use and for sale into electric market. It should be clarified that the entity who invests in any GHG avoidance or reduction activity should receive all the financial and other benefits of those carbon reductions or avoidance. However, market reforms are necessary and PURPA protections need to be retained, particularly in the regulated markets.

There are significant benefits to the manufacturing sector's purchase of renewable energy and/or self-generation. The manufacturing sector has millions of acres of land inside their facilities fence lines in which to build renewable energy generation that is not encumbered by eminent domain. Self-generation offsets electricity purchases from the grid, reduces grid transmission congestion and transmission costs, decreases GHG electric transmission line losses, reduces GHGs and criteria pollutants and can be sold to the grid to reduce peak electricity prices. Also, self-generation capacity is not the target of cyber-attacks. *Therefore, any incentives afforded to the electric market should be afforded the manufacturing sector.*

- **Increase purchases or self-generate renewable energy:** Electric markets are dramatically different across the U.S. and access to renewable energy can be very difficult and sometimes impossible. Manufacturers would like to increase the purchase of renewable energy at competitive rates in order to reduce their GHG emissions and potentially reduce electricity costs. Manufacturers are also building inside their fence lines when it is economical to do so.
- **Increase self-generation of CHP:** Increased industrial combined heat and power (CHP) generation compliments increased grid-related renewable energy capacity because manufacturing facilities operate 24/7, which provides a reliable power supply. CHP systems can achieve fuel efficiency of up to 75 percent as compared to natural gas-fired power generation maximum of 42 percent, thereby reducing GHG emissions.

Self-generation offsets manufacturing's electricity purchases from the grid. Besides the attributes mentioned above, manufacturing CHP facilities provide the grid with valuable spinning reserve capacities which helps to maintain grid reliability. Market reforms are needed to compensate manufacturing for the spinning reserve services.

According to the DOE, manufacturing CHP capacity has been relatively flat for more than a decade due to a number of factors that differ from state or region because of regulatory or economic barriers.

According to the DOE's CHP database, in 2017, there were 1,165 industrial CHP installations accounting for over 64 GW of capacity or 4 percent of U.S. electric generation.³ There is an additional technical CHP/WHP capacity potential of 68 GW located across the U.S. at 43,571 locations.⁴ However, *technical* potential does not mean that it is *economic* potential. The manufacturing potential is spread across several important industries, which include: chemicals, refining, food, paper, metals, wood textiles, plastics, glass, and beverages.

- **Increase self-generation of inside the fence waste heat to power (WHP):** Waste heat to power electricity is emission-free power and should be designated equal to wind and solar for credits or offsets. When manufacturing companies sell WHP emission-free electricity to the local utility, and when the utility reports its fuel mix, it classifies WHP power as 'other' or simply purchased power. We have examples of WHP electricity selling for an average price of 1.7 cents per kwh in 2020.
- **Increase self-generation of waste to energy (WTE):** Waste to energy (WTE) electricity avoids significant CO₂ emissions and should receive associated benefits afforded to wind and solar for credits or offsets. CO₂ emissions avoided are dependent upon the hydrocarbon feedstock but can avoid up to 90 percent of CO₂ emissions as compared to shale natural gas fired power. Waste feedstock like plastics or tires that are going to landfills have a Btu content about equal to gasoline.

Energy Efficiency

Manufacturing companies are self-motivated to improve energy efficiency to reduce energy costs and increase competitiveness. However, policy changes are needed to remove barriers that will accelerate energy efficiency projects, investments, and jobs.

- **Increase energy efficiency of manufacturing processes:** Modify New Source Review (NSR) specifically for the manufacturing sector to accelerate energy efficiency projects and remain within air permit limits. This is the single fastest and economic way to increase energy efficiency. That said, for EITE industries, low hanging fruit projects have already been completed.

³ U.S. DOE Combined Heat and Power Installation Database, <https://doe.icfwebservices.com/chpdb/>

⁴ Combined Heat and Power (CHP) Technical Potential in the United States, DOE, March, 2016: <https://www.energy.gov/eere/amo/downloads/new-release-us-doe-analysis-combined-heat-and-power-chp-technical-potential>

- **Establish a national program to cost-effectively increase recycling of energy-intensive products:** Wind blades and solar panels should be recycled, along with conventional materials such as steel, aluminum, glass, paper, plastic, tires. Recycling is consistent with the circular economy model and reduces/avoids GHG emissions.
- **Increase utilization and improve demand response in electric markets:** Support a national demand response policy that provides consistent and sufficient compensation in electric markets.
- **Support energy efficiency improvements in existing and new buildings:** The existing housing sector has seen little energy intensity reduction improvements. We encourage policies, including new business models and market incentives, that promote energy use reduction in the existing housing sector. Insulating existing buildings is typically one of the lowest cost GHG reduction options. We also support stronger codes and standards for new buildings.

Alternative Fuels

- **Support incentives to promote production and consumption of decarbonized hydrogen and related products:** IECA supports U.S. efforts to increase cost-effective production and distribution of low-carbon hydrogen and related energy sectors, such as low-carbon ammonia. Hydrogen can help decarbonize the U.S. economy across the U.S. power grid, transportation, and other hard to decarbonize sectors. Implementation of increased utilization of hydrogen may require significant infrastructure investment. Utilizing current natural gas transportation to move hydrogen by injecting it into the natural gas stream is problematic because it can damage our equipment and can disrupt manufacturing production processes under certain circumstances.
- **Increase air permit flexibility to use alternative energy fuels/feedstocks:** Expanding the diversity of hydrocarbon containing materials for use as a fuel, versus going to a landfill, is consistent with the circular economy.

Electric Infrastructure

- **Fully implement FERC Order 1000 to increase competition when building electric transmission lines and reduce costs to consumers:** Electric transmission costs are the highest and most rapidly increasing energy costs for manufacturers.
- **Reduce costs and increase availability of energy storage:** Increased availability of low-cost energy storage is essential to increased national renewable energy capacity. IECA supports DOE and industry R&D efforts to drive down costs. Federal policy needs to consider manufacturing's onsite use of storage. Unlike other electricity consumer sectors, the manufacturing sector is sophisticated and has the technical capabilities to play a role in supporting reliability and resiliency of the national electricity grid. We also urge you to promote innovation in energy storage and not just pick, e.g., lithium-ion batteries as the presumptive winner. For example, emerging forms of thermal energy storage are based on energy efficiency. Such systems can store thermal energy from renewable sources, especially solar, while also reducing energy use and avoiding GHG emissions.

EITE Process Technology R&D

- **Increase federal R&D investment and develop market-incentives for private sector R&D and deployment of cost-effective industrial process technologies:** DOE R&D dollars directed to EITE -related process technology is the smallest of any expenditure. Additional R&D is essential. *Technology does not today exist to decarbonize EITE industries in a cost-effective manner.* This is a substantial challenge because the manufacturing sector is very diverse. It will take decades to develop and implement new technologies. Government incentives from tax to grant support for private sector activity to pilot and deploy new technologies will accelerate needed activity.
- **Increase R&D and CCUS projects for EITE manufacturers:** Expand R&D, tax incentives, and other government support to boost CCUS projects for emissions from EITE manufacturers, particularly those with volumes of fixed process emissions and unlock avenues for manufacturers to utilize captured CO₂ in their processes.

Establish DOE/EPA Office of GHG Lifecycle Analysis

Consistent with the circular economy model, science, economics, and technology, establish an Office of Life Cycle Analysis to identify and prioritize GHG least-cost reduction options. The U.S. should lead the world in GHG lifecycle analysis. The office would be responsible for calculating and publishing the GHG lifecycle and economics analysis of technology and policy options per ton of CO₂, and estimate the volume of CO₂ tons that can be reduced or avoided. Lifecycle analysis should be used to inform federal and private sector technology investment decision making.

Storage batteries used for grid renewable energy is a prime example where no GHG lifecycle analysis has been done. The U.S. needs these batteries to build out the grid and assure reliability but they are very expensive and the cost will be passed onto us, consumers. The metals used are primarily coming from Africa, shipped to China, smelted in China, used to produce the battery in China and then shipped to the U.S. That is a lot of GHG emissions and jobs created elsewhere, not in the U.S. We would be interested in knowing how storage batteries GHG emissions compare to using shale natural gas to produce electricity, because those jobs are in the U.S.

Account for and Measure Imported GHG Emissions

Increased production of U.S. manufactured products can reduce global GHG emissions. Due to the substantial steps already taken to lower emissions, U.S. manufacturing carbon intensity is lower than many countries with which we compete. As a result, reshoring and producing more products here and importing less, will have the positive impact of decreasing global emissions, even while it could moderately increase total U.S. manufacturing emissions. As a policy matter, we encourage you to account for and measure imported GHG emissions. Doing so is consistent with the “Buy American” Executive Order. In 2017, CO₂ embedded in imported products was equivalent to about 8 percent of U.S. GHG emissions. This amount does not include GHG emissions from ship ocean transportation.

CLIMATE PRINCIPLES FOR ENERGY INTENSIVE TRADE EXPOSED INDUSTRIES *“Manufacturers Drive the Circular Economy”*

As the U.S. addresses climate change, there is no sector of the U.S. economy that is more able to contribute to middle class job creation than the manufacturing sector. It is for this reason that collaboration between government and manufacturing is essential to deliver exciting job growth and investment. To do so requires a healthy understanding of how EITE industries differ than other sectors of the economy and to explain why some policies will create jobs and others will result in industrial GHG leakage. EITE industries consume roughly 80 percent of all of the energy within the manufacturing sector.

Because these industries compete with fierce global competitors that are often subsidized by foreign governments, and are energy-intensive, driving down energy consumption is top of mind to being able to compete and stay in business. These industries desire to implement cost-effective energy reductions because it increases their competitiveness.

Below are fourteen (14) guidepost climate principles that explain how we are different and why we desire to reduce energy use and our limitations in doing so.

- 1. GHG policies must be cost-effective, promote long-term investments, competitiveness, job growth, and recognize the need for transition:** In order to achieve the dual goals of promoting growth of manufacturing jobs and addressing climate objectives, it is vital that climate policies create an environment which promotes long-term investment in a wide-variety of technologies and utilizes approaches that will be needed to decarbonize the U.S. manufacturing sector. Doing so will be essential to maintaining and promoting continued investment and competitiveness in the face of substantial foreign government activity supporting energy transformations overseas. *It is important that GHG policies directed toward the manufacturing sector recognize the substantial GHG reductions already undertaken and the limitations to further near-term decarbonization.*
- 2. EITE industries are price takers:** This means that all GHG compliance costs placed upon the power, fossil fuel, and transportation sectors will be passed on to us, directly impacting manufacturing competitiveness.
- 3. Protect U.S. manufacturing competitiveness and avoid industrial GHG leakage:** If GHG policies increases energy and feedstock costs for U.S. manufacturers, relative to overseas competitors, America’s competitiveness is negatively impacted along with valuable jobs and to the detriment of the Administration’s goals. The Administration must avoid industrial GHG leakage which shifts jobs and GHG emissions offshore. To preserve and increase manufacturing jobs, U.S. GHG policies must seek to prevent unequal cost burdens on U.S. manufacturers relative to costs incurred by competitors overseas.
- 4. Incentives, not mandates, are a better policy for EITE industries. Environmental and electricity regulatory market reforms are needed:** Removal of energy efficiency regulatory barriers and electric market reforms will accelerate GHG reductions. GHG mandates that impose costs on U.S. manufacturing will encourage shifting investments, jobs, and GHG emissions offshore. Incentives, on the other hand, encourage innovation and accelerate GHG reductions in a cost-effective manner.

- 5. Manufacturing process technology does not exist which would allow the EITE industries to decarbonize:** Technologies used by the manufacturing sector are very diverse, capital intensive, and designed to operate for many decades. Investments are being made, but it will take decades to develop and deploy new less carbon-intensive process technology that is cost-effective. It is for this reason that there are serious near-term impediments to decarbonization of the manufacturing sector.
- 6. Recognize that increased production of U.S. manufactured products can reduce global GHG emissions:** Due to the substantial steps already taken to lower emissions, U.S. manufacturing carbon intensity is lower than many countries with which we compete. For example, on a carbon dioxide (CO₂)/value added intensity basis, U.S. manufacturing has about one-third that of China's manufacturing sector.⁵ As a result, reshoring and producing more products here and importing less, will have the positive impact of decreasing global emissions even while it could moderately increase total U.S. manufacturing emissions. As a policy matter, we encourage you to account for and measure imported GHG emissions. In 2017, CO₂ embedded in imported products was equivalent to about 8 percent of U.S. GHG emissions. This amount does not include GHG emissions from ship ocean transportation.
- 7. Manufacturing growth means that GHG emissions may moderately increase:** We are a growth sector in physical output and jobs. Our physical output growth contrasts to other sectors. From 2010 to 2019, U.S. electricity consumption increased by 2 percent and vehicle miles traveled by 10 percent, while manufacturing GDP increased by 31 percent. Our job is to increase the volume of products needed to serve economic growth of the U.S. This growth can accelerate by working collaboratively with industry to decrease GHG emission intensity and by displacing products that are imported and which have high embodied GHG emissions. This statement is consistent with the "Buy American" executive order.
- 8. EITE products are the source of raw materials to GHG reduction technologies and products:** Light weighting vehicles requires aluminum and plastics. Wind turbines requires steel, plastics, and cement. Solar installations require glass, steel, and cement. Home roof, wall, and door insulation requires glass, plastics, and/or paper. Double pained windows use glass. Batteries use metals and plastics. Electric transmission lines require steel and cement. Nitrogen fertilizers increases crop yields and prevents deforestation. With technology improvements and lower costs, some EITE companies could produce hydrogen to enable clean power in the industrial, transportation, and electricity sectors. All use chemicals.
- 9. EITE industries are dependent upon the market for the supply of less carbon-intensive energy, feedstocks, and electricity:** Our core business is manufacturing, not energy production. We are primarily dependent upon suppliers to provide less carbon-intensive energy. With the exception of the limited availability of renewable electricity, there are no short-term or economical supplies of less carbon-intensive fuels and feedstock available to support our decarbonization.
- 10. Industrial process equipment is designed to use natural gas, not electricity:** The industrial sector consumes about 28 percent of U.S. natural gas. Natural gas is used as a fuel and feedstock. As a fuel,

⁵ Source: CO₂ Emissions from Fuel Combustion 2018, International Energy Agency (IEA)
The World Bank, <http://data.worldbank.org/indicator/NV.IND.MANF.CD>

there are hundreds of thousands of individual pieces of equipment and process technologies that are designed to use only natural gas, not electricity. Replacing equipment would be cost prohibitive and significantly increase operating costs. In most cases, the technology does not exist to switch from natural gas to electricity. Most importantly, the cost of a Btu of electricity versus a Btu of natural gas makes electricity cost prohibitive. For these reasons, the industrial sector cannot currently transition away from natural gas to electricity in a cost-effective manner.

- 11. Fuel switching from coal to natural gas is no longer an option:** EIA's 2014 Manufacturing Energy Consumption Survey (MECS) stated that less than 10 percent of coal used by the manufacturing sector could be fuel switched to natural gas. Since 2014, if manufacturing companies had access to pipeline natural gas, it was switched, almost without an exception.
- 12. Hydrogen, as a less carbon intensive alternative, injected into natural gas pipelines, is problematic:** Hydrogen is a less carbon intensive fuel for potential injection into natural gas pipelines. Hydrogen mixed in natural gas will damage manufacturing turbines, compressors, and other equipment. Plus, the cost of hydrogen is cost prohibitive at today's prices. Hydrogen also substantially increases NOx emissions, which would conflict with air permits and could limit production of our products. Nevertheless, several IECA companies are working with the DOE's hydrogen R&D programs.
- 13. Carbon capture and sequestration (CCS) technology R&D and infrastructure requires additional government support to realize its potential contribution for EITE industries:** At large, manufacturers desire to do one thing, produce products and not incur the costs, financial and regulatory risks associated with CCS. There are exceptions. There are IECA companies working with the DOE on carbon capture projects. However, CCS remains cost prohibitive for many industries and geographies. Scaling up CCS such that it becomes economical and accessible requires additional financial incentives, regulatory streamlining, and infrastructure development. There is the potential for CO₂ to be used in products. Cement would be a leading candidate, but the technology is not cost effective or scalable today.
- 14. Federal climate policy should preempt conflicting and/or inefficient state policies:** Climate policy is most appropriately enacted at the federal level to ensure consistency, a level domestic playing field, and reduced compliance costs.