



# Creating a Domestic U.S. Supply Chain for Clean Energy Technology

By Mike Williams and Trevor Sutton | October 4, 2021

The global clean energy industry is at an inflection point. The trajectory of generating and deploying clean energy has risen<sup>1</sup> globally, in spite of the COVID-19 pandemic. Political and consumer support<sup>2</sup> for clean energy remains high, and costs are dropping.<sup>3</sup> In addition, the United States is poised to make historic investments in clean technology deployment in order to meet its international climate commitments and cut the nation's emissions by 50 percent by 2035.

The amount of materials and products needed to supply this growth in production will increase exponentially over the next few years. That raises the question: Will these materials and products come primarily from abroad, or will they be sourced and manufactured in the United States? From lithium in electric vehicle (EV) batteries, to the steel in a wind turbine, to the polysilicon in a solar panel, the next decade represents the best opportunity to date to onshore the manufacturing supply chains of clean technology. In doing so, this country would create and retain<sup>4</sup> tens of thousands, and potentially hundreds of thousands, of good jobs for working Americans.

This issue brief examines one set of proposed policies that will help build domestic renewable energy supply chains: investment tax credits for renewable energy facilities that use domestically made or domestically sourced goods. Such domestic content provisions can be found in the Clean Energy for America Act<sup>5</sup> proposed and moved by the Senate Finance Committee as well as comparable provisions<sup>6</sup> in the House Ways and Means Committee's contributions to the Build Back Better legislation—the effort by Congress to put into law President Joe Biden's agenda of creating jobs and lowering costs for working families. This brief explains why such provisions should be included in clean energy legislation considered by Congress, arguing that domestic content tax credits will create good jobs for working Americans, help fight the climate crisis, and strengthen U.S. national and economic security.

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## Background

Federal support to American industry through domestic content requirements has a long history. The Buy American Act of 1933<sup>7</sup> (BAA) instructed federal agencies and contractors to buy U.S.-manufactured end products and construction materials on contracts valued above a certain threshold. The BAA's requirements can now be waived at the discretion of the president in order to comply with international treaty obligations—for example, commitments to afford foreign goods the same treatment as domestic ones. Such waivers became substantially harder to obtain under the Trump administration, which ordered<sup>8</sup> federal agencies to make efforts to ensure contractors are not using so-called dumped goods—that is, foreign goods sold at a lower price than in their domestic market. For its part, the Biden administration is seeking to ensure that federal procurement supports American workers and businesses through a Buy American rule<sup>9</sup> proposed in July.

The Clean Energy for America Act—and comparable provisions in the House Ways and Means Committee's provisions—represents a new approach to domestic content requirements. Under the act, investments in renewable energy facilities—those producing zero greenhouse gas (GHG) emissions—put in service starting in 2023, or electric grid improvement properties, will receive a 30 percent tax credit relative to the value of the investment. For certain facilities in disadvantaged communities, the credit increases to 40 percent. In cases where the taxpaying entity lacks sufficient revenue to benefit from these tax credits, it can receive a direct, or cash, payment from the government equal to the amount of the tax credit. These provisions would substantially enhance some existing tax credits for investments in renewable energy and make permanent others that are set to expire.

The proposed domestic content credit under the act would increase the renewable energy tax credit available to all investments by 10 percent where the facility in question is composed of domestically made steel or iron and/or manufactured products. In the case of manufactured products, “domestically made” means that at least 55 percent of the total cost of the components of the product can be attributed to domestically produced items.<sup>10</sup> Additionally, a clean electricity project will eventually lose the opportunity to receive a direct payment in lieu of a tax credit if the project fails to meet domestic content requirements.

The domestic content credit is novel in two ways: First, it encourages onshoring of supply chains through the tax code, rather than through public procurement requirements, and second, it extends the incentive to buy American to private sector actors, unlike the BAA, which applies only to federal agencies and their contractors. By guiding private markets, this tax credit has the potential to move the renewable energy sector toward domestic supply chains in a manner that was previously possible only for industries that depended heavily on federal contracts, such as aerospace and defense.

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## Building a domestic supply chain for renewable energy: It's now or never

These domestic content provisions come at a crucial juncture for the renewable energy industry and its suppliers. Today, renewable energy accounts for barely more than one-tenth<sup>11</sup> of total energy generation and consumption in the United States. The Biden administration has set a target<sup>12</sup> of 80 percent clean power by 2030 and a fully carbon-free electricity grid by 2035. While achieving those targets will depend on many factors—most crucially, the fate of climate legislation in Congress—there is no question that the U.S. renewable energy sector is poised for a massive expansion in the coming decade. This growth in renewables will require a comparable growth in the supply of both finished and component goods to support the construction of new facilities and the upgrading of existing ones.

Currently, the U.S. renewables sector is highly dependent on foreign supply chains. Chinese exports dominate<sup>13</sup> the supply of solar panels used in both commercial and private energy generation, owing in large part to years of Chinese subsidies; funding for research and development; and what the United States and European Union have characterized as prohibited dumping<sup>14</sup> practices. In the case of offshore wind, meanwhile, both the industry and, by extension, the U.S. supply chain are “immature”<sup>15</sup> to the point of being nonexistent; however, there is significant domestic industrial capacity to support manufacturing offshore wind turbines and their component parts as more offshore wind projects come online in the next decade.

While the prospect of rapid growth in renewable energy presents an opportunity for domestic suppliers to meet rising demand, that outcome should not be assumed; the experience of other industries—for example, semiconductors—reflects that a growing domestic market does not translate into more onshore production and jobs. This means that the next decade presents a critical window for American industry to support a massive expansion in U.S. renewable infrastructure—one that will likely never recur. The supply chain relationships that develop during the coming renewables boom will likely define the industry for the foreseeable future. If U.S. manufacturers of solar panels, wind turbines, and utility-scale batteries—as well as the inputs used in the production of these technologies, such as steel and aluminum—are not able to secure a favored, or at least competitive, place in those supply chains, their commercial outlook will be substantially impaired. It is not inconceivable that the renewable industry could follow the path of semiconductors<sup>16</sup> and consumer electronics, in which engineering and design occurs in the United States, but most production occurs overseas with foreign components.

The tax credits connected to domestic content—alongside direct investments in industry such as the 48C credit<sup>17</sup>—provided in clean energy tax legislation currently moving through the Senate and House of Representatives can help domestic industry meet this challenge. More than a decade of focused industrial policy vaulted Chinese solar manufacturing into a position of global dominance.<sup>18</sup> If the United States hopes to compete in this and other renewable sectors globally, it will need to show a similar focus and commitment to supporting industry during critical growth periods.

All of this raises the question: From a public policy perspective, why should the United States seek to ensure that renewable energy supply chains are manufactured domestically? This issue brief sets out three key reasons below.

### 1. Domestic manufacturing will create good jobs and contribute to a revitalized middle class

Plainly stated, manufacturing is a boon to the economy. It supports local communities and often provides quality, middle-class livelihoods for working people. According to the Economic Policy Institute,<sup>19</sup> manufacturing workers—who make up more than 11 million people in the U.S. workforce—earn 13 percent more in hourly compensation than comparable workers in other industries, and they have an advantage in health care and retirement benefits.

Manufacturing's impacts on the broader economy are foundational and yet often understated.<sup>20</sup> The act of producing a good has a long stream of value, from the processing of the raw materials through the production process and then into the downstream sales. Analysis<sup>21</sup> that considers the value from inputs not including downstream output shows that manufacturing accounts for more than 11 percent of the U.S. gross domestic product (GDP), including a total output of more than \$2.3 billion in 2018. Research<sup>22</sup> shows that these numbers may be lower than the reality, as they underestimate the “multiplier effect”—which shows the impact on other industries from economic activity in manufacturing—notably by excluding the downstream impact. The MAPI research shows that manufacturing accounts for roughly one-third of U.S. GDP when considering the full value stream impact

Now consider this in less technical terms by envisioning a hypothetical situation. An EV is manufactured in America—say, for example, in Michigan. Thinking about the upstream value, its frame is made with steel melted and poured in Pennsylvania and comes from iron ore mined in Minnesota. Its battery is assembled in Georgia and includes lithium that comes from California. Those materials, and many more, need to be produced and refined in their own manner and then transported to the point of assembly. Once assembled, the EV itself is then transported to dealerships across the country. At every point in this hypothetical journey, there would be real communities with real people who benefit from these jobs.

## 2. Locating manufacturing supply chains in the United States meets the country's climate and justice goals

Manufacturing's environmental and societal impacts are not uniform. A good can be produced utilizing a workforce with full rights and decent pay, or it can come from the hands of a workforce subject to dangerous workplace conditions and low pay relative to local cost of living, or even forced labor. A good can be produced in a facility with efficient and advanced pollution controls—even with minimal to no pollution—or it can emerge from a facility that degrades the local and global environment.

Starting with the climate impact, manufacturing is responsible for roughly one-third<sup>23</sup> of global GHG emissions. Iron and steel alone make up 11 percent<sup>24</sup> of global emissions, and cement produces 4.5 percent<sup>25</sup> of emissions. China accounts for more than half<sup>26</sup> of the world's steel production, and it manufactures steel with upward of twice<sup>27</sup> the emissions intensity on average that is produced in the United States. With regard to vehicles, the United States is a net importer<sup>28</sup> of embodied emissions—the emissions associated with a good's production—across multiple sectors of vehicles, ranging from two to four times more emissions in the goods this country imports than those that are domestically produced.

The situation with human rights is perhaps even bleaker. The solar industry is working to realign its global supply chains to avoid the provinces of China where there are allegations of forced labor.<sup>29</sup> The minerals that go into many clean energy products, most notably batteries, currently come from mining processes that have been particularly harsh to the miners and the communities where the mines are located. Cobalt is an egregious example, where there is an ongoing lawsuit<sup>30</sup> alleging the use of child labor. The mining of lithium and copper in Chile has contributed to the desolation<sup>31</sup> of the Atacama Desert.

Sourcing critical minerals from countries with poor human rights and environmental records is effectively streamlining this part of the supply chain in a manner that places profits over the human impacts. Similarly, as this supply chain grows in the United States, it is critical that strong safeguards for working people, their communities, and the environment are in place. A recent report<sup>32</sup> from a coalition of environmental and conservation organizations phrased it well: “This requires smart planning, stakeholder collaboration and careful execution. History provides a powerful lesson on what happens when those attributes are absent.”

The United States needs batteries, steel, and cement to produce the clean energy products that will drive its emissions to zero. How America chooses to produce these materials is not forced on it. The country can produce these goods with minimal impact on the environment and with a workforce treated with decency and respect. America's best hope to achieve this is by controlling its own destiny and producing materials domestically. Then, using this example, the country needs to establish a significantly more just trade regime that lifts up workers and protects the environment.

### 3. Sourcing supply chains domestically is critical to ensuring national and economic security

Last but not least, promoting the onshoring of renewable energy supply chains would carry significant national security benefits to the United States. The COVID-19 pandemic has laid bare the substantial risks to the health and well-being of U.S. citizens posed by “just-in-time”<sup>33</sup> supply chains—that is, supply chains designed to deliver only enough inventory to meet anticipated market demand, and no more—in areas such as personal protective equipment, medicine, and even basic hygiene and sanitation supplies. These supply chains, while carrying cost advantages to industries during ordinary times, proved fragile and unreliable in a period of economic and political crisis.

U.S. policymakers are currently examining<sup>34</sup> the threat of supply chain fragility across a range of industries that are viewed as strategically sensitive to U.S. interests—most prominently, semiconductors—with a view toward building redundancy and resilience in the supply of critical goods. The purpose of such efforts is to ensure that future disruptions do not deprive the U.S. government and ordinary Americans of goods that are vital to their safety, security, and comfort. Such future disruptions could include not only natural disasters, such as another pandemic, but also those arising from geopolitical tensions. As illustrated by Russia’s energy politics in Eastern Europe,<sup>35</sup> a supply chain that is concentrated in the territory of a geopolitical adversary makes the United States and its consumers vulnerable to retaliation and extortion by a foreign government.

There is a compelling argument for treating resilient renewable energy supply chains as a critical national security issue. Energy security has long been a national security priority of the United States and most other countries. During the past decade, the United States has substantially increased its domestic energy base, but it has done so primarily through innovations in hydraulic fracking that have increased the availability of natural gas and oil. Renewable energy offers the country a way of sustaining—and eventually increasing—its energy security in a way that does not contradict its climate goals. This sector also does not subject communities to the rapacious cycle of extraction and abandonment that characterizes the boom-and-bust world of fracking.

But achieving energy security through a pivot to renewables is only possible if the products and components used to generate solar, wind, and other forms of clean energy are reliably available to operators of energy grids. And that, in turn, requires onshore supply chains with substantial capacity to make up for disruptions in global trade, whether natural or resulting from geopolitics or armed conflict. If renewable energy supply chains remain concentrated in foreign jurisdictions—especially in those with authoritarian governments, whose values and interests are often antagonistic to those of the United States and its democratic allies—policymakers will face an unenviable choice between greening the U.S. energy base and exposing the U.S. economy to foreign influence and coercion.

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America should demand that public funds used to support an industry maximize public good

The summary of these three arguments can be boiled down to this: When public funds are used to support an industry, that money should prioritize the public good. Good jobs, a clean environment, and energy and national security meet the vision laid out in President Biden's Build Back Better agenda.

Americans should not ignore that this effort may require time to invest in domestic facilities in order to build up capacity. This type of retooling and new investment is not unique, however; there are many examples<sup>36</sup> of companies meeting the moment of the coronavirus crisis and rapidly switching their production to produce personal protective equipment. The Manufacturing Extension Partnership<sup>37</sup> exists to help manufacturers achieve exactly this, and there is a significant level of funding included in the proposed Build Back Better legislation<sup>38</sup> to support the resilience, diversity, and strength of domestic supply chains.

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## Conclusion

The level of investment in clean energy deployment, paired with direct investments and domestic content requirements in the Build Back Better legislation, creates a clear path for manufacturers to take on a large portion of the clean energy supply chain. This is America's moment to act.

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