How the 45X Advanced Manufacturing Credit Drives American Energy Dominance

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What is the 45X Advanced Manufacturing Credit?

The section 45X Advanced Manufacturing Credit is a federal tax incentive which was established under the Inflation Reduction Act (IRA) in 2022. The goal of 45X is to push for the domestic manufacturing of clean energy goods. It provides economic incentives for innovation and investment in a broad-based “America First” energy policy. American manufacturers are rewarded by this production-based tax credit for each eligible clean energy component they produce and sell, which encourages the development of domestic renewable energy technology. Eligible components are solar, wind, battery, inverters, and critical minerals.

Companies qualify for the 45X tax credit if they produce the clean energy technology in the United States and sell them to an unrelated party, or another company which is not a part of the same business group. This criterion exists to ensure that this credit helps develop resilient domestic supply chains. If a

company sells to a related business, such as a subsidiary, they can still get the credit after making a petition to the IRS. Manufacturers fill out IRS Form 7207 to include in their tax return before receiving the credit.

The tax credit can differ based on what component is produced as well as its quantity, and there are three primary methods that are used to calculate its values.

Based on Power

Goods that are used to produce, transmit, or store energy receive credits that are proportional to the amount of power it can handle. For example, solar panels get seven cents for every watt produced, and battery cells get $35 for every kilowatt-hour stored.

Based on Size

Subcomponent goods, which are smaller parts used to create an energy-producing product, get a set amount of money based on its size or weight. Blades that are in wind turbines are eligible for two cents per blade, and torque tubes that are in solar panels get back 87 cents per kilogram of material.

Based on Production Cost

Companies are eligible to receive a flat rate of their production cost back. For example, manufacturers are eligible to receive 10% back on the cost of making or refining minerals, such as lithium. This includes the cost required for mining, processing, purifying, and turning it into batteries and electrode materials.

This credit applies to eligible energy components that are produced and sold beginning in 2023. Through the current legislation, products have the full credit available from 2023 to 2029 and begin to phase down between 2030 and 2032. Most credits end in 2033, with the exception of critical minerals, as the federal government wants to encourage domestic mineral processing for national security purposes.

Manufacturers that utilize 45X also have extra flexibility with how they use the tax credit. Companies can sell their credits to another business. This way, companies that don't owe a large amount in taxes can sell their credits for cash and transfer the benefits to another manufacturer. Some companies such as tax-exempt agencies are also eligible to opt for elective pay, which means that the IRS will treat the credit like a cash refund rather than a tax cut.



What the 45X Credit is Designed to Do

The 45X credit was created to boost domestic clean energy manufacturing by lowering the production cost of energy components within U.S. borders, to ensure that companies do not need to rely on foreign markets. The core goals of the 45X credit is to bring manufacturing back to the United States, strengthen energy independence, and create jobs in clean energy.

Solar Components

45X includes solar energy to encourage domestic production of solar cells, wafers, and full modules (solar panels). Its goal is to reduce foreign-manufactured solar parts, especially since most materials come from China. A credit per watt generated or square meter of material makes American solar more competitive and a reliable product to build a domestic solar supply chain.

Wind Components

Including wind components in the legislation promotes the American manufacturing of blades, nacelles (casing), and towers for both land-based and offshore wind. This will continue to support domestic supply chains and clear energy projects along American coastlines and wind corridors.

Battery Components

This tax credit provides a return on building batteries for electric vehicles (EV), energy grid storage, and electrodes. The inclusion of battery production helps scale the United States's capacity for battery cells, modules, cathodes, and anodes, which are all key internal materials. This also makes the U.S. more self-reliant when it comes to EVs.

Inverters

Inverters are used to convert solar energy into electricity that the grid can use to power homes. 45X encourages domestic production of various types of inverters that can be used to power residential buildings as well as larger industrial facilities. This supports the solar power ecosystem and boosts American energy reliability.

Critical Minerals

Minerals such as lithium, cobalt, and nickel are essential materials for clean energy technology, but are often imported from overseas by American companies. This credit encourages America-based mining, refining, and processing of these minerals. This would allow for the creation of a secure domestic pipeline for materials that power solar panels, batteries, and windmills.





Why 45X Embodies the "America First" Agenda

The 45X is a national industrial strategy that strongly pushes for energy independence in the U.S.— it's more than a clean energy initiative. 45X directly supports key goals of the "American First" agenda by rewarding companies for producing innovative clean energy components in the U.S. These rewards will result in the U.S. becoming a more self-reliant and globally competitive force in the clean energy economy.

American Manufacturing

As companies have moved production jobs overseas to lower-cost countries, American manufacturing jobs have disappeared. Industrial towns weaken as workers lose their jobs, and the nation's capacity to build key technologies has gone down. The 45X credit creates more financial incentives to encourage

companies to build their technology within the U.S. by ensuring that they are paid back for every product made, instead of just a one-time tax break. This would help lower the cost of domestic manufacturing and make it a more viable option for American companies. This credit also supplements additional American manufacturing policies, such as the CHIPS and Science Act, which assists with domestic semiconductor production.

National Security

Energy is also a matter of national security, not just an economic one. Currently, the U.S. heavily relies on foreign sources of energy, especially those from China, which controls over 75% of the global production of solar modules. During a global conflict, the U.S. can potentially lose access to this energy supply. By incentivizing domestic energy production, 45X allows the U.S. to build its own self-reliance and supports the idea that national security begins with energy independence. This would encourage the reshoring of critical manufacturing and give American companies the chance to dominate the global market for energy components, rather than solely utilizing imported materials from unreliable competitors.

Well-Paying Jobs

The return of middle-class jobs in advanced manufacturing, particularly in red states, has already begun as the 45X credit was passed. States like Georgia, Ohio, and Alabama are seeing companies such as First Solar and Q CELLS move and build large facilities and hire American workers. This policy shifts the idea of energy technology manufacturing into a job opportunity for working-class, blue-collar individuals.

The 45X credit is a bold investment for the “America First” agenda. It ensures that we no longer rely on foreign suppliers for the technology that powers our nation. The United States has outsourced the production of critical energy technologies to foreign entities for several years, which potentially poses a risk for national security as well as a vulnerable economy. This credit flips the script and rewards companies for building infrastructure and creating energy technologies here in the U.S. This credit not only helps build solar panels and wind turbines but also rebuild American strength one job and one factory at a time.





The Foreign Entity of Concern (FEOC) Debate

Lawmakers may begin to consider who is benefiting from these initiatives as billions of dollars flow back into the domestic clean energy economy. There is a growing concern regarding who should be allowed to access these taxpayer-funded credits, especially when it comes to companies that are linked to foreign governments. Under the Infrastructure Investment and Jobs Act and the IRA, this issue is defined as the Foreign Entity of Concern (FEOC). China, Russia, Iran, and North Korea are the countries that fall under FEOC. Other tax credits such as the 30D EV battery credit specifically note that materials cannot be sourced from a FEOC to qualify for the benefit.

FEOC restrictions are also being considered for 45X with the argument that taxpayer dollars should not be used to incentivize foreign governments and any other state-controlled company. Firms that are affiliated with foreign

governments could build shell companies in the United States and collect the 45X payment, for example. It would impact national security as well as the flow of taxpayer money if part of the domestically produced energy is manufactured by entities of concern. Ultimately, this reverses the progress made towards a more secure and nationally independent clean energy system.

The argument against adding FEOC restrictions includes the fact that many American clean energy markets still depend on inputs from the listed countries, particularly for materials used to build solar panels. Adding restrictions could disrupt the flow of these materials into the United States, which may lead to raising costs and a shortage of supplies. Additionally, American-based companies that rely on these foreign shipments may see it as a punishment from the federal government.

Foreign adversaries should not be profiting from American tax dollars. Without strong guardrails, companies that are associated with potentially hostile international entities could take advantage of loopholes to access tax dollars and relocate this money to their own economies. FEOC provisions ensure that these incentives go towards trusted American manufactures, not shell companies that may secretly have ties with other countries. These rules are about protecting national security as well as the integrity of the domestic energy supply chain, to ensure that America wins the clean energy race.

Legislators on both sides of the FEOC debate suggest that better definitions and guidance must be included in the language to ensure that the requirements are as clear as possible to incentivize domestic manufacture without making rules unworkable.



45X is Already Sparking American Innovation

There are already several American projects that are currently benefitting from the 45X tax credit. These initiatives represent the broad impact of 45X across multiple different components, which show that the credit contributes to energy transition goals across various sectors of the industry.

Critical Minerals

In October 2024, the United States Department of the Treasury announced that mining businesses would be able to benefit from the 45X credit, with the intention of boosting domestic production of solar panels and lithium-ion batteries. Sibanye Stillwater, a palladium mining company, uses its materials for catalytic converters and fuel cell products. The company benefits from 45X as it is based in Montana, and it has previously made efforts to offset Russian

competitors that also sell palladium. With this credit, more money is flowing back into the market and into the hands of American businesses. Sibanye Stillwater will be able to use this credit to increase their U.S. based operations and create more jobs at their location in Montana. In early 2023, Ford Motor Company began a $3.5 billion project with the goal of building a lithium iron phosphate (LFP) EV battery plant in Michigan. With the $45 per kilowatt-hour bonus, the company's CEO, Jim Farley, refers to the credit as the company's largest opportunity in the IRA.

Solar Energy

In 2023, First Solar announced a $1.2 billion investment to expand its U.S. operations, including a new vertically integrated photovoltaic (PV) module factory in Alabama. The company manufactures everything from solar wafers to full solar panels domestically, allowing it to benefit from multiple 45X credits. The company has shared how these credits improve long-term financial sustainability, reduce foreign dependents, and support its workers. First Solar expects to significantly scale production while contributing to regional job growth and clean energy leadership in the Southeast.

Wind Energy

Siemens Gamesa is investing $500 million into a new wind turbine plant in New York. This investment comes directly in response to incentives in the IRA, including the 45X credit. With wind components like nacelles and blades eligible for flat-rate or per-weight production credits, Siemens Gamesa's America-based project benefits financially for every unit. The facility is expected to serve East Coast offshore wind projects and help reduce U.S. dependence on European suppliers. These investments also come at a time when domestic wind infrastructure is expanding, and 45X provides companies like Siemens Gamesa with long-term certainty and production-based revenue streams.





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