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Environmental Defense Fund

IRA Activation Guide:

Advanced Manufacturing

May 2023

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Any company that owns or sources from industrial facilities may benefit from IRA incentives

Automotive

Consumer Products

Clean Energy Inputs

Batteries

Machinery

Mining

Paper

Plastics

Cement

Steel

Glass

Chemicals

§45X and §48C are the key provisions to know for advanced manufacturing, offering incentives for domestic clean technology and energy efficient manufacturing

	§45X: Advanced Manufacturing Production Credit	§48C: Advanced Energy Project Credit
PROVISION	Provides a new production tax credit for the manufacture or assembly of certain eligible clean technology components sold to an unrelated person beginning in 2023	Provides a tax credit of 6% or 30% for re-equipping, expanding, or establishing an industrial or manufacturing facility for clean technology components
KEY TAKEAWAYS	• Covers a variety of components such as solar energy, wind energy, inverters, qualifying battery components, and critical minerals, among others • Like the renewable energy generation tax credits, uncapped production credit with no annual funding limits • Begins to phase out in calendar year 2030, completely phasing out by 2033 (exception applies for critical minerals) • Eligible for direct pay for 5 years and transferable • Denial of double benefit for components produced in a facility for which Sec. 48C has been authorized	• Covers a variety of investments (incl. energy efficiency and GHG reduction retrofits) in manufacturing facilities and capabilities such as energy storage systems, critical minerals processing and recycling, and grid modernization equipment • Competitive application process scored and administered by the IRS in consultation with the Department of Energy (DOE) • Must meet prevailing wage and apprenticeship requirements for the full 30% rate. If such requirements are not met, the credit is reduced to 6% • Denial of double benefit with other applicable credits such as Sections 45X, 48, 48A, 48B, 48E, 45Q, or 45V

Notes: Unless otherwise specified, all references to "Section" in this presentation are to the Internal Revenue Code of 1986, as amended (IRC).
Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRC.

§45X: The advanced manufacturing production tax credit covers a wide scope of clean technology manufacturing activities and is one of the most impactful IRA provisions

CREDIT OVERVIEW

- **Provision Description**: Provides a production tax credit for domestic manufacturing of components for solar and wind energy, inverters, battery components, and critical minerals
- **Period of Availability:** Permanent for critical minerals. For other items, the full credit is available between 2023-29 and phases down over 2030-32.
- **Incentive Type:** Production tax credit. Permanent direct pay for tax-exempt entities. 5-year direct pay for businesses until 2032.
- **New or Modified Provision:** New

Transferable | Direct Pay Eligibility | Not Stackable with §48C | No Limit to Size of Credit

Tax Credit Amount (EV battery example):

ADDED $ REVENUE PER KWH BY BATTERY COMPONENT

Notes

- Bar chart is scaled to $100/kWh excl. module and pack manufacturing.
- §45X includes additional per kWh-based incentives for battery cell assembly into combined modules of approx. $10/kWh.
- Credit amounts vary by each type of eligible component. In the case of an eligible component sold during 2030, 2031, and 2032, the phase out percentages are 75, 50, and 25 percent, respectively.

ELIGIBILITY REQUIREMENTS

Available January 1, 2023 until December 31, 2032 for most components

Organization Types and Usage:

- Domestic manufacturers of eligible components

Eligible Components:

Solar Energy Components | Wind Energy Components | Inverters | Qualifying Battery Components | Critical Minerals

Eligible Activities:

- Each value chain participant may stack the credit for every discrete manufacturing, integration, incorporation, or assembly step of eligible components

Activity	Materials Purifying & Processing	Active Materials Mfg.	Cell & Inactive Materials Mfg.	Assembly
Examples	Intermediate materials and purified aluminum, graphite etc.	Materials that contribute to electric conductivity (cathode, anode, electrolyte salts)	Materials incl. separators, housing	Battery module production

HOW TO CLAIM THE CREDIT

- Complete IRS Form 7207 to claim the Advanced Manufacturing Production Credit
- Follow the Instructions for Form 7207 released by the IRS when completing the form
- Reference additional information regarding the Advanced Manufacturing Production Credit

Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRC.

§45X: The advanced manufacturing production provides different incentive levels by clean technology type

PRODUCTION CREDIT AMOUNTS BY COMPONENT TYPE

Eligible Components		Credit Amount
Solar energy component	Solar modules	7 cents x the capacity of such module (expressed on a per direct current watt basis)
	Photovoltaic cells	4 cents x the capacity of such cell (expressed on a per direct current watt basis)
	Photovoltaic wafers	$12 per square meter
	Solar grade polysilicon	$3 per kilogram
	Torque tubes or structural fasteners	87 cents per kilogram / $2.28 per kilogram
	Polymeric backsheets	40 cents per square meter
Wind energy components	Blades	2 cents multiplied by the total rated capacity (expressed on a per watt basis) of the completed wind turbine for which such component is designed.
	Nacelles	5 cents multiplied by the total rated capacity (expressed on a per watt basis) of the completed wind turbine for which such component is designed.
	Towers	3 cents multiplied by the total rated capacity (expressed on a per watt basis) of the completed wind turbine for which such component is designed.
	Offshore wind foundations	fixed platform, 2 cents, or floating platform, 4 cents multiplied by the total rated capacity (expressed on a per watt basis) of the completed wind turbine for which such component is designed.
	Related offshore wind vessels	An amount equal to 10 percent of the sales price of such vessel.

Eligible Components		Credit Amount
Inverter	Central Inverter	0.25 cents multiplied by the capacity of such inverter (expressed on a per alternating current watt basis)
	Commercial Inverter	2 cents the capacity of such inverter (expressed on a per alternating current watt basis)
	Distributed Wind Inverter	11 cents the capacity of such inverter (expressed on a per alternating current watt basis)
	Microinverter	11 cents the capacity of such inverter (expressed on a per alternating current watt basis)
	Residential Inverter	6.5 cents the capacity of such inverter (expressed on a per alternating current watt basis)
	Utility Inverter	1.5 cents the capacity of such inverter (expressed on a per alternating current watt basis)
Qualifying battery component	Electrode active materials	An amount equal to 10 percent of the costs incurred by the taxpayer with respect to production of such materials
	Battery cells	$35, multiplied the capacity of such battery cell (expressed on a kilowatt-hour basis)
	Battery modules	$10 (or, in the case of a battery module which does not use battery cells, $45), multiplied the capacity of such battery cell (expressed on a kilowatt-hour basis)
Applicable critical mineral	Applicable critical mineral as defined in IRC Section 45X that meets certain minimum purity requirements and/or converted to another mineral	10 percent of the costs incurred by the taxpayer with respect to production of such materials

Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRC.

§48C: The Advanced Energy Project Credit provides funding for clean technology manufacturing and investments in energy efficiency and GHG reduction in industrial facilities

CREDIT OVERVIEW

- **Provision Description**: Provides a tax credit for investments in manufacturing capacity for clean energy technologies (including production and recycling), projects to reduce industrial GHG emissions and energy consumption, and critical minerals processing and recycling facilities
- **Period of Availability:** Round 1 applications begin May 31, 2023, and funding is available until 1st round of credits is allocated ($4 billion, ~$1.6 billion earmarked for energy communities). Round 2 applications will likely begin when 1st round of funding is exhausted.
- **Incentive Type:** Allocated investment credit. Provides $10 billion of allocations, at least $4 billion of which must be allocated to energy communities.
- **New or Modified Provision:** Modified and extended. §48C was enacted in 2009 and fully allocated in 2013. IRA provides $10 billion of new allocations, directs a minimum share to energy communities, and expands eligibility to new types of projects.

Transferable

Direct Pay for Tax-Exempt Organizations

Not Stackable with §45X

Competitive Credit with $10 B Cap ($4 B in Round 1)

Tax Credit Amount (in %):

Bonus Credit is awarded for meeting Prevailing Wage & Apprenticeship requirements (5x bonus multiplier times the base)

ELIGIBILITY REQUIREMENTS

Concept papers due July 31, 2023 for Round 1; funds available until exhausted

Organization Types and Usage:

Manufacturing facilities for renewables equipment/components, grid modernization, CCUS, low carbon fuels, energy conservation, and EV/fuel cell vehicles, among other technologies

Qualifying Facilities:

1) Re-equip, expand, or establish an industrial or manufacturing facility for the production or recycling of eligible components;
2) Re-equip an industrial or manufacturing facility with equipment to reduce GHG emissions by 20% through the installation of low-carbon heat systems, CCUS, energy efficiency and reduction in waste, or any other eligible industrial technology to reduce GHG emissions; or
3) Re-equip, expand, or establish a facility for processing, refining, or recycling critical minerals

Selection Criteria:

Domestic Job Creation

Commercial Viability

Project Timeline

Reduction In Energy Consumption or GHG Emissions

Impact On Air Pollutant and/or GHG Emissions

Innovation & Commercial Deployment

HOW TO CLAIM THE CREDIT

- Submit project concept papers to the Department of Energy (DOE) via the eXCHANGE portal by July 31, 2023. Following submission of a concept paper, DOE will encourage or discourage taxpayers from submitting a joint application for DOE recommendation and for IRS §48C cert.
- An applicant who receives a certification has 2 years from the date of issuance of the certification to place the project in service and notify the DOE Secretary through the eXCHANGE portal. The taxpayer can then claim the credit on its income tax return for the taxable year in which the project was placed in service.
- Review the initial IRS guidance on prevailing wage and apprenticeship requirements
- Submit IRS Form 3468 in taxable year that project was placed in service

Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRS, IRC.

Companies are already using §45X and §48C to support their clean manufacturing

Battery Joint Venture

In January 2023, Ford Motor Company announced an investment of $3.5 billion to build a lithium iron phosphate (LFP) EV battery plant in Marshall, Michigan. In its Q3 2022 earnings call, Ford CEO referred to the **Sec. 45X credit with $45 per kilowatt per hour as the Company's largest opportunity in the IRA.**

Solar Panel Manufacturing

In August 2022, First Solar, Inc. announced plans to invest up to $1.2 billion in the US to scale domestic manufacturing of PV modules. The plan includes a vertically integrated domestic factory in Lawrence County, Alabama. The manufacturing and production tax incentives in the IRA are referred to as **providing the necessary long-term clarity for US manufacturing investments.**

Wind Power On-shoring

Foreign manufacturers of wind power components, such as Spanish-German company Siemens Gamesa, have **announced investments in US manufacturing capabilities to effectively respond to the IRA and become eligible for its incentives**. In January 2023, the Company announced a wind turbine nacelle manufacturing plant investment of $500 million in New York.

HVAC Manufacturing

AAF-McQuay Inc. received $1.3 million in funding from the Sec. 48C Phase I funding for a building in Fairbault, Virgina **to re-equip a manufacturing facility for the production of rooftop air-conditioning systems** used on Heating, Ventilation, and Air-Conditioning (HVAC) systems.

Wind Turbine Manufacturing

American Industrial Transport (formerly American Railcar Industries) received $5.3 million in funding to **re-equip a rail car manufacturing plant for the production of 500 structural steel towers per year** for large-scale commercial wind turbines in Fort Dodge, Iowa.

Biofuel Production

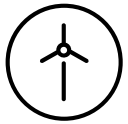
Novozymes Blair, Inc received $28.4 million to **install equipment at a new manufacturing facility** in Blair, Nebraska. The facility produces enzymes used in manufacturing cellulosic ethanol from corn stover by the biochemical platform (e.g., biomass pretreatment, enzymatic hydrolysis, fermentation) to then manufacture biofuel.

Sources: Ford, First Solar, Siemens Gamesa, WH Archive 48C Selection

Every function has a role to play to take advantage of the IRA to support investment in clean technology manufacturing capabilities

Strategy

- Assess existing clean technology product portfolio and planned CAPEX against corporate strategy and IRA induced shifts in demand
- Identify priority sites, products, and technologies for investments in manufacturing capabilities and energy efficiency upgrades



Sustainability

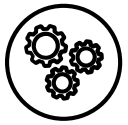
- Calculate projected abatement potential (air quality and GHG emissions) for Sec. 48C projects for industrial facilities and compare against goals, strategy and alternatives

Finance

- Refresh business case to include IRA incentives
- Conduct ROI analysis for priority sites, products, and technologies that can benefit from Sec. 45X and 48C
- Assess financial impacts of re-equipping vs. expanding vs. new build of clean technology industrial facilities

Tax

- Review manufactured products and operations for Sec. 45X credit eligibility, including assessment of legal entity structure
- Review new and existing manufacturing sites for Sec. 48C eligibility, collaborate with Strategy and Operations on Sec. 48C concept paper and application
- Analyze value of direct pay vs. using credits pursuant to Sec. 38



Operations & Procurement

- Engage with Strategy and Tax to determine eligible product lines for Sec. 45X and track production volumes in the required format for IRS Form 7207
- Collaborate with Strategy, Finance, and Tax to identify suitable site for investments in clean technology manufacturing for Sec. 48C

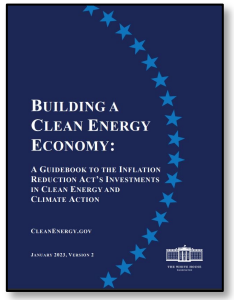
Government Affairs

- Identify additional federal, state and local incentive structures
- While the comment period for both Sec. 45X and Sec. 48C closed on November 4, 2022, the IRS will consider comments provided after this date (reference IRS-2022-0047 in comment)

Sources: Deloitte Analysis, P.L. 117-119, WH IRA Guidebook, IRS, IRC.

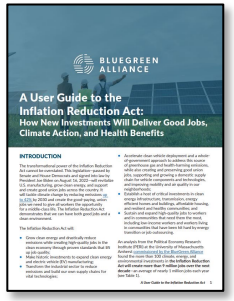
Several additional resources exist to help companies activate the IRA's building energy efficiency provisions

General IRA Resources



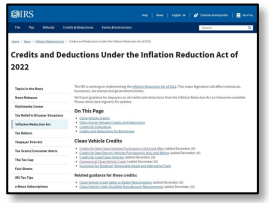
WH IRA Guidebook

Includes overview, description, and funding details for each IRA funded incentive



BGA IRA User Guide

Provides overview of IRA incentives by sector and explains funding mechanisms



IRS Credits and Deductions under the IRA

Resources, forms and descriptions of IRA tax credits and deductions

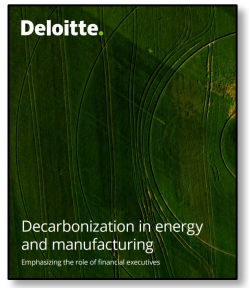
Clean Manufacturing Resources

Advancing energy security

Outlines comprehensive Deloitte overview of IRA enhanced sustainability incentives

Deloitte Podcast on Advanced Manufacturing Credits

Provides an overview 45X and 48C and how companies can activate them



Decarbonization in energy and manufacturing

Details survey results on the role of financial executives in influencing organization's decarbonization journey

Victoria Mills
Managing Director
vmills@edf.org

Other useful resources:

- Instructions for IRS Form 3468
- DOE Summary of previous Sec. 48C program and projects
- DOE List of 48C projects
- Decarbonizing the steel value chain: Forging new paths together
- Deloitte Tax alert on prevailing wage and apprenticeship requirements

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