

ADVANCED ENERGY PROVISIONS IN THE INFLATION REDUCTION ACT OF 2022

By Advanced Energy Economy
Developed with input from

**WILSON
SONSINI**

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INTRODUCTION

On Friday, August 12, 2022, the Inflation Reduction Act (H.R. 5376, the “IRA”) passed the U.S. House of Representatives, the final stop in the legislative process before it arrives at President Biden’s desk for his signature. With over \$396 billion in direct federal investments in advanced energy, transportation, and manufacturing, the IRA represents the largest climate and clean energy bill in US history – as well as one of the latest pieces of industrial policy. The legislation covers the waterfront of advanced energy technologies, providing support in the form of tax credits, loan guarantees, and grants to bolster the production and deployment of wind, solar, energy efficiency, transmission, advanced nuclear, hydrogen, heat pumps, electric vehicles, grid modernization technologies and more. By leveraging innovative financial tools such as the Department of Energy’s Loan Programs Office and establishing a Greenhouse Gas Reduction Fund - a financing tool for state and local green banks – the IRA is poised to leverage public capital to generate trillions in private investment into this industry.

AEE’s Advanced Energy Manufacturing and Infrastructure (AEMI) Working Group has dug into the details of the IRA and produced this detailed synopsis. We have cross-referenced this with public summaries and analyses put forward by Senate staff and outside organization. The team at Wilson Sonsini Goodrich & Rosati – in particular Jaron Goddard, Hershel Wein, Brandon King, Kristen Berry, and Todd Glass – provided invaluable support, reviewing drafts of this document, honing its analysis and adding greater depth.

This document is intended to provide a detailed yet succinct synopsis of the IRA’s energy and climate provisions. Given the complexity of this legislation, and the nuances of legal interpretation and administrative implementation, this should not be considered official legal or financial advice. We have provided links to additional summary documents, as well as the full legislative text, and the end of this document.



Clean Electricity Tax Credits

TAX PROVISIONS RELATED TO ENERGY GENERATION AND STORAGE:

Investment Tax Credit

- Extends the section 48 ITC through 2024. The provision provides a base credit rate of 6% of the basis of qualified energy property or a bonus credit rate of 30% of the basis of qualified energy property. In order to receive the bonus rate the project must meet prevailing wage and apprenticeship requirements. (section 13102)
- Provides a 10% increase in the ITC to solar or wind facilities placed in service in low-income communities (section 13103)
- Expands the ITC to include energy storage technology (including thermal storage), linear generators, microgrid controllers, dynamic glass, biogas property. These technologies are eligible for a 6% base credit rate or a 30% bonus credit rate. (section 13102)

Production Tax Credit

- Extends section 45 PTC for landfill gas, trash (municipal solid waste), qualified hydropower, marine and hydrokinetic renewable energy facilities, and geothermal through 2024. (section 13101)
- Revives the section 45 PTC for solar energy through 2024. Allows taxpayers to continue claiming ITC in lieu of the PTC. (section 13101)
- Creates a new PTC (section 45V) for clean hydrogen beginning in 2022 and extending for ten years. The amount of the credit is equal to the applicable percentage of the base rate of \$0.60 or the bonus rate of \$3.00, indexed to inflation, multiplied by the volume (in kilograms) of clean hydrogen produced by the taxpayer at a qualified facility during the taxable year. In order to claim a bonus rate on the credit, prevailing wage and apprenticeship requirements must be met. (section 13401)
- Creates a new PTC (section 45U) for nuclear energy through 2032. (section 13105)

Technology Neutral Credits

- Creates an emissions based incentive that begins in 2025 and would be neutral across clean electricity technologies. Taxpayers can choose between a PTC (section 45Y) or ITC (section 48D), that is based on the carbon emissions of the electricity that is generated. Any power facility can qualify for the credits as long as their emissions are at or below zero. Choosing the PTC will result in a credit equal to up to 2.5 cents per kilowatt hour and for the ITC a credit worth up to 30% of the investment. Receiving the full value of the credit is dependent on meeting prevailing wage and apprenticeship requirements. The credits will phase out in 2032 or when emissions targets are achieved. (sections 13701-13702)



- Provides for an additional 10% incentive for projects qualifying for the section 48F ITC if it locates in a low-income community or 20% if the project is a qualifying low-income residential building project. This provision will take effect on January 1, 2027. (section 136803)
- Extends the section 25D residential energy property (including solar, geothermal, and fuel cells) credit at 30% through 2034. The credit phases down to 26% in 2033 and 22% in 2034, then expires after the end of 2034. (section 13302).
- Allows qualified entities including any organization exempt from tax, state or local governments, the Tennessee Valley Authority, Indian tribal governments, or Alaska Native Corporations to be eligible for “direct pay” for the following credits (section 13801):
 - Section 48 ITC
 - Section 45 PTC
 - Section 45Q credit for carbon capture and sequestration
 - Section 30C alternative fuel vehicle refueling property credit
 - Section 48C advanced energy project credit
 - Section 45U zero-emission nuclear power production credit
 - Section 45W commercial vehicle credit
 - Section 45V clean hydrogen production credit
 - Section 45X advanced manufacturing production credit
 - Section 45Y clean electricity production credit
 - Section 48D clean electricity investment credit
 - Section 45Z clean fuel production credit
- Allows taxpayers to elect to be treated as having made a payment of tax equal to the value of the credit they would otherwise be eligible for. The following credits are eligible for “direct pay” (section 13801):
 - Section 45Q credit for carbon capture and sequestration
 - Section 45V clean hydrogen production credit
 - Section 45X advanced manufacturing production credit
- Allows for the transfer of certain credits (section 13801)



⦿ Bonus Credit Requirements

Throughout the legislation several sections of clean energy tax credits allow bonus credits to be claimed if they meet certain domestic content, prevailing wage, and apprenticeship requirements. The definitions for meeting those requirements are listed below:

- Domestic Content - A manufactured product meets this standard if not less than 40% for projects that begin construction before 2025, 45% for projects that begin construction in 2025, 50% for projects that begin construction in 2026, and 55% percent for projects that begin thereafter is attributable to components which are mined, produced, or manufactured in the United States. For offshore wind the requirements are 20% for projects that begin construction before 2025, 27.5% for projects that begin construction in 2025, 35% for projects that begin construction in 2026, and 45% percent for projects that begin construction thereafter.
- Prevailing Wage - Any laborers and mechanics employed by contractors and subcontractors must be paid prevailing wages during the construction and, in some cases, for any alterations or repairs.
- Apprenticeship - To meet this requirement, total labor hours of 10% for projects for which construction begins in 2022, 12.5% in 2023, and 15% thereafter must be completed by qualified apprentices. It requires that each contractor and subcontractor who employs 4 or more individuals for construction must employ at least one qualified apprentice.

⦿ Other Items

- Extends the section 45Q tax credit for carbon capture by 10 years (section 13104).
- Any facility described in the clean electricity production credit and any qualified property or grid improvement property described shall be treated as five-year property under GDS for purposes of section 168 of the Internal Revenue Code (section 13703).
- Creates a technology-neutral incentive (45Z) for the domestic production of clean fuels. The credit phases out in 2032 or when emission targets are achieved (section 13704).



Electrified Transportation

PROVISIONS RELATED TO THE PURCHASE / DEPLOYMENT OF CLEAN FUEL VEHICLES AND CHARGING INFRASTRUCTURE, AS WELL AS FUNDING FOR EV FLEETS:

○ Light-Duty Purchase Incentives

- Amends 30D credit by adding qualified fuel cell powered vehicles as eligible to receive the credit. The amount of credit allowed by this provision with respect to a qualified vehicle is equal to \$3,750 if it meets domestic critical mineral requirements (80% of critical minerals from U.S, North America, or allied countries by 2027 while scaling up over time) plus an additional \$3,750 for meeting domestic battery component requirements (100% sourced in the U.S by 2029 and scaling up over time). Extends the credit through 2032.(section 13401).
 - The unit per manufacturer cap is eliminated starting in 2023.
 - No credit is allowed for taxpayers whose adjusted gross income exceeds \$150k for single and \$300k for joint filers.
 - No credit is allowed for vehicles over the following prices - vans: \$80k; SUVs: \$80k; pickup trucks: \$80k; any other vehicle: \$55k
- Creates a new refundable credit for the purchase of used EVs. Buyers can claim a credit of \$4,000 or a credit equal to 30% of sales price, whichever is less. (section 13402).
- Creates a new credit 45W for qualified commercial electric vehicles (section 13403). The allowed amount is equal to 15% (30% for vehicles not powered by a gasoline or diesel internal combustion engine) of the cost of the vehicle. The credit applies to light, medium, and heavy-duty vehicles.

○ Charging Infrastructure

- Extends the Section 30C alternative fuel vehicle refueling property credit through 2032 and increases it from \$30,000 per property to \$100,000 per item of property. (section 13404).
 - Credit is only allowable under qualifying 45D or non-urban census tracts
 - Projects must meet prevailing wage requirements and apprenticeship requirements.

○ Heavy-Duty Vehicles

- Provides EPA \$1 billion for replacing eligible heavy-duty (class 6 and 7) vehicles with zero-emission vehicles. Allocates \$400 million specifically to non-attainment areas. Eligible funding uses also include infrastructure needed to charge, fuel, or maintain zero-emission vehicles; workforce development and training; and planning and technical activities to support the adoption and deployment of zero-emission vehicles. (section 60101)



- **Addressing Transportation Emissions**
 - \$60 million for EPA to reduce diesel emissions at goods movement facilities, including vehicles that serve such facilities, in low-income and disadvantaged communities. (section 60104)
 - \$5 million to EPA to provide grants to states to adopt and implement GHG and zero-emission standards for mobile sources. (section 60105)

- **Federal Clean Vehicle Fleet**
 - Provides \$3 billion for the procurement of electric USPS vehicles and charging infrastructure. (section 70002)

Advanced Energy Manufacturing

INDUSTRIAL POLICY PROVISIONS FOCUSED ON BOLSTERING DOMESTIC ADVANCED ENERGY AND TRANSPORTATION MANUFACTURING

- **Manufacturing Investment Tax Credits**
 - Revives the 48C qualified advanced energy property credit by allowing the Secretary an allocation of \$10 billion through 2032. (section 13501).
 - \$4 billion in credits is reserved for projects in qualifying energy communities
 - Projects must meet prevailing wage requirements and apprenticeship requirements.
 - Qualifying projects now include recycling along with those which re-equip a manufacturing facility to reduce greenhouse gas emissions. Energy storage systems and components, hydro, grid modernization, energy conservation technologies, and EV charging infrastructure projects are all now eligible.

- **Manufacturing Production Tax Credits**
 - Establishes a new advanced manufacturing PTC (45X) for the production of solar, wind, battery, and critical mineral supply chain components (section 13502)
 - Solar components include polysilicon, wafers, cells, modules, torque tubes or structural fasteners, and polymeric backsheets
 - Wind components include blades, nacelles, towers, offshore foundations, and related offshore wind vessels
 - Battery components include electrode active materials, cells and modules.
 - Applicable critical minerals are aluminum, barite, beryllium, cerium, cesium, chromium, cobalt, dysprosium, europium, fluorspar, gadolinium, germanium, graphite, indium, lithium, manganese, neodymium, nickel, niobium, tellurium, tin, tungsten, vanadium, and yttrium.



- The credits are provided on a mass or watt-capacity basis. The credit is extended in full until 2030 and decreases by 25% each year until it expires in 2033.

- **Defense Production Act**

- \$500 million allocated to the Defense Production Act Fund to be used for authorized uses including for solar, heat pumps, power grid infrastructure, building insulation, and equipment for making and using clean electricity-generated fuels. (section 30001)

- **DOE Loan Programs**

- \$40 billion in loan authority for the DOE Loan Program Office, plus \$3.6 billion appropriated for the costs of the guarantees. (section 50141)
- \$3 billion to DOE for direct loans under the Advanced Technology Vehicles Manufacturing program, including for medium- and heavy-duty vehicles and zero-emission trains or locomotives, maritime vessels, aircraft, or hyperloop technology. The section also removes the cap on the amount of direct loans the Secretary can issue. (section 50142)

- **Demonstration Projects**

- \$5.812 billion to DOE for demonstration projects carried out by the Office of Clean Energy Demonstrations. (section 50161)

- **Other Items**

- \$2 billion to DOE for domestic manufacturing conversion grants for domestic production of plug-in electric hybrid, plug-in electric drive, and hydrogen fuel cell electric vehicles, as well as the component parts. (section 50143)



Building Efficiency & Electrification

PROVISIONS RELATED TO RESIDENTIAL AND COMMERCIAL ENERGY EFFICIENCY AND ELECTRIFICATION:

○ Residential Efficiency & Electrification

- \$4.3 billion to DOE to provide funding to state energy offices for HOMES rebate programs of up to \$8,000 for low-income families. Rebates are available for both single-family and multifamily retrofits. (section 50121)
- \$4.3 billion to DOE for rebates for qualifying electrification projects, including to homeowners and owners of multifamily buildings (section 50122)
- Extends the section 25C credit for residential energy efficiency improvements through 2032 (section 13301).
- Extends the 45L new energy efficient home credit through 2032 (section 13304).
 - Provides a \$2,500 credit for energy efficient single family and manufactured new homes meeting certain ENERGY STAR requirements.
 - Provides a \$5,000 credit for eligible single family and manufactured homes and multifamily units that satisfy prevailing wage requirements certified as zero energy ready under the DOE Zero Energy Ready Home Program.

○ Commercial & Public Buildings

- \$250 million for the Federal Buildings Fund to convert federal facilities to high performance green buildings. (section 60502)
- \$50 million to EPA for monitoring and reducing air pollution at public schools in low-income and disadvantaged communities. (section 30107)
- \$500 million to DOE to provide funding to states for the purposes of resiliency, energy efficiency, renewable energy, and grid integration improvements at public and nonprofit buildings. (section 30421)
- \$1 billion to DOE for State Energy Program grants to assist states and local communities in adopting updated building energy codes for residential and commercial buildings. (section 50131)
- Increases the maximum deduction for energy efficient commercial buildings (section 13303). This provision allows taxpayers to elect to take an alternative, parallel deduction for energy efficient lighting, HVAC, and building envelope costs placed into service in connection with a qualified retrofit plan.



Transmission Infrastructure

PROVISIONS TO PROVIDE FINANCIAL SUPPORT FOR TRANSMISSION MODELING, SITING, AND DEPLOYMENT

- \$2 billion to DOE for loans to construct new high-capacity transmission lines and upgrade interties between interconnections. (section 50151)
- \$760 million to DOE for grants to siting authorities, including state, local, or Tribal governmental entities, to study impacts of covered transmission projects, examine alternate transmission siting corridors, host negotiations regarding covered transmission projects, participate in regulatory proceedings, and for economic development activities for affected communities. (section 50152)
- \$100 million to DOE for transmission planning, modeling, and analyses of interregional and offshore wind transmission projects. (section 50153).
- \$125 million to DOE and \$100 million to FERC for the development of better processes for reviews of planning, permitting, and approvals (not specific to transmission). (sections 50301 and 50302)

Clean Energy Equity and Community Investment

PROVISIONS FOCUSED UPON ENVIRONMENTAL JUSTICE, ENERGY EQUITY, AND POLICIES TO SUPPORT LOW- AND MODERATE-INCOME CONSUMERS:

- \$27 billion to EPA for establishing a Greenhouse Gas Reduction Fund to support nonprofit, state, and local climate finance institutions that support the rapid deployment of low- and zero-emission technologies, with 40% of investments dedicated to low-income and disadvantaged communities. Funds can be used to establish or expand state and local financing programs that deploy low- and zero-emission technologies. \$7 billion of the total is invested in programs to install zero-emission distributed technologies in states that serve low-income and disadvantaged communities. (section 60103)
- \$87 million to EPA to help educate consumers, support low-income communities, and offer technical assistance to industry, and state and local governments, in regards to achieving reductions in GHG emissions occurring from domestic electricity generation and use. (section 60107)
- \$5 billion to EPA for grants to develop plans to reduce greenhouse gas air pollution, including directing the EPA to make such a grant to at least one entity in each state. (section 60114)



- \$3 billion to EPA for grants to community-led projects in disadvantaged communities and community capacity building centers to address impacts of pollution and climate change. (section 60201)
- \$5 billion to DOE for the Energy Community Reinvestment Financing Program, which provides financial support for low-carbon investments in communities where members of the community are or were providing energy-intensive goods or services. (section 50144)
- \$75 million for DOE to fund the tribal energy loan guarantee program, plus an increase in the loan guarantee cap to \$20 billion (section 50145)

Rural Energy

USDA-SPECIFIC PROVISIONS FOCUSED ON CLEAN ENERGY FINANCING AND DEPLOYMENT IN RURAL COMMUNITIES:

- \$1 billion to USDA for loans for renewable electricity, including for projects that store renewable electricity. (section 22001)
- \$2.025 billion for USDA's Rural Energy for America Program, which promotes energy efficiency and renewable energy for agricultural producers and rural small businesses. Section includes \$304 million for "financial assistance for underutilized renewable energy technologies and program technical assistance". Match reduced to 50% (from 75%). (section 22002)
- \$9.7 billion to USDA for rural electric cooperatives to purchase renewable energy or renewable energy systems, deploy renewable energy systems, or make energy efficiency improvements. Funds can also be used for debt relief associated with terminating nonrenewable energy assets. (section 22004)

Other Areas of Importance

- Directs the Department of the Interior over a ten year period to not issue an offshore wind lease unless an oil and gas lease sale has been held in the year prior (section 50251)
- \$2.25 billion to EPA for zero-emission equipment and technology at ports. 25% of investments must be made in non-attainment areas. (section 60102)
- \$5 million to EPA to support standardizing and making transparent corporate climate action commitments and their progress for meeting such goals. (section 60111)



- ⦿ \$250 million to EPA for establishing a program to support development and enhanced standardization and transparency of environmental product declaration for construction materials and products. (section 60112)
- ⦿ \$850 million to EPA for grants, rebates, contracts, and loans to reduce methane emissions. (section 60113)
- ⦿ \$100 million to EPA for identifying and labeling low-embodied carbon construction materials and products used for transportation projects. (section 30118)
- ⦿ Includes \$925 million for federal clean procurement. (section 60504)

Key Reference Documents

- ⦿ [Full Legislative Text](#)
- ⦿ [Topline Summary of Full Act](#)
- ⦿ [Section by Section](#)

