Issue Briefing

October 2022

Inflation Reduction Act of 2022: Climate and Energy Provisions

On August 16, 2022, President Biden signed into law the Inflation Reduction Act of 2022 (H.R. 5376), a historic bill that represents the largest investment ever in climate action from the U.S. Congress.[1] The legislation includes $369 billion for climate and energy provisions and will contribute to reducing carbon emissions from 2005 levels by approximately 40 percent by 2030 by accelerating the decarbonization of electricity production and other carbon-intensive sectors.

While this legislation will transform the climate and energy landscape in the U.S., given its scale and breadth, all of the potential impacts and opportunities may not be readily apparent. The IRA's climate investments are broad and reach across many sectors, including provisions to address emissions reductions for the energy, transportation, industrial, and agricultural sectors. ERM has in depth experience supporting clients across all the sectors of the U.S. economy affected by the Inflation Reduction Act of 2022, partnering with the world's leading organizations to bring innovation solutions to sustainability challenges. Here we provide an analysis of key IRA provisions that we see as most critical to companies and industries directly and indirectly affected by this historic legislation.

1 Inflation Reduction Act of 2022 (H.R. 5376), https://www.congress.gov/bill/117th-congress/house-bill/5376.

Overview

Specific provisions additionally call for emissions reductions and/or climate benefits to be located in disadvantaged communities.

Combined with the $1.2 trillion Infrastructure Investment and Jobs Act currently under implementation, the clean energy and climate impacts of the Inflation Reduction Act of 2022 (IRA) will be significant and will unfold over this decade and into the next. The figure below provides a view of how the funding, incentives, and credits in the IRA are allocated across key focus areas through both pieces of legislation. Provisions include investments focused on environmental justice, extension and expansion of existing energy tax credits, new production tax credits for zero-emission fuels such as nuclear power and clean hydrogen, electric vehicle tax credits, and advanced manufacturing tax credits, among others.

Key investment areas

The new and expanded clean energy incentives reshape near-term investment outlooks and provide a needed roadmap for planning over the next ten years. These actions provide critical support toward meeting the Biden Administration's stated 2030 goal of 50 percent to 52 percent reduction in U.S. greenhouse gas emissions below 2005 levels. While the new legislation provides a major boost to clean energy demand, the pace of investments will be shaped by a range of factors, including the response of clean energy supply chains to address current constraints, the ability to site critical infrastructure in a timely manner, and administrative capacity to implement new complex grant and loan programs.

Decarbonizing the Electric Sector

$175 billion

The IRA provides significant funding, over $175 billion, to decarbonize the electric sector. It includes investment tax incentives to support the deployment of clean generation technologies, tax incentives for the production of low- and zero-carbon fuels, funding to support building out electric transmission to connect new sources to the grid, and loan assistance for rural electric cooperatives.

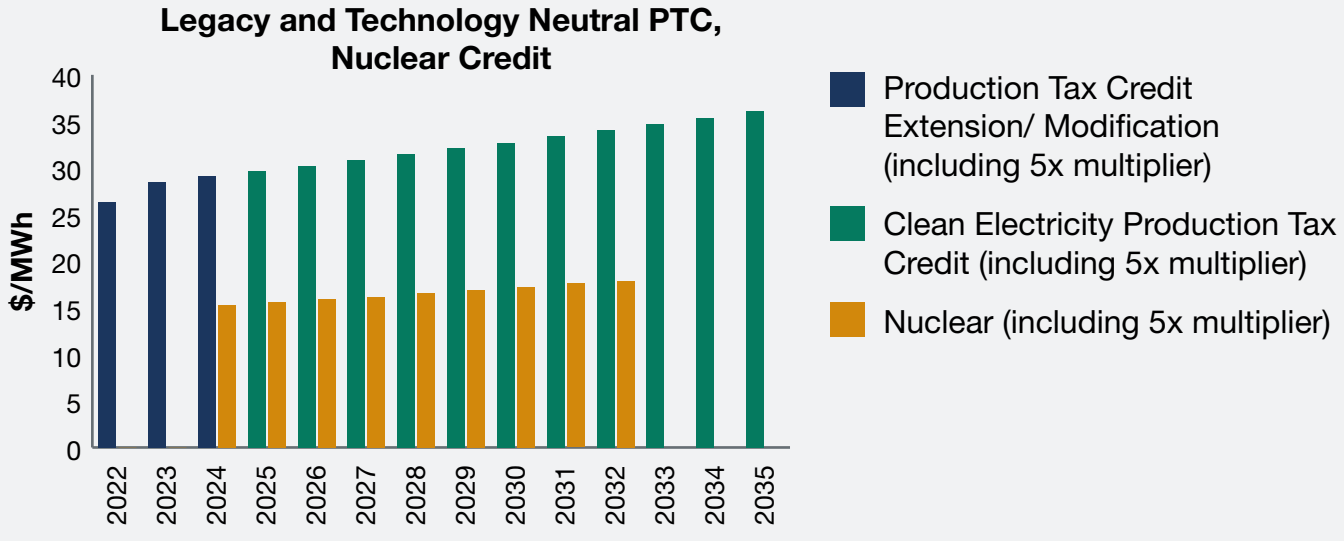
Investment and Production Tax Credits

A majority of the climate-related provisions of the Act include a base tax credit, which can increase if various criteria are met. The most common multiplier is five times that base rate when wage and apprenticeship requirements are met. There are additional adders for development within an energy community and/or if domestic content requirements are met. Additionally, many production tax credits are adjusted for inflation, and the base credit will be multiplied by an inflation adjustment factor to get the correct tax credit rate. See definitions of the requirements in the table below that qualify an entity for multipliers.

Key Term	Definition
Wage Requirements	Taxpayer must ensure Laborers and Mechanics are paid prevailing wages during construction for a qualifying project and in some cases also for future maintenance.
Apprenticeship Requirements	Taxpayer must ensure qualified apprentices performed no less than the required number of hours (2022: 10 percent; 2023: 12.5 percent; and 2024 and after: 15 percent).
Energy Community	A brownfield site, or a location that: ■ since 1999 has experienced a coal mine closure; ■ since 2009 has experienced a coal plant closure; or ■ since 2009 had significant direct employment related to fossil fuels and has an unemployment rate above the national average.
Domestic Content Requirements	■ Steel & Iron: 100% produced in the U.S. ■ Manufactured Products: total cost of components and subcomponents of the project is attributed to components that are mined, produced, or manufactured in the U.S. – 40 percent for projects that begin before 2025, – 45 percent for projects that begin construction in 2025, – 50 percent for projects that begin construction in 2026, and – 55 percent for projects that begin construction thereafter.

The IRA will significantly extend and expand the existing Production Tax Credit (PTC) and Investment Tax Credit (ITC), which are the main tax incentives that have been in place to support the development of clean electricity projects:

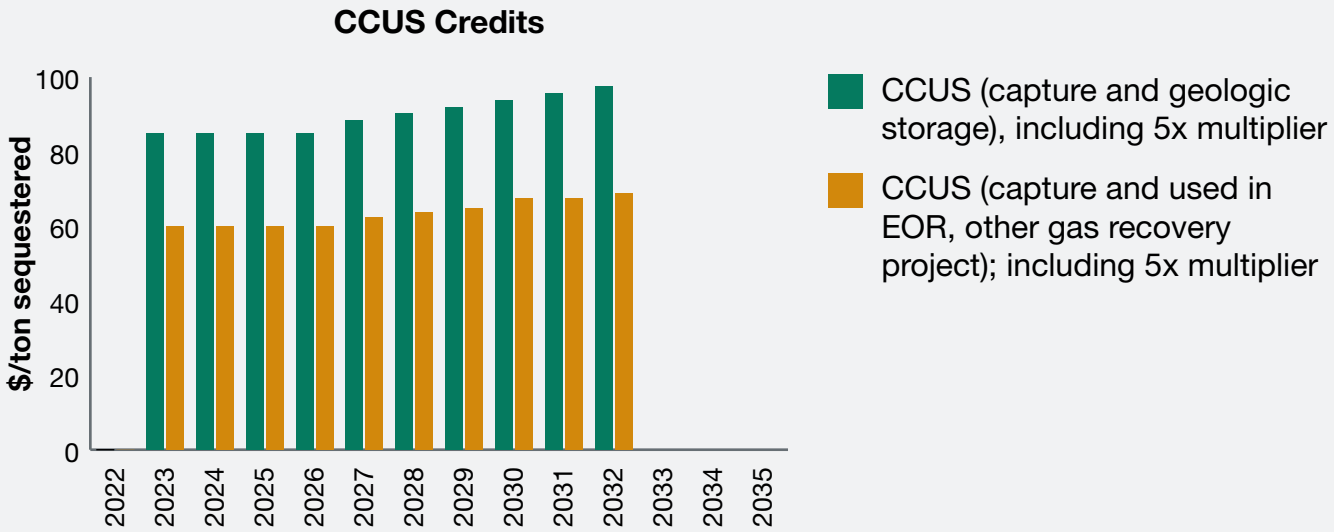
- The IRA will extend the existing renewable energy ITC, which provides a 30 percent credit for the cost of eligible energy property, including solar and offshore wind, and adds energy storage and biogas property to the eligible energy properties covered. This credit is extended to projects that begin construction before January 1, 2025. With the extension, qualifying for the full 30 percent credit requires meeting wage and apprenticeship requirements. The extension also includes a 10 percentage-point increase if the project is located in an energy community and/or it meets domestic content requirements. An additional increase is available for facilities that are located in a low-income community, are part of a low-income residential building project, are part of a low-income economic benefit project, or are located on Indian land.
- The existing PTC will be extended to projects that begin construction before 2025. The credit is equal to 0.5 cents per kWh in 2022 (0.3 cents in 1992 dollars per the original legislation) of eligible electricity produced, which can further be multiplied by five times if wage and apprenticeship requirements are met, for a total of 2.6 cents per kWh in 2022. An additional 10 percent credit applies if the project meets the same criteria as the ITC's 10 percentage point increase. See Legacy and Technology Neutral PTC, Nuclear Credit Figure below for projected nominal credits accounting for inflation.



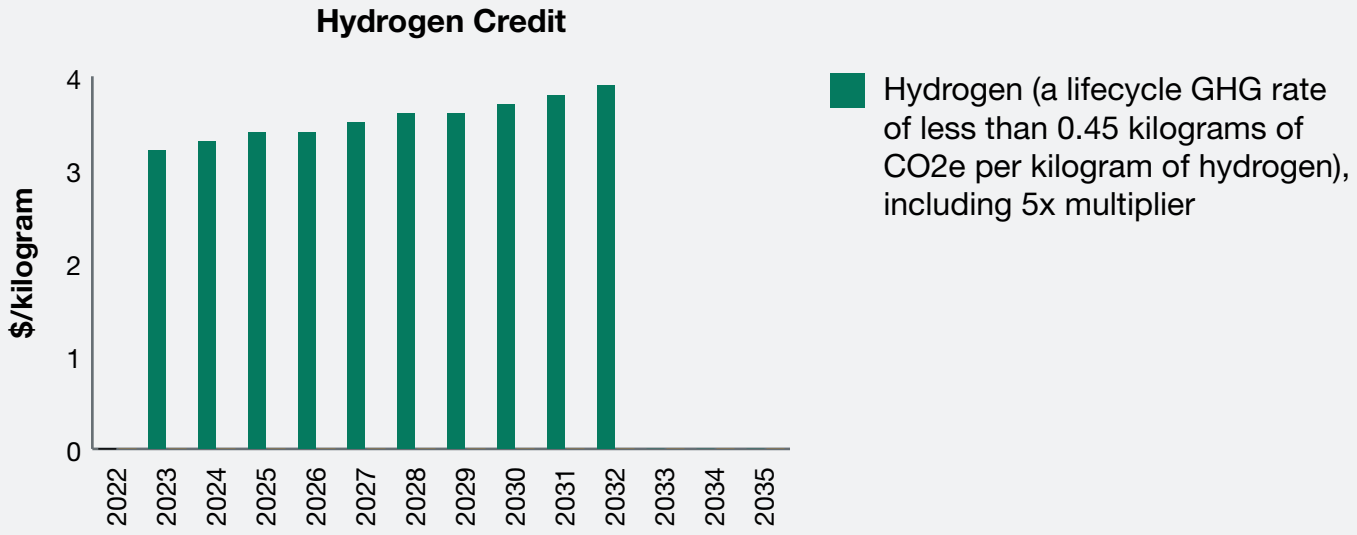
- After the sunset of the IRA's extensions of the existing ITC and PTC, the legislation adds new technology-neutral credits available to facilities that generate electricity while emitting no greenhouse gases. Facilities that start construction through the later of 2032 or the year in which the electricity sector has reduced greenhouse gas emissions by 75% will be eligible. These credits also include a phase-out provision in which years 1, 2, and 3 after 2032 (or the year of 75% reduction) receive 100%, 75%, and 50% of the inflation-adjusted PTC credit in those years, respectively, and an ITC credit of up to 30%, 26%, and 22% in the phase-out years. If the IRA guidance on the existing ITC and PTC remains the same—with its safe-harbor provision of a 4 year window from start of construction to commercial operation—projects that reach commercial operation through at least 2037 could potentially qualify for the full credit.

In addition, the IRA would extend and establish new credits for carbon sequestration, zero-emission nuclear power, and clean hydrogen.

- The carbon sequestration credit amends the 45Q tax credit to form a base credit of $17 or $12 per ton of CO2 captured from carbon capture equipment, or $36 or $26 per ton of CO2 captured from direct air capture projects, dependent on whether the CO2 is stored in geological storage (higher value) or used in projects like enhanced oil recovery (lower value). This credit is multiplied by five times if wage and apprenticeship requirements are met. This is a 12-year credit that is available to projects that are placed into service after 2023 and begin construction before 2032. The magnitude of the tax credit is tied to a 2025 base year and will be inflated starting in 2027. See Carbon Capture, Utilization, and Storage (CCUS) Credits Figure for projected nominal credits accounting for inflation.



- The nuclear power credit is a new credit established with a base credit of $3 per megawatt hour (MWh) of qualifying nuclear power. The provision applies to electricity produced and sold between December 21, 2023 and December 31, 2032, including from existing nuclear power plants. This credit is multiplied by five times if wage and apprenticeship requirements are met. The magnitude of the tax credit is tied to a 2023 base year. See Legacy and Technology Neutral PTC, Nuclear Credit Figure for projected nominal credits accounting for inflation.
- The hydrogen production tax credit is a new credit established under the IRA and has a base credit of $0.60 per kilogram of clean hydrogen produced, multiplied by an applicable percentage that is based on the hydrogen's lifecycle GHG emissions rate and by five times if wage and apprenticeship requirements are met. The highest tax credit provided is $3 per kilogram and is associated with the lowest lifecycle rate (0.45 kilograms of CO2e per kilogram of hydrogen). The hydrogen tax credit is a 10-year credit, available to projects that start construction between 2023 and 2032. The magnitude of the tax credit is tied to a 2022 base year. See Hydrogen Credit Figure for projected nominal credits accounting for inflation.



The majority of the electric sector tax credits include direct pay provisions that allow tax exempt entities to elect, at the time the facility is placed into service, to be treated as having made a payment of tax equal to the value of the credit they would otherwise be eligible for. Taxpayers who are ineligible for the direct pay election may instead opt to transfer any applicable credit to another taxpayer. This system will allow nonprofit organizations such as schools, public power utilities, cities, and other entities that do not pay income taxes to take advantage of these tax credits.

Transmission

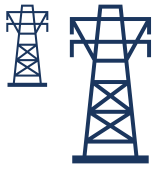
Transmission provisions will provide almost $3 billion in funding and resources to increase the buildout of new electric transmission facilities, including loans for transmission investments, grants to increase the siting of interstate transmission, and funding to support transmission planning for offshore wind.

- Under the transmission facility loans program, $2 billion in funding will be used to provide loans to carry out construction or modification of electric transmission facilities. Funding must be disbursed by September 30, 2031.
- Interstate transmission line grants and fund processes totaling $760 million will help site interstate transmission such as the hosting and the facilitation of negotiations between the siting authority and the transmission project to identify potential obstacles to the permitting process. Funding must be disbursed by September 30, 2031.
- The interregional offshore wind transmission planning program will provide $100 million in funding to conduct planning, modeling, and analysis regarding interregional electricity transmission generated by offshore wind. This funding will be available through September 30, 2031.

Key Considerations

- The billions of investment of the IRA could drive nearly $3.5 trillion in cumulative capital investment in new American energy supply infrastructure over the next decade.
- Tiered 45Q carbon credits will be available for not only pure sequestration but also enhanced oil recovery (EOR) projects, allowing operators to extend the life of fields and monetize assets that might otherwise be stranded.
- The IRA represents a historic policy shift for carbon management technologies and makes the landscape of low and no carbon investments significantly more lucrative and accessible.
- CCUS investments stand to take a remarkable incentive by extending the 45Q tax credits start of construction window, by increasing the credit value to above breakeven costs, making the tax credit direct pay and expanding its transferability, as well as lowering the capture thresholds. The passing of the IRA bill makes a slew of facilities and projects eligible to 45Q tax credit in the US and validates the economic proposition of CCUS.
- Access to renewable energy infrastructure supported by the IRA will be critical to deliver the absolute emission reductions that energy intensive sectors such as heavy industries and chemicals are targeting by 2030; in recent assessments, 60-75% of targeted emission reductions come from electrification and access to renewable energy.
- The inclusion of a new hydrogen production tax credit provides critical incentives to energy intensive companies to accelerate switching to low carbon fuels, both in legacy infrastructure turnarounds/retrofits as well as greenfield projects; integration of hydrogen in some processes can represent up to half of the emission reductions towards net-zero projects
- The additional energy storage is significant and was a sticking point in the ITC for solar projects that wanted to build with a battery.

Expanding Domestic Manufacturing Capacity for Clean Energy and Transportation



$60 billion

The IRA includes substantial investment in the expansion of domestic manufacturing, totaling over $60 billion going to onshore clean energy manufacturing in the United States across the full supply chain of clean energy and transportation technologies. It invests the following:

- $30 billion in advanced manufacturing production tax credits to accelerate U.S. manufacturing of solar panels, wind turbines, and batteries, and to the processing of critical minerals;
- $10 billion investment tax credit to build clean technology manufacturing facilities, such as facilities that make electric vehicles, wind turbines, and solar panels;
- $500 million for the Defense Production Act to support domestic manufacturing;
- $2 billion in domestic manufacturing conversion grants to retool existing auto manufacturing facilities to manufacture clean vehicles;
- $3 billion in loans to build new clean vehicle manufacturing facilities across the country; and
- $2 billion for the National Laboratory System to accelerate breakthrough energy research in support of domestic clean energy manufacturing.

It also designates over $9 billion for federal procurement of American-made clean technologies to create a stable market for clean products manufactured domestically, such as the $3 billion for the USPS to electrify its delivery fleet.

Key Considerations

- Investments in manufacturing facilities and capacity will need to be paired with development of skilled labor. Even prior to the passage of the IRA, the U.S. was facing a skilled labor shortage, with an estimated 2.1 million unfilled manufacturing jobs by 2030.
- As the demand for clean energy transportation (ZEVs) increases, the demand for critical minerals needed to produce electric vehicles will increase. This will add more stress to the entire supply chain (vehicle manufacturers, battery manufacturers and mines). Close collaboration within the industry and with local populations and partners is critical to achieve these goals responsibly and sustainably.

Environmental Justice

$60 billion

Approximately $60 billion supports environmental justice programs, which are programs specifically focused on providing funding to disadvantaged communities. In the IRA text and in the context of energy programs, a disadvantaged community is defined as "a community that the Secretary [of Energy] determines, based on appropriate data, indices, and screening tools, is economically, socially, or environmentally disadvantaged." Environmental justice programs will provide emissions reductions and health benefits for disadvantaged communities through increased use of low-carbon technology, funding for climate pollution reduction plans, workforce development programs, and increased pollution monitoring through programs like the Environmental and Climate Justice Block Grants and the Superfund Pollution Tax.

In addition to the funding associated with the Environmental Justice provisions, many of the IRA provisions also have bonus multipliers or carve-outs for clean energy investments and development in disadvantaged communities.

Key Considerations

- The IRA provides major incentives to produce clean energy and reduce pollution in low-income and disadvantaged communities across the country.
- IRA-dedicated funding for air quality data gathering and related enforcement, in combination with existing and evolving federal and state environmental justice (EJ) regulations, makes it critical for industry to focus on internal EJ management practices and policies. More proactive and equitable public involvement should be incorporated into project siting, permitting, and operations.

Clean Transportation

$30 billion

The IRA includes substantial investments designed to decarbonize the transportation sector, with approximately $22.7 billion in total tax incentives and an additional $7 billion in grant funding to electrify ports, heavy-duty vehicles, and the delivery fleet of the U.S. Postal Service (USPS). Funding for the transportation sector will support the purchase of clean and electric vehicles (EVs), the use of alternative fuels, and the deployment of clean transportation infrastructure.

Clean Vehicles

The IRA extends the existing $7,500 tax credit for the purchase of a new EV and creates a new $4,000 credit for the purchase a used EV, allocating approximately $7.5 billion in credits for new EVs and approximately $1.3 billion in credits for used EVs. Consumer eligibility for the credits will be subject to income caps, and vehicle eligibility for the credits will be subject to domestic manufacturing requirements. The IRA removes the existing cap for vehicles sold per manufacturer, which currently stands at 200,000 vehicles. Removal of this manufacturer cap will reinstate eligibility of the credit to be used for the purchase of EVs manufactured by Tesla, General Motors, and Toyota. The IRA also includes $3.6 billion for a new commercial tax credit for the purchase of qualified commercial clean vehicles.

The IRA dedicates $1 billion in grants for the purchase of zero emission heavy-duty vehicles like school buses, transit buses, and garbage trucks. It also allocates $1.3 billion to the USPS for the procurement of zero-emission delivery vehicles.

Fuels and Infrastructure

The IRA also includes tax credits and grants for alternative fuels and infrastructure. Tax credits include the following:

- $1.7 billion for the Alternative Fuel Vehicle Refueling Property Credit, in which a property located in a low-income community or rural census tract used for the storage or dispensing of clean-burning fuel is eligible for a base credit of six percent; this credit is multiplied by a factor of five if wage and apprenticeship requirements are met (up to $100,000 per project).
- $3 billion for an alternative and clean fuels production tax credit. Fuels may qualify for the credit if the fuel's lifecycle emissions are at least 25 percent less than the current U.S. nationwide average. Zero-emission fuels qualify for a base incentive of $0.20 per gallon or gallon equivalent (adjusted for inflation). Between now and 2030, qualifying fuels must become increasingly cleaner to qualify for the credit.

- $5.6 billion for tax credits for biodiesel and renewable diesel fuels. This is an extension of the income and excise tax credits for biodiesel and biodiesel mixtures at $1.00 per gallon, the $0.10-per-gallon small agri-biodiesel producer credit, and the $0.50 per gallon excise tax credits for alternative fuels and alternative fuel mixtures through to December 31, 2024.
- $49 million in tax credits for sustainable aviation fuel, with the magnitude of the credit tied to the amount of qualified sustainable aviation fuel used in the fuel mixture and the fuels' lifecycle greenhouse gas emissions reductions percentage compared to petroleum-based jet fuel.

The IRA also establishes a grant program to distribute $3 billion for the purchase and installation of zero-emission technology at port facilities. This program will fund the replacement Class 6 or Class 7 heavy-duty vehicles with zero-emission vehicles, as well as fund the purchase, installation, operation, and maintenance of supporting charging infrastructure.

The grant program for electrifying the USPS fleet also designates $1.7 billion for the installation of supporting charging infrastructure for its electric delivery vehicles.

Key Considerations

Clean Vehicles

- ERM found that the clean vehicles grants alone—not accounting for the extensive tax credits—could increase the number of ZEV sales by over 74,000 vehicles between 2023 and 2031.
- Additionally, ERM found that the purchase price for a wide range of commercial ZEVs will reach parity with comparable diesel or gas vehicles within 5 – 12 years earlier than initially forecasted, for many as soon as 2023.

Fuels and Infrastructure

- Biofuels, sustainable fuels, hydrogen, and sustainable aviation fuels all get significant support from the IRA, incentivizing industries to move away from hydrocarbon fuels.

Decarbonizing Manufacturing

$12 billion

In addition to supporting the expansion of domestic clean energy manufacturing, the IRA contains provisions to decarbonize the manufacturing sector. It includes grants and tax credits to reduce emissions from industrial manufacturing processes, including almost $6 billion for a new Advanced Industrial Facilities Deployment Program to reduce emissions from the largest industrial emitters such as chemical, steel, and cement plants. This new competitive grant program will provide funding to eligible facilities to purchase and install advanced industrial technology, conduct retrofits or other improvements to install advanced industrial technology, and perform engineering studies and other work needed to implement advanced industrial technology or retrofits.

It also includes $350 million for low-carbon materials investments. EPA is appropriated $100 million to identify and label low-embodied carbon construction materials and products. An additional $250 million is appropriated to the EPA to advance environmental product declarations that include measurements of the embodied greenhouse gas emissions for construction materials and products. EPA is directed to develop and carry out a program that supports enhanced standardization and transparency, and reporting criteria for environmental product declarations.

Key Considerations

- The decarbonization of the manufacturing sector gets a significant boost through the IRA in the form of funding of greenhouse gas intensive industries and incentivizing energy efficiency, transition to low-carbon fuels, and the use of CCUS in manufacturing.
- Different parts of the IRA are expected to have net economic multipliers; in particular the expansion of domestic manufacturing around low carbon technologies and production hubs, will have positive ripple effects up and down the value chain.
- The accelerated decarbonization pathway supported by the IRA will also demand that the upstream supply chain sources parts and materials with the lowest carbon footprint, creating a positive demand for renewables and other low carbon technologies.

Agriculture and Conservation

$25 billion

Over $25 billion in funding will go towards climate-smart agriculture, climate-smart forestry programs, and restoration programs. Climate-smart agriculture practices supported through the IRA will reduce greenhouse gases as well as increase carbon storage in soil and vegetation. Climate-smart agriculture practices supported in the IRA include optimizing fertilizer and increasing cover crops. The forestry and restoration programs include actions such as prescribed burning to reduce wildfires, investments in tree planting, increased protection to restore and reforest lands, and making habitats more resilient to climate change.

Key Considerations

- The IRA prioritizes investments to help farmers, ranchers, and forest landowners deploy climate-smart practices that will reduce greenhouse gas emissions, increase storage of carbon in soils and trees, and make their operations more productive.
- It also adds over $18 billion in additional funding for existing farm bill conservation programs provide financial and technical assistance to private landowners to voluntarily implement conservation practices.
- The IRA reinforces the need for every farmer to contribute to reducing food inflation and feeding the nation and the world. The Inflation Reduction Act will help keep distressed farmers farming and provide assistance to farmers who have experienced discrimination in USDA's leading programs. The law includes:
  - Relief for distressed USDA borrowers whose agricultural operations are at risk through loan modifications or payments.
  - Financial assistance to farmers who have experienced past discrimination in USDA lending.

Energy Efficiency

Approximately $10 billion of the electric sector funding will support energy efficiency initiatives. These initiatives include a range of tax credits including credits for improving residential housing, for investing in affordable housing, and for constructing efficient commercial buildings.

- The residential clean electricity tax credit will distribute approximately $22 billion between 2022 and 2034 to individuals in the form of credits of up to $2,000 for qualifying clean energy investments such as solar panels and solar hot water heaters.
- The high-efficiency electric home rebate program will provide approximately $4 billion in funding to state energy offices to provide homeowners and owners of multi-family buildings with rebates for qualifying electrification projects. Funding will remain available until September 30, 2031.
- The home electrification and energy efficiency rebates program will distribute $9 billion in funding for whole house energy efficiency retrofits. Funding will remain available until September 30, 2031.
- The affordable housing resilience and efficiency investments program provides $1 billion through September 2028, in both grants and loans, to improve energy and water efficiency and support the climate resiliency of affordable housing.

Key Considerations

- For commercial buildings, Geothermal Heat Pumps (GHPs) are often more efficient than solar panels paired with battery storage for heating and cooling needs. GHPs employ proven technology that can significantly reduce variable operating costs while helping achieve emission reduction goals.

Key contacts

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