

# U.S. Senate Passes the Inflation Reduction Act, Committing \$370 Billion to Action on Climate and Energy

Article By:

James M. Auslander

Eric L. Christensen

Brook J. Detterman

Stacey Sublett Halliday

Peter J. Schaumberg

Mary K. Crowell

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After months of intense, and at times acrimonious, negotiations among the Democratic caucus, the United States Senate on August 7, 2022, passed the Inflation Reduction Act (IRA). The IRA includes a host of programs aimed at addressing climate change and energy production. These include, for example, major new or expanded funding to reduce emissions of greenhouse gases (GHGs) such as methane and hydrofluorocarbons (HFCs), to encourage a domestic supply chain for electric vehicles and energy storage systems, to promote agricultural practices that capture carbon dioxide in soils, to expand offshore production of energy (both fossil and wind), and to provide federal support for energy efficiency. The IRA also includes dozens of new and extended tax credits for renewable energy, electric vehicles, electric transmission, and related industries. If adopted by the House of Representatives and signed by President Biden, as expected, the IRA will be by far the most significant federal initiative to address climate change.

## Key Takeaways and Action Items

Although it significantly pares back both the spending and substantive provisions of the companion [Build Back Better](#) bill passed by the House of Representatives in November 2021, the IRA nonetheless is the largest federal response to climate change in history and will set the course for substantial changes in how the nation produces energy over the next decade. Major provisions include:

- *Offshore Wind and Fossil Fuel Production.* The IRA would significantly expand offshore

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leasing for wind energy but would require oil and gas leases to be offered over large tracts of the outer continental shelf as a condition of making wind leases available.

- *Air Emissions.* The IRA includes major provisions aimed at reducing GHG emissions, like HFC refrigerants, and emissions of the “criteria” pollutants traditionally regulated under the Clean Air Act.
- *Methane.* The IRA substantially increases support for the U.S. Environmental Protection Agency (EPA)’s existing efforts to address methane emissions and also creates a new system of fees that would impose charges on owners of oil and gas infrastructure if methane emitted from that infrastructure exceeds specified thresholds.
- *Agriculture and Forestry.* The IRA includes several programs aimed at reducing GHGs from agriculture, promoting soils- and forestry-based carbon sequestration, and improving the climate resiliency of farms and forests.
- *Alternative Fuels.* The IRA would substantially expand federal support for biofuels, sustainable fuels, hydrogen as a fuel, and sustainable aviation fuels.
- *Manufacturing.* The IRA provides support for decarbonization of GHG-intensive industries through measures like energy efficiency, transition to low-carbon inputs, and use of materials that capture large volumes of carbon during manufacturing.

The IRA also includes major revisions to the nation’s system of tax credits for renewable energy production, carbon capture and sequestration, and advanced manufacturing. It would extend the existing system of Investment Tax Credits (ITC) and Production Tax Credits (PTC), and it would maintain or increase tax credits for construction using labor that is paid prevailing wages with qualifying apprenticeship programs. The IRA would also create several new tax credits, such as for renewable aviation fuels and clean hydrogen. Finally, after 2025, the IRA would phase out the existing system of credits in favor of a new system that would award credits for any technology that produces carbon-free energy and keeps that system in place until the nation’s electricity sector reduces its GHG emissions to 25% of 2022 levels.

## Background

The IRA is the long-delayed legislative companion of the bipartisan [Infrastructure Investment and Jobs Act \(IIJA\)](#), the major infrastructure package adopted in November 2021 with significant Republican support in the Senate. The IRA – the Senate response to the more ambitious Build Back Better legislation passed by the House – was adopted on a strictly party-line vote using “reconciliation” rules that permit legislation to be passed without facing a filibuster, but limit the subject matter of such legislation to fiscal matters. The House of Representatives has scheduled a vote on the IRA for Friday, August 12, where it is expected to pass and to be signed into law by President Biden shortly thereafter.

Like the IIJA, the IRA addresses a range of issues related to energy production and climate policy, and sets the stage for major federal involvement in the energy industry aimed at accelerating the transition to low-carbon and carbon-neutral systems of electricity production and electrification of the nation’s transportation system. Many of the provisions also earmark or steer funds toward low-income and disadvantaged communities, building on [key environmental justice themes](#) of the Biden-

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Harris campaign and administration. In addition, many provisions include domestic content requirements aimed at boosting U.S. industries, as well as “prevailing wage” and apprenticeship requirements aimed at promoting union jobs and increasing pay for blue collar workers.

## **Summary of Key Climate and Energy Provisions**

The IRA includes a variety of grants, loans, and appropriations to federal agencies aimed at reducing GHG emissions, speeding the transition to a decarbonized economy, promoting environmental justice, supporting energy- and climate-related research and development, and improving climate resiliency.

The provisions fall into several categories:

- Offshore Wind and Federal Oil & Gas Offshore and Onshore
- Air & GHG Emissions
- Methane Emissions Reduction Programs
- Agriculture & Forestry
- Electric Transmission
- Advanced Manufacturing and Decarbonization
- Alternative Fuel and Low-Emission Aviation Technology Program
- Water Infrastructure
- Other Climate Provisions
- Environmental Permitting and Reviews
- Climate Resiliency
- Tax Credits

### **A. Offshore Wind and Federal Oil & Gas Offshore and Onshore**

- The bill makes significant changes to rules related to leasing and development of federal lands onshore and on the Outer Continental Shelf (OCS) for wind and oil and gas.
- The bill expressly predicates, for the next decade, future onshore and offshore federal wind leases on first holding onshore and offshore oil and gas lease sales with minimum offered acreage in the preceding 120 days onshore or one year offshore. The bill also reinstates OCS Lease Sale 257 that was vacated by a federal district court, and directs that three other lease sales which had been scheduled under the 2017-2022 OCS leasing program be held within the next year, notwithstanding that the U.S. Department of the Interior (DOI) had previously cancelled those leases and (for the first time in history) allowed that prerequisite five-year

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OCS leasing program to expire with no replacement.

- Regarding OCS wind, the bill authorizes DOI to grant leases, easements, and rights-of-way pursuant to the Outer Continental Shelf Lands Act (OCSLA), 43 U.S.C. § 1337(p)(1)(c), in areas of the Atlantic coast withdrawn from leasing by two prior executive orders. It also mandates that the Secretary issue calls for information and nominations for proposed OCS wind sales by September 30, 2025 near U.S. territories including around Puerto Rico, Guam, American Samoa, the U.S. Virgin Islands, and the Northern Mariana Islands.
- Regarding oil and gas, the bill makes several key changes to OCSLA and the Mineral Leasing Act to increase minimum royalty rates, bonus bids, and rentals for newly-issued leases. The bill creates a new per-acre fee for submissions of expressions of interest for onshore oil and gas leases. Also for onshore federal oil and gas, the bill eliminates noncompetitive leasing and increases onshore bonding requirements for both new and existing leases.
- Finally, for all future leases, the bill specifies that royalties must be paid on all gas produced from leases on federal lands and on the OCS that is consumed, or that is lost by venting, flaring, or negligent releases through any equipment during upstream operations. The bill codifies existing royalty-free exceptions for gas vented or flared for not longer than 48 hours due to emergencies, gas used on the lease, unit or communitized area for its benefit, and any gas that is “unavoidably lost”—which the legislation does not define and continues to be a point of contention in certain cases.

**B. Air & GHG Emissions.** The IRA includes a variety of provisions addressing emissions of both GHGs and traditional “criteria” air pollutants.

- **HFC reductions under the American Innovation and Manufacturing (AIM) Act.** [EPA has been busy regulating HFCs](#), a category of GHGs, under the AIM Act passed in 2020. The IRA would support that work by appropriating millions of dollars to EPA to conduct rulemakings under the AIM Act geared at phasing down the overall potency of HFCs imported or produced in the U.S.; regulating uses of HFCs in the U.S.; and supporting reclaim of HFCs. Separate funds would be available for “implementation and compliance tools” to support those rulemakings. Finally, EPA could offer competitive grants to companies with “reclaim and innovative destruction technologies” concerning HFCs.
- **Increased funding for EPA GHG programs, including under Clean Air Act (CAA) Section 115.** The IRA includes EPA funding to pursue GHG reduction programs under nine different provisions of the CAA. EPA has already begun to pursue reductions of GHG emissions under several of these provisions. Section 111 was the source of authority for (among other GHG rules) the Obama EPA’s Clean Power Plan and the Trump EPA’s Affordable Clean Energy Rule, and the Biden Administration is widely expected to be developing its own regulation for GHGs from power plants under the same authority following the *West Virginia v. EPA* decision. Likewise, funding would be increased for EPA programs adopted under other provisions related to mobile sources, renewable fuels, and HFCs in other parts of the CAA. But the IRA’s reference to work “with respect to greenhouse gases” under Section 115 is particularly notable. That provision relates to “international air pollution” and has thus far not been a tool that EPA has publicly explored as a way to pursue significant GHG reductions under the CAA.

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- **Air pollution monitoring.** The IRA would appropriate millions of dollars for various EPA-administered grants under the CAA. These include grants related to air toxics and community monitoring (including fence-line air monitoring), and for multipollutant monitoring stations expand the number of monitors for criteria pollutants under the National Ambient Air Quality Standards (NAAQS) program. A subset of these funds would be earmarked for air quality sensors in “low-income and disadvantaged communities.” An expansion of air monitoring networks could provide EPA and state agencies with more detail about recorded concentrations of hazardous air pollutants and criteria pollutants, in areas where agencies currently use modeled emissions based in part on wind patterns. More precise data could have regulatory consequences during EPA’s residual risk and technology reviews under CAA Section 112, under the nonattainment area designation process for NAAQS pollutants under CAA Section 107, and under many other CAA programs.
  - **Renewable Fuels Standard (RFS) funding, including for advanced biofuels.** The bill would appropriate funds to EPA to carry out the RFS in CAA Section 211(o), including funding to study the health effects of fuels and fuel additives, to support lifecycle GHG emissions analysis of certain fuels, and effects of pollution on low-income and disadvantaged communities. EPA would also be able to issue new grants to industry to support investments in advanced biofuels.
  - **Clean heavy-duty vehicles.** The IRA would fund administrative programs related to clean heavy-duty vehicles. This includes money to replace eligible vehicles located in nonattainment areas under the CAA. It also provides grants and rebates to cover incremental costs of replacing a high-emission vehicle with a zero-emission vehicle; infrastructure needed to charge zero-emission vehicles; workforce development and training to support zero-emission vehicles; and planning and technical activities to support zero-emission vehicles.
  - **Grants to reduce air pollution at ports.** The IRA would create a “general assistance” fund for port authorities to install zero-emission port equipment, conduct planning or permitting in connection with such zero-emission port equipment or technology, and to develop qualified climate action plans. Additional funding is available to award rebates and grants to eligible recipients to carry out the same activities in nonattainment areas under the CAA.
  - **New “Greenhouse Gas Reduction Fund.”** The IRA would amend the CAA to create a “Greenhouse Gas Reduction Fund.” The Fund will provide financial and technical assistance grants to states, tribal governments, and others to enable low-income and disadvantaged communities to deploy or benefit from zero-emission technologies (e.g., distributed technologies on residential rooftops). The new Fund can also be used to provide general financial and technical assistance, with a sizable sum set aside specifically for low-income and disadvantaged communities.
  - **Other emission grants and funding.** The IRA would provide grants, rebates, and loans to reduce diesel emissions in low-income and disadvantaged communities to address the health impacts of such emissions on those communities. The bill would provide for other EPA-administered CAA grants to address emissions from wood heaters and to monitor methane emissions. With respect to vehicles, EPA has grant money for states to support GHG and “zero-emission standards” under CAA Section 177. Additional EPA grants would provide technical assistance for schools in low-income and disadvantaged communities to address environmental issues, renovate buildings, and mitigate “ongoing air pollution hazards” in the school environment.

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**C. Methane Emissions Reduction Programs.** To address emissions of methane, a potent GHG, the IRA provides funding to support EPA efforts under existing statutory authority and also creates a new methane fee program.

- **Support for EPA methane mitigation and monitoring.** In an effort to mitigate and monitor methane emissions, the IRA appropriates \$850 million to EPA to support efforts for GHG reporting by owners and operators of facilities, methane emissions monitoring, and the reduction of emissions from petroleum and natural gas systems. The IRA targets emissions from petroleum and natural gas systems and marginal conventional wells by directing the funding towards:
  - Improving climate resiliency of communities and petroleum/natural gas systems;
  - Improving and deploying industrial equipment to reduce methane emissions;
  - Supporting innovation to reduce methane and other GHGs;
  - Permanently shutting in and plugging wells on federal lands;
  - Mitigating the health impacts of methane emissions in low-income or disadvantaged communities; and
  - Supporting environmental restoration.
- **Fee on methane waste emissions.** The IRA authorizes a fee on excess methane emissions that exceed a defined emissions waste threshold. The IRA sets the fee by multiplying the number of metric tons of excess methane emissions by \$900. This multiplying figure increases each year, from \$1,200 in 2025 to \$1,500 in 2026. This charge would apply to many industries, including offshore and onshore petroleum and natural gas production; onshore natural gas processing and transmission compression; underground natural gas storage; liquefied natural gas storage, import, and export equipment; onshore petroleum and natural gas gathering and boosting; and onshore natural gas transmission pipelines. This new methane fee could have significant consequences for [the Biden-Harris Administration's methane strategy](#), particularly with respect to the economic analysis calculating the costs and benefits of new rulemakings.

**D. Agriculture & Forestry.** The IRA includes multiple provisions targeted at the agricultural and forestry sectors, including programs aimed both at reducing GHG emissions from these sectors and promoting agricultural and silvicultural carbon sequestration. Unlike industrial facilities and vehicles, the GHGs associated with the agricultural sector are more diffuse and not readily controlled with technological requirements. The IRA would provide funding for several agricultural conservation purposes, including to improve soil carbon uptake and retention, to reduce nitrogen losses, and to reduce GHG emissions. The funding could also be used for capturing GHG emissions associated with agricultural production. Hundreds of millions of dollars would also be available to provide grants to increase the sale and use of agricultural commodity-based fuels. The IRA would provide over \$2 billion for the National Forest System to support vegetation management projects and the protection of old-growth forests.

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**E. Electric Transmission.** The IRA includes major provisions aimed at expanding the nation's electric transmission system, widely recognized as one of the keys to achieving deep decarbonization of the electricity sector.

- **Transmission facility financing and transmission line siting.** The IRA would provide money for U.S. Department of Energy (DOE) loans to upgrade certain “national interest” electric transmission facilities and to site interstate or offshore electrical transmission lines. The transmission siting loans can be used for numerous purposes, including certain impact studies and analyses, reviews of alternate siting corridors, project negotiations, and participation in various regulatory proceedings before the Federal Energy Regulatory Commission or state regulatory commissions. Certain funds can also be used for economic development purposes in communities affected by transmission project construction or operation.
- **Interregional and offshore wind electricity transmission planning, modeling, and analysis.** The IRA would provide funding for offshore wind electricity transmission planning. This includes research into using non-transmission alternatives, energy storage, and grid-enhancing technologies and for community economic development.

**F. Advanced Manufacturing and Decarbonization.** The IRA would provide financial assistance to industrial manufacturers to install, retrofit, or implement technology designed to accelerate GHG emissions reduction at manufacturing facilities, like those that produce iron, steel, steel mill products, aluminum, cement, concrete, glass, pulp, paper, industrial ceramics, chemicals, and other energy intensive industrial processes.

**G. Alternative Fuel and Low-Emission Aviation Technology Program.** The IRA would establish a grant program with nearly a quarter-billion dollars available for projects relating to the production, transportation, blending, or storage of sustainable aviation fuel, plus nearly \$50 million for projects relating to low-emission aviation technologies.

#### **H. Water Infrastructure.**

- **Bureau of Reclamation domestic water supply projects.** The IRA would provide funding to disadvantaged communities for projects to provide domestic water supplies to communities or households that do not have reliable access to domestic water supplies in a state or territory.
- **Canal improvement projects.** The IRA would fund grants to cover water conveyance facilities with solar panels to generate renewable energy, or for other solar projects associated with Bureau of Reclamation projects that increase water efficiency and assist in the implementation of clean energy goals.

#### **I. Other Climate Provisions**

- The IRA designates \$250 million in Greenhouse Gas Air Pollution Planning Grants per state and \$4.75 billion for implementation grants to carry out the plans for GHG reduction.
- \$100 million goes to EPA to develop and administer a low carbon labelling program for construction materials for federal buildings and transportation projects.

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- \$250 million is made available to convert federal buildings to high-performance green buildings.
  - \$2.15 billion is appropriated to the Federal Buildings Fund for the acquisition and installation of low-embodied carbon materials.
  - \$975 million is appropriated to the Federal Buildings Fund for emerging and sustainable technologies.
  - \$2 billion is made available for low-embodied carbon construction materials and products for transportation and infrastructure projects.
  - \$3 billion is appropriated to purchase zero-emission Postal Service delivery vehicles and related infrastructure.
  - There is significant money for infrastructure related to research into nuclear energy, energy efficiency, renewables, and fossil and carbon energy.
  - The IRA would appropriate money to the Department of Housing and Urban Development (HUD) to address energy and climate issues in low-income housing, including improving energy efficiency, water efficiency, indoor air quality, and sustainability; to implement the use of low-emission technologies, materials, or processes, including zero-emission electricity generation, energy storage, or building electrification; and to improve climate resilience.

## J. Environmental Permitting and Reviews.

- **Environmental reviews.** In an effort to accelerate environmental reviews, the IRA appropriates \$40 million for the development of “efficient, accurate, and timely” environmental reviews. This would be accomplished through additional hiring and training, improved information systems, engagement with stakeholders and the community, and the purchase and development of new environmental analysis equipment and other analysis tools.
- **Environmental and climate justice.** Climate and environmental justice are key features of the IRA, primarily focused on directing funding to disadvantaged communities. The IRA would appropriate \$2.8 billion in Environmental and Climate Justice Block Grants to community-based nonprofits and other partnerships for a range of climate-based activities, specifically for disadvantaged communities, including:
  - Community-led air and other pollution monitoring;
  - Investments in low/zero-emission infrastructure and workforce development to reduce GHG emissions;
  - Mitigating climate and health risks from urban heat islands, extreme heat, wood heater emissions, and wildfires;
  - Climate resiliency;



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- Climate adaptation;
  - Reduction of indoor air toxins; and
  - Greater engagement with disadvantaged community members during state and federal processes, including rulemakings.

In addition, the IRA funds a \$1.893 billion “Neighborhood Access and Equity Grant Program” for the Federal Highway Administration to, among other aims, improve walkability, safety, and affordable transportation in disadvantaged or underserved communities. There is an additional nearly \$1.1 billion allocated for projects in economically disadvantaged or underserved communities.

- **Council on Environmental Quality (CEQ) engagement.** Another provision sets aside \$30 million to the CEQ for, among other goals, improving stakeholder and community engagement during the environmental review process.
- **Endangered Species Act (ESA).** Recovery plans under the ESA receive attention from the IRA, with \$125 million appropriated to develop and implement recovery plans. Further, \$121.25 million is designated to rebuild and restore units of the National Wildlife Refuge System and state wildlife management areas facing invasive species and increasing damage from weather events.

## **K. Climate Resiliency.**

- **Tribal climate resilience.** The IRA allocates \$220 million to the Bureau of Indian Affairs for Tribal climate resilience and adaptation programs and \$23.5 million for climate resilience and adaptation activities to serve the Native Hawaiian community. In addition, the IRA allocates \$145.5 million to develop a “Tribal Electrification Program” focused on developing zero-emissions energy systems in homes, as well as \$12.5 million for drought relief programs.
- **Coastal climate resiliency.** The IRA would provide funding to the National Oceanic and Atmospheric Administration for the purpose of investing in coastal communities and climate resilience.

**L. Tax Credits.** Some of the most transformative aspects of the IRA operate through the tax code, with a series of new, expanded, or otherwise modified tax credits to incentivize zero-carbon energy and energy efficiency. For many of these tax credits, a “direct pay” provision would authorize payment of the tax credit directly to the taxpayer in situations where a taxpayer doesn’t have sufficient tax liability to fully utilize the tax credit. The current system, which provides tax credits to specific energy production technologies transitions to a new technology-neutral system starting in 2025, which will continue until the emissions from the nation’s electricity sector reach 25% of 2022 levels. Some of the most significant tax changes are as follow:

- **Changes to the Section 45 production tax credit (PTC).** The IRA amends the tax code to rework and expand the Section 45 PTC. It extends the eligibility date to facilities that begin construction by January 1, 2025 (the current program expired on January 1, 2022). The base credit amount of 1.5 cents/kWh would be provided only to facilities that pay prevailing wages

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for construction, repair, or expansion of the facility and meet apprenticeship requirements. (Other facilities get a lower 0.3 cents/kWh.) The amount of the tax credits increases even more if the manufacturer uses American-made steel and components, and can go higher still for projects constructed in “energy communities” (e.g., brownfields and communities that have or had significant employment in the fossil fuel industry or which have experienced the closure of a coal mine or coal-fired plant). Another bonus PTC (10-20%) is available for wind or solar facilities constructed on low-income housing or Indian lands, with some limits on capacity for eligibility. The PTC would also be fully available for new hydropower added to non-power dams or incremental increases in hydropower production from existing hydropower projects, for marine hydrokinetic technology, and for generators placed in irrigation or domestic water pipelines.

- **Changes to the Section 48 investment tax credit (ITC).** The IRA extends the sunset dates to encompass most projects that begin construction by January 1, 2025. Groundwater-sourced heat pumps and cooling systems are eligible for longer. As with the PTC, the full tax credits are now provided only for technologies that meet prevailing wage and apprenticeship requirements. (Otherwise the tax credits are substantially lower.) And as with the PTC, energy properties that meet specified domestic content requirements receive a bonus credit (2-10%), and further bonus credits are available for energy projects in the same “energy communities” discussed with the PTC. Other technologies that had previously only been eligible for a 10% ITC are now eligible for the standard 30% ITC, including geothermal, energy storage systems, microgrids, combined heat and power systems, small wind systems, certain fuel cells, facilities that convert biomass into methane for commercial use, building heating and cooling systems that store thermal energy, and others. The ITC can also be used for interconnection facilities, not just the relevant energy projects.
- **Key changes to the Section 45Q credit for carbon capture and sequestration (CCS).** The IRA would significantly extend the eligibility date to facilities that begin construction before January 1, 2033. More facilities would now be eligible for the CCS tax credit as well. Smaller-scale direct air capture facilities could also now qualify, as long as they capture at least 1,000 metric tons per year. The qualifying thresholds for CCS associated electricity generators and other industrial facilities are also reduced. The IRA would enact new baseline credits for each metric ton of carbon captured, including for direct air capture. And just like with the PTC and ITC, the potential tax credits increase substantially (in the Section 45Q case, by 5x) for projects that meet prevailing wage and apprenticeship requirements.
- **New Section 45U tax credit for nuclear power.** The IRA would also create a new “zero-emission nuclear power” credit of 0.3 cents/kWh of electricity sold from existing nuclear reactors. The tax credit would last through December 31, 2032. It does not apply to reactors that qualify for the advanced nuclear tax credit, and it also is increased by 5x if the taxpayer meets prevailing wage requirements.
- **New 45Y technology-neutral PTC.** The IRA would create a new technology-neutral tax credit structure for facilities that produce zero-GHG electricity (on a net basis) and that are placed in service after December 31, 2024. The base credit would be 0.3 cents/kWh, but that would rise to 1.5 cents/kWh if the producer meets prevailing wage and apprenticeship requirements (subject to inflation adjustments). The tax credit would be 10% higher for generators located in “energy communities,” and another 10% higher if the generator meets domestic content requirements. The credits are available for 10 years after electricity production begins. The technology-neutral credit would begin to phase out in 2032, or earlier

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if before then the electric power sector achieves 25% reductions in GHG emissions compared to 2022 levels.

- **New 48D technology-neutral ITC incentivized for environmental justice communities.** The IRA would create a technology neutral ITC for net-zero electric generators and energy storage facilities placed in service after December 31, 2024. As with the technology-neutral PTC, the tax credit could be up to 5x higher if the facility meets prevailing wage and apprenticeship requirements, with additional bonus credits for investments in energy communities, and for facilities meeting domestic content requirements. The phase-down structure would also track the phase-down for the 45Y technology-neutral PTC. A bonus credit of 20% would be available on a limited basis for facilities that are constructed in environmental justice communities (although halved if the facility does not meet prevailing wage and apprenticeship requirements).
- **Tax credits for buildings.** The IRA would expand or change numerous tax credits related to buildings:
  - **Clean energy and energy efficiency tax credits for individuals.** The IRA would extend certain energy efficiency tax credits through 2032, including those related to installation of energy efficient doors, windows, roofs, etc.; the installation of heat pumps and biomass stoves; and for home energy audits. Individual tax credits for residential renewable energy systems (e.g., rooftop solar) would be extended through 2034, although with phase-down beginning in 2032. Home battery storage systems would also be eligible for tax credits.
  - **Commercial building energy efficiency.** Tax credits would be available on a per square-foot basis (up to \$1/square foot) for buildings that that achieve certain energy cost savings over a baseline. Those tax credits can be even higher (up to \$5/square foot) if the building was installed with labor paid prevailing wages and meeting apprenticeship requirements.
  - **Energy efficiency credit for new homes.** The IRA would extend the sunset date of this tax credit through the end of 2032. Tax credits of \$500–\$5,000 would be available for new construction of residential homes, based on the level of Energy Star rating achieved. As with many other tax credits under the IRA, the base rate could be increased substantially (up to 5x) if construction practices meet prevailing wage and apprenticeship requirements.
- **Tax credits for vehicles and fuels.** In recent years mobile sources like cars and trucks have surpassed the electric power sector as the largest source of GHG emissions in the U.S. The IRA would enact or expand numerous tax credits related to vehicles, particularly credits that would incentivize electrification of the sector.
  - **Clean vehicle tax credit.** The IRA would amend existing provisions of the tax code to establish a baseline tax credit of \$7,500 per vehicle and extend the availability of the tax credit through 2032. Half of that credit (\$3,750) would be available only if the vehicle's battery meets critical minerals limits that get more restrictive between now and 2027. The other half of the credit would depend on whether the battery was manufactured or assembled in North America and the degree to which the automaker's fleet manufactures batteries in the U.S. This requirement would initially

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require the automaker to use batteries made or assembled in North America for 50% of its electric vehicle fleet, increasing gradually to 100% North America requirement by 2029.

- Critically, the IRA eliminates the per-manufacturer limit on credits, which had previously limited companies like Tesla, GM, and Toyota that had either exceeded the limit on qualifying electric vehicles (EVs) or were at risk of soon exceeding that limit.
- The IRA would also provide a new tax credit for used EVs of up to \$4,000 (although not greater than 30% of the sales price).
- There are various exceptions where the tax credits would not be available. Beginning in a few years, certain EVs would not be eligible for the tax credit if their batteries contain critical minerals or components associated with an “entity of foreign concern.” Taxpayers with an adjusted gross income above \$150,000 (or above \$300,000 for married couples) would not be eligible. And vehicles with a manufacturer’s suggested retail price (MSRP) above certain thresholds would also not be eligible.
- The IRA would also expand vehicles eligible for tax credits to include vehicles powered by fuel cells.
- **New 45W credit for commercial clean vehicles.** The IRA would create a new tax credit for clean vehicles purchased by commercial entities, limited to \$7,500 for smaller vehicles (less than 14,000 pounds gross vehicle weight) and \$40,000 for larger vehicles. This tax credit would sunset at the end of 2032.
- **Tax credit for alternative fuel refueling stations in rural or low-income areas.** The IRA would raise the limit on tax credits for alternative fuel refueling stations and add further credits if the facility meets prevailing wage and apprenticeship requirements. These refueling stations would have to be constructed in either a rural census tract or a low-income census tract. EV charging stations would be authorized to provide bi-directional charging equipment so that electricity can be delivered from the EV battery to the grid as well as from the grid to the recharging battery.
- **Extension of renewable and alternative fuel tax credit.** The IRA would extend tax credits for biodiesel, renewable diesel, alternative fuels, and second generation biofuels to the end of 2024.
- **New 40B tax credit for sustainable aviation fuel.** The IRA would create a new credit for use of sustainable aviation fuel, starting at \$1.25 per gallon, and sun-setting at the end of 2024. The new tax credit would increase by 1 cent for each percentage point above 50% that the sustainable aviation fuel reduces life-cycle GHG emissions compared to traditional aviation fuel. The credit can be used in conjunction with other alternative fuel, and airlines could deduct the credit directly from their gross income.
- **???????New 45V clean hydrogen tax credit.** The IRA would establish a new tax credit for production of “clean hydrogen” (i.e., hydrogen produced with no more than 4 kilograms of CO<sub>2</sub>e emitted per kilogram of hydrogen). These 45V tax credits range from \$0.012 to \$0.60 per kg, depending on the GHG intensity of hydrogen production. A significant multiplier is available if the hydrogen fuel is produced in a U.S. facility

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that meets prevailing wage and apprenticeship requirements. The 45V can be used in conjunction with the PTC and ITC (e.g., the PTC if renewable energy is used to produce clean hydrogen).

- **???????New 45Z clean fuel production tax credit.** The IRA would establish a new production tax credit for clean fuels depending on the GHG intensity of the fuel. The rate for most clean fuels would begin at \$0.20 per gallon (adjusted by the GHG intensity), but would begin at \$1 per gallon if the fuel producer meets prevailing wage and apprenticeship requirements. Renewable aviation fuels receive a base rate of 35 cents per gallon, adjusted to \$1.75 per gallon if prevailing wage and apprenticeship requirements are met. These credits would sunset at the end of 2027.

- **Manufacturing.**

- **Extension of advanced energy project tax credit.** The IRA would allocate \$10 billion for advanced energy project tax credits, with at least \$4 billion allocated to “energy communities” (current allocation is \$2.3 billion). These include recycling facilities and certain manufacturing facilities like those that manufacture hydropower equipment; that make or blend low-carbon fuels; that produce hybrid and fuel cell vehicles or components; existing manufacturing facilities that are re-equipped with CCS equipment, zero- or low-carbon process heat systems, energy efficiency, or waste reduction processes; and facilities for the production or recycling of critical minerals.
- **???????New 45X advanced manufacturing production credit.** The IRA would create a new production tax credit for advanced manufacturing of a variety of specific solar, wind energy, and battery components.

- **Extension of the Superfund tax.** The bill would reinstate the Superfund tax on certain crude oil and petroleum products, and increase the tax rate to 16.4 cents per barrel (up from 9.7 cents). The reinstated portion of the tax would apply to crude oil received at a U.S. refinery and to petroleum products entering the U.S. for consumption, use, or warehousing. That tax rate could increase further beginning in 2023 based on a new provision that provides for inflation adjustment. The bill would also allow companies to make advances to the Superfund itself for the first time in 27 years.

## Conclusion

For businesses involved in the energy industry, the IRA and the administrative processes that will be necessary to carry out its many mandates bear careful scrutiny because they are likely to profoundly affect how the industry does business, both by increasing the regulatory and tax burden faced by the industry and by creating major new business opportunities to obtain federal support for expanded industrial activity. For manufacturing and high-technology industries, the IRA creates major new opportunities for funding or tax breaks to support advanced manufacturing, energy efficiency, and new opportunities to achieve climate and sustainability goals.

*Jackson Garrity, Lauren Karam, Zach Pilchen, and Nikki Waxman also contributed to this article.*

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