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Green Tax Credits in the United States

Scott Andrew Yetmar, PhD

Associate Professor of Accounting, Monte Ahuja College of Business Administration, Cleveland State University, Cleveland, Ohio, USA

s.yetmar@csuohio.edu

216-687-3999

Abstract

A tax credit is a dollar-for-dollar reduction in a taxpayer's tax liability. Green tax credits, also known as clean energy tax credits or renewable energy tax credits, are government incentives designed to encourage individuals and businesses to invest in environmentally friendly technologies and practices. By lowering the cost of clean energy and energy-efficient upgrades, green credits encourage investment in renewable energy, energy efficiency, and other environmentally beneficial projects. A sustainable business, or a green business, is an enterprise that has (or aims to have) a minimal negative (or potentially positive) impact on the global or local environment, community, society, or economy.

Keywords: Tax credits, United States, Clean energy, Renewable energy

Introduction

The Inflation Reduction Act made several consequential changes to federal tax rules, offering incentives to taxpayers to make more energy-efficient choices related to their homes and automobiles. The Inflation Reduction Act's primary focus is a collection of climate and energy incentives supporting domestic clean and renewable energy production. Here are some of the most important opportunities available via the tax credits and incentives. The breadth of qualifying activities is significant, including the production of electricity; production of solar, wind, and energy equipment; installation of energy-efficient upgrades to businesses and homes; and the acquisition of electric vehicles (EVs) and charging equipment.

Individual Tax Credits

The Energy Efficient Home Improvement Credit (EEHI). The general limitation is $1,200 and allows it to be claimed on an annual basis beginning Jan. 1, 2023, and running until the expiration date of the credit currently set for Dec. 31, 2032. An additional $2,000 in annual credit is available for purchases of very specific types of heat pumps, water heaters, and other equipment, making for a total possible annual credit of $3,200 available to taxpayers who spend enough on qualified purchases.

The amount of the EEHI credit available to homeowners who make certain energy-efficient upgrades took a sizable jump through an expansion of Section 25C. The amount of credit is equal to 30% of the cost of qualifying improvements and expenditures. Such amounts are then subject to specific category-based limitations, in addition to the overall annual limitation described above. Credits claimed for purchases of building envelope components designated as qualified energy improvements under the law are limited to:

- Up to $250 per door for exterior doors, with an annual limit of $500 (2 doors).
- $600 in the aggregate for exterior windows.
- Amounts spent on insulation materials and air sealing materials/systems are not subject to any separate annual limitation outside of the total 30% up to $1,200 amount.

The rules also limit credits claimed annually for certain residential energy property expenditures to $600 each for:

- Central air conditioners
- Furnaces (gas, propane, or oil)
- Water heaters (gas, propane, or oil)
- Panelboard (breaker box) improvements

On the other hand, the rules allow a more generous separate \$2,000 annual credit for 30% of expenditures on:

- Electric or natural gas heat pumps
- Electric or natural gas heat pump water heaters
- Biomass stoves and biomass boilers

A taxpayer could qualify for \$1,200 of credits with qualifying expenditures on energy improvements and residential energy property and an additional \$2,000 of credits for purchases of qualifying heat pump and biomass equipment.

In addition to credit amounts available for money spent on equipment, the law also allows a credit for 30% of the cost of a home energy audit up to \$150 of credit per year (30% of the cost of a \$500 energy audit.) That amount would count toward the \$1,200 annual cap.

The annual cap on the credit brings up another important consideration: Under the current rules, the EEHI credits are nonrefundable (meaning that they can reduce your federal tax liability for the year to zero, but the IRS will not pay you a refund on your federal taxes to the extent these credits reduce them below zero), and excess credits do not carry forward.

For an energy-efficient improvement to a building envelope component (e.g., exterior window, exterior door) to qualify, it must be made to the taxpayer's primary residence and the taxpayer must own the residence. “Qualified energy property” (e.g., electric or natural gas heat pump, central air conditioner), however, will qualify for the credit even if installed in a dwelling unit that is merely a residence of the taxpayer. For qualified energy property, the residence where the property is installed does not have to be the taxpayer’s primary residence, nor does the taxpayer have to own it.

The Residential Clean Energy Property Credit (RCE). There is generally no overall limit on the amount of credit that can be claimed under the RCE, except for the new fuel cell property limits discussed below. The taxpayer can take a credit against federal income taxes for 30% of the cost of qualified expenditures made for property placed in service anytime beginning in 2022 and extending through 2032. Under the current law, the credit rate drops to 26% in 2033, 22% in 2034, and the credit will fully phase out for property placed in service after 2034.

Qualifying residential clean energy expenditures include:

- Solar panels, including certain solar roof tiles and shingles.
- Solar water heaters
- Wind turbines used to generate electricity
- Geothermal heat pump expenditures
- Battery storage technology expenditures (capacity of at least 3 kilowatt hours; installed after Dec. 31, 2022)
- Fuel cell property expenditures (up to \$500 for each half kilowatt of capacity)

The RCE can be claimed on any dwelling unit located in the United States and used by the taxpayer as a residence, except in the case of fuel cell property, in which case the dwelling unit must be the primary residence of the taxpayer for the related costs to qualify for the credit.

Unlike the EEHI, the RCE can be carried forward to future tax years if it is not usable in the year that the qualifying property is installed. However, to the extent that fuel cell credits are constrained by the kilowatt capacity limitation, that particular excess cannot be carried forward.

Clean Vehicle Energy Credits. The IRA legislation expanded tax benefits available to those who purchase plug-in electric vehicles (EVs) or fuel cell vehicles (FCVs) in 2023 or after. With the Infrastructure Investment and Jobs Act an allocation of $7.5 billion to states and local governments helps increase public charging station availability nationwide.

Sec. 30D permits qualified taxpayers, both individuals and businesses, to claim a nonrefundable credit of up to $7,500 against their federal income tax for the purchase of a qualifying vehicle anytime starting in 2023 through 2032. The credit amount is subject to a two-tier computation, as well as an overall income-based phase out.

- **Credit elements** - The credit amount will be composed of two elements, each equal to either $0 or $3,750.

When applicable, the first element is a requirement that a stated percentage of the critical minerals used in the battery must be either: (a) recycled in North America, or (b) extracted or processed in the United States or a country with which the United States has a free trade agreement. The required percentage starts at 40% in 2023 and increases by 10% per year, up to 80% in 2027 and after.

The second element is a requirement that a stated percentage of the value of the components contained in the battery must be either manufactured or assembled in North America. The required percentage starts at 50% in 2023, increases to 60% for 2024 and 2025, and continues to increase by 10% per year, up to 100% in 2029 and after.

- **Phase out** — The credit is also subject to a full phase out if the modified adjusted gross income (MAGI) of the taxpayer exceeds an applicable threshold. When determining this, a taxpayer can apply the lower of: (1) the MAGI for the tax year when the vehicle is placed in service, or (2) the MAGI for the prior tax year. However, in any event, the income-based limitation operates as a cliff, resulting in full disqualification. The applicable MAGI thresholds are as follows:

  - $300,000 for joint filers
  - $225,000 for heads of households
  - $150,000 for all other filers

Taxpayers qualify if:

- The original use of the vehicle starts with the taxpayer (e.g., new vehicle).
- The vehicle is for personal or business use, not for resale.
- The vehicle is primarily used in the United States.

A vehicle qualifies for the credit if:

- Its gross vehicle weight is less than 14,000 pounds.
- It is propelled by an electric motor drawing on a battery with a capacity of at least 7 kilowatt hours that is capable of being recharged from an external source, or it is powered by 1 or more fuel cells.
- It is made by a qualified manufacturer (except for FCVs).
- It undergoes final assembly in the United States.
- Its MSRP does not exceed:
  - $80,000 for vans, sport utility vehicles, and pickup trucks.
  - $55,000 for other vehicles.

Previously Owned Clean Vehicle Credits. Beginning Jan. 1, 2023, taxpayers who buy a qualified vehicle from a licensed dealer for $25,000 or less may be eligible for a previously owned clean vehicle tax credit pursuant to Sec. 25E. The amount of the credit is equal to 30% of the sale price up to a maximum credit of $4,000.

To qualify, taxpayers must be individuals who cannot be claimed as a dependent on another person's tax return. Their MAGI must also not exceed an applicable threshold. Like the Sec. 30D credit, the income threshold operates as a cliff, but taxpayers can apply the lower of: (1) the MAGI for the tax year when the vehicle is placed in service, or (2) the MAGI for the prior tax year. The applicable MAGI thresholds are as follows:

- $150,000 for joint filers
- $112,500 for heads of households
- $75,000 for all other filers

A previously owned clean vehicle qualifies if:

- The sale price is $25,000 or less.
- The purchase occurs from a dealer.
- The model year is at least two years earlier than the calendar year in which the used car is purchased.
- It has not already been transferred to a qualified buyer after Aug. 16, 2022.
- The gross vehicle weight is less than 14,000 pounds.
- It is a qualified EV with a battery capacity of at least 7 kilowatt hours or is an FCV.

Business Tax Credits

Manufacturers have three predominant credit options based on the IRA and the Creating Helpful Incentives to Produce Semiconductors Act (CHIPS):

Advanced Manufacturing Production Credit. A significant tax credit is a production credit under Sec. 45X for businesses that manufacture and sell a variety of energy components. Specifically, this includes the production of solar energy components, wind energy components, inverters, battery components, or critical minerals. To qualify, the taxpayer must both produce the eligible components and sell them to an unrelated person after Dec. 31, 2022. Production must also occur within the United States. The amount of this credit is calculated through different methods depending on the specific components that are produced and sold (e.g., stated rates based on the electricity output of the system, capacity of the battery, or weight of components, among others).

Qualifying Advanced Energy Project Credit. The second credit that specifically benefits manufacturers is the advanced energy project credit under Sec. 48C. This is an enhanced tax credit provided to those that place in service new investments into industrial or manufacturing facilities for the production or recycling of components for the green energy supply chain. This credit previously existed but has been expanded to cover new investments and $10 billion in additional funding has been provided. Those modifications took effect on Jan. 1, 2023. Some of the definitions of qualifying investments mirror those of the Sec. 45X credit discussed above, but this credit is much more expansive with a certification process requirement. Qualification for this credit requires an advanced application and the receipt of an allocation of such credits through a competitive process administered by the Department of Energy (DOE). Those allocated tax credits will then be claimed in the future after the qualifying equipment is placed in service.

Advanced Manufacturing Investment Credit. The third credit for manufacturing and production is an investment credit found in Sec. 48D that was included in the CHIPS Act. This is a tax credit provided to manufacturers that place in service qualified property as part of an advanced manufacturing facility. Such facilities include both those that manufacture semiconductors and those that manufacture semiconductor manufacturing equipment. Qualified property must be placed in service after Dec. 31, 2022. However, if the construction of the property began before 2023, then only the basis of property constructed after Aug. 9, 2022, may be included in the computation of the credit. Like the Sec. 48C credit above, the Sec. 48D credit is obtained through a competitive application process administered by the Commerce Department.

The Section 48 credit is initially equal to 6% of the basis of qualifying energy property, but this is increased to 30% if either: (1) the facility has a maximum net output of less than 1 mW of electrical (alternating current) or thermal energy, (2) the prevailing wage and apprenticeship requirements are satisfied, or (3) construction began before Jan. 29, 2023. That credit percentage can be increased by additional 10% increments if domestic content rules are satisfied, or the project is placed in an energy community. Additional bonus credits (10 or 20% increments) are available to solar and wind facilities that are placed in service of a low-income community under Sec. 45(d)(1), on Indian land, as part of a low-income residential building project, or as part of a qualified low-income economic benefit project. The spectrum of potential tax credits could range from 6 to 70% of the eligible basis, subject to several specific details.

Clean Electricity Production Credit. Taxpayers are eligible for the Sec. 45Y credit if they produce electricity at a qualified facility and either sell the electricity to an unrelated taxpayer or install a special meter and then either sell, use, or store such electricity. For this purpose, a qualified facility is one that: (1) is used for the generation of electricity, (2) is placed in service after Dec. 31, 2024, and (3) achieves a zero-greenhouse gas emissions rating. Qualified facilities are further limited to claiming this credit for a 10-year period beginning when the facility is placed in service. Overall, this credit is very similar to the Sec. 45 credit but does not mandate the resources used to generate electricity. Instead, a greenhouse gas emissions rating system will be established to determine qualification.

The base credit amount is 0.3 cents per kW of electricity but is increased to 1.5 cents if the facility either: (1) has a maximum net output of less than 1 mW (alternating current), or (2) satisfies the prevailing wage and apprenticeship hour requirements. Those credit amounts are subject to inflation-based adjustments in future years. This credit is also subject to a four-year phase down beginning the first calendar year after the later of the year in which greenhouse gas emissions from electricity production are 25% of the 2022 level or 2032.

Clean Electricity Investment Credit. The Sec. 48E credit is the investment credit match to Sec. 45Y. The core qualifications, including the definition of a qualified facility, are nearly identical. The core definitional distinctions are that the Sec. 48E credit also applies to energy storage technology and qualified interconnection property.

Like the Sec. 48 credit, the base percentage for the Sec. 48E credit is 6% but is increased to 30% if either: (1) the facility has a maximum net output of less than 1 mW of electrical (alternating current) energy, or (2) the prevailing wage and apprenticeship requirements are satisfied. Additional 10% bonus increments are available if the facility is located within an energy community or the domestic content requirements are satisfied. Finally, additional credit allocations of 10% and 20% are available for facilities placed in service in connection with low-income communities. Such credit allocations are obtained through an application process like the one under Sec. 48.

Credit for Qualified Commercial Clean Vehicles (QCCV). The QCCV in Sec. 45W is specifically provided to businesses that place in service "qualified commercial clean vehicles" that are acquired after Dec. 31, 2022, and before Jan. 1, 2033. The credit is calculated as the lesser of: (1) a percentage of the cost of the vehicle (30% of EVs and 15% for FCVs); or (2) the incremental costs of the clean vehicle over the cost of a comparable vehicle powered by a gasoline or diesel internal combustion engine. The maximum credit is $7,500 for vehicles with a GVW rating of less than 14,000 pounds and $40,000 for all vehicles exceeding that amount. Qualified commercial vehicles must be depreciable in the hands of the taxpayer and meet additional definitional rules. However, the Sec. 45W credit will generally provide much more expansive benefits to businesses since it does not require satisfaction of the numerous special rules that are found in the Sec. 30D credit (battery component and critical mineral requirements, purchase price limitation, MAGI phase-out, etc.).

Alternative Fuel Refueling Property Credit. The alternative fuel refueling property credit found in Sec. 30C is a previously existing credit that was significantly expanded for property placed in service after Dec. 31, 2022. Qualifying property must be installed in either: (1) a census tract defined as a low-income community for purposes of the New Markets Tax Credit (poverty rate of at least 20% or not exceeding 80% of median family income comparison test), or (2) a census tract that wasn't designated as an urban area based on the most recent census. Qualifying refueling property includes certain qualified clean fuel vehicle property that utilizes: (1) electricity; (2) fuels composed of at least 85% ethanol, natural gas, liquefied petroleum gas, or hydrogen; (3) mixtures, including biodiesel, diesel fuel, or kerosene; and (4) after Dec. 31, 2024, transportation fuels under Sec. 45Z. The credit calculation depends on whether the property is depreciable by the taxpayer (e.g., installation by a business).

o **Businesses:** For businesses, the credit is equal to 6% of the cost of any qualifying refueling property placed in service for the year. That credit percentage is increased to 30% if either: (1) prevailing wage and apprenticeship hour requirements are satisfied, or (2) construction of the project began before Jan. 29, 2023. However, this credit is subject to an overall limitation of $100,000 per any single item of qualifying refueling property. That overall limitation is a significant expansion from prior rules. Previously, this was capped at $30,000 with respect to all qualifying refueling property placed in service during the year by the taxpayer.

o **Individuals:** For individuals, the credit is equal to 30% of the cost of any qualifying refueling property placed in service for the year. This is subject to an overall limitation of $1,000 per any single item of qualifying refueling property.

Energy-efficient upgrades and construction. The IRA includes additional tax incentives focused on energy-efficient upgrades to commercial buildings as well as the construction of new energy-efficient homes. These programs previously existed but were expanded and modified significantly. While these are both tax incentives, one takes the form of accelerated depreciation, and the other is a production tax credit.

Energy-Efficient Commercial Buildings Deduction. Enhanced deductions in Sec. 179D are provided to businesses that place in service energy-efficient building property or energy-producing property. Starting Jan. 1, 2023, the baseline deduction amount is $0.50 per square foot but is increased by $0.02 for every percentage point decrease in energy and power costs in excess of 25%, up to a maximum of $1.00 per square foot. Those amounts are increased by 5x, up to $2.50 per square foot and a maximum of $5.00 per square foot if either: (1) the installation began prior to Jan. 29, 2023, or (2) the project satisfies prevailing wage and apprenticeship hour requirements. Additionally, the rules regarding eligible property and computations were relaxed to provide more benefits if the taxpayer wants to periodically upgrade their energy-efficient property after four years.

New Energy-Efficient Home Credit. Sec. 45L in the IRA also modified the production tax credit resulting from the construction and sale of qualified new energy-efficient homes. The changes extend the availability of the credit through the end of 2032, as well as increasing the maximum credit amounts for qualified energy-efficient property, subject to certain energy savings and prevailing wage standards. The credits are calculated as follows:

o Dwelling units eligible to participate in the Energy Star Residential New Construction Program or the Energy Star Manufactured New Homes Program: $2,500 per unit that meets the applicable energy savings requirements, or $5,000 per unit that is certified as a zero-energy ready home by the Department of Energy.

o Dwelling units eligible to participate in the Energy Star Multifamily New Construction Program: For multifamily homes, the base credit amount per dwelling unit is $500 for units that meet the Energy Star Multifamily Home standard, and $1,000 for units that meet the Zero Energy Ready Home standard. These credit amounts per dwelling unit are increased to $2,500 and $5,000, respectively, if the prevailing wage requirements are met.

While Sec. 6418 allows for the transfer of a variety of tax credits from one taxpayer to another, the Sec. 45L credit is not one of those credits - meaning that the Sec. 45L credit remains nontransferable. The credit can only be claimed by an “eligible contractor” on the qualified energy-efficient property when the qualified energy-efficient property is acquired from the eligible contractor by another party.

Fuel production and use credits

Clean hydrogen. Sec. 45V is a production tax credit for taxpayers that produce “qualified clean hydrogen” at a qualified production facility. Clean hydrogen must be produced through a process resulting in greenhouse gas emissions of not more than 4 kilograms (kgs) of carbon dioxide per kilogram of hydrogen. A qualified facility only includes the first 10 years of operation. The facility must also: (1)

be owned by the taxpayer, (2) production must occur in the United States as part of a trade or business, and (3) construction of the facility must commence before Jan. 1, 2033. Amplified credits are available if prevailing wage and apprenticeship hour requirements are met.

Alcohol, Etc. Used as Fuel. Sec. 40 is a credit for taxpayers producing and either using or selling alcohol for use as a fuel, mixtures of alcohol and gasoline or a special fuel, or ethanol. Production and use must occur within the United States prior to Jan. 1, 2025. Special registration requirements also apply to second generation biofuel producers.

Clean Fuel Production Credit. Sec. 45Z is a tax credit provided to taxpayers producing clean transportation fuels. It includes a delayed effective date that will generally replace the Sec. 40, 40A, and 40B credits for activities occurring after Dec. 31, 2024. Such fuels must be: (1) suitable as fuel for highway vehicles or aircraft, (2) have an emissions rate of not greater than 50 kg of carbon dioxide per 1,000,000 British thermal units (mmBTU), and (3) not derived from coprocessing an applicable material with a feedstock that's not biomass. The production must occur in the United States and the producer must also meet registration requirements. Increased credits are available if prevailing wage and apprenticeship requirements are met.

Conclusion

Significant legislation was enacted that has dramatically expanded the available tax credits, tax incentives, and other funding opportunities related to the green energy sector. Several of these are built on previously existing programs, but many are new and widely applicable. The breadth of qualifying activities is significant, including the production of electricity; production of solar, wind, and energy equipment; installation of energy-efficient upgrades to businesses and homes; and the acquisition of electric vehicles (EVs) and charging equipment. Going further, new monetization options open the benefits of qualifying activities to nonprofits, governments, and other organizations that are tax-exempt. This vast array of new and enhanced options creates opportunities for almost all taxpayers and organizations.

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