

(e) VIN number requirement

No credit shall be determined under subsection (a) with respect to any vehicle unless the taxpayer includes the vehicle identification number of such vehicle on the return of tax for the taxable year.

(f) Regulations and guidance

The Secretary shall issue such regulations or other guidance as the Secretary determines necessary to carry out the purposes of this section, including regulations or other guidance relating to determination of the incremental cost of any qualified commercial clean vehicle.

(g) Termination

No credit shall be determined under this section with respect to any vehicle acquired after December 31, 2032.

(Added Pub. L. 117-169, title I, §13403(a), Aug. 16, 2022, 136 Stat. 1964.)

Statutory Notes and Related Subsidiaries**EFFECTIVE DATE**

Pub. L. 117-169, title I, §13403(c), Aug. 16, 2022, 136 Stat. 1966, provided that: “The amendments made by this section [enacting this section and amending sections 38 and 6213 of this title] shall apply to vehicles acquired after December 31, 2022.”

§ 45X. Advanced manufacturing production credit**(a) In general****(1) Allowance of credit**

For purposes of section 38, the advanced manufacturing production credit for any taxable year is an amount equal to the sum of the credit amounts determined under subsection (b) with respect to each eligible component which is—

- (A) produced by the taxpayer, and
- (B) during the taxable year, sold by such taxpayer to an unrelated person.

(2) Production and sale must be in trade or business

Any eligible component produced and sold by the taxpayer shall be taken into account only if the production and sale described in paragraph (1) is in a trade or business of the taxpayer.

(3) Unrelated person**(A) In general**

For purposes of this subsection, a taxpayer shall be treated as selling components to an unrelated person if such component is sold to such person by a person related to the taxpayer.

(B) Election**(i) In general**

At the election of the taxpayer (in such form and manner as the Secretary may prescribe), a sale of components by such taxpayer to a related person shall be deemed to have been made to an unrelated person.

(ii) Requirement

As a condition of, and prior to, any election described in clause (i), the Secretary

may require such information or registration as the Secretary deems necessary for purposes of preventing duplication, fraud, or any improper or excessive amount determined under paragraph (1).

(b) Credit amount**(1) In general**

Subject to paragraph (3), the amount determined under this subsection with respect to any eligible component, including any eligible component it incorporates, shall be equal to—

(A) in the case of a thin film photovoltaic cell or a crystalline photovoltaic cell, an amount equal to the product of—

- (i) 4 cents, multiplied by
- (ii) the capacity of such cell (expressed on a per direct current watt basis),

(B) in the case of a photovoltaic wafer, \$12 per square meter,

(C) in the case of solar grade polysilicon, \$3 per kilogram,

(D) in the case of a polymeric backsheets, 40 cents per square meter,

(E) in the case of a solar module, an amount equal to the product of—

- (i) 7 cents, multiplied by
- (ii) the capacity of such module (expressed on a per direct current watt basis),

(F) in the case of a wind energy component—

- (i) if such component is a related offshore wind vessel, an amount equal to 10 percent of the sales price of such vessel, and
- (ii) if such component is not described in clause (i), an amount equal to the product of—

(I) the applicable amount with respect to such component (as determined under paragraph (2)(A)), multiplied by

(II) the total rated capacity (expressed on a per watt basis) of the completed wind turbine for which such component is designed,

(G) in the case of a torque tube, 87 cents per kilogram,

(H) in the case of a structural fastener, \$2.28 per kilogram,

(I) in the case of an inverter, an amount equal to the product of—

- (i) the applicable amount with respect to such inverter (as determined under paragraph (2)(B)), multiplied by
- (ii) the capacity of such inverter (expressed on a per alternating current watt basis),

(J) in the case of electrode active materials, an amount equal to 10 percent of the costs incurred by the taxpayer with respect to production of such materials,

(K) in the case of a battery cell, an amount equal to the product of—

- (i) \$35, multiplied by
- (ii) subject to paragraph (4), the capacity of such battery cell (expressed on a kilowatt-hour basis),

(L) in the case of a battery module, an amount equal to the product of—

(i) \$10 (or, in the case of a battery module which does not use battery cells, \$45), multiplied by

(ii) subject to paragraph (4), the capacity of such battery module (expressed on a kilowatt-hour basis), and

(M) in the case of any applicable critical mineral, an amount equal to 10 percent of the costs incurred by the taxpayer with respect to production of such mineral.

(2) Applicable amounts

(A) Wind energy components

For purposes of paragraph (1)(F)(ii), the applicable amount with respect to any wind energy component shall be—

- (i) in the case of a blade, 2 cents,
- (ii) in the case of a nacelle, 5 cents,
- (iii) in the case of a tower, 3 cents, and
- (iv) in the case of an offshore wind foundation—

(I) which uses a fixed platform, 2 cents, or

(II) which uses a floating platform, 4 cents.

(B) Inverters

For purposes of paragraph (1)(I), the applicable amount with respect to any inverter shall be—

- (i) in the case of a central inverter, 0.25 cents,
- (ii) in the case of a utility inverter, 1.5 cents,
- (iii) in the case of a commercial inverter, 2 cents,
- (iv) in the case of a residential inverter, 6.5 cents, and
- (v) in the case of a microinverter or a distributed wind inverter, 11 cents.

(3) Phase out

(A) In general

Subject to subparagraph (C), in the case of any eligible component sold after December 31, 2029, the amount determined under this subsection with respect to such component shall be equal to the product of—

- (i) the amount determined under paragraph (1) with respect to such component, as determined without regard to this paragraph, multiplied by
- (ii) the phase out percentage under subparagraph (B).

(B) Phase out percentage

The phase out percentage under this subparagraph is equal to—

- (i) in the case of an eligible component sold during calendar year 2030, 75 percent,
- (ii) in the case of an eligible component sold during calendar year 2031, 50 percent,
- (iii) in the case of an eligible component sold during calendar year 2032, 25 percent,
- (iv) in the case of an eligible component sold after December 31, 2032, 0 percent.

(C) Exception

For purposes of determining the amount under this subsection with respect to any applicable critical mineral, this paragraph shall not apply.

(4) Limitation on capacity of battery cells and battery modules

(A) In general

For purposes of subparagraph (K)(ii) or (L)(ii) of paragraph (1), the capacity determined under either subparagraph with respect to a battery cell or battery module shall not exceed a capacity-to-power ratio of 100:1.

(B) Capacity-to-power ratio

For purposes of this paragraph, the term “capacity-to-power ratio” means, with respect to a battery cell or battery module, the ratio of the capacity of such cell or module to the maximum discharge amount of such cell or module.

(c) Definitions

For purposes of this section—

(1) Eligible component

(A) In general

The term “eligible component” means—

- (i) any solar energy component,
- (ii) any wind energy component,
- (iii) any inverter described in subparagraphs (B) through (G) of paragraph (2),
- (iv) any qualifying battery component, and
- (v) any applicable critical mineral.

(B) Application with other credits

The term “eligible component” shall not include any property which is produced at a facility if the basis of any property which is part of such facility is taken into account for purposes of the credit allowed under section 48C after the date of the enactment of this section.

(2) Inverters

(A) In general

The term “inverter” means an end product which is suitable to convert direct current electricity from 1 or more solar modules or certified distributed wind energy systems into alternating current electricity.

(B) Central inverter

The term “central inverter” means an inverter which is suitable for large utility-scale systems and has a capacity which is greater than 1,000 kilowatts (expressed on a per alternating current watt basis).

(C) Commercial inverter

The term “commercial inverter” means an inverter which—

- (i) is suitable for commercial or utility-scale applications,
- (ii) has a rated output of 208, 480, 600, or 800 volt three-phase power, and
- (iii) has a capacity which is not less than 20 kilowatts and not greater than 125 kilowatts (expressed on a per alternating current watt basis).

(D) Distributed wind inverter

(i) In general

The term “distributed wind inverter” means an inverter which—

(I) is used in a residential or non-residential system which utilizes 1 or more certified distributed wind energy systems, and

(II) has a rated output of not greater than 150 kilowatts.

(ii) Certified distributed wind energy system

The term “certified distributed wind energy system” means a wind energy system which is certified by an accredited certification agency to meet Standard 9.1-2009 of the American Wind Energy Association (including any subsequent revisions to or modifications of such Standard which have been approved by the American National Standards Institute).

(E) Microinverter

The term “microinverter” means an inverter which—

(i) is suitable to connect with one solar module,

(ii) has a rated output of—

(I) 120 or 240 volt single-phase power, or

(II) 208 or 480 volt three-phase power, and

(iii) has a capacity which is not greater than 650 watts (expressed on a per alternating current watt basis).

(F) Residential inverter

The term “residential inverter” means an inverter which—

(i) is suitable for a residence,

(ii) has a rated output of 120 or 240 volt single-phase power, and

(iii) has a capacity which is not greater than 20 kilowatts (expressed on a per alternating current watt basis).

(G) Utility inverter

The term “utility inverter” means an inverter which—

(i) is suitable for commercial or utility-scale systems,

(ii) has a rated output of not less than 600 volt three-phase power, and

(iii) has a capacity which is greater than 125 kilowatts and not greater than 1000 kilowatts (expressed on a per alternating current watt basis)¹

(3) Solar energy component

(A) In general

The term “solar energy component” means any of the following:

(i) Solar modules.

(ii) Photovoltaic cells.

(iii) Photovoltaic wafers.

(iv) Solar grade polysilicon.

(v) Torque tubes or structural fasteners.

(vi) Polymeric backsheets.

(B) Associated definitions

(i) Photovoltaic cell

The term “photovoltaic cell” means the smallest semiconductor element of a solar module which performs the immediate conversion of light into electricity.

(ii) Photovoltaic wafer

The term “photovoltaic wafer” means a thin slice, sheet, or layer of semiconductor material of at least 240 square centimeters—

(I) produced by a single manufacturer either—

(aa) directly from molten or evaporated solar grade polysilicon or deposition of solar grade thin film semiconductor photon absorber layer, or

(bb) through formation of an ingot from molten polysilicon and subsequent slicing, and

(II) which comprises the substrate or absorber layer of one or more photovoltaic cells.

(iii) Polymeric backsheet

The term “polymeric backsheet” means a sheet on the back of a solar module which acts as an electric insulator and protects the inner components of such module from the surrounding environment.

(iv) Solar grade polysilicon

The term “solar grade polysilicon” means silicon which is—

(I) suitable for use in photovoltaic manufacturing, and

(II) purified to a minimum purity of 99.999999 percent silicon by mass.

(v) Solar module

The term “solar module” means the connection and lamination of photovoltaic cells into an environmentally protected final assembly which is—

(I) suitable to generate electricity when exposed to sunlight, and

(II) ready for installation without an additional manufacturing process.

(vi) Solar tracker

The term “solar tracker” means a mechanical system that moves solar modules according to the position of the sun and to increase energy output.

(vii) Solar tracker components

(I) Torque tube

The term “torque tube” means a structural steel support element (including longitudinal purlins) which—

(aa) is part of a solar tracker,

(bb) is of any cross-sectional shape,

(cc) may be assembled from individually manufactured segments,

(dd) spans longitudinally between foundation posts,

(ee) supports solar panels and is connected to a mounting attachment for solar panels (with or without separate module interface rails), and

(ff) is rotated by means of a drive system.

(II) Structural fastener

The term “structural fastener” means a component which is used—

(aa) to connect the mechanical and drive system components of a solar

¹ So in original. Probably should be followed by a period.

tracker to the foundation of such solar tracker,

(bb) to connect torque tubes to drive assemblies, or

(cc) to connect segments of torque tubes to one another.

(4) Wind energy component

(A) In general

The term “wind energy component” means any of the following:

- (i) Blades.
- (ii) Nacelles.
- (iii) Towers.
- (iv) Offshore wind foundations.
- (v) Related offshore wind vessels.

(B) Associated definitions

(i) Blade

The term “blade” means an airfoil-shaped blade which is responsible for converting wind energy to low-speed rotational energy.

(ii) Offshore wind foundation

The term “offshore wind foundation” means the component (including transition piece) which secures an offshore wind tower and any above-water turbine components to the seafloor using—

(I) fixed platforms, such as offshore wind monopiles, jackets, or gravity-based foundations, or

(II) floating platforms and associated mooring systems.

(iii) Nacelle

The term “nacelle” means the assembly of the drivetrain and other tower-top components of a wind turbine (with the exception of the blades and the hub) within their cover housing.

(iv) Related offshore wind vessel

The term “related offshore wind vessel” means any vessel which is purpose-built or retrofitted for purposes of the development, transport, installation, operation, or maintenance of offshore wind energy components.

(v) Tower

The term “tower” means a tubular or lattice structure which supports the nacelle and rotor of a wind turbine.

(5) Qualifying battery component

(A) In general

The term “qualifying battery component” means any of the following:

- (i) Electrode active materials.
- (ii) Battery cells.
- (iii) Battery modules.

(B) Associated definitions

(i) Electrode active material

The term “electrode active material” means cathode materials, anode materials, anode foils, and electrochemically active materials, including solvents, additives, and electrolyte salts that contribute to the electrochemical processes necessary for energy storage.

(ii) Battery cell

The term “battery cell” means an electrochemical cell—

(I) comprised of 1 or more positive electrodes and 1 or more negative electrodes,

(II) with an energy density of not less than 100 watt-hours per liter, and

(III) capable of storing at least 12 watt-hours of energy.

(iii) Battery module

The term “battery module” means a module—

(I)(aa) in the case of a module using battery cells, with 2 or more battery cells which are configured electrically, in series or parallel, to create voltage or current, as appropriate, to a specified end use, or

(bb) with no battery cells, and

(II) with an aggregate capacity of not less than 7 kilowatt-hours (or, in the case of a module for a hydrogen fuel cell vehicle, not less than 1 kilowatt-hour).

(6) Applicable critical minerals

The term “applicable critical mineral” means any of the following:

(A) Aluminum

Aluminum which is—

(i) converted from bauxite to a minimum purity of 99 percent alumina by mass, or

(ii) purified to a minimum purity of 99.9 percent aluminum by mass.

(B) Antimony

Antimony which is—

(i) converted to antimony trisulfide concentrate with a minimum purity of 90 percent antimony trisulfide by mass, or

(ii) purified to a minimum purity of 99.65 percent antimony by mass.

(C) Barite

Barite which is barium sulfate purified to a minimum purity of 80 percent barite by mass.

(D) Beryllium

Beryllium which is—

(i) converted to copper-beryllium master alloy, or

(ii) purified to a minimum purity of 99 percent beryllium by mass.

(E) Cerium

Cerium which is—

(i) converted to cerium oxide which is purified to a minimum purity of 99.9 percent cerium oxide by mass, or

(ii) purified to a minimum purity of 99 percent cerium by mass.

(F) Cesium

Cesium which is—

(i) converted to cesium formate or cesium carbonate, or

(ii) purified to a minimum purity of 99 percent cesium by mass.

(G) Chromium

Chromium which is—

(i) converted to ferrochromium consisting of not less than 60 percent chromium by mass, or

(ii) purified to a minimum purity of 99 percent chromium by mass.

(H) Cobalt

Cobalt which is—

(i) converted to cobalt sulfate, or

(ii) purified to a minimum purity of 99.6 percent cobalt by mass.

(I) Dysprosium

Dysprosium which is—

(i) converted to not less than 99 percent pure dysprosium iron alloy by mass, or

(ii) purified to a minimum purity of 99 percent dysprosium by mass.

(J) Europium

Europium which is—

(i) converted to europium oxide which is purified to a minimum purity of 99.9 percent europium oxide by mass, or

(ii) purified to a minimum purity of 99 percent by mass.

(K) Fluorspar

Fluorspar which is—

(i) converted to fluorspar which is purified to a minimum purity of 97 percent calcium fluoride by mass, or

(ii) purified to a minimum purity of 99 percent fluorspar by mass.

(L) Gadolinium

Gadolinium which is—

(i) converted to gadolinium oxide which is purified to a minimum purity of 99.9 percent gadolinium oxide by mass, or

(ii) purified to a minimum purity of 99 percent gadolinium by mass.

(M) Germanium

Germanium which is—

(i) converted to germanium tetrachloride, or

(ii) purified to a minimum purity of 99.99 percent germanium by mass.

(N) Graphite

Graphite which is purified to a minimum purity of 99.9 percent graphitic carbon by mass.

(O) Indium

Indium which is—

(i) converted to—

(I) indium tin oxide, or

(II) indium oxide which is purified to a minimum purity of 99.9 percent indium oxide by mass, or

(ii) purified to a minimum purity of 99 percent indium by mass.

(P) Lithium

Lithium which is—

(i) converted to lithium carbonate or lithium hydroxide, or

(ii) purified to a minimum purity of 99.9 percent lithium by mass.

(Q) Manganese

Manganese which is—

(i) converted to manganese sulphate, or

(ii) purified to a minimum purity of 99.7 percent manganese by mass.

(R) Neodymium

Neodymium which is—

(i) converted to neodymium-praseodymium oxide which is purified to a minimum purity of 99 percent neodymium-praseodymium oxide by mass,

(ii) converted to neodymium oxide which is purified to a minimum purity of 99.5 percent neodymium oxide by mass²

(iii) purified to a minimum purity of 99.9 percent neodymium by mass.

(S) Nickel

Nickel which is—

(i) converted to nickel sulphate, or

(ii) purified to a minimum purity of 99 percent nickel by mass.

(T) Niobium

Niobium which is—

(i) converted to ferroniobium, or

(ii) purified to a minimum purity of 99 percent niobium by mass.

(U) Tellurium

Tellurium which is—

(i) converted to cadmium telluride, or

(ii) purified to a minimum purity of 99 percent tellurium by mass.

(V) Tin

Tin which is purified to low alpha emitting tin which—

(i) has a purity of greater than 99.99 percent by mass, and

(ii) possesses an alpha emission rate of not greater than 0.01 counts per hour per centimeter square.

(W) Tungsten

Tungsten which is converted to ammonium paratungstate or ferrotungsten.

(X) Vanadium

Vanadium which is converted to ferrovandium or vanadium pentoxide.

(Y) Yttrium

Yttrium which is—

(i) converted to yttrium oxide which is purified to a minimum purity of 99.999 percent yttrium oxide by mass, or

(ii) purified to a minimum purity of 99.9 percent yttrium by mass.

(Z) Other minerals

Any of the following minerals, provided that such mineral is purified to a minimum purity of 99 percent by mass:

(i) Arsenic.

(ii) Bismuth.

(iii) Erbium.

(iv) Gallium.

(v) Hafnium.

(vi) Holmium.

(vii) Iridium.

(viii) Lanthanum.

(ix) Lutetium.

² So in original. Probably should be followed by “, or”.

- (x) Magnesium.
- (xi) Palladium.
- (xii) Platinum.
- (xiii) Praseodymium.
- (xiv) Rhodium.
- (xv) Rubidium.
- (xvi) Ruthenium.
- (xvii) Samarium.
- (xviii) Scandium.
- (xix) Tantalum.
- (xx) Terbium.
- (xxi) Thulium.
- (xxii) Titanium.
- (xxiii) Ytterbium.
- (xxiv) Zinc.
- (xxv) Zirconium.

(d) Special rules

In this section—

(1) Related persons

Persons shall be treated as related to each other if such persons would be treated as a single employer under the regulations prescribed under section 52(b).

(2) Only production in the United States taken into account

Sales shall be taken into account under this section only with respect to eligible components the production of which is within—

(A) the United States (within the meaning of section 638(1)), or

(B) a possession of the United States (within the meaning of section 638(2)).

(3) Pass-thru in the case of estates and trusts

Under regulations prescribed by the Secretary, rules similar to the rules of subsection (d) of section 52 shall apply.

(4) Sale of integrated components

For purposes of this section, a person shall be treated as having sold an eligible component to an unrelated person if such component is integrated, incorporated, or assembled into another eligible component which is sold to an unrelated person.

(Added Pub. L. 117-169, title I, §13502(a), Aug. 16, 2022, 136 Stat. 1971.)

Editorial Notes

REFERENCES IN TEXT

The date of the enactment of this section, referred to in subsec. (c)(1)(B), is the date of enactment of Pub. L. 117-169, which was approved Aug. 16, 2022.

Statutory Notes and Related Subsidiaries

EFFECTIVE DATE

Pub. L. 117-169, title I, §13502(c), Aug. 16, 2022, 136 Stat. 1981, provided that: “The amendments made by this section [enacting this section and amending section 38 of this title] shall apply to components produced and sold after December 31, 2022.”

§ 45Y. Clean electricity production credit

(a) Amount of credit

(1) In general

For purposes of section 38, the clean electricity production credit for any taxable year is an amount equal to the product of—

(A) the kilowatt hours of electricity—

(i) produced by the taxpayer at a qualified facility, and

(ii)(I) sold by the taxpayer to an unrelated person during the taxable year, or

(II) in the case of a qualified facility which is equipped with a metering device which is owned and operated by an unrelated person, sold, consumed, or stored by the taxpayer during the taxable year, multiplied by

(B) the applicable amount with respect to such qualified facility.

(2) Applicable amount

(A) Base amount

Subject to subsection (g)(7), in the case of any qualified facility which is not described in clause (i) or (ii) of subparagraph (B) and does not satisfy the requirements described in clause (iii) of such subparagraph, the applicable amount shall be 0.3 cents.

(B) Alternative amount

Subject to subsection (g)(7), in the case of any qualified facility—

(i) with a maximum net output of less than 1 megawatt (as measured in alternating current),

(ii) the construction of which begins prior to the date that is 60 days after the Secretary publishes guidance with respect to the requirements of paragraphs (9) and (10) of subsection (g), or

(iii) which—

(I) satisfies the requirements under paragraph (9) of subsection (g), and

(II) with respect to the construction of such facility, satisfies the requirements under paragraph (10) of subsection (g),

the applicable amount shall be 1.5 cents.

(b) Qualified facility

(1) In general

(A) Definition

Subject to subparagraphs (B), (C), and (D), the term “qualified facility” means a facility owned by the taxpayer—

(i) which is used for the generation of electricity,

(ii) which is placed in service after December 31, 2024, and

(iii) for which the greenhouse gas emissions rate (as determined under paragraph (2)) is not greater than zero.

(B) 10-year production credit

For purposes of this section, a facility shall only be treated as a qualified facility during the 10-year period beginning on the date the facility was originally placed in service.

(C) Expansion of facility; incremental production

The term “qualified facility” shall include either of the following in connection with a facility described in subparagraph (A) (without regard to clause (ii) of such subparagraph) which was placed in service before January 1, 2025, but only to the extent of the