



## DEPARTMENT OF THE TREASURY

### Internal Revenue Service

#### 26 CFR Part 1

[REG-107423-23]

RIN 1545-BQ85

#### Section 45X Advanced Manufacturing Production Credit

**AGENCY:** Internal Revenue Service (IRS), Treasury.

**ACTION:** Notice of proposed rulemaking and public hearing.

**SUMMARY:** This document contains proposed regulations to implement the advanced manufacturing production credit established by the Inflation Reduction Act of 2022 to incentivize the production of eligible components within the United States. Eligible components include certain solar energy components, wind energy components, inverters, qualifying battery components, and applicable critical minerals. The proposed regulations would affect eligible taxpayers who produce and sell eligible components and intend to claim the benefit of an advanced manufacturing production credit, including by making elective payment or credit transfer elections. This document also provides notice of a public hearing on the proposed regulations.

**DATES:** Written or electronic comments must be received by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

A public hearing on this proposed regulation has been scheduled for February 22, 2024, at 10 a.m. ET. Requests to speak and outlines of topics to be discussed at the public hearing must be received by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. If no outlines are received by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the public hearing will be cancelled.

Requests to attend the public hearing must be received by 5 p.m. ET on February 20, 2024. The public hearing will be made accessible to people with disabilities. Requests for special assistance during the public hearing must be received by 5 p.m. ET on February 16, 2024.

**ADDRESSES:** Commenters are strongly encouraged to submit public comments electronically via the Federal eRulemaking Portal at <https://www.regulations.gov> (indicate IRS and REG-107423-23) by following the online instructions for submitting comments. Requests for a public hearing must be submitted as prescribed in the “Comments and Public Hearing” section. Once submitted to the Federal eRulemaking Portal, comments cannot be edited or withdrawn. The Department of the Treasury (Treasury Department) and the IRS will publish for public availability any comments submitted to the IRS’s public docket. Send paper submissions to: CC:PA:01:PR (REG-107423-23), room 5203, Internal Revenue Service, P.O. Box 7604, Ben Franklin Station, Washington, DC 20044.

**FOR FURTHER INFORMATION CONTACT:** Concerning the proposed regulations, Mindy Chou, John Deininger, or Alexander Scott at (202) 317-6853 (not a toll-free number); concerning submissions of comments or the public hearing, Vivian Hayes at (202) 317–6901 (not a toll-free number) or by email to [publichearings@irs.gov](mailto:publichearings@irs.gov) (preferred).

## **SUPPLEMENTARY INFORMATION:**

### **Background**

This document contains proposed amendments to the Income Tax Regulations (26 CFR part 1) to implement section 45X of the Internal Revenue Code (Code). Section 45X was added to the Code on August 16, 2022, by section 13502(a) of Public Law 117-169, 136 Stat. 1818, 1971, commonly referred to as the Inflation Reduction Act of 2022 (IRA). Section 13502(c) of the IRA provides that section 45X applies to

components produced and sold after December 31, 2022.

## *I. Overview of Section 45X*

Section 45X(a)(1) provides that, for purposes of the general business credit under section 38 of the Code, the advanced manufacturing production credit (section 45X credit) for any taxable year is an amount equal to the sum of the credit amounts determined under section 45X(b) with respect to each eligible component, as defined in section 45X(c)(1), which is produced by the taxpayer, and during the taxable year, sold by such taxpayer to an unrelated person. Section 45X(a)(2) provides that any eligible component produced and sold by the taxpayer is taken into account only if the production and sale is in a trade or business of the taxpayer.

Section 45X(a)(3) provides rules regarding the sale of components to an unrelated person, and generally provides a special rule that, for purposes of section 45X(a), treats a taxpayer as selling a component to an unrelated person if that component is sold to the unrelated person by a person related to the taxpayer. Under section 45X(a)(3)(B), if a taxpayer makes an election in the form and manner prescribed by the Secretary of the Treasury or her delegate (Secretary), a sale of components by the taxpayer to a related person will be treated as if made to an unrelated person for purposes of section 45X(a) (Related Person Election). As a condition of, and prior to, a taxpayer making the Related Person Election, the Secretary may require such information or registration as the Secretary deems necessary for purposes of preventing duplication, fraud, or any improper or excessive credit amount.

Section 45X(b)(1)(A) through (M) and section 45X(b)(2) set forth the credit amounts for each type of eligible component, which amounts, except for purposes of determining the credit amount for any applicable critical mineral, are subject to phase out rules set forth in section 45X(b)(3). For any eligible component (except applicable critical minerals) sold after December 31, 2029, the credit amount for such component

equals the product of the amount determined under section 45X(b)(1) for such component multiplied by the applicable phase out percentage under section 45X(b)(3)(B)(i) through (iv). In the case of an eligible component sold during calendar year 2030, 2031, and 2032, the phase out percentages are 75 percent, 50 percent, and 25 percent, respectively. In the case of an eligible component sold after December 31, 2032, the phase out percentage is zero percent. Thus, current law provides no section 45X credit after 2032 for eligible components other than for applicable critical minerals.

Section 45X(b)(4) provides capacity limitations used to compute the credit amount for eligible battery cells and battery modules under sections 45X(b)(1)(K)(ii) and (L)(ii). To compute the credit for these eligible components, section 45X(b)(4)(A) provides that the capacity determined with respect to a battery cell or battery module must not exceed a capacity-to-power-ratio of 100:1. Section 45X(b)(4)(B) defines the term “capacity-to-power-ratio” as the ratio of the capacity of a battery cell or battery module to the maximum discharge amount of such cell or module.

Section 45X(c)(1)(A) defines the term “eligible component” to mean any solar energy component, any wind energy component, any inverter described in section 45X(c)(2)(B) through (G), any qualifying battery component, and any applicable critical mineral. Section 45X(c)(1)(B) clarifies that the term “eligible component” does not include any property that is produced at a facility if the basis of any property that is part of such facility is taken into account for purposes of the qualifying advanced energy project credit allowed under section 48C after August 16, 2022 (the date of enactment of the IRA).

Section 45X(c)(2)(A) generally defines an “inverter” as an end product that is suitable to convert direct current (DC) electricity from one or more solar modules or certified distributed wind energy systems into alternating current (AC) electricity. Section 45X(c)(2)(B) through (G) define the following different types of eligible inverters:

central inverter, commercial inverter, distributed wind inverter, microinverter, residential inverter, and utility inverter.

Section 45X(c)(3)(A) defines a “solar energy component” as a solar module, photovoltaic cell, photovoltaic wafer, solar grade polysilicon, torque tube, structural fastener, or polymeric backsheet. Section 45X(c)(3)(B) defines these different types of eligible solar energy components as well as the term “solar tracker.”

Section 45X(c)(4)(A) defines a “wind energy component” as blades, nacelles, towers, offshore wind foundations, and related offshore wind vessels. Section 45X(c)(4)(B) defines these different types of eligible wind energy components.

Section 45X(c)(5)(A) defines a “qualifying battery component” as electrode active materials, battery cells, and battery modules. Section 45X(c)(5)(B) defines these different types of qualifying battery components.

Section 45X(c)(6) provides the following list of 50 minerals that if converted or purified to specified purities are considered an “applicable critical mineral” for purposes of the section 45X credit: aluminum, antimony, arsenic, barite, beryllium, bismuth, cerium, cesium, chromium, cobalt, dysprosium, erbium, europium, fluorspar, gadolinium, gallium, germanium, graphite, hafnium, holmium, indium, iridium, lanthanum, lithium, lutetium, magnesium, manganese, neodymium, nickel, niobium, palladium, platinum, praseodymium, rhodium, rubidium, ruthenium, samarium, scandium, tantalum, tellurium, terbium, thulium, tin, titanium, tungsten, vanadium, ytterbium, yttrium, zinc, and zirconium.

Section 45X(d) provides special rules that are applicable to the section 45X credit. Section 45X(d)(1) provides that persons are treated as related to each other if they would be treated as a single employer under the regulations prescribed under section 52(b) of the Code. Section 52(b) generally provides that trades or businesses that are partnerships, trusts, estates, corporations, or sole proprietorships under

common control are members of a controlled group and are treated as a single employer. See §1.52-1(b). Section 52(b) requires the regulations under section 52(b) to be based on principles similar to the principles that apply for purposes of section 52(a), which generally provides that corporations that are members of a controlled group of corporations are treated as a single employer. Section 52(a) provides that a controlled group of corporations is defined with reference to section 1563(a) of the Code. Section 52(b) and §1.52-1 provide rules similar to those under section 52(a), but with certain modifications to account for different types of ownership interests.

Section 45X(d)(2) provides that sales of eligible components are taken into account under section 45X only for eligible components that are produced within the United States (including continental shelf areas described in section 638(1) of the Code), or a U.S. territory (including continental shelf areas described in section 638(2)). (For purposes of this document, the term “U.S. territory” has the meaning of the term “possession” as defined in section 638(2).) Section 45X(d)(3) directs the Secretary to promulgate regulations adopting rules similar to the rules of section 52(d) to apportion credit amounts between estates or trusts and their beneficiaries on the basis of the income of the estates or trusts allocable to each, and to pass-thru any apportioned credit amounts to the beneficiaries. Section 45X(d)(4) provides that for purposes of the section 45X credit, a person is treated as having sold an eligible component to an unrelated person if such component is integrated, incorporated, or assembled into another eligible component that is sold to an unrelated person.

## *II. Notice 2022-47*

On October 24, 2022, the Treasury Department and the IRS published Notice 2022-47, 2022-43 I.R.B. 312. The notice requested general comments on issues arising under section 45X, as well as specific comments concerning: (1) definitions (including the definitions of eligible components); (2) the Related Person Election;

(3) capacity-to-power ratios for battery cells or battery modules; (4) credit amount for components used in systems of varying capacity; (5) offshore wind vessels; (6) applicable critical minerals; and (7) apportionment and pass-thru of credit amounts to beneficiaries of estates or trusts. The Treasury Department and the IRS received over 300 comments from industry participants and other stakeholders. The Treasury Department and the IRS appreciate the commenters' interest and engagement on these issues. These comments have been carefully considered in the preparation of these proposed regulations.

### *III. Notices 2023-18 and 2023-44*

On March 6, 2023, the Treasury Department and the IRS published Notice 2023-18, 2023-10 I.R.B. 508, to establish the qualifying advanced energy projects program (section 48C(e) program). On June 20, 2023, the Treasury Department and the IRS published Notice 2023-44, 2023-25 I.R.B. 924, to provide additional guidance on the section 48C(e) program, including rules for the interaction between sections 45X and 48C. The rules regarding the interaction between sections 45X and 48C provided in Notices 2023-18 and 2023-44 have been incorporated into these proposed regulations and upon finalization of this rulemaking, section 5.05 of Notice 2023-18 and section 3 of Notice 2023-44 will be superseded.

## **Explanation of Provisions**

### *I. Overview of Proposed Regulations*

Consistent with section 45X(a)(1), these proposed regulations would provide that for purposes of section 38, the section 45X credit for any taxable year is an amount equal to the sum of the credit amounts determined under section 45X(b) with respect to each eligible component, as defined in section 45X(c), produced by the taxpayer, and, during the taxable year, sold by that taxpayer to an unrelated person. Consistent with section 45X(a)(2), only eligible components that are produced and sold in a trade or

business of the taxpayer are taken into account for purposes of the section 45X credit.

These proposed regulations are organized into four sections, proposed §§1.45X-1 through 1.45X-4. Proposed §1.45X-1 would provide general rules applicable to the section 45X credit, including the definition of the term “produced by the taxpayer” for both primary and secondary production. Primary production involves producing an eligible component using non-recycled materials while secondary production involves producing an eligible component using recycled materials. Proposed §1.45X-2 would provide rules for sales to unrelated persons through a person related to the taxpayer, including the rules for a taxpayer to make an election to treat sales of eligible components to related persons (Related Person Election) as if made to unrelated persons. Proposed §1.45X-3 would provide definitions and credit amounts for certain eligible components, including solar energy components, wind energy components, inverters, and qualifying battery components, and phase-out rules. Proposed §1.45X-4 would provide definitions and credit amounts for applicable critical minerals that are eligible components.

## *II. General rules applicable to the advanced manufacturing production credit*

### *A. Overview*

Proposed §1.45X-1(a) would provide an overview of the general rules regarding the advanced manufacturing production credit under section 45X.

### *B. Credit amount*

Proposed §1.45X-1(b) would explain how to calculate the amount of the credit provided under section 45X for any taxable year.

### *C. Definition of produced by the taxpayer*

Proposed §1.45X-1(c) would define the term “produced by the taxpayer” for both primary and secondary production. Proposed §1.45X-1(c)(1) would provide the general definition of the term. Proposed §1.45X-1(c)(1)(i) would state that partial transformation



that does not result in a substantial transformation of inputs into a complete and distinct eligible component is not included in the definition of “produced by the taxpayer.” Proposed §1.45X-1(c)(1)(ii) would state that neither minor assembly of constituent inputs nor superficial modification of a final eligible component are included in the definition of “produced by the taxpayer.” Proposed §1.45X-1(c)(1)(iii) would provide examples illustrating the definition of “produced by the taxpayer.” Proposed §1.45X-1(c)(2) would provide a special rule for applying the definition of “produced by the taxpayer” for solar grade polysilicon, electrode active materials, and applicable critical minerals.

Proposed §1.45X-1(c)(3)(i) would state that the taxpayer claiming a section 45X credit with respect to an eligible component must be the person that performs the actual production activities that bring about a substantial transformation resulting in the eligible component and that sells such eligible component to an unrelated person. Proposed §1.45X-1(c)(3)(ii)(A) would provide that if the production of an eligible component is performed in whole or in part subject to a contract that is a contract manufacturing arrangement, then the party to such contract that may claim the section 45X credit with respect to such eligible component, provided all other requirements in section 45X are met, is the taxpayer that performs the actual production activities that bring about a substantial transformation resulting in the eligible component. This proposed rule is intended to provide an administrable rule that provides taxpayers clarity and certainty in determining which taxpayer may claim the section 45X credit in a contract manufacturing arrangement.

Proposed §1.45X-1(c)(3)(ii)(B) would define the term “contract manufacturing arrangement” to mean any agreement providing for the production of an eligible component if the agreement is entered into before the production of the eligible component to be delivered under the contract is completed. Proposed §1.45X-

1(c)(3)(ii)(B) would further provide that a routine purchase order for off-the-shelf property is not treated as a contract manufacturing arrangement for purposes of proposed §1.45X-1(c)(3). Proposed §1.45X-1(c)(3)(ii)(B) would also provide that an agreement will be treated as a routine purchase order for off-the-shelf property if the contractor is required to make no more than de minimis modifications to the property to tailor it to the customer's specific needs, or if at the time the agreement is entered into, the contractor knows or has reason to know that the contractor can satisfy the agreement out of existing stocks or normal production of finished goods. This definition of the term "routine purchase order" is based on the definition found in §1.263A-2(a)(1)(ii)(B)(2)(ii). The Treasury Department and the IRS request comments on whether this definition should be further clarified or modified.

Proposed §1.45X-1(c)(3)(iii) would explain the special rule allowing parties to a contract manufacturing arrangement to agree on which party to the contract will claim the section 45X credit for eligible components produced subject to such contract. Proposed §1.45X-1(c)(3)(iv) would explain the certification requirements for the special rule. Proposed §1.45X-1(c)(3)(v) would provide examples illustrating the application of the special rule.

Proposed §1.45X-1(c)(4)(i) would explain the requirements for the timing of production and sale of eligible components. Proposed §1.45X-1(c)(4)(ii) would provide an example illustrating the application of these requirements.

#### *D. Produced in the United States*

Proposed §1.45X-1(d)(1) would state that sales are taken into account for purposes of the section 45X credit only for eligible components produced within the United States, as defined in section 638(1) of the Code, or a United States territory, which for purposes of section 45X has the meaning of the term "possession" provided in section 638(2) of the Code. Proposed §1.45X-1(d)(2) would clarify that constituent

elements, materials and subcomponents used in the production of eligible components are not subject to the domestic production rule. It would also be permissible for elements, materials, and subcomponents used in the production of eligible components to be recycled rather than newly created elements, materials, and subcomponents.

*E. Production and sale in a trade or business*

Proposed §1.45X-1(e) would state that an eligible component must be produced and sold in a trade or business of the taxpayer, with the term “trade or business” defined as a trade or business within the meaning of section 162 of the Code.

*F. Integrated, incorporated, or assembled*

Proposed §1.45X-1(f)(1) would state that a taxpayer is treated as having produced and sold an eligible component to an unrelated person if such component is integrated, incorporated, or assembled into another eligible component that is then sold to an unrelated person. This proposed rule would further define the term “integrated, incorporated, or assembled” to mean the production activities by which eligible components that are constituent elements, materials, or subcomponents are substantially transformed into another complete and distinct eligible component functionally different from that which would result from mere assembly or superficial modification of the eligible components used as elements, materials or subcomponents and other elements, materials or subcomponents. Proposed §1.45X-1(f)(2)(i) would clarify that a taxpayer may claim a section 45X credit for each eligible component the taxpayer produces and sells to an unrelated person, including any eligible component the taxpayer produces that was used as a constituent element, material, or subcomponent and integrated, incorporated, or assembled into another complete and distinct eligible component or another complete and distinct product that the taxpayer also produces and sells to an unrelated person. Proposed §1.45X-1(f)(2)(ii) would provide an example of the credit eligibility of a sale of a product with incorporated

eligible components to an unrelated person.

#### *G. Interaction between sections 48C and 45X*

Proposed §1.45X-1(g)(1) would, consistent with section 45X(c)(1)(B), provide that for purposes of section 45X, an eligible component must be produced at a section 45X facility and does not include any property (produced property) that is produced at a facility if the basis of any property that is part of the production unit that produces the produced property is eligible property that is included in a section 48C facility and is taken into account for purposes of a credit allowed under section 48C (section 48C credit) after August 16, 2022. Proposed §1.45X-1(g)(2)(i) would define a section 45X facility to include all tangible property that comprises an independently functioning production unit that produces one or more eligible components. Proposed §1.45X-1(g)(2)(ii) would provide that a production unit is comprised of the tangible property that substantially transforms material inputs to complete the production process of an eligible component. Proposed §1.45X-1(g)(3)(i) would define a section 48C facility to include all eligible property included in a qualifying advanced energy project for which a taxpayer receives an allocation of section 48C credits and claims such credits after August 16, 2022. Proposed §1.45X-1(g)(3)(ii) would define eligible property included in a section 48C facility. Proposed §1.45X-1(g)(4) would provide examples to illustrate the application of these rules.

#### *H. Pass-thru from estates and trusts*

The Treasury Department and the IRS intend to provide rules addressing how the section 45X credit applies in the case of pass-thru from estates and trusts. The Treasury Department and the IRS request comments on how such rules should be implemented and whether there are any special considerations for estates and trusts claiming the section 45X credit. Proposed §1.45X-1(h) is reserved for this purpose.

#### *I. Anti-abuse rule*

Proposed §1.45X-1(i)(1) provides a general anti-abuse rule that would make the section 45X credit unavailable in extraordinary circumstances in which, based on a consideration of all the facts and circumstances, the primary purpose of the production and sale of an eligible component is to obtain the benefit of the section 45X credit in a manner that is wasteful, such as discarding, disposing of, or destroying the eligible component without putting it to a productive use.

In cases where the cost of producing certain eligible components is less than the amount of the section 45X credit that would be available, the Treasury Department and the IRS are concerned that taxpayers may have an incentive to produce such components solely for the purpose of exploiting the section 45X credit in a manner that is inconsistent with a purpose of section 45X, which is to provide an incentive to produce eligible components that contribute to the development of secure and resilient supply chains. Producing and selling eligible components with the primary purpose of obtaining the benefit of the section 45X credit in a wasteful manner would not satisfy the requirement for the eligible component to be produced and sold in a trade or business of the taxpayer under section 45X(a)(2) in certain circumstances. Proposed §1.45X-1(i)(2) would provide an example illustrating this anti-abuse rule.

### *III. Sale to an unrelated person*

Proposed §1.45X-2(a) would state the general rule that the amount of the section 45X credit for any taxable year is equal to the sum of the credit amounts determined under section 45X(b) (and described in §§1.45X-3 and 1.45X-4) with respect to each eligible component that is produced by the taxpayer and, during the taxable year, sold by the taxpayer to an unrelated person (as defined in section 45X(a)(3) and described in §1.45X-2(b)(3)).

### *A. Definitions*

Section 45X(d)(1) provides that persons are treated as related to each other if

such persons would be treated as a single employer under the regulations prescribed under section 52(b). Proposed §1.45X-2(b) would provide definitions of the terms “person,” “related person,” and “unrelated person” for purposes of the section 45X credit.

#### *B. Special rule for sale to related person*

Section 45X(a)(3)(A) provides a special rule for purposes of section 45X that a taxpayer is treated as selling components to an unrelated person if such component is sold to such person by a person related to the taxpayer. Proposed §1.45X-2(c) would provide this rule and an example to illustrate its application.

#### *C. Related person election*

Section 45X(a)(3)(B)(i) provides that 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 is treated as if made by the taxpayer to an unrelated person for purposes of section 45X(a) (Related Person Election). Thus, the Related Person Election is only available if an eligible component is sold by a taxpayer to a related person. The Related Person Election is not available if a taxpayer does not actually sell the eligible component to another person, for example, if an eligible component is transferred between a person and an entity that is not regarded as separate from the person under §301.7701-3 of the Procedure and Administration Regulations (26 CFR part 301) or between divisions of a single corporation. Section 45X(a)(3)(B)(ii) provides that 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 section 45X(a)(1).

Proposed §1.45X-2(d)(1) would provide that the Related Person Election must be made in the form and manner prescribed in guidance. The term “guidance” is defined

as guidance published in the **Federal Register** or Internal Revenue Bulletin, as well as administrative guidance such as forms, instructions, publications, or other guidance on the IRS.gov website. See §§ 601.601 and 601.602 of the Statement of Procedural Rules (26 CFR part 601). For members of a consolidated group (as defined in §1.1502-1(h)), the election is made by each member, in the manner set forth in proposed §1.45X-2(d)(4)(i). In addition, if a member of a consolidated group sells eligible components to another member of the group, the selling member may make the Related Person Election to claim the section 45X credit in the taxable year of sale. Proposed §1.45X-2(d)(1) would also provide that as a condition of, and prior to, a taxpayer making a Related Person Election, the Secretary may require such information or registration as the Secretary deems necessary for purposes of preventing duplication, fraud, or any improper or excessive credit amount determined under section 45X(a)(1).

Proposed §1.45X-2(d)(2) would provide the time and manner for a taxpayer to make the Related Person Election. Proposed §1.45X-2(d)(2)(i) would state that a taxpayer must make an affirmative Related Person Election annually in the form and manner prescribed in guidance (currently Form 7207, *Advanced Manufacturing Production Credit*, and its instructions), and filed with the taxpayer's timely filed original Federal income tax return, including extensions. Proposed §1.45X-2(d)(2)(i) would also provide that the Related Person Election will be applicable to all sales of eligible components to related persons by the taxpayer for each trade or business that the taxpayer engages in during the taxable year that resulted in a credit claim and for which the taxpayer has made the Related Person Election. Proposed §1.45X-2(d)(2)(ii) would provide the required information to make a Related Person Election.

Proposed §1.45X-2(d)(3) would describe the scope and effect of the Related Person Election and provide that a separate Related Person Election must be made

with respect to related person sales made by a taxpayer in each eligible trade or business of the taxpayer. Proposed §1.45X-2(d)(3) would also provide that a Related Person Election applies to all sales to related persons (including between members of the same consolidated group, notwithstanding the rules provided in §1.1502-13) of eligible components produced by the taxpayer during the taxable year for which that election is made and is irrevocable for that taxable year. Additionally, proposed §1.45X-2(d)(3) would provide that a Related Person Election applies solely for purposes of the section 45X credit, the provisions of proposed §§1.45X-1 through 1.45X-4, and so much of sections 6417 and 6418 and the regulations under sections 6417 and 6418 related to the section 45X credit.

Proposed §1.45X-2(d)(3)(ii) and (iii) would apply the provisions of proposed §1.45X-2(d)(2) and (d)(3)(i) to consolidated groups and partnerships. Proposed §1.45X-2(d)(3)(ii) would apply the provisions of proposed §1.45X-2(d)(2) and (d)(3)(i) to consolidated groups by providing that for a trade or business of a consolidated group (as defined in §1.1502-1(h)), a Related Person Election is made by the agent for the group on behalf of the member claiming the section 45X credit and filed with the group's timely filed original Federal income tax return, including extensions, with respect to each trade or business that the consolidated group conducts. See §1.1502-77 (providing rules regarding the status of the common parent as agent for its members). A separate election must be filed on behalf of each member claiming the section 45X credit, and each election must include the name and employer identification number (EIN) of the agent for the group and the member on whose behalf the form is being filed.

Proposed §1.45X-2(d)(3)(iii) would apply the provisions of proposed §1.45X-2(d)(2) and (d)(3)(i) to partnerships by stating that an election for a partnership must be filed with the partnership's timely filed original Federal income tax return, including extensions, with respect to each trade or business that the partnership conducts.



Additionally, proposed §1.45X-2(d)(3)(iii) provides that an election by a partnership does not apply to any trade or business conducted by a partner outside the partnership.

Proposed §1.45X-2(d)(4) would provide an anti-abuse rule for the Related Person Election that is necessary for preventing duplication, fraud, or any improper or excessive amount of the section 45X credit. This anti-abuse rule would make the Related Person Election unavailable in extraordinary cases where a taxpayer seeks to use the Related Person Election to exploit the section 45X credit in an improper and wasteful manner or sell defective components to a related person. Proposed §1.45X-2(d)(4)(i) would provide that a Related Person Election may not be made if the taxpayer fails to provide the information required by proposed §1.45X-2(d)(2) with respect to the relevant eligible components, the taxpayer provides information that shows such components were put to an improper use or were defective, or such components were actually put to an improper use or were defective.

Proposed §1.45X-2(d)(4)(ii) would provide that an eligible component is put to an improper use if it is so used by the related person to which the eligible component is sold. The term “improper use” would mean a use that is wasteful, such as discarding, disposing of, or destroying the eligible component without putting it to a productive use.

As discussed previously, in cases in which the cost of producing certain eligible components may be less than the amount of the section 45X credit that is available, the Treasury Department and the IRS are concerned that taxpayers may have an incentive to produce such components solely for the purpose of exploiting the section 45X credit without putting such components to a productive use. In such cases, the Related Person Election would remove an important safeguard against the improper and wasteful production of eligible components that an unrelated-person-sale requirement would provide. The Treasury Department and the IRS request comments on this definition of the term “improper use” and whether any clarifications to its scope are

necessary.

Proposed §1.45X-2(d)(4)(iii) would provide that an eligible component is “defective” if it does not meet the requirements of section 45X. The Treasury Department and the IRS are concerned that the Related Person Election may be used by taxpayers to claim a credit for eligible components that are defective, not capable of being used for its intended purpose, do not meet the requirements for the section 45X credit, and therefore are not eligible for the section 45X credit. For example, a taxpayer that mass produces a large quantity of an eligible component may find that some of those components are defective, cannot be used for its intended purposes, and are not eligible for the section 45X. Such components could also be difficult to sell to an unrelated person because they are defective. In such cases, the Related Person Election would remove an important safeguard against improper credit claims for defective components that an unrelated-person-sale requirement would provide. The Treasury Department and the IRS request comments on the definition of the term “defective components” and whether clarifications to its scope are necessary.

#### *D. Related person sale of integrated components*

Section 45X(d)(4) provides that for purposes of section 45X, a person is treated as having sold an eligible component to an unrelated person if such component is integrated, incorporated, or assembled into another eligible component that is sold to an unrelated person. See part II.F of this Explanation of Provisions for rules applicable to eligible components that are integrated, incorporated or assembled into other eligible components and sold to an unrelated person.

Proposed §1.45X-2(e)(1) would provide that a taxpayer that produces and then sells an eligible component to a related person who then integrates, incorporates, or assembles the taxpayer’s eligible component into another complete and distinct eligible component that is subsequently sold to an unrelated person may claim a section 45X

credit in the taxable year of the sale to the unrelated person. Proposed §1.45X-2(e)(2) would provide examples to illustrate the treatment of sales of multiple incorporated eligible components to related and unrelated persons if the taxpayer makes the Related Person Election.

Proposed §1.45X-2(e)(3)(i) would provide that if a taxpayer makes the Related Person Election and produces and sells an eligible component to a related person who then integrates, incorporates, or assembles the taxpayer's eligible component into another complete and distinct eligible component that is subsequently sold to an unrelated person, the taxpayer's sale of the eligible component to the related person would be treated as if made to an unrelated person in the taxable year in which the sale to the related person occurs. Proposed §1.45X-2(e)(3)(ii) would provide an example to illustrate the treatment of sales of multiple integrated eligible components to related and unrelated persons with a Related Person Election.

#### *IV. Eligible components*

For solar energy components, wind energy components, inverters, and qualifying battery components, proposed §1.45X-3 would provide definitions, rules for determining the credit amount, and documentation requirements. Proposed §1.45X-3 would also provide rules for applying the phase out of the section 45X credit. Proposed §1.45X-4 would provide such information for applicable critical minerals (other than rules for applying the phase out which do not apply to applicable critical minerals).

##### *A. Eligible Components Generally*

Proposed §1.45X-3(a) defines the term "eligible component" as any solar energy component, any wind energy component, any inverter, any qualifying battery component, and any applicable critical mineral.

##### *B. Solar*

Proposed §1.45X-3(b) would define the term "solar energy component" as a solar

module, photovoltaic cell, photovoltaic wafer, solar grade polysilicon, torque tube, structural fastener, or polymeric backsheet. Proposed §1.45X-3(b) would clarify the definition of each type of solar energy component.

Proposed §1.45X-3(b) would also clarify the calculation of the credit amount for each type of solar energy component. Proposed §1.45X-3(b)(1)(ii) and (b)(5)(ii) would require the capacity of a solar module or photovoltaic cell to be determined by the nameplate capacity in direct current watts using Standard Test Conditions, as defined by the International Electrotechnical Commission.

Proposed §1.45X-3(b) would also require taxpayers to maintain specific documentation with respect to certain solar energy components. For example, for structural fasteners to be eligible for the section 45X credit, section 45X(c)(3)(B)(vii)(II) provides that structural fasteners must be used (1) to connect the mechanical and drive system components of a solar tracker to the foundation of such solar tracker, (2) to connect torque tubes to drive assemblies, or (3) to connect segments of torque tubes to one another. Proposed §1.45X-3(b)(8)(iii) would require taxpayers to document that a structural fastener meets this use requirement with a bill of sale, or other similar documentation that explicitly describes such use. Proposed §1.45X-3(b)(7)(iii) would apply similar documentation rules to torque tubes because section 45X(c)(3)(B)(vii)(I)(aa) requires a torque tube to be “part of a solar tracker” to be eligible for the section 45X credit.

### *C. Wind*

Proposed §1.45X-3(c) would define the term “wind energy component” as a blade, nacelle, tower, offshore wind foundation, or related offshore wind vessel. Proposed §1.45X-3(c) would clarify the definition of each type of wind energy component.

Proposed §1.45X-3(c)(4)(i) would clarify the definition of the term “related

offshore wind vessel.” Section 45X(c)(4)(B)(iv) defines the term “related offshore wind vessel” as any vessel that is purpose-built or retrofitted for purposes of the development, transport, installation, operation, or maintenance of offshore wind energy components. Proposed §1.45X-3(c)(4)(i) would clarify that a vessel is purpose-built for development, transport, installation, operation, or maintenance of offshore wind energy components if it is built to be capable of performing such functions and it is of a type that is commonly used in the offshore wind industry. Proposed §1.45X-3(c)(4)(i) would further clarify that a vessel is retrofitted for development, transport, installation, operation, or maintenance of offshore wind energy components if such vessel was incapable of performing such functions prior to being retrofitted, the retrofit causes the vessel to be capable of performing such functions, and the retrofitted vessel is of a type that is commonly used in the offshore wind industry.

Proposed §1.45X-3(c) would also clarify the calculation of the credit amount for each type of wind energy component. The credit amount for a blade, nacelle, tower, or offshore wind foundation is based on the total rated capacity of the completed wind turbine for which such component is designed. Proposed §1.45X-3(c)(6) would define “total rated capacity of the completed wind turbine” as, for the completed wind turbine for which a blade, nacelle, offshore wind foundation, or tower was manufactured and sold, the nameplate capacity at the time of sale as certified to the relevant national or international standards, such as International Electrotechnical Commission (IEC) 61400, or ANSI/ACP 101-1-2021, the Small Wind Turbine Standard. Certification of the turbine to such standards must be documented by a certificate issued by an accredited certification body. The total rated capacity of a wind turbine must be expressed in watts.

For a related offshore wind vessel, the credit amount is equal to 10 percent of the sales price of the vessel. The sales price of the vessel does not include the price of

maintenance or other services that may be sold with the vessel. Proposed §1.45X-3(c)(4)(ii) would confirm that, for a related offshore wind vessel with respect to which a Related Person Election (as discussed in part III.C of this Explanation of Provisions) has been made, the effect of the election is limited to allowing the related person sale to qualify for a credit under section 45X (despite the fact that it is not actually between unrelated persons) and, therefore, the election does not also treat the sale price as an arm's length price that was determined between uncontrolled taxpayers for purposes of section 482 of the Code and the regulations thereunder.

For blades, nacelles, offshore wind foundations, or towers, proposed §1.45X-3(c)(7) would require a taxpayer to document the turbine model for which such component is designed and the total rated capacity of the completed wind turbine in technical documentation associated with the sale of such component.

#### *D. Inverters*

Proposed §1.45X-3(d) would define the term “inverter” as an end product that is suitable to convert DC electricity from one or more solar modules or certified distributed wind energy systems into AC electricity. An end product is suitable to convert DC electricity from one or more solar modules or certified distributed wind energy systems into AC electricity if, in the form sold by the manufacturer, it is able to connect with such modules or systems and convert DC electricity to AC electricity from such connected source. For purposes of section 45X, the term inverter includes a central inverter, commercial inverter, distributed wind inverter, microinverter, or residential inverter. Proposed §1.45X-3(d) would clarify the definition of each of these types of inverters.

Section 45X(c)(2) requires certain types of inverters be “suitable to” or “suitable for” a statutorily required use or application to be considered an eligible component. For example, section 45X(c)(2)(B) requires a central inverter to be “suitable for large utility-scale systems.” Proposed §1.45X-3(d)(2)(i) would clarify that an inverter is suitable for

large utility-scale systems if, in the form sold by the manufacturer, it is capable of serving as a component in a large utility-scale system and meets the core engineering specifications for such application.

Proposed §1.45X-3(d)(5) would clarify that a direct current optimized inverter system (DC optimized inverter system) may qualify as a microinverter. Proposed §1.45X-3(d)(5)(i) would define a microinverter as an inverter that is suitable to connect with one solar module, has a rated output of 120 or 240 volt single-phase power, or 208 or 480 volt three-phase power, and has a capacity, expressed on an AC watt basis, that is not greater than 650 watts. Proposed §1.45X-3(d)(5)(iii)(A) would clarify that an inverter is suitable to connect to one solar module if, in the form sold by the manufacturer, it is capable of connecting to one or more solar modules and regulating the DC electricity from each module independently before that electricity is converted into alternating current electricity. Proposed §1.45X-3(d)(5)(iii)(B) would provide that a DC optimized inverter system is an inverter that is comprised of an inverter connected to multiple DC optimizers that are each designed to connect to one solar module.

Proposed §1.45X-3(d)(5)(iv)(B) would clarify how to determine the credit amount for a DC optimized inverter system that qualifies as a microinverter. For a DC optimized inverter system to qualify as a microinverter, the inverter must meet the requirements of section 45X(c)(2)(E) and a taxpayer must produce and sell the inverter and the DC optimizers in the DC optimized inverter system together as a single end product.

Proposed §1.45X-3(d)(5) would clarify that, similar to a DC optimized inverter system, a multi-module inverter may also qualify as a microinverter. The term “multi-module inverter” means an inverter that is comprised of an inverter with independent connections and DC optimizing components for two or more modules. Proposed §1.45X-3(d)(5)(iv)(C) would provide that the credit amount for a multi-module inverter that qualifies as a microinverter is equal to the product of 11 cents multiplied by the total

alternating current capacity of the DC optimizers in the multi-module inverter when paired with the inverter in the multi-module inverter.

Proposed §1.45X-3(d) would also clarify the calculation of the credit amount for each type of inverter. In general, the credit amount for each type of inverter would be equal to the product of the inverter's total rated capacity and the amount prescribed in section 45X(b)(2)(B) for such inverter.

Proposed §1.45X-3(d) would generally require taxpayers to document whether an inverter is suitable to or suitable for a statutorily required use or application, the inverter's rated output, and the inverter's capacity, as applicable, in a specification sheet, bill of sale, or other similar documentation.

#### *E. Battery components*

Proposed §1.45X-3(e)(1) would define the term "qualifying battery component" as electrode active materials, battery cells, or battery modules. Proposed §1.45X-3(e)(2)(i)(A) would define the term "electrode active materials" to include cathode electrode materials, anode electrode materials, and electrochemically active materials that contribute to the electrochemical processes necessary for energy storage. In general, electrode active materials are materials that are capable of being used within a battery for energy storage. Proposed §1.45X-3(e)(2)(i)(A) would also provide that the following materials in a battery or vehicle would not qualify for the section 45X credit as an electrode active material: battery management systems, terminal assemblies, cell containments, gas release valves, module containments, module connectors, compression plates, straps, pack terminals, bus bars, thermal management systems, and pack jackets.

Proposed §1.45X-3(e)(2)(i)(B) would define "cathode electrode materials" to mean the materials that comprise the cathode of a commercial battery technology, such as binders, and current collectors (that is, cathode foils). Proposed §1.45X-3(e)(2)(i)(C)



would define “anode electrode materials” to mean the materials that comprise the anode of a commercial battery technology, including anode foils. Proposed §1.45X-3(e)(2)(i)(D) would define “electrochemically active materials that contribute to the electrochemical processes necessary for energy storage” to mean the battery-grade materials that enable the electrochemical storage within a commercial battery technology. In addition to the list of electrochemically active materials provided in section 45X(c)(5)(B)(i) (solvents, additives, and electrolytic salts), these may include electrolytes, catholytes, anolytes, separators, and metal salts and oxides. Proposed §1.45X-3(e)(2)(i)(E) would also include an example illustrating this concept. Proposed §1.45X-3(e)(2)(i)(F) would define “battery-grade materials” to mean the processed materials found in a final battery cell or an analogous unit, or the direct battery-grade precursors to those processed materials.

Proposed §1.45X-3(e)(2)(v) would clarify that a taxpayer may claim only one section 45X credit with respect to a material that qualifies as both an electrode active material and an applicable critical mineral.

#### *F. Production costs incurred*

Proposed §1.45X-3(e)(2)(ii) would provide that for an electrode active material the credit amount is equal to 10 percent of the costs incurred by the taxpayer with respect to production of such materials. Proposed §1.45X-3(e)(2)(iii) would also provide the definition of purified and converted with respect to electrode active materials. Proposed §1.45X-3(e)(2)(iv) would clarify that the costs incurred for purposes of determining the credit amount includes costs as defined in §1.263A-1(e) that are paid or incurred within the meaning of section 461 of the Code by the taxpayer for the production of an electrode active material only. Thus, production costs with respect to an electrode active material would not include any costs incurred after the production of the electrode active material. For example, the costs to incorporate the electrode active

material into a battery component would not be taken into account as costs incurred in producing the electrode active material. These proposed regulations apply section 263A and the regulations under section 263A (section 263A regulations) solely to identify the types of costs that are includible in production costs incurred for purposes of computing the amount of the section 45X credit, but do not apply section 263A or the section 263A regulations for any other purposes, such as to determine whether a taxpayer is engaged in production activities.

Direct material costs as defined in §1.263A-1(e)(2)(i)(A), or indirect material costs as defined in §1.263A-1(e)(3)(ii)(E), and any costs related to the extraction or acquisition of raw materials would not be taken into account as production costs. A wide range of costs that are attributable to the production of an electrode active material would be taken into account as a cost incurred in producing the electrode active material, including, but not limited to, labor, electricity used in the production of the electrode active material, storage costs, depreciation or amortization, recycling, and overhead. However, the cost of acquiring the raw material used to produce the electrode active material, the cost of materials used for conversion, purification, or recycling of the raw material, and other material costs related to the production of the electrode active material would not be taken into account.

The Treasury Department and the IRS seek to appropriately provide a credit for the costs associated with production activities that add value to the electrode active material and are conducted by the taxpayer that produces the electrode active material. Merely purchasing raw materials may enable a taxpayer to produce an electrode active material but it is not by itself an activity that adds value. Excluding material costs would also mitigate the risk of crediting the same costs multiple times. For example, if material costs are included in production costs for electrode active materials, the costs of producing an applicable critical mineral that is later incorporated into an electrode active

material could be credited more than once, and such material costs could make up a significant share of the cost of producing the electrode active material.

The Treasury Department and the IRS recognize that a wide range of costs are incurred in the production of electrode active materials. The Treasury Department and the IRS request comments on this proposed rule for determining the costs incurred with respect to the production of electrode active materials, specifically whether and how extraction and other similar value-added activities in the production of raw materials used in electrode active materials should be taken into account. The Treasury Department and the IRS welcome an assessment of the magnitude of extraction costs and other direct and indirect material costs relative to the overall costs incurred in the production of an electrode active material, and the extent to which these costs are incurred by the taxpayer that also produces the electrode active material and add value to the electrode active material. The Treasury Department and the IRS also welcome comments on how extraction should be defined for this purpose, and whether it should be defined consistent with proposed §1.30D-3(c)(8).

The Treasury Department and the IRS are considering including in production costs the costs of extraction and other similar value-added activities in the production of raw materials used in electrode active materials. However, such costs would only be included if the IRS could effectively administer such an approach and there are sufficient assurances that adopting such an approach would pose a limited risk of (i) crediting the same production costs multiple times and (ii) increasing other forms of fraud, waste, and abuse. The Treasury Department and the IRS request comments on whether and to what extent including these costs might raise such risks.

The Treasury Department and the IRS intend for the production cost incurred rules in proposed §1.45X-3(e)(2) to apply to a credit claimant in a contract manufacturing arrangement. The Treasury Department and the IRS request comments

on whether the proposed rules need further clarification or modification as applied to contract manufacturing arrangements.

*G. Battery cells and modules*

Proposed §1.45X-3(e)(3) and (4) would provide definitions, rules for measuring capacity, and documentation requirements for battery cells and battery modules.

Proposed §1.45X-3(e)(4)(i) would define a “battery module” as a module, in the case of a module using battery cells, with two or more battery cells that are configured electrically, in series or parallel, to create voltage or current, as appropriate, to a specified end use, or a module with no battery cells, and, in each case, 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). Proposed §1.45X-3(e)(4)(i)(A) would define a “module using battery cells” as a module with two or more battery cells that are configured electrically, in series or parallel, to create voltage or current (as appropriate), to a specified end use, meaning an end-use configuration of battery technologies. An end-use configuration is the product that ultimately serves a specified end use. It is the collection of interconnected cells, configured to that specific end-use and interconnected with the necessary hardware and software required to deliver the required energy and power (voltage and current) for that use. As applied to batteries commonly used in electric vehicles, proposed §1.45X-3(e)(4)(i)(A) would permit a credit for the production and sale of the battery pack in the electric vehicle, but it would not permit a credit for the production of a module that is not the end-use configuration. The Treasury Department and the IRS request comments on this proposed interpretation of the phrase “to a specified end use” in section 45X(c)(5)(B)(iii)(I)(aa).

Proposed §1.45X-3(e)(4)(i)(B) would define the term “module with no battery cells” as a product with a standardized manufacturing process and form that is capable of storing and dispatching useful energy, that contains an energy storage medium that

remains in the module (for example, it is not consumed through combustion), and that is not a custom-built electricity generation or storage facility. This proposed definition would allow battery technologies such as flow batteries and thermal batteries to be eligible for the section 45X credit, but it would not permit technologies that do not meet this definition such as standalone fuel storage tanks or fuel tanks connected to engines or generation systems to qualify as a module with no battery cells.

Proposed §1.45X-3(e) would clarify how capacity must be determined for battery cells and battery modules. Proposed §1.45X-3(e)(3)(ii) would provide that taxpayers must measure the capacity of a battery cell in accordance with a national or international standard, such as IEC 60086-1 (Primary Batteries), or an equivalent standard. Taxpayers can reference the United States Advanced Battery Consortium (USABC) Battery Test Manual for additional guidance. Proposed §1.45X-3(e)(4)(ii)(A) would provide that, for modules using battery cells, taxpayers must measure the capacity of a module using battery cells with a testing procedure that complies with a national or international standard published by a recognized standard setting organization. The capacity of a battery module using battery cells may not exceed the total capacity of the battery cells in the module. Proposed §1.45X-3(e)(4)(ii)(B) would provide that, for modules with no battery cells, taxpayers must measure the capacity using a testing procedure that complies with a national or international standard published by a recognized standard setting organization. If no such standard applies to a type of module with no battery cells, taxpayers must measure the capacity of such module as the Secretary may prescribe in regulations or other guidance. The Treasury Department and the IRS request comments on what recognized national or international standards are currently available for measuring capacity of modules with no battery cells and whether further guidance may be required.

#### *H. Phase Out*

Proposed §1.45X-3(f) would provide the rules for the phase out of the section 45X credit. In the case of any eligible component that is not an applicable critical mineral and is sold after December 31, 2029, the amount of the section 45X credit determined with respect to such eligible component would be equal to the product of the amount determined under proposed §1.45X-3 with respect to such eligible component, multiplied by the phase out percentage. Proposed §1.45X-3(f)(2) would provide the phase out percentages. The phase out percentage would be equal to 75 percent for eligible components sold during calendar year 2030; 50 percent for eligible components sold during calendar year 2031; 25 percent for eligible components sold during calendar year 2032, and zero percent for eligible components sold after calendar year 2032. The phase out percentages would be determined based on the year the eligible component is sold rather than the year in which the eligible component is produced by the taxpayer. Proposed §1.45X-3(f)(3) would clarify that the phase out rules described in proposed §1.45X-3(f) do not apply to applicable critical minerals as defined in proposed §1.45X-4(b).

#### *V. Applicable critical minerals*

##### *A. In general*

Section 45X(c)(6) defines applicable critical minerals that are eligible components for purposes of the section 45X credit. Congress enacted section 45X to incentivize the domestic production of eligible components, including certain applicable critical minerals, that are vital to strengthening the country's renewable energy and energy storage supply chains. In addition, Congress amended section 30D in the IRA to provide that section 30D credit eligibility and credit amount is based in part on the sourcing of applicable critical minerals contained in the battery of new clean vehicles from secure and resilient supply chains, with applicable critical minerals defined by cross-reference to section 45X(c)(6). See section 30D(d)(7)(A) and (e)(1). The

Treasury Department and the IRS interpret the applicable critical minerals described in section 45X(c)(6) through this lens.

Proposed §1.45X-4(b) adopts, with some clarifications, the definitions of applicable critical minerals provided in section 45X(c)(6). In particular, section 45X(c)(6)(N) provides that the term “graphite” means graphite (both natural and synthetic) that is purified to a minimum purity of 99.9 percent graphitic carbon by mass. Some stakeholders have questioned whether this definition could be interpreted to refer to a particular crystalline structure of carbon, that is, 99.9 percent carbon in a graphitic form. After consulting with experts at the Department of Energy, U.S. Geological Survey, and Department of the Interior, the Treasury Department and the IRS are unaware of a current application in the energy sector for graphite that is at least 99.9 percent carbon in the graphitic form. However, graphite that is at least 99.9 percent carbon by mass is used in electric vehicle batteries to facilitate the electrochemical processes necessary for energy storage, as well as in other energy sector applications. Consistent with the general intent of section 45X, proposed §1.45X-4(b)(14) would clarify that the term “99.9 percent graphitic carbon by mass” means graphite that is 99.9 percent carbon by mass. This interpretation reflects that various forms of matter are 99.9 percent carbon, such as carbon black, so the word “graphitic” is providing additional clarification regarding the particular application of the carbon. This interpretation provides an incentive for the domestic production of the type of graphite that is used in the renewable energy and energy storage industry, including both synthetic and natural graphite for use in electric vehicle batteries. This interpretation also supports the secure supply chain objectives expressed by Congress in amendments to section 30D that cross-reference the section 45X definition of applicable critical minerals.

Section 45X(c)(6)(A) provides that aluminum that is converted from bauxite to a

minimum purity of 99 percent alumina by mass or purified to a minimum purity of 99.9 percent aluminum by mass, qualifies as an applicable critical mineral. Some stakeholders have requested clarification whether commercial grade aluminum that is 99.7 percent aluminum by mass may qualify as an applicable critical mineral under section 45X(c)(6)(A).

Section 45X(c)(6)(A) should be interpreted in light of the dynamics of the aluminum industry and the role that critical materials like aluminum play in the renewable energy and energy storage industry. Aluminum oxide, commonly known as alumina, is a form of aluminum that is referred to in section 45X(c)(6)(A)(i). Proposed §1.45X-4(b)(1) would interpret section 45X(c)(6)(A) to mean aluminum, including commodity-grade aluminum, described in section 45X(c)(6)(A)(i) and (ii). Proposed §1.45X-4(b)(1) would define “commodity-grade aluminum” as aluminum that has been produced directly from aluminum that is described in proposed §1.45X-4(b)(1)(i) or (ii) and is in a form that is sold on international commodity exchanges, which would include commercial grade aluminum that is 99.7 percent aluminum by mass.

Proposed §1.45X-4(b)(1) clarifies that the term “commodity-grade aluminum” is limited to primary production of unwrought forms by specifying that commodity-grade aluminum must be “produced directly” from certain forms of aluminum. The Treasury Department and the IRS currently understand that the ability to ascertain and substantiate the process or processes used in an earlier point in the lifecycle of feedstock aluminum for secondary production is limited. Such limitations would pose significant substantiation and administrability issues if secondary production were permitted for commodity-grade aluminum under proposed §1.45X-4(b)(1). Excluding secondary production would also avoid significant administrability challenges that would arise if the process or processes used at previous points in the lifecycle of feedstock aluminum used in secondary production had to be verified to determine eligibility for the



section 45X credit.

The Treasury Department and the IRS request comments on this interpretation of section 45X(c)(6)(A).

#### *B. Credit amount*

Section 45X(b)(1) generally provides the credit amount determined with respect to any eligible component, including any eligible component it incorporates, subject to the credit phase out provided at section 45X(b)(3). Section 45X(b)(3)(C) provides that the credit phase out does not apply with respect to any applicable critical mineral.

Section 45X(b)(1)(M) provides that in the case of any applicable critical mineral, the credit amount is an amount equal to 10 percent of the costs incurred by the taxpayer with respect to production of such mineral.

Proposed §1.45X-4(c)(1) would provide that for an applicable critical mineral the credit amount is equal to 10 percent of the costs incurred by the taxpayer with respect to production of such materials. Proposed §1.45X-4(c)(2) would provide definitions of production processes for applicable critical minerals. Proposed §1.45X-1(c)(2)(i) would provide that for purposes of section 45X, the term “conversion” means a chemical transformation from one species to another. Proposed §1.45X-1(c)(2)(ii) would provide that for purposes of section 45X, the term “purification” means increasing the mass fraction of a certain element.

#### *C. Production costs incurred*

Proposed §1.45X-4(c)(3) would clarify that the costs incurred for purposes of determining the credit amount includes costs as defined in §1.263A-1(e) that are paid or incurred within the meaning of section 461 of the Code by the taxpayer for the production of an applicable critical mineral only. Thus, production costs with respect to an applicable critical mineral would not include any costs incurred after the production of the applicable critical mineral. For example, the costs to incorporate the applicable

critical mineral into another product would not be taken into account as costs incurred in producing the applicable critical mineral. These proposed regulations apply section 263A and the section 263A regulations solely to identify the types of costs that are includible in production costs incurred for purposes of computing the credit amount, but do not apply section 263A or the section 263A regulations for any other purposes, such as to determine whether a taxpayer is engaged in production activities.

Direct or indirect materials costs as defined in §1.263A-1(e)(2)(i)(A) and (e)(3)(ii)(E), respectively, and any costs related to the extraction or acquisition of raw materials would not be taken into account as production costs. A wide range of costs that are attributable to the production of an applicable critical mineral would be taken into account as a cost incurred in producing the applicable critical mineral, including, but not limited to, labor, electricity used in the production of the applicable critical mineral, storage costs, depreciation or amortization, recycling, and overhead. However, the cost of acquiring the raw material used to produce the applicable critical mineral, the cost of materials used for conversion, purification, or recycling of the raw material, and other material costs related to the production of the applicable critical mineral would not be taken into account.

The Treasury Department and the IRS seek to appropriately provide a credit for the costs associated with production activities that add value to the applicable critical mineral and are conducted by the taxpayer that produces the applicable critical mineral. Merely purchasing raw materials may enable a taxpayer to produce an applicable critical mineral but it is not by itself an activity that adds value. Excluding material costs would also mitigate the risk of crediting the same costs multiple times. For example, if material costs are included in production costs for an applicable critical mineral, the costs of producing an applicable critical mineral that is later incorporated into another applicable critical mineral could be credited more than once, and such material costs

could make up a significant share of the cost of producing the applicable critical mineral. This might be the case if, for instance, Taxpayer 1 produces Applicable Critical Mineral 1 and then sells it to Taxpayer 2 who uses it to create Applicable Critical Mineral 2. The cost of producing Applicable Critical Mineral 1 would be credited twice if material costs are included in production costs, once by Taxpayer 1 for the initial production of Applicable Critical Mineral 1 and then again by Taxpayer 2 because Taxpayer 2 would include its cost of purchasing Applicable Critical Mineral 1 in its production costs for Applicable Critical Mineral 2.

The Treasury Department and the IRS recognize that a wide range of costs are incurred in the production of applicable critical minerals. The Treasury Department and the IRS request comments on this proposed rule for determining the costs incurred with respect to the production of applicable critical minerals, specifically whether and how extraction and other similar value-added activities in the production of raw materials used in applicable critical minerals should be taken into account. The Treasury Department and the IRS welcome an assessment of the magnitude of extraction costs and other direct and indirect material costs relative to the overall costs incurred in the production of an applicable critical mineral, and the extent to which these costs are incurred by the taxpayer that also produces the applicable critical mineral and add value to the applicable critical mineral. The Treasury Department and the IRS also welcome comments on how extraction should be defined, and whether it should be defined consistent with proposed §1.30D-3(c)(8).

The Treasury Department and the IRS are considering including in production costs the costs of extraction and other similar value-added activities in the production of raw materials used in applicable critical minerals. However, such costs would only be included if the IRS could effectively administer such an approach and there are sufficient assurances that adopting such an approach would pose a limited risk of (i)

crediting the same production costs multiple times and (ii) increasing other forms of fraud, waste, and abuse. The Treasury Department and the IRS request comments on whether and to what extent including these costs might raise such risks.

Proposed §1.45X-4(c)(3) would also provide that the rules regarding ownership and property produced under a contract with a taxpayer under §1.263A-2(a)(1)(ii) that are used to determine whether a taxpayer is engaged in production or resale activities for purposes of section 263A do not apply for purposes of determining the taxpayer that is engaged in production activities for purposes of section 45X and the section 45X regulations.

#### *D. Substantiation*

Proposed §1.45X-4(c)(4) would require the taxpayer to document that their product meets the criteria for an applicable critical mineral as described in section 45X(c)(6) with a certificate of analysis (COA) provided by the taxpayer to the person to which the taxpayer sold the applicable critical mineral. The Treasury Department and the IRS request comments on this substantiation requirement, including whether a similar requirement should be applied to electrode active materials.

#### *VI. Substantiation required under section 6001*

Section 6001 of the Code provides that every person liable for any tax imposed by the Code, or for the collection thereof, must keep such records as the Secretary may from time to time prescribe. Section 1.6001-1(a) provides that any person subject to income tax must keep such permanent books of account or records as are sufficient to establish the amount of gross income, deductions, credits, or other matters required to be shown by such person in any return of such tax. Section 1.6001-1(e) provides that the books and records required by §1.6001-1 must be retained so long as the contents thereof may become material in the administration of any internal revenue law. Various provisions under proposed §§1.45X-1 through 1.45X-4 would require taxpayers to

maintain specific documentation regarding certain eligible components that are produced by a taxpayer. These requirements would be part of the general recordkeeping requirements under section 6001 and the regulations under section 6001.

### **Severability**

If any provision in this proposed rulemaking is held to be invalid or unenforceable facially, or as applied to any person or circumstance, it shall be severable from the remainder of this rulemaking, and shall not affect the remainder thereof, or the application of the provision to other persons not similarly situated or to other dissimilar circumstances.

### **Effect on Other Documents**

Section 5.05 of Notice 2023-18 and section 3 of Notice 2023-44, which relate to the interaction between sections 45X and 48C, will be superseded upon the publication in the **Federal Register** of a Treasury Decision addressing the interaction between sections 45X and 48C.

### **Proposed Applicability Dates**

Each of proposed §§1.45X-1 through 1.45X-4 is proposed to apply to eligible components for which production is completed and sales occur after December 31, 2022, and during taxable years ending on or after the date of publication of the final regulations in the **Federal Register**.

### **Special Analyses**

#### *I. Regulatory Planning and Review—Economic Analysis*

Pursuant to the Memorandum of Agreement, Review of Treasury Regulations under Executive Order 12866 (June 9, 2023), tax regulatory actions issued by the IRS are not subject to the requirements of section 6 of Executive Order 12866, as amended. Therefore, a regulatory impact assessment is not required.

## II. *Paperwork Reduction Act*

The Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3520) (PRA) generally requires that a Federal agency obtain the approval of the Office of Management and Budget (OMB) before collecting information from the public, whether such collection of information is mandatory, voluntary, or required to obtain or retain a benefit.

The collections of information in these proposed regulations contain reporting and recordkeeping requirements that are required to validate eligibility to claim a section 45X credit. These collections of information would generally be used by the IRS for tax compliance purposes and by taxpayers to facilitate proper reporting and compliance. The general recordkeeping requirements mentioned within these proposed regulations are considered general tax records under §1.6001-1(e). Specific certification statements under §1.45X-1(c)(3) are considered general tax records and are required for the IRS to validate the taxpayer that may claim a section 45X credit. For PRA purposes, general tax records are already approved by OMB under 1545-0074 for individuals, 1545-0123 for business entities, and under 1545-0092 for trust and estate filers.

These proposed regulations also provide reporting requirements related to making the Related Person Election as described in §1.45X-2(d) and calculating the section 45X credit amount as described in §1.45X-1. The Related Person Election will be made by taxpayers with Forms 1040, 1041, 1120-S, 1065, and 1120, on Form 7207 (or any successor forms); and credit calculations will be made on Form 3800 and supporting forms including Form 7207 (and any successor forms). These forms are approved under 1545-0074 for individuals, 1545-0123 for business entities, 1545-2306 for trust and estate filers of Form 7207, and 1545-0895 for trust and estate filers of Form 3800. These proposed regulations are not changing or creating new collection requirements not already approved by OMB or will be approved under 5 CFR 1320.10

by OMB.

### III. *Regulatory Flexibility Act*

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) (RFA) imposes certain requirements with respect to Federal rules that are subject to the notice and comment requirements of section 553(b) of the Administrative Procedure Act (5 U.S.C. 551 *et seq.*) and that are likely to have a significant economic impact on a substantial number of small entities. Unless an agency determines that a proposal is not likely to have a significant economic impact on a substantial number of small entities, section 603 of the RFA requires the agency to present an initial regulatory flexibility analysis (IRFA) of the proposed rule. The Treasury Department and the IRS have not determined whether the proposed rule, when finalized, will likely have a significant economic impact on a substantial number of small entities. This determination requires further study. However, because there is a possibility of significant economic impact on a substantial number of small entities, an IRFA is provided in these proposed regulations. The Treasury Department and the IRS invite comments on both the number of entities affected and the economic impact on small entities.

Pursuant to section 7805(f) of the Code, this notice of proposed rulemaking has been submitted to the Chief Counsel of the Office of Advocacy of the Small Business Administration for comment on its impact on small business.

#### *A. Need for and objectives of the rule*

The proposed regulations would provide greater clarity to taxpayers that intend to claim a section 45X credit. The proposed regulations would provide necessary definitions, the time and manner to make the Related Person Election and rules regarding the determination of credit amounts. The Treasury Department and the IRS intend and expect that giving taxpayers guidance that allows them to claim the section 45X credit will beneficially impact various industries. In particular, the section 45X credit

encourages the domestic production of eligible components and incentivizes taxpayers to invest in clean energy projects that generate eligible credits.

#### *B. Affected small entities*

The RFA directs agencies to provide a description of, and if feasible, an estimate of, the number of small entities that may be affected by the proposed rules, if adopted. The Small Business Administration's Office of Advocacy estimates in its 2023 Frequently Asked Questions that 99.9 percent of American businesses meet its definition of a small business. The applicability of these proposed regulations does not depend on the size of the business, as defined by the Small Business Administration.

As described more fully in the preamble to this proposed regulation and in this IRFA, section 45X and these proposed regulations may affect a variety of different entities across several different clean energy industries as multiple types of eligible components are provided for under the statute and manufacturers may produce more than one type. Although there is uncertainty as to the exact number of small businesses within this group, the current estimated number of respondents to these proposed rules is 13,450 taxpayers. The estimated total annual reporting burden and estimated average annual burden per respondent will be computed when Form 7207 and the instructions to Form 7207 are updated to reflect these proposed regulations.

The Treasury Department and the IRS expect to receive more information on the impact on small businesses through comments on this proposed rule and after taxpayers start to claim the section 45X credit using the guidance and procedures provided in these proposed regulations.

#### *C. Impact of the rules*

The proposed regulations provide rules for how taxpayers can claim the section 45X credit. Taxpayers that claim the section 45X credit will have administrative costs related to reading and understanding the rules as well as recordkeeping and reporting



requirements because of the Related Person Election, computation of the section 45X credit and tax return requirements. The costs will vary across different-sized entities and across the type of production activities in which such entities are engaged.

The Related Person Election allows a taxpayer to make an irrevocable election annually with their Federal income tax return by providing the information required on Form 7207 (or any successor form), including, for example, the name, EIN of the taxpayer; a description of the taxpayer's trade or business; the name, address and EINs of all related persons; a list of the eligible components that are sold, and the intended purpose of the eligible components sold by the related person. To make the Related Person Election and claim the section 45X credit, the taxpayer must file an annual Federal income tax return. The reporting and recordkeeping requirements for that Federal income tax return would be required for any taxpayer that is claiming a general business credit, regardless of whether the taxpayer was making a Related Person Election under section 45X.

#### *D. Alternatives considered*

The Treasury Department and the IRS considered alternatives to the proposed regulations. For example, the Treasury Department and the IRS considered whether to impose certain pre-return filing requirements as a condition of making the Related Person Election as authorized in section 45X(a)(3)(B)(ii) to prevent duplication, fraud, or improper or excessive credits. The proposed regulations were designed to minimize burdens for taxpayers while ensuring that the IRS has sufficient information to determine eligibility for the section 45X credit. The Treasury Department and the IRS determined that requiring registration before a taxpayer makes the Related Person Election is unnecessary at this time. The proposed regulations would allow taxpayers to make an irrevocable Related Person Election annually with their Federal income tax return by providing the information required on Form 7207 (or any successor form),

which would provide the IRS with sufficient information to assist in preventing duplication, fraud, or the claiming of improper or excessive credits if eligible components are produced and then sold to related persons.

Comments are requested on the requirements in the proposed regulations, including specifically, whether there are less burdensome alternatives that ensure the IRS has sufficient information to administer the advanced manufacturing production credit.

#### *E. Duplicative, overlapping, or conflicting Federal rules*

The proposed rule would not duplicate, overlap, or conflict with any relevant Federal rules. As discussed above, the proposed rule would merely provide procedures and definitions to allow taxpayers to claim the section 45X credit. The Treasury Department and the IRS invite input from interested members of the public about identifying and avoiding overlapping, duplicative, or conflicting requirements.

#### *IV. Unfunded Mandates Reform Act*

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires that agencies assess anticipated costs and benefits and take certain other actions before issuing a final rule that includes any Federal mandate that may result in expenditures in any one year by a State, local, or Indian Tribal government, in the aggregate, or by the private sector, of \$100 million (updated annually for inflation). This proposed rule does not include any Federal mandate that may result in expenditures by State, local, or Indian Tribal governments, or by the private sector in excess of that threshold.

#### *V. Executive Order 13132: Federalism*

Executive Order 13132 (Federalism) prohibits an agency from publishing any rule that has federalism implications if the rule either imposes substantial, direct compliance costs on State and local governments, and is not required by statute, or preempts State law, unless the agency meets the consultation and funding requirements of section 6 of

the Executive order. This proposed rule does not have federalism implications and does not impose substantial direct compliance costs on State and local governments or preempt State law within the meaning of the Executive order.

#### *VI. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments*

Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments) prohibits an agency from publishing any rule that has Tribal implications if the rule either imposes substantial, direct compliance costs on Indian Tribal governments, and is not required by statute, or preempts Tribal law, unless the agency meets the consultation and funding requirements of section 5 of the Executive order. This proposed rule does not have substantial direct effects on one or more federally recognized Indian tribes and does not impose substantial direct compliance costs on Indian Tribal governments within the meaning of the Executive order.

#### **Comments and Public Hearing**

Before these proposed amendments to the regulations are adopted as final regulations, consideration will be given to comments regarding the notice of proposed rulemaking that are submitted timely to the IRS as prescribed in this preamble under the **ADDRESSES** section. The Treasury Department and the IRS request comments on all aspects of the proposed regulations. All comments will be made available at <https://www.regulations.gov>. Once submitted to the Federal eRulemaking Portal, comments cannot be edited or withdrawn.

A public hearing with respect to this notice of proposed rulemaking has been scheduled for February 22, 2024, beginning at 10 a.m. ET, in the Auditorium at the Internal Revenue Building, 1111 Constitution Avenue, NW., Washington, D.C. Due to building security procedures, visitors must enter at the Constitution Avenue entrance. In addition, all visitors must present photo identification to enter the building. Because of

access restrictions, visitors will not be admitted beyond the immediate entrance area more than 30 minutes before the hearing starts. Participants may alternatively attend the public hearing by telephone.

The rules of 26 CFR 601.601(a)(3) apply to the public hearing. Persons who wish to present oral comments at the public hearing must submit an outline of the topics to be discussed and the time to be devoted to each topic by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. A period of 10 minutes will be allotted to each person for making comments. An agenda showing the scheduling of the speakers will be prepared after the deadline for receiving outlines has passed. Copies of the agenda will be available free of charge at the public hearing. If no outline of the topics to be discussed at the public hearing is received by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, the public hearing will be cancelled. If the public hearing is cancelled, a notice of cancellation of the public hearing will be published in the **Federal Register**.

Individuals who want to testify in person at the public hearing must send an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) to have your name added to the building access list. The subject line of the email must contain the regulation number REG-107423-23 and the language TESTIFY In Person. For example, the subject line may say: Request to TESTIFY In Person at Hearing for REG-107423-23.

Individuals who want to testify by telephone at the public hearing must send an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) to receive the telephone number and access code for the public hearing. The subject line of the email must contain the regulation number REG-107423-23 and the language TESTIFY Telephonically. For example, the subject line may say: Request to TESTIFY Telephonically at Hearing for REG-107423-23.

Individuals who want to attend the public hearing in person without testifying must also send an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) to have your name added to the

building access list. The subject line of the email must contain the regulation number REG-107423-23 and the language ATTEND In Person. For example, the subject line may say: Request to ATTEND Hearing In Person for REG-107423-23. Requests to attend the public hearing must be received by 5 p.m. ET on February 20, 2024.

Individuals who want to attend the public hearing by telephone without testifying must also send an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) to receive the telephone number and access code for the public hearing. The subject line of the email must contain the regulation number REG-107423-23 and the language ATTEND Hearing Telephonically. For example, the subject line may say: Request to ATTEND Hearing Telephonically for REG-107423-23. Requests to attend the public hearing must be received by 5 p.m. ET on February 20, 2024.

Public hearings will be made accessible to people with disabilities. To request special assistance during a public hearing please contact the Publications and Regulations Branch of the Office of Associate Chief Counsel (Procedure and Administration) by sending an email to [publichearings@irs.gov](mailto:publichearings@irs.gov) (*preferred*) or by telephone at (202) 317-6901 (not a toll-free number) and must be received by 5 p.m. ET on February 16, 2024.

### **Statement of Availability of IRS Documents**

Guidance cited in this preamble is published in the Internal Revenue Bulletin and is available from the Superintendent of Documents, U.S. Government Publishing Office, Washington, DC 20402, or by visiting the IRS website at <https://www.irs.gov>.

### **Drafting Information**

The principal authors of these proposed regulations are Mindy Chou, John Deininger and Alexander Scott, Office of the Associate Chief Counsel (Passthroughs and Special Industries). However, other personnel from the Treasury Department and the IRS participated in their development.

## List of Subjects in 26 CFR Part 1

Income taxes, Reporting and recordkeeping requirements.

### Proposed Amendments to the Regulations

Accordingly, the Treasury Department and the IRS propose to amend 26 CFR part 1 as follows:

#### PART 1--INCOME TAXES

**Paragraph 1.** The authority citation for part 1 is amended by adding entries in numerical order for §§1.45X-1 through 1.45X-4 to read in part as follows:

**Authority:** 26 U.S.C. 7805 \* \* \*

Section 1.45X-1 also issued under 26 U.S.C. 45X.

Section 1.45X-2 also issued under 26 U.S.C. 45X(b) and (d) and 1502.

Section 1.45X-3 also issued under 26 U.S.C. 45X(b) and (c).

Section 1.45X-4 also issued under 26 U.S.C. 45X(b) and (c).

\* \* \* \* \*

**Par. 2.** Sections 1.45X-0 through 1.45X-4 are added to read as follows:

Sec.

\* \* \* \* \*

1.45X-0 Table of contents.

1.45X-1 General rules applicable to the advanced manufacturing production credit.

1.45X-2 Sale to unrelated person.

1.45X-3 Eligible components.

1.45X-4 Applicable critical minerals.

\* \* \* \* \*

#### §1.45X-0 Table of contents.

This section lists the captions contained in §§1.45X-1 through 1.45X-4.

*§1.45X-1 General rules applicable to the advanced manufacturing production credit.*

(a) Overview.

(b) Credit amount.

(c) Definition of produced by the taxpayer.

(d) Produced in the United States.

(e) Production and sale in a trade or business.

(f) Sale of integrated components.

(g) Interaction between sections 45X and 48C.

- (h) [Reserved]
- (i) Anti-abuse rule.
- (j) Severability.
- (k) Applicability date.

*§1.45X-2 Sale to unrelated person.*

- (a) In general.
- (b) Definitions.
- (c) Special rule for sale to related person.
- (d) Related person election.
- (e) Sales of integrated components to related person.
- (f) Severability.
- (g) Applicability date.

*§1.45X-3 Eligible components.*

- (a) In general.
- (b) Solar energy components.
- (c) Wind energy components.
- (d) Inverters.
- (e) Qualifying battery component.
- (f) Phase out rule.
- (g) Severability.
- (h) Applicability date.

*§1.45X-4 Applicable critical minerals.*

- (a) In general.
- (b) Definitions.
- (c) Credit amount.
- (d) Severability.
- (e) Applicability date.

**§1.45X-1 General rules applicable to the advanced manufacturing production credit.**

(a) *Overview—(1) In general.* This section provides general rules regarding the advanced manufacturing production credit determined under section 45X of the Code (section 45X credit). Paragraph (a)(2) of this section provides definitions of certain terms that apply for purposes of section 45X and the section 45X regulations (defined in paragraph (a)(2)(xiv) of this section). Paragraphs (b) through (j) of this section provide the basic rules regarding the section 45X credit, including the definition of the term *produced by the taxpayer*, and rules to determine the taxpayer that produces an eligible component and whether such taxpayer is entitled to claim a section 45X credit in contract manufacturing arrangements; where the production of eligible components

must occur; the treatment of integrated, incorporated or assembled eligible components; and the interaction between sections 45X and 48C of the Code. See §1.45X-2 for rules regarding sales to unrelated persons, sales to related persons, and the Related Person Election, including rules regarding the time, place, and manner of making the Related Person Election. See §1.45X-3 for the definitions of all eligible components (except applicable critical minerals) and the credit amounts available for each of these eligible components, including certain phase-out percentages. See §1.45X-4 for the definitions of applicable critical minerals and the rules regarding the determination of the credit amount for applicable critical minerals.

(2) *Generally applicable definitions.* This paragraph (a)(2) provides definitions of terms that apply for purposes of section 45X and the section 45X regulations.

(i) *Applicable critical mineral.* The term *applicable critical mineral* means any of the minerals that are listed in section 45X(c)(6) and defined in §1.45X-4(b).

(ii) *Code.* The term *Code* means the Internal Revenue Code.

(iii) *Contract manufacturing arrangement.* The term *contract manufacturing arrangement* is defined in paragraph (c)(3)(ii)(B) of this section.

(iv) *Electrode active materials.* The term *electrode active materials* is defined in §1.45X-3(e)(2).

(v) *Eligible component.* The term *eligible component* is defined in section 45X(c)(1)(A) and described in §§1.45X-3 and 1.45X-4.

(vi) *Eligible taxpayer.* The term *eligible taxpayer* is defined in paragraph (c)(3) of this section.

(vii) *Guidance.* The term *guidance* means guidance published in the **Federal Register** or Internal Revenue Bulletin, as well as administrative guidance such as forms, instructions, publications, or other guidance on the IRS.gov website. See §§ 601.601 and 601.602 of this chapter.



(viii) *IRA*. The term *IRA* means Public Law 117-169, commonly known as the Inflation Reduction Act of 2022.

(ix) *IRS*. The term *IRS* means the Internal Revenue Service.

(x) *Produced by the taxpayer*. The term *produced by the taxpayer* is defined in paragraph (c) of this section, and the related terms *production activities* and *production process* have the meaning given those terms in paragraph (c) of this section.

(xi) *Related person*. The term *related person* is defined in §1.45X-2(b)(2).

(xii) *Related Person Election*. The term *Related Person Election* is defined in §1.45X-2(d)(1).

(xiii) *Secretary*. The term *Secretary* means the Secretary of the Treasury or her delegate.

(xiv) *Section 45X regulations*. The term *section 45X regulations* means the provisions of this section, §§1.45X-2 through 1.45X-4, and the regulations in this chapter under sections 6417 and 6418 of the Code that relate to the section 45X credit.

(xv) *Unrelated person*. The term *unrelated person* is defined in section 45X(a)(3) and described in §1.45X-2(b)(3).

(b) *Credit amount*. Except as otherwise provided in section 45X(b)(3) and §1.45X-3(f), for purposes of section 38 of the Code, the amount of the section 45X credit for any taxable year is equal to the sum of the credit amounts provided under section 45X(b) and described in §§1.45X-3 and 1.45X-4 with respect to each eligible component that is produced by the taxpayer and, within the taxable year, sold by the taxpayer to an unrelated person. See §1.45X-2 for rules regarding sales of eligible components to related persons that may be treated as if sold to unrelated persons for purposes of section 45X(a).

(c) *Definition of produced by the taxpayer—(1) In general*. The term *produced by the taxpayer* means a process conducted by the taxpayer that substantially transforms

constituent elements, materials, or subcomponents into a complete and distinct eligible component that is functionally different from that which would result from mere assembly or superficial modification of the elements, materials, or subcomponents.

(i) *Partial transformation.* The term *produced by the taxpayer* does not include partial transformation that does not result in substantial transformation of constituent elements, materials, or subcomponents into a complete and distinct eligible component as described in this paragraph (c)(1).

(ii) *Mere assembly or superficial modification.* The term *produced by the taxpayer* does not include minor assembly of two or more constituent elements, materials, or subcomponents, or superficial modification of the final eligible component, if the taxpayer does not also engage in the process resulting in a substantial transformation described in this paragraph (c)(1).

(iii) *Examples.* The following examples illustrate the application of this paragraph (c)(1).

(A) *Example 1.* Taxpayers X, Y, and Z each produce one of three sections of a wind tower that together make up the wind tower. No taxpayer has produced an eligible component within the meaning of section 45X(a)(1)(A) because no taxpayer has produced all sections of the wind tower.

(B) *Example 2.* Same facts as paragraph (c)(1)(iii)(A) of this section (*Example 1*), but taxpayers X, Y, and Z instead form Partnership XYZ. Partnership XYZ produces all three sections of the wind tower. Partnership XYZ has produced an eligible component within the meaning of section 45X(a)(1)(A).

(C) *Example 3.* Taxpayer V puts the external casing on a battery module (within the meaning of §1.45X-3(e)(4)(i)(A)) that already had cells, battery management systems, and other components integrated into it. Taxpayer V has engaged in minor assembly and has not produced an eligible component within the meaning of section 45X(a)(1)(A).

(D) *Example 4.* Taxpayer U purchases two finished halves of a wind turbine nacelle and combines them into a single nacelle. Taxpayer U has engaged in minor assembly and has not produced an eligible component within the meaning of section 45X(a)(1)(A).

(E) *Example 5.* Taxpayer T purchases a dry cell battery and fills the electrolyte of the battery. Taxpayer T has engaged in minor assembly and has not produced an eligible component within the meaning of section 45X(a)(1)(A).

(F) *Example 6.* Taxpayer W purchases a prefabricated wind turbine blade and applies paint and finishes. Taxpayer W has engaged in superficial modification of the blade and has not produced an eligible component within the meaning of section 45X(a)(1)(A).

(2) *Special rule for certain eligible components.* For solar grade polysilicon, electrode active materials, and applicable critical minerals, the term *produced by the taxpayer* means processing, conversion, refinement, or purification of source materials, such as brines, ores, or waste streams, to derive a distinct eligible component.

(3) *Eligible taxpayer—*(i) *In general.* Except as otherwise provided in paragraph (c)(3)(iii) of this section, a taxpayer claiming a section 45X credit with respect to an eligible component must be the taxpayer that directly performs the production activities that bring about a substantial transformation resulting in the eligible component, and must sell such eligible component to an unrelated person.

(ii) *Contract manufacturing arrangement—*(A) *In general.* If the production of an eligible component is performed in whole or in part pursuant to a contract that is a contract manufacturing arrangement, then, provided the other requirements of section 45X are met, the party to such contract that may claim the section 45X credit with respect to such eligible component is the party that performs the actual production activities that bring about a substantial transformation resulting in the eligible component.

(B) *Contract manufacturing arrangement defined.* The term *contract manufacturing arrangement* means any agreement (or agreements) providing for the production of an eligible component if the agreement is entered into before the production of the eligible component to be delivered under the contract is completed. A routine purchase order for off-the-shelf property is not treated as a contract manufacturing arrangement for purposes of this paragraph (c)(3). An agreement will be treated as a routine purchase order for off-the-shelf property if the contractor is required

to make no more than de minimis modifications to the property to tailor it to the customer's specific needs, or if at the time the agreement is entered into, the contractor knows or has reason to know that the contractor can satisfy the agreement out of existing stocks or normal production of finished goods.

(iii) *Special rule for contract manufacturing arrangements.* If an eligible component is produced by a taxpayer pursuant to a contract manufacturing arrangement, the parties to such agreement may determine by agreement the party that may claim the section 45X credit. If a taxpayer enters into contract manufacturing arrangements with multiple fabricators to produce an eligible component, the parties to such agreements may determine by agreement the party that may claim the section 45X credit. The IRS will not challenge the agreement of the parties provided all the parties submit signed certification statements (as described in paragraph (c)(3)(iv) of this section) indicating that all parties agree as to the party that may claim the section 45X credit.

(iv) *Certification statement requirements.* A certification statement indicating that all parties to a contract manufacturing arrangement agree as to the party that will claim the section 45X credit must include—

(A) All required information set forth in guidance; and

(B) A properly signed penalty of perjury statement.

(v) *Examples.* The following examples illustrate the application of this paragraph (c)(3).

(A) *Example 1: Contract manufacturing with sale.* Taxpayers X, Y and Z are unrelated C corporations that have calendar year taxable years. In 2024, pursuant to a contract manufacturing arrangement as described in paragraph (c)(3)(ii)(B) of this section, X hires Y to produce a solar module. The contract is a tolling arrangement and provides that Y will produce the solar module according to X's designs and specifications and using the materials and subcomponents that X provides. X and Y enter an agreement providing that X is the sole party that may claim a section 45X credit for the production and sale of the solar module, and X and Y each sign a certification statement as described in paragraph (c)(3)(iv) of this section reflecting this agreement. In 2025, Y produces and delivers the solar module to X, and in 2026, X

sells the solar module to Z. X may claim a section 45X credit in taxable year 2026 for the solar module it sold to Z provided all other requirements of section 45X are met and the certification statements signed by X and Y meet the requirements described in paragraph (c)(3)(iv) of this section and are properly submitted by X. Similarly, Y could claim a section 45X credit if the agreement between X and Y had designated Y as the sole party that could claim a section 45X credit for the production and sale of the solar module provided all other requirements of section 45X are met and the certification statements signed by X and Y meet the requirements described in paragraph (c)(3)(iv) of this section and are properly submitted by Y.

(B) *Example 2: Contract manufacturing with no sale.* Assume the facts are the same as in paragraph (c)(3)(v)(A) of this section (*Example 1*), except that X does not sell the solar module and instead X uses it to generate electricity for use in X's trade or business. Because there has been no sale, neither X nor Y may claim a section 45X credit for the solar module regardless of whether X and Y submit signed certification statements described in paragraph (c)(3)(iv) of this section.

(C) *Example 3: Multiple contract manufacturing arrangements.* Taxpayers V, W, X, Y and Z are unrelated C corporations that have calendar year taxable years. In 2024, pursuant to three separate contract manufacturing arrangements as described in paragraph (c)(3)(ii)(B) of this section, V hires W, X, and Y to produce the bottom, middle and top segments, respectively, of a single wind tower that V designed. W, X, Y and V enter into an agreement providing that V is the sole party that may claim a section 45X credit for the production and sale of the wind tower, and W, X, Y and V each sign a certification statement as described in paragraph (c)(3)(iv) of this section reflecting this agreement. In 2024, W and X both produce and deliver their respective wind tower segments to the installation site, and in 2025, Y produces and delivers its wind tower segment to the installation site. In 2026, V sells the completed wind tower to Z. V may claim a section 45X credit in taxable year 2026 for the wind tower it sold to Z provided all other requirements of section 45X are met and the certification statements signed by V, W, X and Y meet the requirements described in paragraph (c)(3)(iv) of this section and are properly submitted by V. Similarly, W or X or Y could be the party that could claim a section 45X credit if the agreement between V, W, X and Y had designated W or X or Y as the sole party that could claim a section 45X credit for the production and sale of the wind tower provided all other requirements of section 45X are met and the certification statements signed by V, W, X and Y meet the requirements described in paragraph (c)(3)(iv) of this section and are properly submitted by the party designated as the sole party that could claim a section 45X credit.

(4) *Timing of production and sale—(i) In general.* Production of eligible components for which a taxpayer is claiming a section 45X credit may begin before December 31, 2022. Production of eligible components must be completed, and sales of eligible components must occur, after December 31, 2022.

(ii) *Example.* Taxpayer X has a calendar year taxable year. Taxpayer X begins production of a related offshore wind vessel (as defined in section 45X(4)(B)(iv) and described in §1.45X-3(c)(4)) in January 2022. Production is completed in December

2024 and the sale to an unrelated person occurs in 2025. Taxpayer X is eligible to claim the section 45X credit in 2025, assuming that all other requirements of section 45X are met.

(d) *Produced in the United States*—(1) *In general.* Sales are taken into account for purposes of the section 45X credit only for eligible components that are produced within the United States, as defined in section 638(1) of the Code, or a United States territory, which for purposes of section 45X and the section 45X regulations has the meaning of the term *possession* provided in section 638(2).

(2) *Subcomponents.* Constituent elements, materials, and subcomponents used in the production of eligible components are not subject to the domestic production requirement provided in paragraph (d)(1) of this section.

(e) *Production and sale in a trade or business.* An eligible component produced and sold by the taxpayer is taken into account for purposes of the section 45X credit only if the production and sale are in a trade or business (within the meaning of section 162 of the Code) of the taxpayer.

(f) *Sale of integrated components*—(1) *In general.* For purposes of the section 45X credit, section 45X(d)(4) provides that a taxpayer is treated as having produced and sold an eligible component to an unrelated person if such component is integrated, incorporated, or assembled into another eligible component that is then sold to an unrelated person.

(i) *Integrated, incorporated, or assembled.* The term *integrated, incorporated, or assembled* means the production activities by which an eligible component that is a constituent element, material, or subcomponent is substantially transformed into another complete and distinct eligible component that is not solar grade polysilicon, an electrode active material, or an applicable critical mineral. The term *integrated, incorporated, or assembled* does not mean the mere assembly or superficial

modification of an eligible component used as an element, material, or subcomponent and other elements, materials, or subcomponents that results in a distinct product.

(ii) *Special rule for eligible components resulting in solar grade polysilicon, electrode active materials, or applicable critical minerals.* For solar grade polysilicon, electrode active material, and applicable critical minerals, the term *integrated, incorporated, or assembled* means the production activities in which an eligible component is processed, converted, refined, or purified to derive a distinct eligible component that is solar grade polysilicon, an electrode active material, or an applicable critical mineral. The term *integrated, incorporated, or assembled* does not mean mere assembly or superficial modification of an eligible component used as an element, material, or subcomponent and other elements, materials, or subcomponents that results in a distinct product.

(2) *Application—(i) In general.* A taxpayer may claim a section 45X credit for each eligible component the taxpayer produces and sells to an unrelated person, including any eligible component the taxpayer produces that was used as a constituent element, material, or subcomponent and integrated, incorporated, or assembled into another complete and distinct eligible component or another complete and distinct product (that is not itself an eligible component) that the taxpayer also produces and sells to an unrelated person.

(ii) *Example: Sale of product with incorporated eligible components to unrelated person.* In 2022, X, a domestic corporation that has a calendar year taxable year, begins production of electrode active materials (EAMs) that are completed in 2023 and incorporated into battery cells that X also produces. In 2024, X incorporates those battery cells into battery modules (within the meaning of §1.45X-3(e)(4)(i)(A)) and integrates the battery modules into electric vehicles. X sells the electric vehicles to Z, an unrelated person, in 2024. X may claim a section 45X credit for the EAMs, the

battery cells, and the battery modules in 2024.

(g) *Interaction between sections 45X and 48C*—(1) *In general.* For purposes of the section 45X credit, consistent with section 45X(c)(1)(B), an eligible component—

(i) Must be produced by a section 45X facility; and

(ii) Does not include any property (produced property) that is produced at a facility if the basis of any property that is part of the production unit (within the meaning of paragraph (g)(2)(ii) of this section) that produces the produced property—

(A) Is eligible property that is included in a section 48C facility; and

(B) Is taken into account for purposes of the credit allowed under section 48C (section 48C credit) after August 16, 2022.

(2) *Section 45X facility*—(i) *In general.* A section 45X facility includes all tangible property that comprises an independently functioning production unit that produces one or more eligible components.

(ii) *Production unit.* The production unit is the tangible property that substantially transforms the material inputs to complete the production process of an eligible component.

(3) *Section 48C facility*—(i) *In general.* A section 48C facility includes all eligible property included in a qualifying advanced energy project for which a taxpayer receives an allocation of section 48C credits under the allocation program established under section 48C(e) and claims such credits after August 16, 2022.

(ii) *Eligible property.* Eligible property is property that—

(A) Is necessary for the production or recycling of property described in section 48C(c)(1)(A)(i), re-equipping an industrial or manufacturing facility described in section 48C(c)(1)(A)(ii), or re-equipping, expanding, or establishing an industrial facility described in section 48C(c)(1)(A)(iii);

(B) Is tangible personal property, or other tangible property (not including a



building or its structural components), but only if such property is used as an integral part of the qualified investment credit facility; and

(C) With respect to which depreciation (or amortization in lieu of depreciation) is allowable.

(4) *Examples.* The following examples illustrate the application of this paragraph (g):

(i) *Example 1: Two independent production units—(A) Facts.* Taxpayer owns and operates a manufacturing site that contains Production Unit A and Production Unit B, each of which function independently and are arranged in serial fashion. Photovoltaic wafers produced by Production Unit A are utilized in Production Unit B to manufacture photovoltaic cells. Taxpayer was allocated a section 48C credit under the section 48C(e) program for a section 48C facility that includes Production Unit A and subsequently placed the section 48C facility and Production Unit A in service in taxable year 2026. Taxpayer claimed a section 48C credit for Production Unit A for taxable year 2026.

(B) *Analysis.* Production Unit A is eligible property that is include in Taxpayer's section 48C facility. Therefore, Production Unit A cannot qualify as a section 45X facility under section 45X(c)(1)(B) and paragraph (g)(2) of this section. Production Unit B, however, is tangible property that comprises an independently functioning production unit that produces eligible components. Production Unit B can be treated as a section 45X facility because the tangible property comprising Production Unit B is not eligible property that is included in a section 48C facility.

(ii) *Example 2: Single production unit—(A) Facts.* Taxpayer owns and operates two manufacturing sites. Manufacturing Site 1 includes tangible property that forms ingots from polysilicon to partially produce photovoltaic wafers. Manufacturing Site 2 completes the production process of the photovoltaic wafers. Taxpayer was allocated a section 48C credit under the section 48C(e) program for tangible property that is used to produce the ingots at Manufacturing Site 1.

(B) *Analysis.* Manufacturing Site 1 and Manufacturing Site 2 comprise a single production unit. As a result, Taxpayer may not claim the section 45X credit for the photovoltaic wafers it produced at Manufacturing Site 1 and Manufacturing Site 2 because Taxpayer claimed the section 48C credit for the tangible property that was used to produce the ingots at Manufacturing Site 1, which is part of a single production unit.

(iii) *Example 3: Independent production units and production of subcomponent—(A) Facts.* Taxpayer owns and operates two manufacturing sites. Manufacturing Site 1 contains Production Unit A and Production Unit B, which are arranged in parallel fashion and each produce photovoltaic cells. Manufacturing Site 2 contains Production Unit C and Production Unit D, which are arranged in serial fashion. Production Unit C produces photovoltaic cells. Production Unit D produces solar modules, in part, by combining the photovoltaic cells produced by Production Units A, B and C. Taxpayer was allocated a section 48C credit under the section 48C(e) program for a section 48C

facility that includes Production Unit C. Subsequently, Taxpayer places the section 48C facility and Production Unit C in service in taxable year 2026. Taxpayer claimed a section 48C credit for Production Unit C in taxable year 2026.

(B) *Analysis.* Production Units A and B each comprise a single production unit that produces eligible components. Production Units A and B can be treated as a section 45X facility because the tangible property comprising Production Units A and B are not eligible property that is included in a section 48C facility. Production Unit C cannot qualify as a section 45X facility under section 45X(c) because Production Unit C is eligible property that is included in a section 48C facility. Production Unit D is tangible property that comprises an independently functioning production unit that produces eligible components utilizing subcomponents produced by Taxpayer in a separate, independently functioning production unit. Therefore, Production Unit D can be treated as a section 45X facility because the tangible property comprising Production Unit D is not eligible property that is included in a section 48C facility.

(iv) *Example 4: Two independent production units manufacturing under a contract manufacturing arrangement—(A) Facts.* X is hired by Y to manufacture photovoltaic cells. X owns and operates a manufacturing site that contains Production Unit A and Production Unit B. Production Unit A and Production Unit B function independently and are arranged in serial fashion. Photovoltaic wafers produced by Production Unit A are utilized in Production Unit B to manufacture photovoltaic cells. X was allocated a section 48C credit under the section 48C(e) program for a section 48C facility that includes Production Unit A and subsequently placed the section 48C Facility and Production Unit A in service in taxable year 2026. X claimed a section 48C credit for Production Unit A in taxable year 2026.

(B) *Analysis.* Production Unit A is eligible property that is included in X's section 48C facility. Therefore, Production Unit A cannot qualify as a section 45X facility under section 45X(c)(1)(B) and paragraph (g)(2) of this section and X does not qualify for a section 45X credit with respect to Production Unit A. Production Unit B is, however, tangible property that comprises an independently functioning production unit that produces eligible components. Production Unit B can be treated as a section 45X facility by X, the party who produces the eligible components, because the tangible property comprising Production Unit B is not eligible property that is included in a section 48C facility.

(v) *Example 5: Two independent production units manufacturing under a contract manufacturing arrangement—(A) Facts.* Assume the facts are the same as in paragraph (g)(4)(iv) of this section (*Example 4*), except that Y owns Production Units A and B and hires X to operate Production Units A and B to produce the eligible components.

(B) *Analysis.* Production Unit A is eligible property that is included in Y's section 48C facility. Y claimed a section 48C credit for Production Unit A in taxable year 2026. Therefore, Production Unit A cannot qualify as a section 45X facility under section 45X(c)(1)(B) and paragraph (g)(2) of this section and X does not qualify for a section 45X credit with respect to Production Unit A. Production Unit B, however, is tangible property that comprises an independently functioning production unit that produces eligible components. Production Unit B can be treated as a section 45X facility by X (and not Y) because the tangible property comprising Production Unit B is not eligible property that is included in a section 48C facility.

(h) [Reserved]

(i) *Anti-abuse rule—(1) In general.* The rules of section 45X and the section 45X regulations must be applied in a manner consistent with the purposes of section 45X and the section 45X regulations (and the regulations in this chapter under sections 6417 and 6418 related to the section 45X credit). A purpose of section 45X and the section 45X regulations (and the regulations in this chapter under sections 6417 and 6418 related to the section 45X credit) is to provide taxpayers an incentive to produce eligible components in a manner that contributes to the development of secure and resilient supply chains. Accordingly, the section 45X credit is not allowable if the primary purpose of the production and sale of an eligible component is to obtain the benefit of the section 45X credit in a manner that is wasteful, such as discarding, disposing of, or destroying the eligible component without putting it to a productive use. A determination of whether the production and sale of an eligible component is inconsistent with the purposes of section 45X and the section 45X regulations (and the regulations in this chapter under sections 6417 and 6418 related to the section 45X credit) is based on all facts and circumstances.

(2) *Example—(i) Facts.* Taxpayer is engaged in the activity of producing and selling multiple units of Eligible Component 1 (EC1). Taxpayer engages in no other activities. The cost of producing each unit of EC1 is less than the amount of the section 45X credit that would be available if each EC1 qualified for the section 45X credit. Taxpayer sells some of its units of EC1 to related persons and makes a Related Person Election pursuant to section 45X(a)(3)(B)(i). Taxpayer also sells some of its units of EC1 to unrelated persons. Taxpayer sells all units of EC1 at an amount equal to cost plus a markup to reflect an anticipated accommodation fee and establishes corresponding accounts receivable at the time of the respective sales. In addition, Taxpayer knows or reasonably expects that after acquiring the units of EC1, the related

and unrelated transferees will not resell the units of EC1 or use them in their trades or businesses. Taxpayer intends to obtain the benefit from the section 45X credit by claiming such credits itself or monetizing such credits through an election under sections 6417 or 6418. Taxpayer eliminates the aforementioned accounts receivable at the time it claims the section 45X credit or receives related payments attributable to the section 45X credit, and further makes payments to the related and unrelated transferees as accommodation fees computed as a percentage of such benefits.

(ii) *Analysis.* Based on all of the facts and circumstances in paragraph (i)(2)(i) of this section, the primary purpose of Taxpayer's production and sale of EC1 is to obtain the benefit of the section 45X credit in a manner that is wasteful and will not be treated as the production and sale of eligible components in a trade or business of Taxpayer for purposes of section 45X(a)(1) and (2). Taxpayer is not eligible for the section 45X credit with respect to units of EC1 that it produced and sold. See sections 6417(d)(6) (excessive payments) and 6418(g)(2) (excessive credit transfer).

(j) *Severability.* The provisions of this section are separate and severable from one another. If any provision of this section is stayed or determined to be invalid, it is the agencies' intention that the remaining provisions shall continue in effect.

(k) *Applicability date.* This section applies to eligible components for which production is completed and sales occur after December 31, 2022, and during a taxable year ending on or after [date of publication of final regulations in the **Federal Register**].

#### **§1.45X-2 Sale to unrelated person.**

(a) *In general.* The amount of the section 45X credit for any taxable year is equal to the sum of the credit amounts determined under section 45X(b) (and described in §§1.45X-3 and 1.45X-4) with respect to each eligible component that is produced by the taxpayer and, during the taxable year, sold by the taxpayer to an unrelated person. Applicable Federal income tax principles apply to determine whether a transaction is in

substance a sale (or the provision of a service, or some other disposition). See §1.45X-1(d) and (e) for additional requirements relating to sales.

(b) *Definitions.* This paragraph (b) provides definitions of terms that apply for purposes of this section.

(1) *Person.* The term *person* means an individual, a trust, estate, partnership, association, company or corporation, as provided in section 7701(a)(1) of the Code. For purposes of this section, an entity disregarded as separate from a person (for example, under §301.7701-3 of this chapter) is not a person.

(2) *Related person.* The term *related person* means a person who is related to another person if such persons would be treated as a single employer under the regulations in this chapter under section 52(b) of the Code.

(3) *Unrelated person.* The term *unrelated person* means a person who is not a related person as defined in paragraph (b)(2) of this section.

(c) *Special rule for sale to related person—(1) In general.* For purposes of section 45X(a), a taxpayer is treated as selling an eligible component to an unrelated person if such component is sold to such person by a person who is a related person with respect to the taxpayer.

(2) *Example.* X and Y are members of a group of trades or businesses under common control under section 52(b), and thus are related persons under section 45X(d)(1). Each of X and Y has a calendar year taxable year. Z is an unrelated person. X is in the trade or business of producing and selling solar modules. X produces and sells solar modules to Y in 2023. Y sells the solar modules to Z in 2024. X may claim a section 45X credit for the sale of the solar modules in 2024, the taxable year of X in which Y sells the solar modules to Z.

(d) *Related person election—(1) Availability of election—(i) In general.* In such form and manner as the Secretary may prescribe, a taxpayer may make an election

under section 45X(a)(3)(B) (Related Person Election), to treat a sale of eligible components by such taxpayer to a related person as if made to an unrelated person. As a condition of, and prior to, a taxpayer making a Related Person Election (as described in paragraph (d)(2) of this section), the Secretary may require such information or registration as the Secretary deems necessary for purposes of preventing duplication, fraud, or any improper or excessive credit amount determined under section 45X(a)(1).

(ii) *Members of a consolidated group.* A Related Person Election is made by a member of a consolidated group (as defined in §1.1502-1(h)) in the manner described in paragraph (d)(3)(ii) of this section. A member of a consolidated group that sells eligible components in an intercompany transaction (as defined in §1.1502-13(b)(1)) may make the Related Person Election to claim the section 45X credit in the year of the intercompany sale. For the treatment of the selling member's gain or loss from that sale, see §1.1502-13.

(2) *Time and manner of making election—(i) In general.* A taxpayer must make an affirmative Related Person Election annually on the taxpayer's timely filed original Federal income tax return, including extensions in such form and in such manner as may be prescribed in Internal Revenue Service forms or instructions or in publications or guidance published in the Internal Revenue Bulletin. See §601.601 of this chapter. The Related Person Election will be applicable to all sales of eligible components to related persons by the taxpayer for each trade or business that the taxpayer engages in during the taxable year that resulted in a credit claim and for which the taxpayer has made the Related Person Election.

(ii) *Required information.* For all sales of eligible components to related persons, the taxpayer must provide all required information set forth in guidance. Such information may include, for example, the taxpayer's name, employer identification

number (EIN), a description of the taxpayer's trade or business (including principal business activity code); the name(s) and EINs of all related persons; a listing of the eligible components that are sold; and the intended purpose of any sales of eligible components to or from related persons.

(3) *Scope and effect of election—(i) In general.* A separate Related Person Election must be made with respect to related person sales made by a taxpayer for each eligible trade or business of the taxpayer. The election applies only to such trade or business for which the Related Person Election is made. An election under this section applies to all sales to related persons (including between members of the same consolidated group) of eligible components produced by the taxpayer during the taxable year with respect to each trade or business for which the Related Person Election is made and is irrevocable for the taxable year for which the election is made. An election under paragraph (d)(2)(i) of this section applies solely for purposes of the section 45X credit and the section 45X regulations (and the regulations in this chapter under sections 6417 and 6418 related to the section 45X credit).

(ii) *Application to consolidated groups.* For a trade or business of a consolidated group, a Related Person Election must be made by the agent for the group on behalf of the members claiming the section 45X credit and filed with the group's timely filed original Federal income tax return, including extensions, with respect to each trade or business that the consolidated group conducts. See §1.1502-77 (providing rules regarding the status of the common parent as agent for its members). A separate election must be filed on behalf of each member claiming the section 45X credit, and each election must include the name and EIN of the agent for the group and the member on whose behalf the election is being made.

(iii) *Application to partnerships.* The Related Person Election for a partnership must be made on the partnership's timely filed original Federal income tax return,

including extensions, with respect to each trade or business that the partnership conducts. The election applies only to such trade or business for which the Related Person Election is made. An election by a partnership does not apply to any trade or business conducted by a partner outside the partnership.

(4) *Anti-abuse rule*—(i) *In general*. A Related Person Election may not be made if, with respect to the eligible components relevant to such election, the taxpayer fails to provide the information described in paragraph (d)(2) of this section, provides information described in paragraph (d)(2) of this section that shows that such components are described in paragraph (d)(4)(ii) or (iii) of this section, or such components are described in paragraph (d)(4)(ii) or (iii) of this section.

(ii) *Improper use*. For purposes of this paragraph (d)(4) the term *improper use* means a use that is wasteful, such as discarding, disposing of, or destroying the eligible component without putting it to a productive use by the related person to which the eligible component is sold.

(iii) *Defective components*. The term *defective component* means a component that does not meet the requirements of section 45X and the section 45X regulations.

(e) *Sales of integrated components to related person*—(1) *In general*. For purposes of section 45X and the section 45X regulations (and the regulations in this chapter under sections 6417 and 6418 related to the section 45X credit), a taxpayer that produces and then sells an eligible component to a related person, who then integrates, incorporates, or assembles the taxpayer's eligible component into another complete and distinct eligible component that is subsequently sold to an unrelated person, may claim a section 45X credit (or make an election under section 6417 or 6418) with respect to the taxable year in which the related person's sale to the unrelated person occurs.

(2) *Examples*. The following examples illustrate the rules provided in paragraph (e)(1) of this section.



(i) *Example 1: Sales of multiple incorporated eligible components to related persons.* X and Y are C corporations that are members of a group of trades or businesses under common control under section 52(b), and thus are related persons under section 45X(d)(1) and paragraph (b)(2) of this section. Each of X and Y has a calendar year taxable year. Z is an unrelated person. X and Y are in the trade or business of producing and selling photovoltaic wafers and cells. X produces and sells photovoltaic wafers to Y in 2023. Y incorporates the photovoltaic wafers into photovoltaic cells and sells the photovoltaic cells to Z in 2024. X may claim a section 45X credit for the sale of the photovoltaic wafers in 2024, the taxable year of X in which Y sells the photovoltaic cells to Z.

(ii) *Example 2: Sales of multiple incorporated eligible components to related and unrelated persons.* W, X, and Y are domestic C corporations that are members of a group of trades or businesses under common control under section 52(b), and thus are related persons under section 45X(d)(1) and paragraph (b)(2) of this section. Each of W, X, and Y has a calendar year taxable year. W produces electrode active materials (EAMs) and sells the EAMs to X in 2023. In 2024, X incorporates the EAMs into battery cells that it produces and sells the battery cells to Y. In 2025, Y incorporates the battery cells into battery modules (within the meaning of §1.45X-3(e)(4)(i)(A)) that it produces and sells the battery modules to Z, an unrelated person. W may claim a section 45X credit for EAMs sold to X, X may claim a section 45X credit for the battery cells sold to Y, and Y may claim a section 45X credit for the battery modules sold to Z in 2025, the taxable year of each of W, X, and Y in which the battery modules are sold to Z.

(3) *Special rules applicable to related person election—(i) In general.* If a taxpayer makes a valid Related Person Election under section 45X(a)(3)(B)(i) and paragraph (d)(1) of this section, and the taxpayer produces and then sells an eligible component to a related person, who then integrates, incorporates, or assembles the taxpayer's eligible component into another complete and distinct eligible component that is subsequently sold to an unrelated person, the taxpayer's sale of the eligible component to the related person is treated (solely for purposes of the section 45X credit and the section 45X regulations, and the regulations in this chapter under sections 6417 and 6418 related to the section 45X credit) as if made to an unrelated person in the taxable year in which the sale to the related person occurs.

(ii) *Example: Sales of multiple integrated eligible components to related and unrelated persons with a related person election.* W, X, and Y are domestic C corporations that are members of a group of trades or businesses under common control and thus are related persons under section 45X(d)(1) and paragraph (b)(2) of

this section. Each of W, X, and Y has a calendar year taxable year. W produces electrode active materials (EAMs) and sells the EAMs to X in 2023. W makes a valid Related Person Election under paragraph (d)(1) of this section in 2023 with regard to the sale. In 2024, X incorporates the EAMs into battery cells that it produces and sells the battery cells to Y. X makes a valid Related Person Election under paragraph (d)(1) of this section in 2024 with regard to the sale. In 2025, Y incorporates the battery cells into battery modules that it produces and sells the battery modules to Z, an unrelated person. W may claim a section 45X credit for the sale of the EAMs in 2023 because the sale to X is treated as if made to an unrelated person solely for purposes of section 45X(a). X may claim a section 45X credit for the sale of the battery cells in 2024 because the sale to Y is treated as if made to an unrelated person solely for purposes of section 45X(a). Y may claim a section 45X credit for the sale of battery modules in 2025 because Z is an unrelated person.

(f) *Severability.* The provisions of this section are separate and severable from one another. If any provision of this section is stayed or determined to be invalid, it is the agencies' intention that the remaining provisions shall continue in effect.

(g) *Applicability date.* This section applies to eligible components for which production is completed and sales occur after December 31, 2022, and during a taxable year ending on or after [date of publication of the final regulations in the **Federal Register**].

### **§1.45X-3 Eligible components.**

(a) *In general.* For purposes of the section 45X credit, *eligible component* means any solar energy component (as defined in paragraph (b) of this section), any wind energy component (as defined in paragraph (c) of this section), any inverter (as defined in paragraph (d) of this section), any qualifying battery component (as defined in paragraph (e) of this section), and any applicable critical mineral (as defined in §1.45X-

4(b)). See paragraph (f) of this section for certain phase-out rules applicable to eligible components other than applicable critical minerals.

(b) *Solar energy components.* *Solar energy component* means a solar module, photovoltaic cell, photovoltaic wafer, solar grade polysilicon, torque tube, structural fastener, or polymeric backsheet, each as defined in this paragraph (b).

(1) *Photovoltaic cell*—(i) *Definition.* *Photovoltaic cell* means the smallest semiconductor element of a solar module that performs the immediate conversion of light into electricity that is either a thin film photovoltaic cell or a crystalline photovoltaic cell.

(ii) *Credit amount.* For a photovoltaic cell, the credit amount is equal to the product of 4 cents multiplied by the capacity of such photovoltaic cell. The capacity of each photovoltaic cell is expressed on a direct current watt basis. Capacity is the nameplate capacity in direct current watts using Standard Test Conditions, as defined by the International Electrotechnical Commission. In the case of a tandem technology produced in serial fashion, such as a monolithic multijunction cell composed of two or more sub-cells, capacity must be measured at the point of sale at the end of the single cell production unit. In the case of a four-terminal tandem technology produced by mechanically stacking two distinct cells or interconnected layers, capacity must be measured for each cell at each point of sale.

(iii) *Substantiation.* The taxpayer must document the capacity of a photovoltaic cell in a bill of sale or design documentation, such as an International Electrotechnical Commission certification (for example, IEC 61215 or IEC 60904).

(2) *Photovoltaic wafer*—(i) *Definition.* *Photovoltaic wafer* means a thin slice, sheet, or layer of semiconductor material of at least 240 square centimeters that comprises the substrate or absorber layer of one or more photovoltaic cells. A photovoltaic wafer must be produced by a single manufacturer by forming an ingot from

molten polysilicon (for example, Czochralski method) and then subsequently slicing it into wafers, forming molten or evaporated polysilicon into a sheet or layer, or depositing a thin-film semiconductor photon absorber into a sheet or layer (that is, thin-film deposition).

(ii) *Credit amount.* For a photovoltaic wafer, the credit amount is \$12 per square meter.

(3) *Polymeric backsheet*—(i) *Definition.* *Polymeric backsheet* means a sheet on the back of a solar module that acts as an electric insulator and protects the inner components of such module from the surrounding environment.

(ii) *Credit amount.* For a polymeric backsheet, the credit amount is 40 cents per square meter.

(4) *Solar grade polysilicon*—(i) *Definition.* *Solar grade polysilicon* means silicon that is suitable for use in photovoltaic manufacturing and purified to a minimum purity of 99.999999 percent silicon by mass.

(ii) *Credit amount.* For solar grade polysilicon, the credit amount is \$3 per kilogram.

(5) *Solar module*—(i) *Definition.* *Solar module* means the connection and lamination of photovoltaic cells into an environmentally protected final assembly that is--

(A) Suitable to generate electricity when exposed to sunlight; and

(B) Ready for installation without an additional manufacturing process.

(ii) *Credit amount.* For a solar module, the credit amount is equal to the product of 7 cents multiplied by the capacity of such module. The capacity of each solar module is expressed on a direct current watt basis. Capacity is the nameplate capacity in direct current watts using Standard Test Conditions, as defined by the International Electrotechnical Commission.

(iii) *Substantiation.* The taxpayer must document the capacity of a solar module

in a bill of sale or design documentation, such as an International Electrotechnical Commission certification (for example, IEC 61215 or IEC 61646).

(6) *Solar tracker*. *Solar tracker* means a mechanical system that moves solar modules according to the position of the sun and to increase energy output. A torque tube (as defined in paragraph (b)(7) of this section) or structural fastener (as defined in paragraph (b)(8) of this section) are solar tracker components that are eligible components for purposes of the section 45X credit.

(7) *Torque tube*—(i) *Definition*. *Torque tube* means a structural steel support element (including longitudinal purlins) that—

- (A) Is part of a solar tracker;
- (B) Is of any cross-sectional shape;
- (C) May be assembled from individually manufactured segments;
- (D) Spans longitudinally between foundation posts;
- (E) Supports solar panels and is connected to a mounting attachment for solar panels (with or without separate module interface rails); and
- (F) Is rotated by means of a drive system.

(ii) *Credit amount*. For a torque tube, the credit amount is 87 cents per kilogram.

(iii) *Substantiation*. The taxpayer must document that a torque tube is part of a solar tracker with a specification sheet, bill of sale, or other similar documentation that explicitly describes its application as part of a solar tracker.

(8) *Structural fastener*—(i) *Definition*. *Structural fastener* means a component that is used—

- (A) To connect the mechanical and drive system components of a solar tracker to the foundation of such solar tracker;
- (B) To connect torque tubes to drive assemblies; or
- (C) To connect segments of torque tubes to one another.

(ii) *Credit amount.* For a structural fastener, the credit amount is \$2.28 per kilogram.

(iii) *Substantiation.* The taxpayer must document that a structural fastener is used in a manner described in paragraph (b)(8)(i)(A), (B), or (C) of this section with a bill of sale or other similar documentation that explicitly describes such use.

(c) *Wind energy components.* *Wind energy component* means a blade, nacelle, tower, offshore wind foundation, or related offshore wind vessel, each as defined in this paragraph (c).

(1) *Blade—(i) Definition.* *Blade* means an airfoil-shaped blade that is responsible for converting wind energy to low-speed rotational energy.

(ii) *Credit amount.* For a blade, the credit amount is equal to the product of 2 cents multiplied by the total rated capacity of the completed wind turbine for which the blade is designed.

(2) *Offshore wind foundation—(i) Definition.* *Offshore wind foundation* means the component (including transition piece) that secures an offshore wind tower and any above-water turbine components to the seafloor using—

(A) Fixed platforms, such as offshore wind monopiles, jackets, or gravity-based foundations; or

(B) Floating platforms and associated mooring systems.

(ii) *Credit amount.* For a fixed offshore wind foundation platform, the credit amount is equal to the product of 2 cents multiplied by the total rated capacity of the completed wind turbine for which the fixed offshore wind foundation platform is designed. For a floating offshore wind foundation platform, the credit amount is equal to the product of 4 cents multiplied by the total rated capacity of the completed wind turbine for which the floating offshore wind foundation platform is designed.

(3) *Nacelle—(i) Definition.* *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.

(ii) *Credit amount.* For a nacelle, the credit amount is equal to the product of 5 cents multiplied by the total rated capacity of the completed wind turbine for which the nacelle is designed.

(4) *Related offshore wind vessel—(i) Definition.* *Related offshore wind vessel* means any vessel that is purpose-built or retrofitted for purposes of the development, transport, installation, operation, or maintenance of offshore wind energy components. A vessel is purpose-built for development, transport, installation, operation, or maintenance of offshore wind energy components if it is built to be capable of performing such functions and it is of a type that is commonly used in the offshore wind industry. A vessel is retrofitted for development, transport, installation, operation, or maintenance of offshore wind energy components if such vessel was incapable of performing such functions prior to being retrofitted, the retrofit causes the vessel to be capable of performing such functions, and the retrofitted vessel is of a type that is commonly used in the offshore wind industry.

(ii) *Credit amount.* For a related offshore wind vessel, the credit amount is equal to 10 percent of the sales price of the vessel. The sales price of the vessel does not include the price of maintenance, services, or other similar items that may be sold with the vessel. For a related offshore wind vessel with respect to which an election under section 45X(a)(3)(B)(i) has been made, such election shall not cause the sale price of such vessel to be treated as having been determined with respect to a transaction between uncontrolled taxpayers for purposes of section 482 of the Code and the regulations in this chapter.

(5) *Tower—(i) Definition.* *Tower* means a tubular or lattice structure that supports the nacelle and rotor of a wind turbine.

(ii) *Credit amount.* For a tower, the credit amount is equal to the product of 3 cents multiplied by the total rated capacity of the completed wind turbine for which the tower is designed.

(6) *Total rated capacity of the completed wind turbine.* For purposes of this section, *total rated capacity of the completed wind turbine* means, for the completed wind turbine for which a blade, nacelle, offshore wind foundation, or tower was manufactured and sold, the nameplate capacity at the time of sale as certified to the relevant national or international standards, such as International Electrotechnical Commission (IEC) 61400, or ANSI/ACP 101-1-2021, the Small Wind Turbine Standard. Certification of the turbine to such standards must be documented by a certificate issued by an accredited certification body. The total rated capacity of a wind turbine must be expressed in watts.

(7) *Substantiation.* Taxpayers must maintain specific documentation regarding wind energy components for which a section 45X credit is claimed. For blades, nacelles, offshore wind foundations, or towers, a taxpayer must document the turbine model for which such component is designed and the total rated capacity of the completed wind turbine in technical documentation associated with the sale of such component.

(d) *Inverters—(1) In general.* *Inverter* means an end product that is suitable to convert direct current (DC) electricity from 1 or more solar modules or certified distributed wind energy systems into alternating current electricity. An end product is suitable to convert DC electricity from 1 or more solar modules or certified distributed wind energy systems into alternating current electricity if, in the form sold by the manufacturer, it is able to connect with such modules or systems and convert DC electricity to alternating current electricity from such connected source. The term inverter includes a central inverter, commercial inverter, distributed wind inverter,



microinverter, or residential inverter. Only an inverter that meets at least one of the requirements in paragraphs (d)(2) through (7) of this section is an eligible component for purposes of the section 45X credit.

(2) *Central inverter*—(i) *Definition.* *Central inverter* means an inverter that is suitable for large utility-scale systems and has a capacity that is greater than 1,000 kilowatts. The capacity of a central inverter is expressed on an alternating current watt basis. An inverter is suitable for large utility-scale systems if, in the form sold by the manufacturer, it is capable of serving as a component in a large utility-scale system and meets the core engineering specifications for such application.

(ii) *Credit amount.* For a central inverter the total rated capacity of which is expressed on an alternating current watt basis, the credit amount is equal to the product of 0.25 cents multiplied by the total rated capacity of the central inverter.

(iii) *Substantiation.* The taxpayer must document that a central inverter meets the core engineering specifications for use in a large utility-scale system and has a capacity that is greater than 1,000 kilowatts with a specification sheet, bill of sale, or other similar documentation that explicitly describes such specifications and capacity.

(3) *Commercial inverter*—(i) *Definition.* *Commercial inverter* means an inverter that—

- (A) Is suitable for commercial or utility-scale applications;
- (B) Has a rated output of 208, 480, 600, or 800 volt three-phase power; and
- (C) Has a capacity expressed on an alternating current watt basis that is not less than 20 kilowatts and not greater than 125 kilowatts.

(ii) *Suitable for commercial or utility-scale applications.* An inverter is suitable for commercial or utility-scale applications if, in the form sold by the manufacturer, it is capable of serving as a component in commercial or utility-scale systems and meets the core engineering specifications for such application.

(iii) *Credit amount.* For a commercial inverter the total rated capacity of which is expressed on an alternating current watt basis, the credit amount is equal to the product of 2 cents multiplied by the total rated capacity of the commercial inverter.

(iv) *Substantiation.* The taxpayer must document that a commercial inverter meets the core engineering specifications for use in commercial or utility-scale applications, the inverter's rated output, and the inverter's capacity in a specification sheet, bill of sale, or other similar documentation.

(4) *Distributed wind inverter*—(i) *In general.* *Distributed wind inverter* means an inverter that is used in a residential or non-residential system that utilizes 1 or more certified distributed wind energy systems and has a total rated output, expressed on an alternating current watt basis, of not greater than 150 kilowatts.

(ii) *Certified distributed wind energy system.* *Certified distributed wind energy system* means a wind energy system that is certified by an accredited certification agency to meet Standard 9.1-2009 of the American Wind Energy Association; International Electrotechnical Commission 61400-1, 61400-2, 61400-11, 61400-12; or ANSI/ACP 101-1-2021, the Small Wind Turbine Standard, including any subsequent revisions to or modifications of such Standard that have been approved by the American National Standards Institute.

(iii) *Credit amount.* For a distributed wind inverter the total rated capacity of which is expressed on an alternating current watt basis, the credit amount is equal to the product of 11 cents multiplied by the total rated capacity of the distributed wind inverter.

(iv) *Substantiation.* The taxpayer must document that a distributed wind inverter is used in a residential or non-residential system that utilizes one or more certified distributed wind energy systems with a specification sheet, bill of sale, or other similar documentation that explicitly describes such use and the total rated output of the

inverter on an alternating current watt basis.

(5) *Microinverter*—(i) *Definition*. *Microinverter* means an inverter that—

(A) Is suitable to connect with one solar module;

(B) Has a rated output described in paragraph (d)(5)(ii) of this section; and

(C) Has a capacity, expressed on an alternating current watt basis, that is not greater than 650 watts.

(ii) *Rated output*. For purposes of paragraph (d)(5)(i)(B) of this section, for an inverter to be a microinverter, the inverter must have a rated output of—

(A) 120 or 240 volt single-phase power; or

(B) 208 or 480 volt three-phase power.

(iii) *Suitable to connect to one solar module*—(A) *In general*. An inverter is suitable to connect to one solar module if, in the form sold by the manufacturer, it is capable of connecting to one or more solar modules and regulating the DC electricity from each module independently before that electricity is converted into alternating current electricity.

(B) *Application to direct current (DC) optimized inverter systems*. A *DC optimized inverter system* means an inverter that is comprised of an inverter connected to multiple DC optimizers that are each designed to connect to one solar module. A DC optimized inverter system is suitable to connect with one solar module if, in the form sold by the manufacturer, it is capable of connecting to one or more solar modules and regulating the DC electricity from each module independently before that electricity is converted into alternating current electricity.

(C) *Application to multi-module inverters*. A *multi-module inverter* means an inverter that is comprised of an inverter with independent connections and DC optimizing components for two or more modules. A multi-module microinverter is suitable to connect with one solar module if it is capable of connecting to one or more

solar modules and regulating the DC electricity from each module independently before that electricity is converted into alternating current electricity.

(iv) *Credit amount*—(A) *In general.* For a microinverter the total rated capacity of which is expressed on an alternating current watt basis, the credit amount is equal to the product of 11 cents multiplied by the total rated capacity of the microinverter.

(B) *DC optimized inverter systems.* A DC optimized inverter system qualifies as a microinverter if it meets the requirements of paragraph (d)(5)(i) of this section. For purposes of paragraph (d)(5)(i)(C) of this section, a DC optimized inverter system's capacity is determined separately for each DC optimizer paired with the inverter in a DC optimized inverter system. If each DC optimizer paired with the inverter in a DC optimized inverter system meets the requirements of paragraph (d)(5)(i) of this section, then the DC optimized inverter system qualifies as a microinverter. The credit amount for a DC optimized inverter system that qualifies as a microinverter is equal to the product of 11 cents multiplied by the lesser of the sum of the alternating current capacity of each DC optimizer when paired with the inverter in the DC optimized inverter system or the alternating current capacity of the inverter in the DC optimized inverter system. For purposes of this paragraph (d)(5)(iv)(B), capacity must be measured in watts of alternating current converted from DC electricity by the inverter in a DC optimized inverter system. For a DC optimized inverter system to qualify as a microinverter, a taxpayer must produce and sell the inverter and the DC optimizers in the DC optimized inverter system together as a combined end product.

(C) *Multi-module inverters.* A multi-module inverter qualifies as a microinverter if it meets the requirements of paragraph (d)(5)(i) of this section. For purposes of paragraph (d)(5)(i)(C) of this section, a multi-module inverter's capacity is determined separately for each internal DC optimizer paired with the inverter. The credit amount for a multi-module inverter is equal to the product of 11 cents multiplied by the total

alternating current capacity of the DC optimizers in the multi-module inverter when paired with the inverter in the system. For purposes of this paragraph (d)(5)(iv)(C), capacity must be measured in watts of alternating current converted from DC electricity by the inverter in a multi-module microinverter.

(v) *Substantiation.* The taxpayer must document that a microinverter meets the core engineering specifications to be suitable to connect with one solar module, the inverter's rated output, and the inverter's capacity in a specification sheet, bill of sale, or other similar documentation. In the case of a DC optimized inverter system, the taxpayer must also document that the DC optimizers and the inverter in such system were sold as a combined end product.

(6) *Residential inverter*—(i) *Definition.* *Residential inverter* means an inverter that—

- (A) Is suitable for a residence;
- (B) Has a rated output of 120 or 240 volt single-phase power; and
- (C) Has a capacity expressed on an alternating current watt basis that is not greater than 20 kilowatts.

(ii) *Suitable for a residence.* An inverter is suitable for a residence if, in the form sold by the manufacturer, it is capable of serving as a component in a residential system and meets the core engineering specifications for such application.

(iii) *Credit amount.* For a residential inverter the total rated capacity of which is expressed on an alternating current watt basis, the credit amount is equal to the product of 6.5 cents multiplied by the total rated capacity of the residential inverter.

(iv) *Substantiation.* The taxpayer must document that a residential inverter meets the core engineering specifications for use in a residence, the inverter's rated output, and the inverter's capacity in a specification sheet, bill of sale, or other similar documentation.

(7) *Utility inverter*—(i) *Definition.* *Utility inverter* means an inverter that—

(A) Is suitable for commercial or utility-scale systems;

(B) Has a rated output of not less than 600 volt three-phase power; and

(C) Has a capacity expressed on an alternating current watt basis that is greater than 125 kilowatts and not greater than 1000 kilowatts.

(ii) *Suitable for commercial or utility-scale systems.* An inverter is suitable for commercial or utility-scale systems if, in the form sold by the manufacturer, it is capable of serving as a component in such systems and meets the core engineering specifications for such application.

(iii) *Credit amount.* For a utility inverter the total rated capacity of which is expressed on an alternating current watt basis, the credit amount is equal to the product of 1.5 cents multiplied by the total rated capacity of the utility inverter.

(iv) *Substantiation.* The taxpayer must document that a utility inverter meets the core engineering specifications for use in commercial or utility-scale systems, the inverter's rated output, and the inverter's capacity in a specification sheet, bill of sale, or other similar documentation.

(e) *Qualifying battery component*—(1) *In general.* *Qualifying battery component* means electrode active materials, battery cells, or battery modules, each as defined in this paragraph (e).

(2) *Electrode active materials*—(i) *Definitions*—(A) *Electrode active materials.*

Electrode active materials means cathode electrode materials, anode electrode materials, and electrochemically active materials that contribute to the electrochemical processes necessary for energy storage. Electrode active materials do not include battery management systems, terminal assemblies, cell containments, gas release valves, module containments, module connectors, compression plates, straps, pack terminals, bus bars, thermal management systems, and pack jackets.

(B) *Cathode electrode materials.* Cathode electrode materials means the materials that comprise the cathode of a commercial battery technology, such as binders, and current collectors (for example, cathode foils).

(C) *Anode electrode materials.* Anode electrode materials means the materials that comprise the anode of a commercial battery technology, including anode foils.

(D) *Electrochemically active materials.* Electrochemically active materials that contribute to the electrochemical processes necessary for energy storage means battery-grade materials that enable the electrochemical storage within a commercial battery technology. In addition to solvents, additives, and electrolyte salts, electrochemically active materials that contribute to the electrochemical processes necessary for energy storage may include electrolytes, catholytes, anolytes, separators, and metal salts and oxides.

(E) *Example.* A commercial battery technology contains Cathode Active Material (CAM), which is a powder used in the battery that is made by processing and combining Battery-Grade Materials A and B. Battery-Grade Material A is a derivative of Material C, which has been refined to the necessary level to enable electrochemical storage. The production costs for CAM and its direct inputs (Battery-Grade Material A and Battery-Grade Material B) are eligible for the section 45X credit for electrode active materials, but the unrefined Material C is not.

(F) *Battery-grade materials.* Battery-grade materials means the processed materials found in a final battery cell or an analogous unit, or the direct battery-grade precursors to those processed materials.

(ii) *Credit amount.* For an electrode active material, the credit amount is equal to 10 percent of the costs incurred by the taxpayer with respect to production of such materials.

(iii) *Production processes for electrode active materials—(A) Conversion.* For

purposes of section 45X, the term *conversion* means a chemical transformation from one species to another.

(B) *Purification*. For purposes of section 45X, the term *purification* means increasing the mass fraction of a certain element.

(iv) *Production costs incurred*. Costs incurred by the taxpayer with respect to production of electrode active materials includes all costs as defined in §1.263A-1(e) that are paid or incurred within the meaning of section 461 of the Code by the taxpayer for the production of an electrode active material only, except direct materials costs as defined in §1.263A-1(e)(2)(i)(A), or indirect materials costs as defined in §1.263A-1(e)(3)(ii)(E), and any costs related to the extraction of raw materials. Section 263A of the Code and the regulations in this chapter under section 263A apply solely to identify the types of costs that are includible in production costs incurred for purposes of computing the amount of the section 45X credit, but do not apply for any other purpose, such as to determine whether a taxpayer is engaged in production activities.

(v) *Materials that are both electrode active materials and applicable critical minerals--(A) In general*. A material that qualifies as an electrode active material and an applicable critical material is eligible for the section 45X credit. A taxpayer may claim the section 45X credit with respect to such material either as an electrode active material or an applicable critical material, but not both.

(B) *Example*. Lithium carbonate is an electrode active material because it is a direct battery-grade precursor to electrolyte salts, which are processed materials found in a final battery cell. Lithium carbonate is also eligible for the 45X critical minerals credit. A taxpayer who produces and sells lithium carbonate may claim either the electrode active material credit or the critical mineral credit for its production and sale of lithium carbonate but may not take both credits.

(3) *Battery cells—(i) Definition*. *Battery cell* means an electrochemical cell—



(A) Comprised of one or more positive electrodes and one or more negative electrodes;

(B) With an energy density of not less than 100 watt-hours per liter; and

(C) Capable of storing at least 12 watt-hours of energy.

(ii) *Capacity measurement.* Taxpayers must measure the capacity of a battery cell in accordance with a national or international standard, such as IEC 60086-1 (Primary Batteries), or an equivalent standard. Taxpayers can reference the United States Advanced Battery Consortium (USABC) Battery Test Manual for additional guidance.

(iii) *Credit amount.* For a battery cell, the credit amount is equal to the product of \$35 multiplied by the capacity of such battery cell, subject to the limitation provided in paragraph (e)(5) of this section. The capacity of a battery cell is expressed on a kilowatt-hour basis.

(4) *Battery module definitions and applicable rules—(i) Battery module defined.* The term *battery module* means a module described in paragraph (e)(4)(i)(A) or (B) of this section 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).

(A) *Modules using battery cells.* A module using battery cells, is a module with two or more battery cells that are configured electrically, in series or parallel, to create voltage or current, as appropriate, to a specified end use, meaning an end-use configuration of battery technologies. An end-use configuration is the product that ultimately serves a specified end use. It is the collection of interconnected cells, configured to that specific end-use and interconnected with the necessary hardware and software required to deliver the required energy and power (voltage and current) for that use.

(B) *Modules with no battery cells.* A module with no battery cells means a

product with a standardized manufacturing process and form that is capable of storing and dispatching useful energy, that contains an energy storage medium that remains in the module (for example, it is not consumed through combustion), and that is not a custom-built electricity generation or storage facility. For example, neither standalone fuel storage tanks nor fuel tanks connected to engines or generation systems qualify as modules with no battery cells.

(ii) *Capacity measurement*—(A) *Modules using battery cells*. Taxpayers must measure the capacity of a module using battery cells with a testing procedure that complies with a national or international standard published by a recognized standard setting organization. The capacity of a battery module may not exceed the total capacity of the battery cells in the module. Taxpayers must measure the capacity of a battery cell in accordance with a national or international standard, such as IEC 60086-1 (Primary Batteries), or an equivalent standard. Taxpayers can reference the USABC Battery Test Manual for additional guidance.

(B) *Modules with no battery cells*. Taxpayers must measure the capacity of a module with no battery cells with a testing procedure that complies with a national or international standard published by a recognized standard setting organization. If no such standard applies to a type of module with no battery cells, taxpayers must measure the capacity of such module as the Secretary may prescribe in regulations or other guidance.

(iii) *Credit amount*—(A) *Modules using battery cells*. For a battery module with cells, the credit amount is equal to the product of \$10 multiplied by the capacity of such battery module, subject to the limitation provided in paragraph (e)(5) of this section. The capacity of each battery module is expressed on a kilowatt-hour basis.

(B) *Modules with no battery cells*. For a battery module without cells, the credit amount is equal to the product of \$45 multiplied by the capacity of such battery module,

subject to the limitation provided in paragraph (e)(5) of this section. The capacity of each battery module is expressed on a kilowatt-hour basis.

*(5) Limitation on capacity of battery cells and battery modules—(i) In general.*

For purposes of paragraphs (e)(3)(iii) and (e)(4)(iii) of this section, the capacity determined with respect to a battery cell or battery module must not exceed a capacity-to-power ratio of 100:1.

*(ii) Capacity to power ratio.* For purposes of paragraph (e)(5)(i) of this section, *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.

*(f) Phase out rule—(1) In general.* Except as provided in paragraph (f)(3) of this section, in the case of any eligible component sold after December 31, 2029, the amount of the section 45X credit determined with respect to such eligible component must be equal to the product of—

(i) The amount determined under this section with respect to such eligible component, multiplied by;

(ii) The phase out percentage under paragraph (f)(2) of this section.

*(2) Phase out percentages.* The phase out percentage is equal to 75 percent for eligible components sold during calendar year 2030; 50 percent for eligible components sold during calendar year 2031; 25 percent for eligible components sold during calendar year 2032, and zero percent for eligible components sold after calendar year 2032.

*(3) Exception for applicable critical minerals.* The phase out rules described in paragraphs (f)(1) and (2) of this section apply to all eligible components except applicable critical minerals.

*(g) Severability.* The provisions of this section are separate and severable from one another. If any provision of this section is stayed or determined to be invalid, it is

the agencies' intention that the remaining provisions shall continue in effect.

(h) *Applicability date.* This section applies to eligible components for which production is completed and sales occur after December 31, 2022, and during a taxable year ending on or after [date of publication of the final regulations in the **Federal Register**].

#### **§1.45X-4 Applicable critical minerals.**

(a) *In general.* The term *applicable critical mineral* means any of the minerals that are listed in section 45X(c)(6) and defined in paragraph (b) of this section.

(b) *Definitions—*(1) *Aluminum.* The term *commodity-grade aluminum* means aluminum that has been produced directly from aluminum described in paragraph (b)(1)(i) or (ii) of this section and is in a form that is sold on international commodity exchanges. The term *aluminum* means aluminum, including commodity-grade aluminum, that 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.

(2) *Antimony.* The term *antimony* means antimony that 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.

(3) *Barite.* The term *barite* means barite that is barium sulfate purified to a minimum purity of 80 percent barite by mass.

(4) *Beryllium.* The term *beryllium* means beryllium that is—

- (i) Converted to copper-beryllium master alloy; or
- (ii) Purified to a minimum purity of 99 percent beryllium by mass.

(5) *Cerium.* The term *cerium* means cerium that is—

- (i) Converted to cerium oxide that 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.

(6) *Cesium*. The term *cesium* means cesium that is—

(i) Converted to cesium formate or cesium carbonate; or

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

(7) *Chromium*. The term *chromium* means chromium that 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.

(8) *Cobalt*. The term *cobalt* means cobalt that is—

(i) Converted to cobalt sulfate; or

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

(9) *Dysprosium*. The term *dysprosium* means dysprosium that 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.

(10) *Europium*. The term *europium* means europium that is—

(i) Converted to europium oxide that is purified to a minimum purity of 99.9

percent europium oxide by mass; or

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

(11) *Fluorspar*. The term *fluorspar* means fluorspar that is—

(i) Converted to fluorspar that 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.

(12) *Gadolinium*. The term *gadolinium* means gadolinium that is—

(i) Converted to gadolinium oxide that 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.

(13) *Germanium*. The term *germanium* means germanium that is—

(i) Converted to germanium tetrachloride; or

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

(14) *Graphite*. The term *graphite* means natural or synthetic graphite that is purified to a minimum purity of 99.9 percent graphitic carbon by mass. The term *99.9 percent graphitic carbon by mass* means graphite that is 99.9 percent carbon by mass.

(15) *Indium*. The term *indium* means indium that is—

(i) Converted to—

(A) Indium tin oxide; or

(B) Indium oxide that 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.

(16) *Lithium*. The term *lithium* means lithium that is—

(i) Converted to lithium carbonate or lithium hydroxide; or

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

(17) *Manganese*. The term *manganese* means manganese that is—

(i) Converted to manganese sulphate; or

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

(18) *Neodymium*. The term *neodymium* means neodymium that is—

(i) Converted to neodymium-praseodymium oxide that is purified to a minimum purity of 99 percent neodymium-praseodymium oxide by mass;

(ii) Converted to neodymium oxide that is purified to a minimum purity of 99.5 percent neodymium oxide by mass; or

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

(19) *Nickel*. The term *nickel* means nickel that is—

(i) Converted to nickel sulphate; or

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

(20) *Niobium*. The term *niobium* means niobium that is—

(i) Converted to ferroniobium; or

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

(21) *Tellurium*. The term *tellurium* means tellurium that is—

(i) Converted to cadmium telluride; or

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

(22) *Tin*. The term *tin* means tin that purified to low alpha emitting tin that—

(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.

(23) *Tungsten*. The term *tungsten* means tungsten that is converted to ammonium paratungstate or ferrotungsten.

(24) *Vanadium*. The term *vanadium* means vanadium that is converted to ferrovandium or vanadium pentoxide.

(25) *Yttrium*. The term *yttrium* means yttrium that is—

(i) Converted to yttrium oxide that 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.

(26) *Other minerals*. The following minerals are also applicable critical 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.
- (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.

(c) *Credit amount*—(1) *In general*. For any applicable critical mineral, the credit amount is equal to 10 percent of the costs incurred by the taxpayer with respect to production of such mineral.

(2) *Production processes for applicable critical minerals*—(i) *Conversion*. For purposes of section 45X, the term *conversion* means a chemical transformation from



one species to another.

(ii) *Purification*. For purposes of section 45X, the term *purification* means increasing the mass fraction of a certain element.

(3) *Production costs incurred*. Costs incurred by the taxpayer with respect to the production of applicable critical minerals includes all costs as defined in §1.263A-1(e) that are paid or incurred within the meaning of section 461 of the Code by the taxpayer for the production of an applicable critical mineral only, except direct or indirect materials costs as defined in §1.263A-1(e)(2)(i)(A) and (e)(3)(ii)(E), respectively, and any costs related to the extraction of raw materials. Section 263A of the Code and the regulations in this chapter under section 263A apply solely to identify the types of costs that are includible in production costs incurred for purposes of computing the amount of the section 45X credit, but do not apply for any other purpose, such as to determine whether a taxpayer is engaged in production activities.

(4) *Substantiation*. The taxpayer must document that an applicable critical mineral meets the requirements of section 45X(c)(6) with a certificate of analysis provided by the taxpayer to the person to which the taxpayer sold the applicable critical mineral.

(d) *Severability*. The provisions of this section are separate and severable from one another. If any provision of this section is stayed or determined to be invalid, it is the agencies' intention that the remaining provisions shall continue in effect.

(e) *Applicability date*. This section applies to eligible components for which production is completed and sales occur after December 31, 2022, and during a taxable year ending on or after [date of publication of the final regulations in the **Federal Register**].

**Douglas W. O'Donnell**

*Deputy Commissioner for Services and Enforcement*

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