February 13, 2024

SUBMITTED ELECTRONICALLY

United States Department of the Treasury
1500 Pennsylvania Avenue, NW
Washington, D.C. 20220

Internal Revenue Service
1111 Constitution Ave., NW
Washington, D.C. 20224

Re: REG-107423-23 – Section 45X Advanced Manufacturing Production Credit

Thank you for providing the Solar Energy Manufacturers for America Coalition (SEMA)[1] the opportunity to provide comments pursuant to REG-107423-23, the Notice of Proposed Rulemaking (NPRM) for the Advanced Manufacturing Production Tax Credit (Section 45X of the Internal Revenue Code).

I. Background

Our members are a diverse group of solar manufacturers throughout the entire solar supply chain that either have a significant manufacturing presence in the United States, or intend to start or shift significant portions of their manufacturing operations to the U.S. following passage of the IRA. They are focused on establishing a strong, secure, and resilient solar manufacturing supply chain to meet our current and future deployment needs in the U.S. and globally while creating good-paying manufacturing jobs.

As the U.S. Department of Treasury (Treasury) and the Internal Revenue Service (IRS) work to develop and issue future IRA guidance, we would like to provide the following comments on the proposed rule to ensure the law's implementation will match the intent of Congress to spur a U.S. manufacturing renaissance for solar energy and other technologies.

Given that solar is poised to be the world's leading source of energy by 2040, and solar manufacturing is currently dominated by our leading geopolitical rival,[2] we must ensure the

[1] https://semacoalition.org/about
[2] Larsen, J., King, B., Kolus, H., Dasari, N., Bower, G., Jones, W. (2022) *A Turning Point for US Climate Progress: Assessing the Climate and Clean Energy Provisions in the Inflation Reduction Act.* Rhodium Group.

IRA's implementation will result in reducing U.S. reliance on overseas supply chains to meet our future clean energy needs. Europe's solar industry has recently collapsed due to a flood of artificially cheap imports from China and the U.S. is poised to be the only country outside of China to house the entire solar manufacturing supply chain.[3] However, China still dominates key parts of the solar manufacturing supply chain, with over 97 percent of solar wafer production located in China.[4]

With an approach that appropriately considers the important role that current and future U.S. solar manufacturers will play in U.S. energy security and our clean energy economy, we believe that we can have a secure, sustainable, and resilient U.S.-based solar manufacturing supply chain in the very near future. To reach these goals, quick and robust implementation of the new Section 45X is essential.

II. Comments

A. The final rule should maintain clear language allowing for taxpayers to vertically integrate and allow flexibility in sales to an unrelated person.

Proposed regulation §1.45X-2(d)(3) states, in part, that "[a]n 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)."

SEMA appreciates this additional guidance provided in the proposed rule regarding the related person requirements under Section 45X. Specifically, the clarity regarding the ability of a taxpayer to receive 45X credits for the production and integration of multiple eligible Section 45X components provides U.S. solar manufacturers with greater certainty. Additionally, the proposed rule's coverage on how and when a related party election can be made is equally helpful for manufacturers to ensure they are meeting eligibility requirements. It is crucial that

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https://rhg.com/research/climate-clean-energy-inflation-reduction-act/;
https://www.iea.org/reports/world-energy-outlook-2023

[3] Sorge, P. (2024, January 17). Europe's Solar Industry Is in Crisis. *Bloomberg*. https://www.bloomberg.com/news/newsletters/2024-01-17/europe-s-solar-industry-is-in-crisis

[4] Dan Murtaugh, Bloomberg, *China Mulls Protecting Solar Tech Dominance With Export Ban January 26, 2023* at 2:57 PM EST: https://www.bloomberg.com/news/articles/2023-01-26/china-mulls-protecting-solar-tech-dominance-with-export-ban

final Section 45X guidance maintain the same interpretation of an eligible sale to an unrelated person detailed in the NPRM.

While the proposed rule does provide useful guidance, there may be ambiguity in the reference to regulations rather than the specific Internal Revenue Code sections 6417 and 6418. The rule appears to outline that 45X credits permitted under the Related Party Election, including for sales between members of the same consolidated tax group, are eligible for direct pay and transferability. The final rule should (i) expand to include a cross reference to Code sections 6417 and 6418, and (ii) specifically address the Related Party Election in the context of direct pay and transferability regulations under (a) section 45X and/or (b) sections 6417 and 6418.

B. Treasury and the IRS should strengthen its anti-abuse provision by incorporating a risk based approach to support fraud avoidance.

SEMA commends the inclusion of the anti-abuse rule in § 1.45X–1(i)(1) and substantial transformation standards in § 1.45X–1(c)(1)(i) which are essential to the successful implementation of Section 45X and ensuring that bad actors do not take advantage of the tax credit. However, given abuses we have witnessed in this sector with the significant circumvention of U.S. antidumping and countervailing duties[5] and significant denials under the Uyghur Forced Labor Prevention Act (UFLPA), we are concerned that certain actors may take advantage of limited IRS resources for auditing possible false claims. Accordingly, we recommend that Treasury and the IRS adopt a risk-based model for auditing taxpayers that claim the Section 45X credit and build upon the proposed general anti-abuse rule by releasing an announcement that informs taxpayers of audit enforcement efforts in respect of Section 45X like the IRS has recently done in other instances.[6]

Specifically, we suggest that when a taxpayer does not cooperate with U.S. Commerce antidumping and countervailing duties (AD/CVD) investigations, or is found to be circumventing U.S. antidumping and countervailing duties (AD/CVD) orders, or is found to be in violation of Customs and Border Protection (CBP) and Department of Homeland Security rules and regulations, the IRS should treat such taxpayer as a high risk for violations of U.S. federal tax

[5] Jennifer A. Dlouhy, Bloomberg News US Probe Finds Asian Solar Makers Evading Tariffs on China, Aug. 18, 2023 https://news.bloomberglaw.com/environment-and-energy/us-probe-finds-asian-solar-makers-evading-tariffs-on-china

[6] Such as IR-2023-135 (July 26, 2023), which announced increased scrutiny on taxpayers that claimed the employee retention tax credit, and IR-2023-166 (Sept. 8, 2023), which announced increased audit efforts for high-income, partnerships, corporations and promoters abusing tax rules.

laws. Accordingly, the IRS would be more likely to audit a taxpayer found to be in violation of other U.S. laws relevant to Section 45X-related industries. We recommend that the IRS include a general description of this process in its official notice to taxpayers regarding audit enforcement efforts in respect of Section 45X.

Additionally, we suggest that the IRS require taxpayers to provide certain information to aid in the detection of violations of the general anti-abuse rule such as through the completion of a separate schedule or form when claiming the Section 45X credit on a U.S. federal income tax return or requiring additional information be provided in the pre-registration process in respect of direct pay and transferability pursuant to Sections 6417 and 6418. Such schedule or form could ask taxpayers to indicate whether they have been investigated and/or prosecuted by specific U.S. federal agencies, such as Commerce, CBP, and Homeland Security and describe in detail the results of such investigations, including whether there have been any adverse findings (preliminary or final) or final resolution to such investigation and/or prosecution. Treasury and the IRS could then use such responses, combined by information provided by CBP (and other agencies) to identify high-priority candidates for examination, with the intent being to disincentivize bad actors from claiming the Section 45X credit. Any enforcement should be targeted and not overly burdensome on either the IRS or taxpayers who do not fall into categories of bad actors.

C. <u>The final rule should clarify the use of "flash" values to determine the value of the tax credit for modules, and ensure this information is leveraged to prevent fraud.</u>

SEMA believes the International Electrotechnical Commission's (IEC) Standard Test Conditions (STC) listed in § 1.45X–3(b)(1)(ii) and (b)(5)(ii) is the best methodology to determine a photovoltaic module and cell capacity as it reflects the actual output capacity of the eligible component. Similarly, SEMA supports the usage of different IEC certifications, such as the IEC 61215, IEC 60904, and IEC 61646, as proposed in the NPRM, to substantiate the capacity of the eligible component through the bill of sale or design documentation.

However, for solar modules, we recommend that Treasury and the IRS go further and require manufacturers to use the "flash" value to determine the 45X credits' value.

In regards to substantiation, we are concerned that any "bill of sale or design documentation," even if reportedly using the STCs, does not provide a high enough burden of proof to demonstrate module capacity. We believe the IEC documentation noted in the guidance – which includes the critical STC flash data – and other third-party verified design documentation should

be required for substantiation. Such documentation is needed to verify the true capacity of modules to avoid fraud.

D. Treasury and the IRS should provide further clarification on "substantial transformation" to ensure manufacturers claiming credits are actually producing an eligible component in the U.S., helping further prevent abuse of the tax credits.

a. Solar Module

The proposed rule defines an eligible taxpayer in § 1.45X–1(c)(3) as "the taxpayer that directly performs the production activities that bring about a substantial transformation resulting in the eligible component." Solar module manufacturing is inherently an assembly-based process, but we must also ensure that module assembly is a true substantial manufacturing process. The final rule should prevent potential uncertainty by more clearly differentiating module manufacturing from "mere assembly." To address this issue, the final rule should confirm that assembly of the various finished components into a module constitutes "produced by the taxpayer." At a minimum, the final rule should clarify that the assembly of modules must include the initial laying out, connecting, and lamination of solar cells.

b. Inverters

Proposed § 1.45X-1(c) defines "produced by the taxpayer" and discusses eligible "substantial transformation" and ineligible "partial transformation" of an eligible component. Multiple examples are listed in the proposed rule outlining scenarios that would be deemed ineligible "partial transformation."

Production of core components of inverters, not just inverters themselves, is integral to building the domestic supply chain and preventing foreign supply chain control over the components of these sensitive and important devices. The final rule should include an example under § 1.45X-1(c) to clarify what is considered partial transformation of inverters; alternatively, it could provide an affirmative example outlining which components define substantial transformation for eligible production of inverters.

E. Treasury and the IRS should adjust the rule to treat tandem solar technologies equally and to address possible gaming.

The NRPM language in § 1.45X–3(b)(1)(ii) is currently problematic for future tandem technology cell production and, perhaps unintentionally, directs the development of certain tandem technologies. The U.S. is a leader in tandem solar technology and could claim technological supremacy, and the manufacturing ecosystem that comes with it, in the production of tandem solar panels. If the proposed rule is not altered it will distort investment decisions in tandem technology before the U.S. has even announced a commercial-scale manufacturing facility.

We would advise that Treasury consider the following principles and rules to limit any gaming and provide equal treatment for tandem technologies:

- No component involved in a tandem device shall be qualified to receive more than two 45X credits for any individual step.
- All steps downstream from the tandem integration step shall be eligible for the single 45X credit as measured post device integration.
- Tandem technologies shall be considered independent of the number of taxpayers involved in the manufacturing process and independent of cell technologies.

To achieve these principles and restrictions, we propose the following reductions and **<u>additions</u>** to the NPRM:

> (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). **<u>For solar components in tandem devices, a tandem solar module shall be considered a single module while cells used in such a module shall only be considered up to two cells and wafers used in those cells shall be considered up to two wafers.</u>**
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> *(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.~~*

In the case of tandem technology, a tandem device is defined as two or more interconnected solar power generation devices that utilize two or more photovoltaic absorbers each with different properties. Tandem cells, composed of multiple semiconductor junctions featuring distinct energy band gaps stacked to enhance the overall conversion efficiency from sunlight to electricity, should be treated as individual cells. Each of these cells is eligible for a separate credit amount determined by its independent capacity under Standard Test Conditions. The tandem device is capable of producing greater power, as measured under Standard Test Conditions, than either of the individual units that comprise the tandem device. The devices that comprise the tandem product are capable of producing electricity independently from the combined tandem stack if fabricated into a complete end use device. Cell capacity for tandem devices will measure each cell independently under Standard Test Conditions prior to their tandem integration, and in the case of monolithically integrated tandem cells, the capacity of the combined stack of cells will be measured at the end of the final production unit and appropriate capacity assigned to the individual cells based on accepted protocols outlined by the National Renewable Laboratory.

(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) **and accepted protocols outlined by the National Renewable Energy Laboratory.**

F. Treasury and the IRS must clarify that ingots must be produced within the U.S. for solar wafers to be eligible for the 45X credit.

The NPRM reiterates in § 1.45X–3(b)(2)(i) that if a taxpayer produces a wafer utilizing an ingot, both the ingot and the wafer must be produced by a single manufacturer. However, the proposed rule does not clarify whether a single manufacturer must produce an ingot within the U.S. in order to receive the photovoltaic wafer Section 45X credit. It is vital that the final rule clarify that an ingot is not defined as a subcomponent of a wafer, and therefore must be produced within the U.S. in order for a taxpayer to receive a Section 45X credit.

For wafers derived from ingots (i.e. excluding “kerfless” or direct wafering technologies), Congress considered ingot formation to be part of the wafer production process, including the

following statutory language defining wafer production: “through formation of an ingot from molten polysilicon and subsequent slicing.”

The ingot production process is cost intensive and crucial to the PV solar supply chain. Companies headquartered in Foreign Entities of Concern (FEOCs), specifically Chinese-headquartered companies, currently control nearly 100 percent of this process. Congress intended to onshore ingot production with the IRA, a goal that would be negated by considering this crucial step a “subcomponent.”

Treasury cannot allow for any misinterpretation of this potential loophole and must explicitly state that ingots and wafers must be produced in the U.S. to obtain the 45X wafer credit.

G. Treasury and the IRS should provide further clarifications on the interaction between Section 48C and Section 45X.

We appreciate Treasury and the IRS’ attempt in § 1.45X–1(g) to provide some bright lines around the interaction between Section 48C and Section 45X, including the affirmation in § 1.45X–1(g)(2) that taxpayers can operate two independent production units at a manufacturing site and claim both incentives, but believe there needs to be additional clarifications for solar manufacturers.

For example, while the NPRM does provide examples of how facilities may interact with Section 48C and still be deemed eligible for a Section 45X credit, there is insufficient clarity on whether a facility that shares upstream raw materials and processes as a Section 48C facility is still eligible for a Section 45X credit. The final rule should provide examples of upstream supply chains and processes that are eligible and ineligible for both Section 48C and Section 45X.

Additionally, the NPRM outlines a rule that would prohibit a taxpayer from simultaneously utilizing Section 48C for the production of ingots and Section 45X for the production of wafers. Given each product is produced on its own production line and can be produced in separate facilities and/or locations, and that the production of ingots is a vital strategic interest in securing solar supply chains, the final rule should clarify that a taxpayer receiving the 45X credit for wafer production may also receive the 48C for the production of ingots for those wafers, so long as the entirety of that ingot production is in the United States. The high capital investment necessary to onshore this manufacturing process and the fact that China’s producers control nearly all global production necessitates this treatment – in line with congressional intent – of 48C and 45X – for this critical portion of the supply chain.

For example, if Company A chose to produce ingots and wafers, Company A should be eligible to apply for and claim 48C for ingot production, and 45X for wafer production, so long as the ingot and wafer production were performed by the single manufacturer. In this scenario, Company A's ingot production would use different "facilities" as defined by Treasury and the IRS from the wafer production, thereby allowing eligibility for both 48C and 45X.

However, to reiterate, Treasury and the IRS should not allow Company A to produce ingots outside of the United States and wafers within the United States, and still allow Company A to claim 45X for wafer manufacturing. As previously noted, Treasury and the IRS must explicitly and urgently clarify that in order for a taxpayer to claim the 45X wafer credit, the taxpayer must produce the ingot in the United States.

The final rule should also confirm that if a producer was allocated a 48C allocation prior to the IRA, that 48C allocation will not negate 45X eligibility, as the IRA states.

H. Treasury and the IRS should clarify that any material meeting the minimum statutory definition of solar grade polysilicon should be eligible to receive the 45X tax credit.

The NPRM provides the following definition for solar-grade polysilicon in § 1.45X–3(b)(4): "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." While this definition is consistent with the statutory language, the SEMA Coalition recommends Treasury and the IRS provide more clarification to more closely comport with standards as they are applied within the industry.

This clarification is important because solar grade polysilicon can have trace amounts of carbon that contribute to overall mass but are not considered an impurity by manufacturers because it will not reduce the effectiveness of the polysilicon to be used in manufacturing solar ingots and wafers. The final rule should provide clarity that the purity level should be calculated such that only "impurities" material to the industry are measured. Thus, as long as it can be used in the trade or business, in this case, to produce solar ingots and wafers, Polysilicon should be eligible for the 45X incentives.

I. SEMA Coalition members appreciate the flexibility provided by Treasury and the IRS to manufacturers entering into contract manufacturing agreements.

The NPRM's proposed § 1.45X–1(c)(3)(ii)(A) regarding the utilization of contract manufacturing for a Section 45X facility provided sufficient clarity on what is deemed contract manufacturing and how to determine which party is eligible to receive a Section 45X credit when utilizing contract manufacturing. This allows companies the flexibility and certainty needed to make investments and enter into contract manufacturing agreements with clarity and confidence in their decisions. The final rule should maintain this approach.

J. Treasury and the IRS should add clarification to allow full access to 45X credits for advanced wafering technology.

In recent years, several industry participants have developed various processes to create wafers directly from polysilicon or constituent gasses. These so-called "kerfless" or "direct 'gas-to-wafer " technologies allow for skipping steps between purification of metallurgical grade silicon and wafer production, such as ingot formation or even precipitation of polysilicon, with attendant cost savings and wafer quality. Further development of this technology in the U.S. could be of significant strategic significance and lead to further cost savings, and emissions reductions, in =the final product while enhancing the competitiveness of U.S. manufacturing.

The statute itself supports such a process in the definition of the wafer component:

> (ii) PHOTOVOLTAIC WAFER.—The term 'photo-voltaic wafer' means a thin slice, sheet, or layer of semiconductor material of at least 240 square centi- meters—
>
> ''(I) produced by a single manufacturer either—
>
> ''(aa) directly from molten **or evaporated solar grade polysilicon** or deposition of solar grade thin film semiconductor photon absorber layer, or
>
> ''(bb) through formation of an ingot from molten polysilicon and subsequent slicing, and
>
> ''(II) which comprises the substrate or absorber layer of one or more photovoltaic cells.

To support this development, Treasury and the IRS should allow for flexibility in the eligibility criteria for the 45X credits for polysilicon (§ 1.45X–3(b)(4)) and wafer (§ 1.45X–3(b)(2)) such that all credits are available regardless of the technology pathway used. For wafer, this only involves further clarification that the bolded language in the statutory definition above **will be applied for the production of wafers directly from silicon-containing gasses** which the statute refers to as "evaporated solar grade polysilicon."

To ensure there is not a disincentive to use technologies that skip or limit the ingot production step, Treasury should clarify that the producer of the silicon gas that is used for direct wafer production receives an equivalent credit for the silicon in the gas to the producer of polysilicon using a traditional ingot process. This could be achieved by clarifying in the NPRM's polysilicon definition that it need not be in the form of solid mineral polysilicon by adding the bolded language below:

> *(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.* ***Such silicon can be in solid or gaseous form, according to the needs of the wafer production process being used.***

III. Conclusion

In conclusion, we appreciate the thoughtful approach and consideration by Treasury and the IRS to implement the 45X Advanced Manufacturing Production Tax Credit. This is a crucial step in supporting investments in new and mothballed factories. We look forward to continuing to work with the Administration in implementing this and other incentives included in the IRA to support the onshoring of the entire solar manufacturing supply chain.

Sincerely,

Mike Carr

Mike Carr
Executive Director
SEMA Coalition