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RE: 3Degrees comments in response to the U.S. Internal Revenue Service Notice 2022-58 related to the credit for the production of clean hydrogen and the clean fuel product credit.

To: U.S. Internal Revenue Service, submitted electronically via www.regulations.gov.

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RE: 3Degrees comments in response to the U.S. Internal Revenue Service Notice 2022-58 related to the credit for the production of clean hydrogen and the clean fuel product credit.

3Degrees appreciates the opportunity to contribute feedback on the U.S. Treasury Department and Internal Revenue Service's (IRS) guidance related to the tax credit for the production of clean hydrogen.

3Degrees is a leading provider of comprehensive clean energy and carbon reduction products, programs, and services that enable organizations and individuals to transition toward a low-carbon economy. To this end, 3Degrees serves hundreds of corporate and institutional customers who voluntarily purchase hundreds of thousands of megawatt-hours (MWh) of renewable electricity products annually from generators across the globe. 3Degrees also supports clean technology companies in maximizing the decarbonization impact of their products and helping meet government decarbonization and clean technology mandates. This includes working with renewable energy generators in providing qualifying RECs to meet renewable portfolio standards (RPS) and advising on clean fuels consumption under clean fuels standards (CFS). Additionally, 3Degrees serves as a carbon credit project developer and has worked closely with more than 50 projects to quantify and validate emissions reductions.

3DEGREES' COMMENTS

3Degrees' comments are focused on questions (1) and (4) regarding how to validate the use of renewable electricity in the production of hydrogen. 3Degrees' comments are informed by over two decades of navigating verification of greenhouse gas emissions and validation of renewable electricity usage across voluntary and mandatory programs.

We recommend that the Treasury Department and IRS recognize a "book-and-claim" accounting approach to substantiate renewable electricity from non-contiguous renewable electricity generators as an energy input to hydrogen production (process energy and converted energy), and that the associated renewable energy certificates (RECs) be sourced from the regional grid. The following comments provide further details and support for this recommendation.

(1) (e) How should qualified clean hydrogen production processes be required to verify the delivery of energy inputs that would be required to meet the estimated lifecycle greenhouse gas emissions rate as determined using the GREET model or other tools if used to supplement GREET?

RECs are required to substantiate usage and/or consumption of renewable electricity across the US and should also be required to substantiate renewable electricity as an input to hydrogen production, regardless of how the renewable electricity is procured.

RECs are recognized across the country, including in renewable portfolio standards and nationally-recognized utility voluntary renewable electricity programs, as the mechanism used to track, transact, and consume renewable electricity on the shared North American grid. The Legal Basis for Renewable Energy Certificates (Available at: https://resource-solutions.org/document/the-legal-basis-for-renewable-energy-certificates/) outlines the legal basis for the use of RECs as instruments that represent the attributes of renewable electricity generation and are used to demonstrate renewable electricity purchasing, delivery, and use in the United States. As noted in the paper, thirty-six states and territories recognize that RECs can be used to track and transact renewable electricity on the grid. This includes all territories with clean electricity or renewable electricity standards, as well as states with clean energy goals. No state or territory contradicts the recognition of RECs to track and represent usage of renewable electricity. Where methodologies do exist that allow the carbon intensity (CI) of hydrogen to be reduced through substantiating renewable electricity procurement (e.g. transportation policies in California, Oregon, and Washington), all require that RECs be retained.

Regardless of the hydrogen producer's renewable electricity procurement method, RECs should be used to verify consumption of the renewable electricity. If the Treasury Department and the IRS do not require RECs to be procured, the renewable electricity risks being double-counted as the REC can be sold separately to another entity who can claim renewable electricity usage.

To substantiate usage and/or consumption of renewable electricity, RECs must be contractually conveyed and retired, either in a tracking system or via contract.

REC tracking systems are electronic databases that record information about each MWh of renewable electricity generated from renewable facilities registered in the database. Tracking systems have a number of benefits in terms of program implementation, including:

- Ensuring that all environmental attributes issued into the tracking system meet the agreed upon criteria. For instance, the tracking system can require that certain data be provided or certain validation be undertaken before the attribute(s) can be issued into the tracking system.
- Preventing double-counting, because only a single entity can issue environmental attributes from a given project, and then only one party can hold those environmental attributes in their account at any one time.
- Facilitating compliance reporting and tracking through standardized reports that can be submitted by compliance entities to the regulator.

The Environmental Protection Agency (EPA) has useful information on certificate-based tracking systems on its website here: https://www.epa.gov/green-power-markets/renewable-energy-tracking-systems. This webpage also has information on how RECs can be conveyed via contract-path tracking when issuing in a tracking system is not possible. However, there should be very few generators that are unable to issue in an electronic tracking system, as tracking systems are available to renewable energy generators in every geography. We recommend that the Treasury Department and the IRS align tracking system requirements with the tracking systems used regionally for renewable portfolio standard (RPS) compliance (where applicable), as the benefits of tracking systems are diminished if renewable energy generators within the same geography begin to use different tracking systems.

(1)(e)(i) How might clean hydrogen production facilities verify the production of qualified clean hydrogen using other specific energy sources?

Existing tracking systems should also be leveraged to substantiate biomethane as an energy source for clean hydrogen production. The M-RETS Tracking Platform is a renewable resource tracking system that has expanded beyond RECs to track other environmental attributes and energy commodities, including certificates to support transactions of biomethane on the common carrier pipeline. These certificates are called renewable thermal certificates (RTCs). The M-RETS system is being leveraged by a number of policies and programs across the U.S. to substantiate procurement and delivery of biomethane, including clean fuels standards, utility requirements to procure biomethane, and voluntary biomethane offers for gas consumers.

More information can be found at https://www.mrets.org/m-rets-renewable-thermal-tracking-system/.

(1)(e)(ii) What granularity of time matching (that is, annual, hourly, or other) of energy inputs used in the qualified clean hydrogen production process should be required?

Eligibility of RECs should be aligned with the physical realities of the electricity system.

A critical component of credible book-and-claim accounting is that the certificate transactions align with the physical realities of the relevant system. One component of this is temporal proximity (i.e. REC vintage). The renewable electricity must be generated close in time to when the hydrogen production occurs. Many state-level renewable energy policies allow RECs generated multiple years in the past to be applied towards a given year's electricity sales. It is generally agreed that this level of flexibility is overly generous for credibility. The voluntary renewable energy market, which underpins credible marketing claims for corporate and institutional customers, requires a maximum 21-month window of REC sourcing for a given year (e.g. for 2021 claims, RECs can be sourced from July 2020 through March 2022).

Over the past several years, it has been common for new programs to limit REC transactions to a calendar year or less. For example, the California Air Resources Board (CARB), which has established book-and-claim accounting for low-carbon inputs to hydrogen production under the California Low Carbon Fuel Standard (LCFS), allows RECs to be generated in the quarter of hydrogen production or the prior two quarters.

In developing temporal proximity constraints, the Treasury Department and IRS should be aware of two restrictions from the existing REC infrastructure:

- Vintage granularity- the lowest common denominator of vintage granularity among existing REC tracking systems is quarterly. The tracking system in Texas, ERCOT, batch issues RECs by quarter. All other tracking systems issue RECs by month. There is one tracking system, MRETS, that has piloted hourly REC issuance (see: https://www.mrets.org/hourlydata/), but this is not yet possible at scale. There are still major implementation questions being answered by groups like EnergyTag (see: https://energytag.org/home/whitepaper/), such as how hourly REC issuance affects conventional monthly REC issuance. We encourage the Treasury Department and IRS to stay abreast of these conversations and consider a timeline for introducing more granular vintage matching once the tracking infrastructure is in place.

- REC issuance- most tracking systems issue RECs 90 days after the end of the period of generation. The Treasury Department and IRS should take this into consideration when it sets deadlines for submitting documentation to validate renewable electricity as an energy input.

(4) (a) Recordkeeping and reporting. What documentation or substantiation do taxpayers maintain or could they create to demonstrate the lifecycle greenhouse gas emissions rate resulting from a clean hydrogen production process?

We encourage the Treasury Department and IRS to align recordkeeping requirements with those in place for clean fuels standards in the US, such as those developed by the California Air Resources Board (CARB) for the state's Low Carbon Fuel Standard (LCFS). This program requires that records be retained for ten years, and outlines the specific records that must be retained by various entities in Section 95491.1.

The current regulation can be found in full here: https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-regulation.

(4)(c) Recordkeeping and reporting. What technologies or accounting systems should be required for taxpayers to demonstrate sources of electricity supply?

As noted under question 1(e), REC tracking systems should be used to demonstrate sources of electricity supply. REC tracking systems support validation of any type of renewable electricity procurement method. The systems can be updated to incorporate any attributes of the renewable electricity supply that the Treasury Department and IRS choose to require. Tracking systems also exist for biogas credits.

(4)(d) What procedures or standards should be required to verify the production (including lifecycle greenhouse gas emissions), sale and/or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit?

As noted under question 4(a), other programs, in particular California's Low Carbon Fuel Standard (LCFS), have established requirements for verifying that fuel production meets the parameters claimed by the fuel producers and that the operational carbon intensity of the fuel meets the claimed carbon intensity. These requirements are outlined in Section 95500 of the LCFS regulation. While the carbon intensity accounting basis under the LCFS is different from that under the proposed rule (well-to-wheel for the LCFS vs. well-to-gate), the same verification principles should apply. Aligning requirements among and between the programs will reduce barriers to participation by eligible producers.

(4)(f) Should indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions (also known as a book and claim system), including, but not limited to, renewable energy credits, power purchase agreements, renewable thermal credits, or biogas credits be considered when calculating the § 45V credit?

Yes, 3Degrees recommends that the Treasury Department and IRS recognize book-and-claim accounting of renewable electricity. We believe book-and-claim accounting should also be recognized for renewable thermal credits and biogas credits. As the hydrogen market expands, additional restrictions on renewable electricity sourcing may be appropriate in order to maximize system benefits.

A common goal of introducing additional restrictions on renewable energy sourcing is to draw a causal connection between an electricity purchase and the development of a renewable energy facility. Examples of additional requirements might include: a certain length of contract, a direct relationship with the generator, or a commitment made by a certain point in the development process. Introduction of any one of these should consider the goal of the provision, its ability to achieve its intended goal, and the challenges it might present for hydrogen development. Before introducing any of these, we recommend additional stakeholder discussions to align on the role of hydrogen in a decarbonized future and the goal of additional renewable energy sourcing requirements.

In the interim, one provision that is common among policies seeking to drive development of new renewable energy capacity is to put in place a commercial on-line date (COD) requirement. A COD requirement can be relative to the online date of the hydrogen production facility itself, align with the beginning of the policy, or align with nearby markets to ensure the policies are complementary. For example, Green-e® Energy, the standard of certification for renewable electricity purchased outside of state mandates (i.e. voluntarily purchased), requires that RECs be sourced from facilities with a COD less than 15 years old.

3Degrees encourages the Treasury Department and the IRS to continue to convene stakeholders to explore additional policy considerations for renewable electricity used as an energy input to produce hydrogen.

(4)(g) If indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions, such as zero-emission credits or power purchase agreements for clean energy, are considered in calculating the § 45V credit, what considerations (such as time, location, and vintage) should be included in determining the greenhouse gas emissions rate of these book accounting factors?

We support placing limits on book-and-claim accounting such that eligibility of RECs is aligned with the physical realities of the electricity system. We have outlined our recommendation for vintage considerations under question (1)(e)(ii). Note that for RECs, vintage refers to the point in time when the MWh of renewable electricity was generated.

The Treasury Department and IRS should also consider geographic restrictions (i.e. eligibility criteria based on the location of the renewable electricity generator as it relates to the location of the hydrogen production). It is important that the renewable electricity be generated within the same electric grid as where the hydrogen production occurs. Geographic eligibility rules for RECs differ across programs in North America. For voluntary purchasing of renewable electricity, the entire U.S. is viewed as a single system within which RECs can be transacted (see the Green-e® Renewable Energy Standard for Canada and the United States at https://www.green-e.org/programs/energy/documents and https://www.epa.gov/greenpower/partnership-green-power-use-requirements). For individual state renewable energy mandates, the geographic eligibility requirements range from an entire

interconnect in some cases to the balancing authority in others. Where more constrained geographic eligibility requirements exist, such as limiting to a specific state's boundaries, it is often due to a policy priority to support local jobs and economies.

In developing geographic eligibility rules, the Treasury Department and IRS should weigh the benefits of sourcing flexibility, given the nascency of the hydrogen market and current sourcing constraints in some regions, and the need to tie geographic eligibility to a reasonable area within which electricity is delivered.