EDP RENEWABLES NORTH AMERICA's FEEDBACK TO IRS REGARDING THE TAX CREDIT UNDER SECTION 45V (CLEAN HYDROGEN)

Notice 2022-58

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EDP Renewables (EDPR) is a global leader in wind, solar, and battery storage development and operations, and is on track to meet highly ambitious goals for further growth. With 14 GW of renewables brought online to-date, and a commitment to being carbon-free by 2030, we are turning our attention to renewable hydrogen.

With a sound development pipeline, first class assets, and market-leading operating capacity, EDPR has undergone exceptional development in recent years and is present in 28 international markets across Europe, Latin America, North America, and Asia.

EDP, the principal shareholder of EDPR, is a global energy company and a leader in value creation, innovation, and sustainability. EDP has been included in the Dow Jones Sustainability Index for 14 consecutive years and was recently recognized as the world's most sustainable electric utility in the Dow Jones index.

EDP is powering forward with renewable hydrogen to achieve a global target of 1.5 GW of electrolyzers for producing renewable hydrogen by 2030. EDPR constituted a dedicated business unit, H2BU, to concentrate all the efforts for deploying this new energy along all the geographies where EDP is present. We have a dedicated hydrogen technical center with more than 40 years of experience developing utility-scale energy infrastructure and proven success in meeting client needs through tailored pricing and technical solutions that allow for sustainable, competitive growth.

Based in Houston, EDP Renewables North America (EDPR NA) is a division of EDP Renewables. EDP Renewables has more than doubled its wind power production since 2007, becoming one of the world's largest producers. In North America, we have developed more than 8,800 megawatts (MW) and operate more than 8,200 MW of renewable energy projects.

EDPR is gaining operational experience in the renewable hydrogen business by developing the construction of 2 small-scale projects, at the same time as it is designing large-scale projects, the most relevant being the transformation of its thermal power plants in Europe and Brazil.

INTRODUCTION. EDPR NA's GENERAL COMMENTS ON CLEAN HYDROGEN DEFINITION

First of all, EDPR NA thanks the IRS for the opportunity to send feedback in order to implement a transparent methodology to determine the carbon emission intensity of hydrogen production, which is necessary to define clean hydrogen eligible to tax credits under 45V.

We highlight that it is not only an obligation derived from the recent Inflation Reduction Act (IRA), but it is a necessary step to promote the decarbonization of sectors that are difficult to electrify and induce comparison and competition between the different methods of hydrogen production from a technologically neutral perspective to achieve decarbonization in the most sustainable and efficient way.

EDPR NA has a long track record in decarbonization efforts through the direct electrification of the economy with wind and solar technologies, and now we see the renewable hydrogen as the natural step to keep on decarbonizing where the use of electricity is not feasible. So, we will focus our feedback on electrolytic hydrogen sourced by renewable power.

EDPR NA recently sent its comments to the Clean Hydrogen Production Standard methodology proposed by the Department of Energy (DOE) in the framework of the Bipartisan Infrastructure Law, and many of our suggestions to that guidance document are also applicable to the definition of clean hydrogen under the IRA. We stated that EDPR NA generally supports the approach of the methodology described in that draft guidance because of the following reasons:

(1) it adopts a well-to-gate life cycle assessment approach for evaluating hydrogen production, which is necessary to assess all the sources of emissions derived from choosing one technology, and not only the emissions that are originated in the point of production, aligning with the methodology proposed in the Inflation Reduction Act (IRA).
(2) it is based in international best practices, which will allow the future trade of hydrogen and comparison of the decarbonization potential among the hydrogen produced different geographies,

We highlight the importance that the two methodologies for determining carbon intensity of hydrogen should match, for the sake of transparency, clarity, legal certainty and comparison.

We are particularly concerned about the part of the methodology dedicated to determining the carbon emission intensity of the hydrogen produced with electricity coming from the grid. In short, we think that in the short term (no later than 2030) less strict rules should apply for kickstarting the market of electrolytic hydrogen, but in the middle to long term several criteria should be required to the electricity sourcing to make sure that the hydrogen is effectively decarbonizing. Among these criteria we can highlight:

- Power Purchase Agreement (PPA) or other qualifying market-based mechanism to prove deliverability of the renewable power to the electrolyzer, in the case of not co-located renewable energy source (RES).

- Additionality, i.e. the clean hydrogen standard should incentivize adding new capacities of clean power instead of re-using assets that are already decarbonizing now.
- Temporal correlation, that is, the hydrogen should be produced close to real time with the renewable power production, to avoid the possibility that electricity coming from gas or coal power plants are used to produce hydrogen. Ideally, we think that hourly correlation is reasonable in the medium to long term.
- Geographical correlation, meaning that the hydrogen should be produced near (same region) the renewable energy source to avoid creating congestions in the networks that can cause redispatching of fossil fuel sources to resolve the congestion.
- Clear roadmap. IRS should establish a clear roadmap for the requirements that are going to be applicable in the following years, because the promoters need legal certainty to design the sourcing of their projects in the long term.

In the next section we describe our responses to the questions proposed by IRS regarding tax credit under section 45V:

EDPR NA'S ANSWERS TO IRS' QUESTIONS

1) Section 45V provides a definition of the term "qualified clean hydrogen". What, if any, guidance is needed to clarify the definition of qualified clean hydrogen?

According to section 45V, the term 'qualified clean hydrogen' means *hydrogen which is produced through a process that results in a lifecycle greenhouse gas emissions rate of not greater than 4 kilograms of CO2e per kilogram of hydrogen*. Also, there are some additional requirements.

EDPR NA considers that it may be adequate to define qualified "renewable" hydrogen as "hydrogen produced from renewable sources and emits zero or de minimis greenhouse gas emissions on a lifecycle basis." We understand that the current definition of "clean" hydrogen can also include hydrogen that is produced from natural gas, coal, and nuclear sources; but those should be phased out in the long-term for an effective decarbonization.

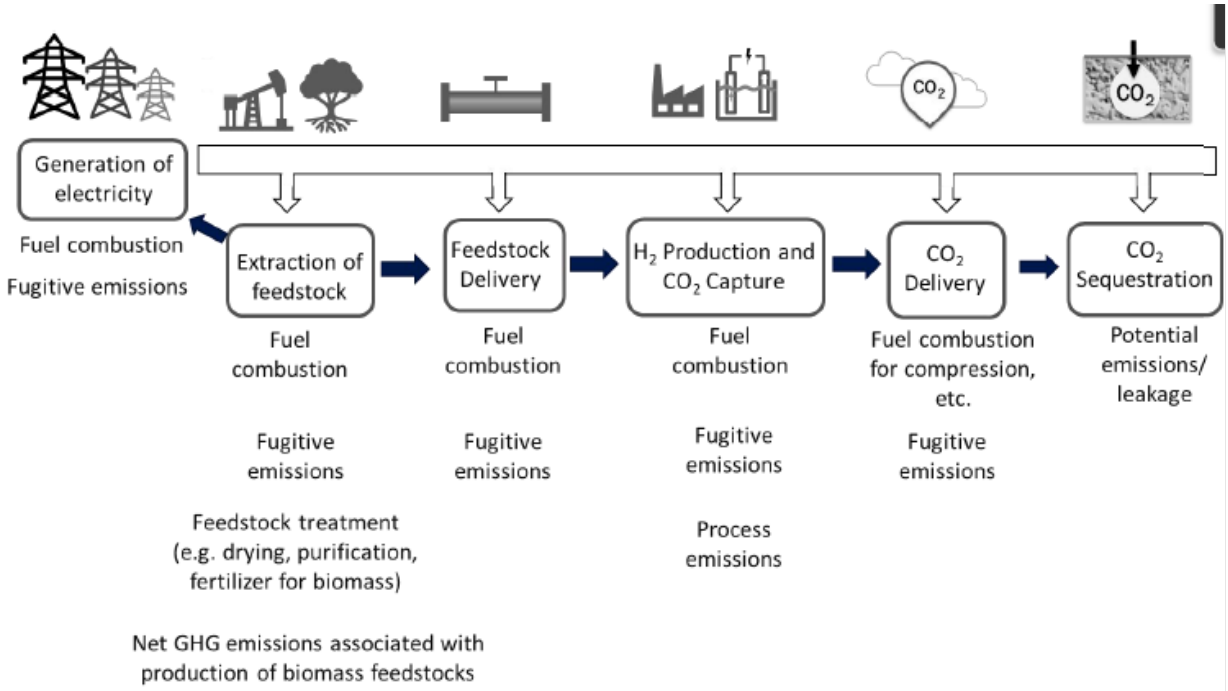
The methodology used for determining the lifecycle greenhouse gas emissions rate is key for the success of this Act, so the final methodology to be adopted should be clearly identified and the rules must be transparent for all the players.

Regarding the additional requirements, and for avoidance of doubt, it should be clarified if clean hydrogen produced for exports, directly or indirectly through its conversion into another carrier, is eligible for tax credits.

More guidance is needed with regards to what it is considered as a "unrelated party".

a) Section 45V defined "lifecycle greenhouse gas emissions" to "only include emissions through the point of production (well-to-gate)". Which specific steps and emissions should be included

within the well-to-gate system boundary for clean hydrogen production from various resources?



EDPR NA advocates for the use of a well-to-gate methodology to avoid underestimating sources of emissions that are not originated in the point of production.

We consider that the different sources of emissions are already reproduced within the figure above that was used by the DOE in its recent consultation, corresponding with the International Partnership for Hydrogen in the Economy (IPHE) methodology.

This methodology can be used across all hydrogen production pathways and is aligned with internationally agreed-upon approaches for evaluating the emissions of fuel production, which is basic to allow for international trade of clean hydrogen. However, the methodology must include more detail regarding the requirements of the electricity coming from the grid that is used for electrolysis.

We are strongly concerned about how emissions will be measured in projects with Carbon Capture and Storage (CCS) technologies, both at the point of capture as well as at the storage facilities, be it onshore or offshore. CCS role in the decarbonization of hydrogen production and other energy-intensive industrial processes can only be classified as clean if emissions are abated. Strong mechanisms should be put in place to make sure that emissions captured and effectively stored - for example, mass balance verification - and to guarantee that storage owners and operators have incentives that are aligned with effectively storing emissions permanently. Leaks, even if they occur significantly after emissions are stored, will have the same environmental consequences as if they were not stored.

b)

i) **How should lifecycle greenhouse gas emissions be allocated to co-products from the clean hydrogen production process? For example, hydrogen producer may valorize steam, elemental carbon, or oxygen produced alongside clean hydrogen**

See next answer

ii) **How should emissions be allocated to the co-products (for example, system expansion, energy-based approach, mass-based approach)?**

There are several possible solutions:

1.Allocate 100% of the emissions to hydrogen as the main product and 0% to the byproducts. However, this solution can be distortive.

2. Allocate emissions in proportion to the heating value of all the products and byproducts – a simple and safe option and safer to avoid distortions.

3. If the byproducts do not have heating value, the economic value of the products and by-products can be used to allocate GHG emissions among them.

iii) **What considerations support the recommended approaches to these issues?**

c) No additional comments.

i) **How should lifecycle greenhouse gas emissions be allocated to clean hydrogen that is a by-product of industrial processes such as chlor-alkali production or petrochemical cracking**

Since EDPR NA aims at producing electrolytic hydrogen, which only produces oxygen and steam as byproducts, this is not necessarily within our scope.

However, as a general principle, the use of hydrogen that is produced as a byproduct of other industrial processes should not be disincentivized. Therefore, there should be no barriers to its use.

However, there should not be incentives for H2 as byproduct to be produced in excess compared to the typical values for a certain industrial process.

There are benchmarks of reasonable production of H2 as a byproduct in the common industrial processes; below the benchmark, the use of the H2 should be incentivized. Anything above the benchmark should be penalized to avoid artificial production of H2 as a by-product (there may be other more efficient processes to produce H2 as a main product).

GHGs are typically allocated among all the products and by-products by their heating value, in the case of products and by-products of the energy sector, or by their economic value otherwise. This criterium should match with the previous question.

ii) **How is byproduct hydrogen from these processes typically handled (for example, venting, flaring, burning onsite for heat and power)?**

No additional comments.

d) **If a facility is producing a qualified clean hydrogen doing part of the taxable year, and also produces hydrogen that is not qualified clean hydrogen during other parts of the taxable year (for example, due to an emissions rate greater than 4 kilograms of Co2e per kilogram of hydrogen, should the facility be eligible to claim 45V only or the qualified clean hydrogen it produces or should it be restricted from claiming 45V credit for that taxable year?**

In the case of a qualified facility producing electrolytic hydrogen, when renewable electricity is supplied through a qualified market-based mechanism, all the batch of hydrogen produced with it should have 0 emissions. The rest of the hydrogen produced during the year with electricity coming from the grid mix not under a PPA or other qualified market-based mechanism, should have the emissions derived from the residual grid mix.

Otherwise, if annual average emissions are considered for the whole taxable year, there would not be incentives for maximizing the load factor of the electrolyzer producing hydrogen when the renewable resource is not present, which would be prejudicial to industrial processes that need a steady source of hydrogen.

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?**

System-level modeling and grid emissions data should be required. A framework with expanded capabilities will be needed to establish a robust system for grid-connected projects, which can then be integrated with GREET.

Certifying schemes must be implemented with clear and transparent rules for determining the carbon intensity of every possible pathway for producing clean H2.

In the case of electrolytic hydrogen, the following data are relevant for the calculation of the carbon intensity (non-exhaustive) when electricity from the grid is used:

- Amount of hydrogen produced in a certain period.
- Electricity consumed by electrolysis and auxiliary consumptions. The metering should be done with the needed granularity.
- The taxpayer should prove the existence of PPAs or other "qualifying market-based mechanisms" to show the origin of electricity in the period of analysis (see our answer to question 1.e.i). In the case of a PPA or other qualifying market-based mechanism with renewable power, the carbon intensity of the electricity input should be 0 kg CO2e/kg H2.
- Location of the renewable assets
- Emission factor of the electricity coming from the grid without a PPA for each period (typically a residual emission factor of the region, or the emission factor of the marginal unit in the relevant market for the period of analysis)
- Other minor information: heat used or produced by the electrolysis, O2 produced

The period of analysis has a significant influence in the outcome, given that if the analysis is done in yearly periods it has the advantage of being simpler but it may underestimate emissions. We advocate for hourly analysis in the long term (no later than 2030) to ensure effective decarbonization, although we recommend to kick start with yearly or monthly periods in an initial and transitional phase.

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

In the case of electrolytic hydrogen we can find the following schemes:

1) Electrolysis co-located with renewable power plants off-grid.

2) Electrolysis co-located with renewable power plants, but connected to the grid.

3) Electrolysis fed with electricity coming from the grid.

The verification of each one of those schemes has to be different.

In the case 1, the accounting of emissions is easy since there are no external energy inputs. However, this scheme is not always the most efficient one because the renewable source could be far from the end-use of hydrogen, and managing variable load factors increases cost of production.

In the cases 2 and 3, connection to the electricity grid will allow higher electrolysis load factor when electrolysis is co-located with end uses, but makes emissions accounting significantly more challenging. There should be a proof on any market-based clean energy procurement mechanism that allows hydrogen producers to claim carbon-free electricity inputs.

According to our view, 4 conditions must be proved by the taxpayer with the market-based mechanism that supplies clean origin of electricity coming from the grid:

1. Deliverability

2. Additionality

3. Temporal matching

4. Geographical matching

Each one of these conditions is critical to ensuring that hydrogen produced via grid-based electrolysis is truly low carbon, and we find that violation of any of them can result in hydrogen production with embodied emissions worse than those of unabated steam methane reforming (the fossil-based pathway used to produce nearly all hydrogen today). The following sections define each condition and explain its importance.

1. Deliverability

There has to be a system that links the origin of the electricity with its consumption.

There exist two main schemes for determining the clean origin of the electricity, particularly the renewable electricity.

a) The "book and claim" system allows energy providers to "book" the renewable electricity they have produced in their systems and energy customers to "claim" the energy they have consumed as renewable. Proving a physical link for energy from the point of production to the point of consumption is not required.

   The administrative costs are relatively low and implementation is easy. The source of hydrogen and place of consumption are sufficient as necessary information. However, this lack of physical link can:

   - create confusion and lack of accuracy regarding actual GHG emissions reduction
   - distort efficient and effective sector coupling; system flexibility (storage, Demand Side Response, etc.) would not be able to capture its actual value and do not send proper locational signs for installing electrolysis and new renewable capacity.
   - in case of the existence of multiple tracking systems, it is possible double certification and measures be put in place to prevent double selling. Third party verification is normally needed.

   Renewable Energy Certificates (RECs) are usually included in this kind of systems.

b) The "mass balancing" system, more commonly used for biofuels, on the other hand, requires a physical link between the production and consumption of green energy, and consignments must be in contact to prove physical traceability.

   However, within the mass balancing system, all parties involved in the supply chain need to be checked, which adds complexity. Detailed and different rules for specific energy carriers may increase difficulty for sector coupling and decrease liquidity in the certificates market. This system may take a time for implementation but it is a robust way of proving the effective clean origin of the electricity and its carbon intensity.

At the beginning of the hydrogen market (until no later than 2030), a "book and claim" system like RECs can be used as a simple means for kickstarting. However, the system should evolve as soon as possible to a mass balancing system to ensure that decarbonization is produced.

PPAs through the electricity grid can be considered a mass balancing system for traceability of clean origin of energy, and as proof of effective decarbonization, provided that the following requirements are met.

2. Additionality

A clean power plant can be considered additional if:

- it entries into operation not far from the entry into operation of the electrolyzer

- if the load factor of the clean power plant increases with the production of the hydrogen

- if the clean power plant has concluded its previous PPA

Otherwise, procuring existing clean resources increases the grid emissions rate for all other users because displaces the current use of the clean power plant.

Also, if the grid mix in a certain hour is nearly 100% renewable, the use of grid mix should count as additional.

There should be guidance to clarify how to proceed in several situations, like for instance:

- if a PPA is concluded and need to be substituted by another PPA
- if the same electrolyser is fed by several PPAs, or how to split the energy if the same PPA is used for several electrolysers
- how to meter if there are co-located renewable assets and a PPA from the grid
- how to certify by a third party that a valid PPA has been used and all the legal requirements are fulfilled.

3. Temporal Matching

The clean electricity PPA should count only if the purchased generation is consumed in the same time window in which it is produced. This is to say; the hydrogen producer should consume electricity from the grid with purchased clean generation at all times. An hourly correlation should be reached in the medium to long term, to strike the balance between managing variability of electricity prices and providing enough time for hydrogen producers to manage real-time operations while keeping emissions at the same level as if it was a co-located RES.With yearly or monthly correlations, the PTC would incentivize hydrogen producers to consume electricity in base load, possibly activating the dispatching of fossil fuel sources of the grid mix when there is not enough clean power available in certain hours, and disincentivizing the addition of new clean power plants.

A transitional period could be allowed during which the period of analysis is larger than hourly, where the electrolyzer used to produce the hydrogen is enabled to take electricity from the grid mix. The introduction of any short-term transitional measure shall ensure that the certification's robustness, integrity, and credibility vis-à-vis consumers are not undermined.

4. Geographical correlation

Green hydrogen tracking systems should require some degree of physical link to ensure that electrolysis powered with renewables is involved in the process of producing hydrogen that is claimed to be green. There should be a definition of regions inside of which, the couple RES-electrolyser is eligible.

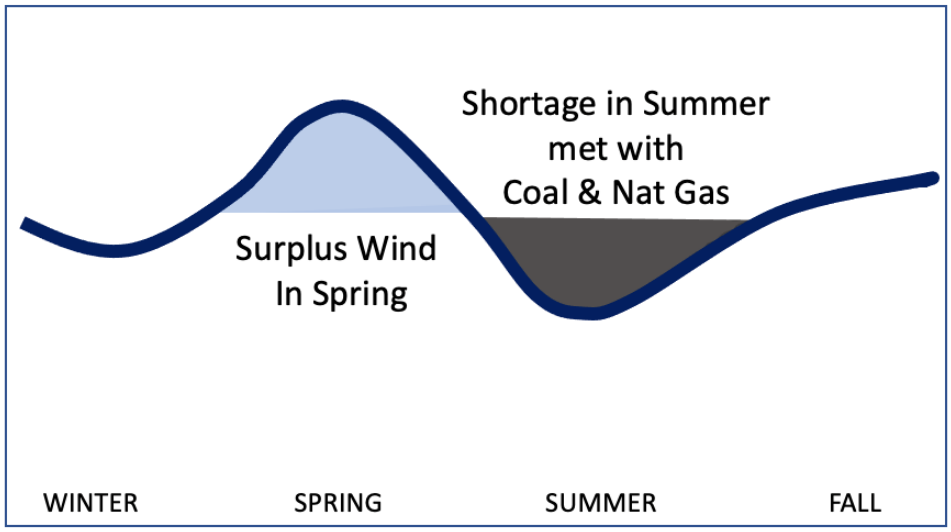
As a conclusion, EDPR agrees to keep a transitory phase where RECs or PPAs without additionality or strict correlation requirements can be used for proving the clean origin of the electricity used to produce H2. However, this transitory phase should not last longer than 2030.

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?

As we explained in the previous question, to avoid the possibility of electricity coming from gas or coal-powered plants being used to produce hydrogen, the hydrogen should be produced close to real-time with renewable power production. Hourly correlation is reasonable in the medium to long-term.

To ensure that the electricity used in electrolysis is clean or renewable, green hydrogen tracking systems should operate on an appropriate time interval that will both meet the demand and support the establishment of future power purchase agreements, as well as include available production forecasts. If renewable electricity production of the PPA or REC and electricity demand of electrolysis is not in the same time frame, electricity from the grid mix will cover the difference, so possibly using fossil fuel sources as gas or coal power plants. So, to ensure effective decarbonization, the temporal correlation should be granular, ideally hourly.

Perversely, "green" hydrogen produced with annual time matching could result in increased use of coal power, which would likely be the most economical option if natural gas prices remain elevated; please see below for an illustration of this concept.



2) Alignment with the Clean hydrogen Production Standard: For purposes of the 45V credit, what should be the definition or specific boundaries of the well-to-gate analysis?

Both methodologies, CHPS and 45V, should match for the sake of clarity and legal certainty. The methodology used should be transparent and clearly defined.

The well-to-gate lifecycle assessment (LCA) should establish consistent GHG reduction from hydrogen facilities, accounting for emissions associated with feedstock production, flaring, hydrogen production, carbon capture, and storage, as well as others. Quantifying these emissions from well-to-gate will aid in conducting a fair and unbiased competitive 45V tax credit program, helping to reduce subjectivity and supporting a scientific-based approach focused on decarbonizing systems. Clearly

defined emissions parameters, including the stopping and starting points of calculation, can also help remove ambiguity from the process of determining "clean hydrogen" and lower the opportunity for market distortion and unfair competition (e.g., through congestion and/or negative pricing). As a technology-agnostic approach, this approach creates a common and an appropriately inclusive methodology, opening a pathway for competition to thrive if the hydrogen production can meet the desired LCA emissions threshold, regardless of technology, and gives more weight to proposals with the lowest emission profiles.

3) **Provisional Emissions Rate - For hydrogen production processes for which a lifecycle greenhouse gas emissions rate has not been determined for purposes of 45V, a taxpayer may file a petition with the secretary for determination of the lifecycle greenhouse gas emissions rate of the hydrogen the taxpayer produces.**

   a) **At what stage in the production process should a taxpayer be able to file such a petition for a provisional emissions rate?**

      We advocate for keeping these situations to the minimum. The methodology for determining emissions should be updated with every possible pathway for the sake of transparency.

   b) **What criteria should be considered by the Secretary in making a determination regarding the provisional emissions rate?**

      We recommend transparency and a consultation process with relevant stakeholders for advising.

4) **Recordkeeping and Reporting**

   a) **What documentation or substantiation do taxpayers maintain or could they create to demonstrate the lifecycle greenhouse gas emissions rate resulting from clean hydrogen production process?**

      Certifying schemes must be implemented with clear and transparent rules for determining the carbon intensity of every possible pathway for producing clean H2.

      In the case of electrolytic hydrogen, the following data are relevant for the calculation of the carbon intensity (non-exhaustive):

      - Amount of hydrogen produced in a certain period.
      - Electricity consumed by electrolysis and auxiliary consumptions. The metering should be done with the needed granularity.
      - PPAs or other means for proving the origin of electricity in the period of analysis. Carbon intensity of the electricity of the PPA (0 kg CO2e/kg H2 in case of renewable sources).
      - Location of the renewable assets
      - Emission factor of the electricity coming from the grid without a PPA for each period (typically a residual emission factor of the region, or the emission factor of the marginal unit in the relevant market for the period of analysis)
      - Other minor information: heat used or produced by the electrolysis, O2 produced

b) What technologies or methodologies should be required for monitoring the lifecycle greenhouse gas emissions rate resulting from the clean hydrogen production process?

A well-to-gate life cycle assessment approach is inclusive of all production types – so long as they have a low CI – and thereby is inherently technology-agnostic. If the IRS still wishes to allow grid-based clean hydrogen production in non-regional transmission organization regions, electrolysis facilities located in these regions could be required to source qualifying clean electricity from within their own local balancing authority. This requirement would minimize (though not necessarily eliminate) the risk of deliverability violations.

c) What technologies or accounting systems should be required for taxpayers to demonstrate sources of electricity supply?

Metering – access to info both in front and behind meter

Access to contracts – RECs, PPAs, etc.

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

To verify the clean production of hydrogen, we recommend that the 45V PTC be implemented for electrolytic hydrogen in a way that allows hydrogen producers flexibility in operating their systems while ensuring credible clean production.

- As a baseline, any electricity generated from behind-the-meter resources and consumed in the hydrogen production process should be considered to have embodied emissions equivalent to those from installed resources.

- Any electricity consumed from the grid that does not use a market-based clean electricity procurement scheme should be considered to have embodied emissions equivalent to the regional average grid emissions rate.

- Any grid electricity purchased through a qualifying market-based clean electricity procurement mechanism (see our answer to question 1.e.i) be considered it has incorporated emissions equivalent to emission rate of the acquired resources. Qualifying market-based mechanisms must meet the hourly temporal matching, additionality, and deliverability requirements, as described above.

- If during a taxable year electricity has different origins, the different batches of hydrogen produced with the different origins should have their own emission factors. This approach to 45V PTC qualification will allow hydrogen producers to combine behind-the-meter generation, clean grid power qualification, and straight-through grid power to better meet their own needs and avoid large increases at the level of the system on greenhouse gas emissions.

To verify the use or sale of the clean hydrogen, there could be different approaches:

- Proof of the sale contracts of hydrogen to other parties
- Proof of the mass-balance of the use of the hydrogen in the facilities of the taxpayer

e) If a taxpayer serves as both the clean hydrogen producer and the clean hydrogen user, rather than selling to an intermediary third party, what verification process should be put in place (for example, amount of clean hydrogen utilized and guarantee of emissions or use of clean electricity) to demonstrate that the production of clean hydrogen meets the requirements of the 45V credit?

Similar to independent producers and users. See previous question.

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

The inclusion of renewable energy credits (RECs) in § 45V would help grid-connected hydrogen production applications for kicking start the market. Today's existing infrastructure and market mechanisms are not sufficiently mature to track and account for the physical delivery of renewable electricity to grid-connected green hydrogen production. A primary goal, therefore, is to support the development of such infrastructure and mechanisms in a sustainable way rather than hinder green hydrogen market development. To this end, we support until 2030 leveraging existing infrastructure and systems that have worked for decades under the REC scheme to accelerate green hydrogen market development.

Specifically, in the short term, we support a "book-&-claim" approach in which RECs can be used to satisfy the "renewable" component of grid-connected hydrogen production. By uncoupling the renewable electricity from the production of hydrogen, the GHC believes this allows for more flexibility for producers and end-users since RECs can be traded in such a way that emissions decrease on a net basis. We believe this flexibility is especially evident in the ramp-up phase of the hydrogen market while policies are being developed. This principle builds on existing principles that allowed REC markets to flourish by providing more flexibility for producers and end-users, increasing competition, and helping overcome near-term barriers to large-scale infrastructure development.

However, in medium to long term, stricter rules as described in question 1.e.i should be put in place to guarantee effective decarbonization.

g) If indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions, such as zero-emissions credits or power purchase agreements for clean energy, are considered

in calculating the 45V, what considerations (such as time, location and vintage) should be included in determining the greenhouse gas emissions rate of these book accounting factors?

While we support RECs in the short term, we believe mass-balancing – which comes with a unique set of factors worthy of consideration – will be critical to success in the medium- to long-term.

To ensure that the electricity used in electrolysis is clean or renewable, green hydrogen tracking systems should operate on an appropriate time interval that will both meet the demand and support the establishment of future power purchase agreements, as well as include available production forecasts. If renewable electricity production of the PPA or REC and electricity demand of electrolysis is not in the same time frame, electricity from the grid mix will cover the difference, so possibly using fossil fuel sources as gas or coal power plants. So, to ensure effective decarbonization, the temporal correlation should be granular, ideally hourly.

A transitional period could be allowed during which the period of analysis is larger than hourly, where the electrolyzer used to produce the hydrogen is enabled to take electricity from the grid mix. The introduction of any short-term transitional measure shall ensure that the certification's robustness, integrity, and credibility vis-à-vis consumers are not undermined.

Green hydrogen tracking systems should require some degree of physical link to ensure that electrolysis powered with renewables is involved in the process of producing hydrogen that is claimed to be green.

5) Unrelated parties

a) What certifications, professional licenses, or other qualifications, if any, should be required for an unrelated part to verify the production and sale or use of clean hydrogen for the 45V credit, 45 credit and 48 credit?

No comments

b) What criteria or procedures, if any, should the Treasury Department and the IRS establish to avoid conflicts of interest and ensure the independence and rigor verification by unrelated parties?

No comments

c) What existing industry standards, if any, should the Treasury Department and the IRS consider for the verification of production and sale or use of clean hydrogen for the 45V, 45 credit and 48 credit

There are international certification rules like:

- ISO 14040 Environmental Management Life Cycle Assessment Principles and Framework
- ISO 14044 Environmental Management Life Cycle Assessment Requirements and Guidelines
- ISO 14067 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification

- GHG Protocol A Corporate Accounting and Reporting Standard. Revised Edition.

6) Coordinating Rules

a) Application of certain 45 Rules

i) Section 45V(d)(3) includes a reduction for the 45V credit when tax-exempt bonds are used in the financing of the facility using rules similar to the rules under 45(b)(3). What, if any, additional guidance would be helpful in determining how to calculate this reduction?

No comments

ii) Section 45V (d)(1) states that the rules for the facilities owned by more than one taxpayer are similar to the rules of 45€(3). How should production from a qualified facility with more than one person holding an ownership interest be allocated?

No comments

b) Coordination with 48

i) What factors should the Treasury Department and the IRS consider when providing guidance on the key definitions and procedures that will be used to administer the election to treat clean hydrogen production facilities as energy property for purposes of the 48 credit?

ii) What factors should the Treasury Department and the IRS consider when providing guidance on whether a facility is "designed and reasonably expected to produce qualified clean hydrogen"?

To consider a facility as producing qualified clean hydrogen, not only the boundaries of the facility producing hydrogen should be assessed. A proper life-cycle assessment should be done considering external factors as carbon leakage. In case of clean hydrogen made with methane, we highlight that methane leakage has a global warming potential 84 times stronger than CO2 over 20 years.

c) Coordinating with 45Q

i) Are there any circumstances in which a single facility with multiple unrelated process trains could qualify for both 45V credit and the 45Q credit notwithstanding the prohibition in 45V preventing any 45V credit with respect to any qualified clean hydrogen produced at a facility that includes carbon capture equipment for which a 45Q credit has been allowed to any taxpayer?

To our opinion, there should not be any circumstance where both tax credits could be compatible.

7) Please provide comments on any other topics related to 45V that may require guidance

It should be clarified if the credits would be awarded in the case that the H2 would be used to produce electricity.