GENERATION ATOMIC – PROPOSED TREASURY GUIDANCE ON HYDROGEN – SUBMISSION OF COMMENTS

The Treasury Department had sought comments on the guidance released in relation sections 45V and 48(a)(15) relating to hydrogen production and hydrogen as an energy property ("Proposed Regulations"). A notice of proposed rulemaking (NPRM) was published in the Federal Register on December 26, with comments due by February 26, 2024.

Generation Atomic, a section 501(c)(3) non-profit organization, has reviewed the draft of the Proposed Regulations and would like to submit its comments through the NPRM comment process as follows. All section references are to the sections of the Proposed Regulations, unless specified otherwise:

1.	In Section V.C.2, comments were sought on, "What information is needed to document and verify GHG emissions related to minimal-emitting electricity generation that is purchased and used for hydrogen production for purposes of claiming the section 45V credit?"

Generation Atomic's response: If a purchase agreement is made between clean hydrogen production facility and a minimal-emitting electricity generation producer then the credits should only be available for the electricity actually produced and used for hydrogen production. For example, this provision should not allow for a hydrogen facility that needs a consistent 50MW of electricity to purchase power exclusively from a 50MW wind or solar farm, given that is their capacity and is not reflective of what is actually being produced on a consistent 24-hour basis. If a 50MW hydrogen facility were able to sign an agreement to solely source its power from an intermittent power generator, but then ran at maximum capacity at all times the true induced GHG Emissions would be produced from the delta between what the intermittent power generator was placing on the grid and the needs of the hydrogen facility.

Therefore we recommend that the documentation required to demonstrate temporally overlapping electricity and hydrogen production when claiming a 45V credit that is associated with a purchase agreement should be what the output of the generating facility was when compared to the hydrogen facility and only credit given for the overlap.

2.	In Section V.C.2, with regard to non-minimally emitting electricity generation, and fossil fuel-powered generation and biomass powered generation with or without CCS in particular, the Treasury Department and the IRS requested comment on mechanisms to verify accurately real-world emissions related to hydrogen production.

Generation Atomic's Response: Generation Atomic does not support biomass as a clean form of power regardless of proposed carbon neutrality.

3.	In Section V.C.2., the Treasury Department and the IRS requested comments on the extent and manner in which incrementality, temporal matching, and deliverability should be applied in accounting for existing or new electricity generation from biomass or fossil feedstock.

Generation Atomic's Response: If a facility has multiple generators within it and only one of those has a CCS facility then only that generator with the CCS installed should be able to apply for the credit for the capacity of that generator and not the facility as a whole. Additionally, if such a facility exists then during the time period that they are claiming credit for the facility should have to be able to prove the share of electricity that was being produced from the CCS generator.

For example if a facility has a 75MW generator and a second with a CCS that is capable of 50MW during a period of time that it is putting 100MW onto the grid it should not receive credit for 50MW of production unless it is able to prove that the split is 50-50 and not 75-25 in favor of the dirty source. Without this requirement it would be easy for a company to make such a claim especially if the 75MW generator is more efficient and therefore more likely to be run if given the option.

4.	In Section V.A. while discussing the "systems expansion" approach, the Treasury Department and IRS have sought comments on such an approach, including whether alternative co-product accounting methods, such as physical allocation (for example, energy allocation or mass allocation) or allocation based on other characteristics, would better ensure well-to-gate carbon intensity of hydrogen production is accurately represented.

Generation Atomic's Response: The U.S. currently produces approximately 10 million tonnes of hydrogen. The sole purpose of having these tax credits is to incentivize the production of clean hydrogen, which is the raison d'etre for these tax credits under section 45V and section 48(a)(15). Our sole hesitation would be that attributing emissions to other co-products besides hydrogen might open the system to exploitation where the lifecycle greenhouse gas emissions that should have been attributable to hydrogen might falsely be attributed to other co-products, giving such hydrogen an unfair advantage over other processes of hydrogen production. This approach would be acceptable so long as the process is designed such that it is not open for exploitation and does not erroneously attribute such emissions to other co-products that should have been attributable to hydrogen molecules.

5.	In Section V.C.2.a, while discussing the alternative test for establishing incrementality for electricity generating facilities that undergo an uprate no more than 36 months before the H2 facility was placed in service, the Treasury and IRS have sought comments on Whether and how to provide alternative approaches to identifying circumstances in which there is minimal risk of significant induced grid emissions for certain existing electricity generating facilities.

Generation Atomic's Response: We agree with §1.45V-4(d)(3)(i)(B) as proposed. The increase in electricity generation from uprates of clean power sources should qualify as new clean generation, and should therefore qualify for the tax credit. If the power sent from the power generation facility to the H2 production facility exceeds the increase in power from the uprate, then the subsidy should be pro-rated, so that it's only applied to the power from the uprate.

We agree with the advice of the Department of Energy (DoE) concerning the circumstances under which the use of electricity from existing clean power sources would not result in any significant increase in grid emissions. Using electricity from clean generators that would otherwise close, and/or using otherwise curtailed clean power, would not result in increased grid emissions. Therefore, we agree with provisions that would allow existing clean generators to qualify for EACs (i.e., the full subsidy) under such circumstances.

We discuss this in more detail in our responses to Sections V.V.2.a.i, V.V.2.a.ii, and V.V.2.a.iii (below).

6.	In Section V.C.2.a.i, regarding the avoided retirement approach for qualifying existing clean generation sources, comments have been sought on: (i) the appropriate criteria that should be considered to assess retirement risk; (ii) the extent to which demonstration of financial loss, projected or actual local electricity market conditions, presence of out-of-market financial support (which could potentially include financial support driven by Federal or State policy, bilateral contracts for EACs or above-market electricity sales, or revenue provided by cost-of-service regulation), or upcoming relicensing decisions, in combination, are appropriate criteria to assess risk; (iii) industry best practices for estimating financial loss and the documentation necessary to support those estimates; (iv) the appropriate criteria that should be taken into account to assess the likelihood that an electricity generator's relationship with a hydrogen production facility avoids retirement of the generator (for example, size of electrolyzer, co-location, contract length, or otherwise); (v) the appropriate criteria that should be taken into account to ensure that only electricity generation supplying the minimum hydrogen production necessary to avoid retirement is counted as incremental, and, in particular, whether there should be a cap on the amount of generation from a given facility that qualifies as incremental and how such a cap should be determined; (vi) the period during which any determination of incrementality of existing electricity generators would be maintained before a new showing would be required; (vii) the process by which eligibility for this approach should be determined and any related administrability considerations. With respect to processes that may be used to implement this approach, comments have also been sought on whether such approach should allow existing minimal-emitting generators that wish to provide EACs to hydrogen producers to demonstrate incrementality through submission to the IRS or another Federal agency, such as the DOE, specific information that supports a conclusion that the electricity generator is at risk of retirement that may be mitigated by sales to hydrogen producers, and, if so, what information and information submission process should be required.

Generation Atomic's Response: We strongly agree with the "avoided retirement" approach in general.

Many of the specific questions asked in this section are beyond our level of expertise, but we have the following general perspective. Existing sources of clean energy on the grid should not be diverted towards production of clean hydrogen, unless but for a guaranteed offtake agreement from a clean hydrogen production facility that clean electricity generating facility will no longer be operational and will retire, such clean electricity should be considered incremental. The focus should be on minimizing the number of clean generation facility closures. It is of paramount importance to consider that the offtake market relating to hydrogen is not very expansive and therefore, the demand for such hydrogen in the near- to mid-term will remain finite even though the tax credits are not capped under the Internal Revenue Code (IRC). Thus, only clean power generators that need this incrementality incentive in order to stay operational should be deemed incremental (as opposed to clean generators that would have stayed open anyway or those that are already benefitting from existing subsidies, incentives, or credits). This is something that especially needs to be considered with respect to the simplified qualification approaches being discussed in Section V.C.2.a.iii.

But even with that clear goal, the best approach is unclear. If the stipulated requirements are very rigorous and the required application analysis effort is very high, and the reward is merely breaking even (zero profit), then even facilities that need this incentive to stay in operation may not apply and decide to shut down anyway. Conversely, if the requirements are too weak, generating facilities that would stay open anyway may qualify for subsidies. Given that in the short- to mid-term future the H2 market is expected to be finite, having facilities that are not in need for such an incentive to stay operational may result in other facilities not getting H2 subsidies that they genuinely need to stay open.

With respect to uncertainties concerning future market conditions, the answer may be to award, or back-adjust, subsidies after the fact, when the (past) market conditions are known.

We do have responses to the specific questions below:

(iii) - Industry best practices for estimating financial loss - Illinois and New Jersey had a "means-tested" subsidy policy to keep existing nuclear plants open. Under those policies, applying plants had to demonstrate need, i.e., they had to estimate their financial losses. We suggest that those models/policies be studied as pertinent examples of good industry practices. One clear, defensible option would be to adopt the practices used in the implementation of those state policies.

(v) - Limiting subsidy to the minimum amount necessary to avoid plant retirement - The argument that only the amount of subsidy needed to avoid retirement should be awarded is correct in principle. But from the practical perspective, there is a fine line. As we discussed above, if a plant has to make a significant effort (application, analyses, reporting, etc.) just for a chance to break even, it may decide to not bother and just retire the plant (which is what we want to avoid). Given this, it may be wiser to just allow all plants that would close to be considered incremental, subject to sufficient documentation to prove that without the incrementality incentive for the purposes of sections 45V or 48(a)(15) they would no longer be operational. It should be noted that all new clean generation facilities get the full amount, despite the fact that many, perhaps most, of them would be built anyway, even if they got less or no H2 subsidy. Ideally, existing clean electrons on the grid should not be diverted towards to production of hydrogen and therefore, a "but for" test needs to be employed, i.e., but for this added incremental incentive, the clean generating facility will no longer stay operational.

(vi) - Frequency of evaluations demonstrating incrementality (need for H2 subsidy to stay in operation) - As discussed in our response to question (iii), Illinois and New Jersey have similar programs that provided financial support to nuclear plants only if they could demonstrate need (financial loss). With the NJ program, subsidies were awarded over three year periods. In IL, the state approved subsidies for a five year period, but the amount of the subsidy varied with wholesale power market prices (a simple, easily determined variable that allowed subsidies to be adjusted without new analyses or applications). Based on these precedents, we recommend that demonstrations of incrementality, using the avoided retirement approach, only be performed once every few years.

7.	In Section V.C.2.a.ii, relating to Zero or Minimal Induced Grid Emissions Through Modeling or Other Evidence, comments were sought on whether to provide an opportunity to demonstrate zero or minimal induced grid emissions through modeling or other evidence under specific circumstances. Additionally, on this demonstrated or modeled minimal-emission approach, including: (i) the circumstances in which it should be available and the criteria that are appropriate to evaluate and determine whether those circumstances occur; (ii) who should apply under this approach, the electricity generation facility, the hydrogen producer, or both; (iii) what data or modeling should be submitted; (iv) best practices for making such demonstrations, including for ensuring the impartiality and replicability of calculation approaches; (v) how an administrator of such a program would validate the accuracy of applicant submissions; (vi) under what circumstances, if any, it would be appropriate to deem generation to satisfy the incrementality requirement without modeling, and what documentation should be provided in these cases; (vii) the process by which eligibility for this approach should be determined and any related administrability considerations; (viii) the period during which any determination of incrementality would be maintained before a new showing would be required; and (ix) the circumstances and capability of EACs and tracking systems to track and verify energy attributes from such sources.

Generation Atomic's Response: Electricity produced by existing facilities seeking an exception to the general incrementality test under a zero or minimally induced emissions scheme should carry the significant burden of demonstrating this assertion. We do have responses to the specific questions below:

(i) Electricity that would have otherwise been curtailed but for use in hydrogen production may be considered eligible, but must be able to demonstrate that curtailment would have occurred but for this use. Such demonstration would necessarily require a temporal match between the time of avoided curtailment and the time of use.

(ii) The production and consumption relationship would require coordination in order to meet the minimally induced grid emissions standard. As such, an application for this exception should be submitted by both generating and consuming entities.

(iii) In order to demonstrate the temporal match as outlined in (i) both the would-be curtailer (the generator) and the electricity consumer (the H2 producer) must be obligated to report the time and quantity of the credited kWh. Such kWh should be required to be matched in order to be credited as incremental for the purposes of this exception.

(iv-vii) No response.

(viii) Eligibility for any EAC obtained via asserted avoided curtailment should be reflective of actual performance. As such they should not be given until after the asserted use is performed, not in advance.

8.	In Section V.C.2.a.iii, regarding the formulaic approaches to addressing incrementality from existing clean generators, the Treasury Department and the IRS has sought comments on this five percent-allowance approach, including the merits of this approach compared to the targeted pathways described, particularly with respect to balancing administrative feasibility and burden with accuracy of identifying circumstances with a low risk of induced grid emissions.

Generation Atomic's response: Generation Atomic does not support a blanket five percent-allowance approach as it is too simplistic and will drive the ability for bad actors to exploit the system. As indicated above, clean electricity already on the grid should not be diverted towards hydrogen production unless without such incentive, the clean generating facility would not remain operational. Only in such an instance, there should be an incentive to keep the clean electrons on the grid albeit dedicated towards production of hydrogen. In the short to medium term, the demand created by hydrogen production facilities will be finite and accordingly, only those facilities that genuinely need the incentive to stay operational should benefit from it with the overarching goal to minimize closures of clean energy sources and not have them replaced with fossil fuel or intermittent sources. With the increased electrification of, and increased constraints on, the grid (including EV chargers, data

centers, etc.), an argument may be made that electricity that is generally curtailed at an average of 5% will be reduced in the future even without this incentive.

Additionally, it is within the operators best interest to be able maintain and track real-time data of their output, so the idea that companies selling electricity do not know how much they are producing and what they are selling it for is in itself a counterfactual argument. The argument that a blanket five percent is needed due to negative electricity prices needs to be examined. In a fair and open market, no producer would be willing to sell their product for a negative price. Only producers who are already receiving a subsidy (whether federal/state/local) that keeps them profitable would be willing to take such a "loss." Therefore, if a five percent production credit is created at a minimum it should only be when the wholesale price is negative. The verbiage should also then be explicitly clear to exclude from any clean producer during the time of negative wholesale pricing that is selling their electricity at a negative price from being considered incremental for the purposes of these credits. Major markets like PJM track and know on an hourly basis the price of electricity within their region. They know who is willingly selling their electricity at a negative wholesale price, and at a minimum the federal government should be able to easily acquire that data prior to distributing additional subsidies to companies artificially lowering the price of their product.

Notwithstanding our disagreement to this overly simplistic mechanism that would drive much needed incentives from plants in need to those that are already benefitting from existing subsidies, the below comments are subject to the event where Treasury Department and the IRS do pursue this option.

9.	In Section V.C.2.a.iii., comments were sought on whether the five percent should apply to all existing minimal-emitting electricity generators in all locations or a subset and for what reasons?

Generation Atomic's response: No, for the reasons stated above. It should only be eligible for regions with non-committed hydrogen producer, during the period of time that there are negative wholesale prices, to minimal-emitting generators not offering their electricity at the negative prices. If given to minimal-emitting generators at a blanket five percent, or any percent, while they are already offering negative prices that is double subsidizing them only to further negatively impact the electricity markets. There should never be negative wholesale prices in a free and open market. As such the added incentive should not be used to help those that are not in need nor should existing clean sources be diverted from the grid for production of clean hydrogen without good reason.

10.	In Section V.C.2.a.iii., comments were sought on whether such an allowance should be assessed at the individual plant level or across an operator's fleet within the same deliverability region?

Generation Atomic's response: Allowances should be assessed at the plant level. Otherwise, an unscrupulous operator could claim capacity of an intermittent minimal emitting source, while actually producing with a GHG producing plant. The amount of electricity being produced at each plant is known by the operator. They should have to provide that data that matches with corresponding clean hydrogen production to receive the tax credit.

11.	In Section V.C.2.a.iii., comments were sought on any other administrability considerations.

Generation Atomic's response: While the simplification of five percent seems like a way to help producers, it would open a gateway of fraud. Simplification should come as a standard format that operators are able to report the required data in order to qualify. Going to the operators, and working with FERC to create simplified forms that are not hundreds of pages long to collect basic data such as what generators were producing at what powers at what times when conditions are met to receive a credit. That would simplify the submission process for the operator, as well as the Treasury and IRS accepting the standard forms. Allowing operators to submit their own forms in their own formats would lead to needless hours of sifting for the requested data, and allow more opportunity to hide numbers. If an operator submits a standard form that the Treasury, FERC, or IRS find to be potentially invalid then they should be able to request the operator's base level data.

12.	In Section V.C.2.a.iii., the Treasury Department and the IRS requested comments on whether there would be an appropriate, more formulaic approach to capturing retirement risk, instead of the application-based process or the five-percent allowance.

Generation Atomic's response: We do not believe that there are effective, appropriate formulaic alternatives to the rigorous application approach that would prevent retirement of clean power generations (e.g., nuclear plants). It's imperative that all financial support associated with the avoided retirement approach go to facilities that need it to stay in operation. Greatly reducing the per-facility support (e.g., down to 5%) and then spreading the support across a much larger set of facilities, most of which either do not need any support to stay in operation and/or are already getting subsidies in the form of existing tax credits, is not an efficient or effective way to prevent retirements. The resulting support received by facilities that actually need it is unlikely to be enough to prevent retirement. Thus, at the expense of simplification, use of a formulaic approach is likely to defeat the entire purpose of the avoided retirement approach.

13.	In Section V.C.2.a.iii, comments were specifically requested on whether such an alternative approach should be limited to facilities with specific technical, market, or geographic characteristics corresponding with a greater risk of retirement (for example, participation in a wholesale market, lack of state support for a facility, nuclear plants with a single reactor) and higher likelihood that using a subset of electricity generation and related EACs for hydrogen production would minimize the risk.

Generation Atomic's response: As stated above, we do not support the use of a formulaic approach in lieu of avoided retirements approach. However, if the Treasury and the IRS proceed with a formulaic approach, reducing the number of eligible facilities (based on general factors such as the ones you list above), and then increasing the fraction of electricity that qualifies as incremental (e.g., to well over 5%), would increase the likelihood of preventing retirements. It would not be as good as the detailed application approach, but it would be better.

Note that the amount of support should scale inversely with the fraction of facilities that are eligible (e.g., if only 20% of US nuclear plants meet the initial eligibility criteria, then the fraction of their power qualifying as incremental would increase from ~5% to ~25%). The ultimate extreme being only 5% of US nuclear plants (i.e., the ~5% of reactors that the EIA thinks will need help) being eligible and getting full (100%) support. That result being similar to the result that is expected to occur under the rigorous application approach (i.e., ~4600 MW of nuclear actually needing help and getting full support).

We generally agree with the set of factors that increase the likelihood of retirement that you list (i.e., participation in a wholesale market, lack of state support for a facility, nuclear plants with a single reactor). Whether or not a facility would face license extension costs in order to stay in operation is another factor that should be considered in the formula, as discussed below. However, the financial importance of each of those factors may require effort to estimate. Thus weighting each factor in the formula may be complicated. The more detailed the formula gets, the more the process looks like the rigorous application approach.

An alternative approach that supports the 24-hour nature of hydrogen production, as well as preventing the double dipping of subsidies, should be considered. Receiving money while the wholesale price of electricity is negative would undoubtedly incentivize high fixed-cost producers, such as nuclear power plants, which are also zero to minimal emitting plants and therefore lower risk of their retirement.

14.	In Section V.C.2.a.iii., the Treasury Department and the IRS, in particular, sought comments on whether existing nuclear and hydroelectric facilities that need to undertake a relicensing process are generally at higher risk of retirement without additional financial assistance and, if so, what considerations should be integrated into a potential formulaic approach.

Generation Atomic's response: Yes, such facilities are at greater risk to retire. Subject to our responses above to comments requested in Section V.C.2.a.i, to create a formula data such as wages at the plant and long term trends of wholesale prices would need to be understood. With the current expense and time that comes from relicensing there is significant capital expended to stay open. Generating the average cost of a relicensing from the NRC by compiling their average billable hours

charge during a relicensing process should be worked into the formula. Different breakdowns could be used to distinguish whether it is a multi or single reactor license.

15.	In Section V.C.2.a.iii., comments were sought on whether there are particular characteristics of hydrogen production facilities associated with existing generators at risk of retirement that should be considered to demonstrate that the hydrogen production reduces retirement risk, such as co-location of hydrogen production with an existing generator.

Generation Atomic's response: Off-Grid Hydrogen production co-located with plants that are at a retirement risk would allow that facility to have a more stable income. The fluctuation of prices for hydrogen as a commodity would could also be assumed to be more stable as hydrogen use around the world continues to grow and new markets open for it.

16.	In Section V.C.2.a.iii., comments were sought on whether there are particular characteristics of hydrogen production facilities associated with existing generators at risk of retirement that should be considered to assess the minimum hydrogen production necessary to reduce retirement risk, such as limitations on project size, electrolyzer capacity, or percent of generation used by the hydrogen production.

Generation Atomic's response: A model based on the New Jersey and Illinois state plans to determine the need of facilities that are at risk of retirement could be used to determine how much hydrogen would have to be produced and therefore 45V credit given to make up the delta. If the hydrogen electrolyzer was co-located and also owned by the operator of the at risk generator, a percent of expected profits from said electrolyzer could be used as supplemental income for the site and be a way to reduce the need for 45V credits.

17.	In Section V.C.2.a, comments were further requested on how to determine the portion of such electricity generation and related EACs, which is generally likely to be sufficient to minimize that risk.

Generation Atomic's Response: This should not be done in a blanket manner, and should be determine on a plant by plant basis. Overall, there should not be a limit on the amount of generation that is able to be attributed to the production of hydrogen up to the point that there is no risk of closure due to finances in so far that the financial distress is caused by market forces and not poor stewardship. If a minimal emitting generator such as a nuclear plant is at risk of retirement due to external forces such as poor management, consideration should be given to withhold credit unless a better steward comes forward to run the operator.

18.	In Section V.C.2.a, the Treasury Department and the IRS requested comments on whether there are formulaic approaches that might be used instead of an application-based pre-qualification process and the broad five-percent allowance

Generation Atomic's Response: A formula could be developed for tracking when electricity wholesale markets are negative. 45V credits could then be awarded to minimally emitting operators that are unable to offer negative prices due to high fixed cost and lack of other subsidy, without an application, based on the amount of electricity produced during that time.

19.	In Section V.C.2.b, regarding temporal matching, The Treasury Department and the IRS acknowledge uncertainty in the timing of implementing an hourly matching requirement, however, and requested comments on the appropriate duration of this transition rule to hourly matching, including specific data regarding current industry practices, the predicted timelines for development of hourly tracking mechanisms, and the predicted timeline for market development for hourly EACs.

Generation Atomic's Response: We are in strong support of proposed rule §1.45V-4(d)(3)(ii)(A) addressing the importance of electricity represented by an EAC being associated with a specific hour and date that match the time of electrical generation and consumption. Absent this requirement, the EAC program cannot achieve its intended results.

The exception to this requirement proposed in §1.45V-4(d)(3)(ii)(B) functionally creates a 5-year delay of any temporal requirements, as a resolution of one year is insufficient to capture the daily, and seasonal variations in zero-emission generation. The explanation given is that the EAC market needs this time to develop the hourly tracking capability necessary to verify compliance with the requirement. A lack of a compliance verification mechanism does not warrant a full suspension of the temporal requirement for five years. A superior approach would be to permit a delay in the rigidity of the documentation requirements, while still requiring an attestation that claims for EAC credit meet the hourly matching requirement.

Additionally, there are markets where hourly rates do exist. PJM tracks its electricity down to the hour today, and it is reasonable to assume that other major markets possess this capability as well, giving credence to the fact that such a compliance verification mechanism should not take five years to develop.