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Internal Revenue Service
CC:PA:LPD:PR (REG-117631-23)
Room 5203
P.O. Box 7604, Ben Franklin Station,
Washington, DC 20044

RE: Comments Responding to U.S. Department of Treasury and Internal Revenue Service Notice of Proposed Rulemaking Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property (REG-117631-23)

Dear Sirs and Madams:

Fidelis New Energy, LLC ("Fidelis") respectfully submits these comments in response to the Notice of Proposed Rulemaking ("NPRM") from the Department of the Treasury ("Treasury Department") and the Internal Revenue Service ("IRS") in REG-117631-23, which proposed regulations relating to the credit for production of clean hydrogen (Section 45V) and energy credit (Section 48(a)(15)) as established and amended by Public Law 117-169, commonly known as the Inflation Reduction Act of 2022 ("IRA").

Fidelis New Energy, LLC ("Fidelis") is a U.S. decarbonization company developing multiple large-scale, climate-positive, carbon-negative infrastructure projects in the hydrogen, sustainable aviation fuel, renewable diesel, carbon management, and biomass energy sectors. Using proven technologies configured in novel, proprietary, and optimized ways, Fidelis aims to develop, invest in, and deliver infrastructure projects that promote job creation, strengthen the U.S. clean energy sector, and support the Administration's stated carbon reduction targets.

Fidelis has invested in and developed a proprietary, patented technology called FidelisH2®, that can significantly reduce carbon emissions in the hydrogen production sector in the very near term. This technology would be deployed as part of Fidelis' Mountaineer Gigasystem™ in West Virginia, an anchor hydrogen supplier within the ARCH2 Hydrogen Hub. The ARCH2 Hub was among seven chosen for DOE funding negotiations under the Clean Hydrogen Hub Program.

We applaud the proposed regulations commitment to carbon intensity-based incentive framework and broad suite of technologies and approaches. The proposed regulation will ensure real emission reductions in the near term, while providing a level playing field for innovative technologies and delivering real investment and high paying jobs for the American people.

As discussed below, Fidelis provides these comments on certain questions posed within the NPRM Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat

Clean Hydrogen Production Facilities as Energy property. Specifically, addressing the role biomass energy should play in the 45V to support the transition to a clean hydrogen economy supporting thousands of American jobs and healthy forests. We appreciate the opportunity to comment on these important issues through this comment letter.

For ease of review, please see the following table summarizing each area of comment, the challenges created by said area, and Fidelis' recommended solutions to said challenges.

NPRM Comment Area:	**Challenges with NPRM:**	**Recommended Solutions:**
Inclusion of additional renewable energy sources like biomass electricity with carbon capture into 45VH2-GREET	Current guidance inconsistently treats biomass with carbon capture when used as a feedstock through biomass gasification or as fuel source for power through biomass combustion. This is despite the fact these processes are functionally equivalent and can be verified with the same degree of accuracy. This inconsistency will limit the deployment of biomass carbon removal and storage ("BiCRS") that are crucial to both the deployment of clean hydrogen and meeting the Administration's "net-zero" target.	Treasury and the IRS should incorporate carbon capture and storage to the existing biomass electricity pathway in 45VH2-GREET like the existing natural gas combined cycle with carbon capture and storage (NGCC w/CCS) power source.
Transition of source specific electricity generating emissions from "background data" to "foreground data"	The current designation of power source emission factors to "background data" prevents the accurate lifecycle modeling of clean hydrogen production facilities and discourages innovations and emission reductions throughout the value chain to produce low carbon hydrogen.	Treasury and the IRS should transition the emission factor for electricity sources like biomass electricity with carbon capture and storage to foreground data.

Verification of source specific electricity generating emissions	Current guidance incorrectly states that source specific electricity as "background data" is "unlikely to be verifiable with high fidelity, given the current status of verification mechanisms." This justification ignores that electricity generating facilities are functionally equivalent to determining and verifying the lifecycle emission of hydrogen production facilities.	Treasury and the IRS should allow for verification of biomass energy generating facilities or other electricity sources meeting the same requirements as outlined in section 1.45V-5 to be included with the qualified hydrogen plant facility attestation and verification for purposes of verifying the lifecycle greenhouse gas emissions rate of the hydrogen.

Comments Responding to Key Provisions and Request for Comments in 45V NPRM.

Comments on the role of biomass to support the production of clean hydrogen through the 45V PTC and reaching Net-Zero Targets and inclusion of biomass electricity with carbon capture.

Fidelis New Energy applauds the Treasury and IRS for inclusion of biomass into the 45V PTC proposed guidance both as a direct source of hydrogen through biomass gasification and through the supply of electricity from the biomass electricity generating systems. Biomass energy and biomass carbon removal and storage ("BiCRS") systems play a critical role in reaching net zero emissions in alignment with the Administrations goals[1] while supporting American forests and American Jobs. The 45V PTC is uniquely able to catalyze significant deployment of BiCRS through biomass gasification to hydrogen and biomass power with CCS ("BECCS"). By enabling private underwriting of large capital investments needed to support hydrogen and carbon dioxide removal ("CDR") deployment, 45V delivers cost-competitive clean hydrogen and critical carbon dioxide reductions.

The instrumental role CDR technologies is recognized by the Administration in the "The Long-Term Strategy of the United States Pathways to Net-Zero Greenhouse Gas Emissions by 2050"[1] which states, "we must also pursue negative emission through robust and verifiable nature-based and technological carbon dioxide removal." Echoing the Intergovernmental Panel on Climate Change: even with significant emissions reductions, "… some hard-to-abate residual GHG emissions … remain and need to be counterbalanced by the deployment of carbon dioxide removal (CDR) methods to achieve net zero CO2 or GHG emissions (*high confidence*)."[2] BICRS leverages the natural carbon cycle in which carbon is removed from the atmosphere through photosynthesis, held in the biomass until re-released to the atmosphere through natural decay or fires. BiCRS beneficially utilizes the carbon stock held in biomass to generate energy (electricity or hydrogen) through combustion or chemical conversion and permanently geologically sequesters the produced carbon. This process results in permanent carbon dioxide removal from the

[1] https://www.whitehouse.gov/wp-content/uploads/2021/10/us-long-term-strategy.pdf
[2] https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf

atmosphere. Furthermore, this also supports sustainable forest management and nature-based CDR techniques through beneficially using biomass byproducts from sustainable land management. BiCRS is critical to achieving the required 1 billion tonnes per year removal target identified in the U.S. Long Term Strategy to Achieve Net Zero.

The "Roads to Removal: Options for Carbon Dioxide Removal in the United States", led by Lawrence Livermore National Laboratory to determine the feasibility of achieving 1 billion tonnes of removal annually, establishes that BiCRS utilizing biomass wastes and forest thinning residues have substantial potential in delivering more than 700 million tonnes of CO2 removal per year and up to 900 million tonnes of removal with purpose grown cover crops.[3] Alongside delivering carbon removals, BiCRS also supports the sustainable management of American forests and the jobs and communities that depend on those forests.

President Biden's Executive Order on Strengthening the Nation's Forests, Communities, and Local Economies, highlights America's forest land's role as a core part of local economies and its potential in mitigating climate change in areas susceptible to wildfires.[4] BiCRS is a key tool in supporting wildfire resilience, biodiversity, and sustainable forestry through the use of waste and residue materials that otherwise would become forest fire fuel. Further, sustainable forestry reduces the risk of devastating wildfires, decreases susceptibility to insects and disease, and alleviates overcrowding. This enables the forest to increase its overall carbon stock and biodiversity. These significant positive impacts are seen in both the Nature Conservancy's Sycan Marsh Preserve which was subject to the Boot Leg fire in July 2021 and the Forest Services' Pacific Southwest Research Station's Variable Density Thinning Study on the Stanislaus-Tuolumne Experimental Forest.[5,6] Sustainable Forest management and residue removal is not possible without the offtake of this material provided by bioenergy or BiCRS.

Bioenergy plants today have been shown to provide strong value to the communities in which they are located. Positive benefits from using biomass for energy to support wildfire mitigation, healthier forests, and local economies are noted in numerous studies with a selection presented below. Biomass for gasification or biomass for power with carbon capture adds further environmental benefit through the additional investment, operations and maintenance, and industrial property tax base from the BiCRS facility.

- United States Department of Agriculture Forest Service's Rocky Mountain Research Station's, "A strategic Assessment of Forest Biomass and Fuel Reduction Treatments in Western States" identifies biomass power as a biomass utilization option to support required expansion of treating high-risk Fire Regime Condition Class 3 timberland.[7]

[3] Available at https://roads2removal.org/
[4] https://www.whitehouse.gov/briefing-room/presidential-actions/2022/04/22/executive-order-on-strengthening-the-nations-forests-communities-and-local-economies/
[5] https://www.nature.org/en-us/about-us/where-we-work/united-states/oregon/stories-in-oregon/climate-change-wildfire-recovery/
[6] https://www.fs.usda.gov/research/psw/projects/variable-density#overview & https://chorophronesis.geog.psu.edu/virtualexperiences/StanislausWebsite/indexSummer2022.html
[7] https://www.fs.usda.gov/rm/pubs/rmrs_gtr149.pdf

- Mirzaee, A., McGarvey, R.G. Aguilar, F.X, *et al*'s "Impact on biopower generation on eastern US Forests", which looked at the impact of biopower plants on the surrounding forests from 2005 to 2017 and found that "net positive trends in timberland structure and carbon stocks near wood-using and non-wood-using power plants."[8]

- Ram P. Dahal, Francisco X. Aguilar, Ronald G. McGarvey, Dennis Becker, Karen L. Abt,'s "Localized economic contributions of renewable wood-based biopower generation", finds that the localized value of biomass plants was $2.80 per dollar spent in operation and maintenance. Furthermore, they concluded that expanded wood-based biopower could contribute between $5 to 20 billion in value-added to local economies across the U.S.[9]

Treasury and IRS should clarify the purposed guidance and update the 45VH2-GREET model to ensure that 45V can support net zero emissions and that BiCRS is not inadvertently prohibited by the proposed guidance. Specifically,

1. **Treasury and the IRS should incorporate carbon capture and storage ("CCS") to the existing biomass electricity pathway in 45VH2-GREET like the existing natural gas combined cycle with carbon capture and storage ("NGCC w/CCS") power source.**
2. **Treasury and the IRS should transition the emission factor for electricity sources like biomass electricity with carbon capture and storage to foreground data.**
3. **Treasury and the IRS should allow for verification of biomass energy generating facilities or other electricity sources meeting the same requirements as outlined in section 1.45V-5 to be included with the qualified hydrogen plant facility attestation and verification for purposes of verifying the lifecycle greenhouse gas emissions rate of the hydrogen.**

These recommendations reflect the ability to determine and verify the "full range of direct and indirect emissions" from "minimal-emitting sources of electricity" like biomass combustion with or without carbon capture, to the same level of efficacy and fidelity as hydrogen production processes with carbon capture today. To expand on the recommendations above:

Recommendation 1: The Treasury and IRS should expand the current guidance to allow for biomass electricity with carbon capture to be an approved source of electricity for qualified clean hydrogen facilities.

In alignment with current guidance allowing natural gas combined cycle plants with CCS to be a user-defined power source in 45VH2-GREET 2023, BECCS should be an allowed electricity source within the 45VH2-GREET Model. This should be an expansion of the existing biomass combustion of logging residues in the 45VH2-GREET model which has an emission factor of 0.052 kg CO2e / kWhe.[10]

[8] https://doi.org/10.1007/s10668-022-02235-4
[9] https://doi.org/10.1016/j.eneco.2020.104913
[10] Department of Energy, Guidelines to Determine Well-to-Gate GHG emissions of Hydrogen Production Pathways using 45VH2-GREET 2023, December 2023. https://www.energy.gov/sites/default/files/2023-12/greet-manual_2023-12-20.pdf

BECCS and biomass gasification with CCS have functionally equivalent lifecycle analysis verification processes. In both, biomass is thermochemically converted to carbon dioxide and energy. For biomass combustion, the energy takes the form of heat recovered as steam to produce power in turbine generator. For biomass gasification, the energy takes the form of hydrogen and waste heat which is typically recovered in waste heat boilers to generate steam that supports the gasification and shift processes and produces power in a turbine generator. Traditional gasification technology has been deployed to produce syngas for various end products as well as power through integrated gasification and combined cycle power plants.[11]

In addition, natural gas combined cycle with carbon capture storage is already an approved specific source of electricity under the 45VH2-GREET 2023 Model. To support the deployment of clean, cost-competitive hydrogen production and BiCRS facilities at scale, Treasury, IRS, and DOE should incorporate BECCS in the 45VH2-GREET model as a specific power source.

Recommendation 2: Treasury and IRS should transition the emission factor for electricity sources like biomass electricity with carbon capture and storage to foreground data.

By restricting the emission factor for electricity sources to "background data", the current guidance and 45VH2-GREET 2023 model eliminate the ability to accurately model emissions from power sources and discourage emission reductions through the entire value chain. Power sources, such as natural gas combined cycle with carbon capture facilities, that have efficiencies greater than the R&D GREET 2023 assumptions are unable to receive the benefits for increased efficiencies under the current regulations.

As highlighted in supplemental comments, the reporting and verification of GHG emissions from electricity generating facilities is common at both a federal level through the EPA's Greenhouse Gas Reporting Program ("GHGRP") and at state level with many states requiring similar reporting programs. The GHGRP's reporting requirements include feedstock consumption and overall energy generation in addition to greenhouse gas emissions. As such, they provide the required documentation and data to fully quantify lifecycle emissions of these facilities, including both direct and indirect emissions. Further, the verification and auditing of the data is an established practice at a state level, with California and Washington requiring annual verification and audits. Specific recommendations on mechanisms to accurately verify real-world emission from biomass-powered electricity generation with or without CCS are detailed below.

Recommendation 3: Treasury and IRS should allow for verification biomass electricity generating facilities that provide electricity used by the hydrogen facilities meeting the same requirements as outlined in section 1.45V-5 as the hydrogen production facility for the purposes of verification.

To streamline verification under 45V and ensure verification of the biomass electricity facility meets the same requirements, the Treasury and IRS should accept a verification of electricity generating facility meeting the same requirements as outlined in section 1.45V-5 as part of the submission of the verification and attestation of the qualified clean hydrogen facility and

[11] S. McNaul, C. White, R. Wallace, T. Warner, H. S. Matthews, J. Ma, M. Ramezan, E. Lewis, "Hydrogen Shot Technology Assessment: Thermal Conversion Approaches," National Energy Technology Laboratory, Pittsburgh, December 5, 2023.

the electricity generating facility. The California Low Carbon Fuel Standard ("LCFS") provides a baseline framework for this verification approach. Under the California LCFS, applicants who work with facilities across the fuel producer's value chain may apply for and submit verifications in which these steps are recognized and verified.

Examples of when this approach is utilized are fuel pathways for biodiesel or renewable diesel that have steps to reduce the required energy for rendering animal feedstock, a fuel pathway with a specified-source feedstock supply. The "joint" pathway application requires each of the segments to be subject to "… all fuel pathway application and maintenance requirements for the portion of the pathway they control, including application materials, attestations, validation, ongoing verification, and recordkeeping."[12]

In addition, this process will complement the existing requirement for acquiring and retiring EACs from specified sources by streamlining the verification of the related emission factor of the electrical generating facility. Through the joint verification the qualifying EACs would be audited along with the documentation supporting the emission factor including the feedstock consumption by the biomass plant, the carbon capture rate, and electricity generating rate ensuring high fidelity and eliminating the potential requirement for a secondary audit of the electricity generating facility.

For these reasons, Treasury and the IRS should implement and allow for the verification of the electricity generating facility from which the power was purchased to attest to the emission factor for this power.

Comments addressing the documentation and verification of key parameters that are relevant for accurate lifecycle analysis for "biomass-power electricity generation with or without CCS."

As stated above, the key parameters to determine the "full range of direct and indirect emission" from, "minimal-emitting sources of electricity" like biomass combustion with or without carbon capture can be documented with the same level of efficacy and fidelity as hydrogen production processes with carbon capture. Specifically, the verification of feedstock origin, carbon capture rate, and other relevant parameters such as feedstock properties and electricity production are possible through several existing commercial mechanisms. To enable verification of these parameters, Fidelis recommends the following be adopted into final regulations:

4. **Treasury and IRS should accept verification of bills of lading ("BOLs") to establish feedstock origin and chain of custody for traceability and verification purposes.**
5. **Treasury and IRS should align and expand the eligible feedstocks for both biomass gasification and electrical generation to support the deployment of crucial BiCRS facilities across the nation and clarify sustainability requirements.**
6. **Treasury and IRS should allow for contractual metering readings verified through joint verification of the electrical generating facility for the verification of additional key parameters such as CO2 capture and sequestration rate to verify the lifecycle emissions rate associated with each MWh of EACs acquired.**

[12] https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/guidance/lcfsguidance_20-02.pdf

To support and expand upon the recommendations above, the following sections address each of the three recommendations in detail.

Recommendation 4: Bills of lading ("BOLs") are a tool used by multiple sectors today to trace material movements along their supply chains and as such provide the traceability of a feedstock to the point of origin for purposes of 45V.

Whether it be forestry management materials, landfill diversion, agricultural residues, or other material groups, BOLs provide a means of tracing the supply chain of custody for biomass to be used for gasification or electricity generation from the point of origin where the waste or residue was generated to final user. As a legally binding document, BOLs provide a complete description of shipments and parties involved, including:

- The quantity, value, and weight of the cargo.
- A complete description of items within the cargo, and its freight classification.
- The shipping and receiving parties as well as their signatures and the shipping date.
- Location of origin and destination.

By tracking and documenting these components, BOL's ensure that there is oversight from point of origin to transport vehicle, to staging destination (if applicable), to end-user. In doing so, this document creates a receipt for the products, and generates a traceable supply chain for BECCS facilities.

Depending on the type of biomass material being utilized and the scale of the BECCS facility, the length and structure of the supply chain will vary. BOL's will allow these variances to be captured. A few examples that help demonstrate this difference are provided below.

One example is in the case of forestry residues such as pulpwood and slash from managed forestry stands which are trucked directly from the timber stand to the BiCRS facility:

- The point of origin for this low-grade wood fiber generated during sustainable forestry management or logging process is the timber stand in which it was generated as a byproduct.
- This material would then be loaded or chipped on site and loaded to be hauled directly to the biomass power with carbon capture or biomass gasification to hydrogen facility.
- A single BOL would be generated in this instance: at the loading of materials onto a truck at the timber stand or managed area, to be delivered to the biomass gasification or electricity generating facility and signed by the receiving personnel on site with specific details around the batch (volume, product, quality, etc.).

Another example of where one BOL would be generated would be when sawmill waste products (saw dusts and byproduct wood chips) are generated at the mill and trucked to the BiCRS facility:

- In the case of mill residues and chips, the point of origin would be the mill where the materials were generated as a secondary waste in the milling process and loaded for transit. Just as the forestry residues generated in sustainable forest management process are tracked from their point of origin or creation, the mill residues and byproduct chips would be tracked to the point of generation at the sawmill. The sawmill would be the point of

generation, given this material was generated as waste from the primary product (saw boards) and were not purposefully generated as a fuel or feedstock.

- A single BOL would be generated in this instance: at the loading of materials onto a truck at the local mill, to be delivered to the biomass gasification or electricity generating facility and signed by the receiving personnel on site with specific details around the batch (volume, product, quality, etc.).
- Further details on the recommended "point-of-origin" for the forestry residues and additional recommended allowable feedstocks are described in more detail below.

An example where multiple BOLs would be generated, is where forest residues generated in the woods were then transported to an intermediate chipping facility, chipped, and transported to the biomass gasification or electricity generating facility:

- Like the case of residues generated from forest management processes and then transported as-is (or chipped prior to transport), the point of origin for this low-grade wood fiber is the stand in which it was produced as part of the management and logging process. A BOL would be generated at the loading of materials onto a truck at the timber stand or managed area, to be delivered to the intermediate chipping facility and signed by the receiving personnel on site with specific details around the batch (volume, product, quality, etc.).
- A second BOL would be generated at the loading of now chipped materials onto a truck at the intermediate chipping facility, to be delivered to the intermediate chipping facility and signed by the receiving personnel at the gasification or electricity generating facility with specific details around the batch (volume, product, quality, etc.).
- Because the material was handled (loaded and unloaded) multiple times between origin and the biomass facility, there will be a BOL for each transfer. Thus, BOL's provide tracking to the ultimate point of origin where the residue, byproduct and/or waste was created.

Through BOL documentation, a clear chain of custody for the delivered material is generated. These BOL's will be processed in a facility's Enterprises Resource Planning ("ERP") software and enable verification of the source of biomass supplied to the facility.

Recommendation 5: The Treasury and IRS should align and expand the eligible feedstocks for both biomass gasification and biomass-power with CCS to support the deployment of crucial BiCRS facilities across the nation while supporting American forests and jobs.

Fidelis applauds the inclusion of agricultural waste like corn stover and forest logging residues in 45V and the recognition of the carbon neutrality (or net carbon neutrality) of these biomass sources. [13] The beneficial utilization of agricultural waste and forestry residues is crucial to supporting the sustainable land and forestry management and the reduction of GHG emissions as described in detail above. Enabling biomass utilization pathways in 45V through the current guidance is a massive positive stride in delivering on the potential of the 45V to deliver significant emission reductions, deployment of billions of private capital and creation of hundreds of jobs.

[13] Department of Energy, Guidelines to Determine Well-to-Gate GHG emissions of Hydrogen Production Pathways using 45VH2-GREET 2023, December 2023. https://www.energy.gov/sites/default/files/2023-12/greet-manual_2023-12-20.pdf

However, the current guidance is inconsistent on the utilization of biomass within 45V as well as too narrow in the allowable feedstocks under 45V.

The 45V PTC regulations and 45VH2-GREET should be updated to recognize biomass sources both as feedstock to gasification pathways and as a fuel for power generation. Currently while corn stover is an allowable feedstock for biomass gasification it is not considered as a fuel source for biomass power generation. There is no material difference in the lifecycle emission from utilizing corn stover as a feedstock in a gasifier for hydrogen production or a fuel from a biomass-power electricity generation. To eliminate this inconsistency, 45V and 45VH2-GREET should recognize all approved biomass feedstocks for gasification pathways as approved feedstocks for biomass power utilized for hydrogen production.

Further, the 45V PTC regulation and 45VH2-GREET should expand the allowable feedstocks to encompass a broader range of agricultural, forestry and biogenic industrial byproducts and wastes. Table 1 provides recommendations on the allowable of biomass feedstocks, relevant counter factual, and recommended point-of-origin for the purposes of supply chain traceability.

Table 1. Recommend Biogenic Feedstocks, Point of Origin and Counterfactuals

Feedstock Category	Feedstock Examples	Counterfactual	Recommended Point-of-Origin
Forestry Management Residues	Bark, branches, cutter shavings, leaves, needles, pre-commercial thinnings, naturally fallen trees from wind or disease, and low-grade residues generated in the final harvest.[14]	This low-grade fiber generated as part of sustainable forestry management would have decayed over time in-situ, pile-burned, or burned in a forest fire. In the case that this material was not harvested due to uneconomical conditions this would lead to increased susceptibility to disease and wildfire.	Timber stand in which the material was generated.
Milling & Processing	Residues, slabs, edgings, trim, bark, chips, sawdust, wood base material	These materials are typically combusted for	Facility in which the waste was generated.

[14] Fidelis recommends the expansion of the current definition to allow for other low value residues generated in final harvests. These byproducts include but are not limited to insect and diseased trees, and other low-grade material generated that is not saw timber grade.

Byproducts and Waste	handling waste, furniture factory waste, broken pieces, other fibrous waste products, etc.	heat and power and or landfilled today.	
Land Management Waste	Right-of-way clearings, tree management wastes, urban forestry, arborist chips, etc.	These materials are generated in the clearing of infrastructure rights-of-way (pipeline, transmission lines, roads, etc.), and are typically pile burned, mulched, or landfilled.	Right-of-way clearing site or urban forestry/arborist site.
Agriculture Waste	Hulls, bagasse, husks, stalks, corn stover, slash, pine straw, orchard prunings, cellulosic components of annual cover crops, etc.	These materials are typically burned or left to decay.	Farm field or orchard in which the waste was generated.
Industrial Biogenic Processing Waste	Spent bleaching earth, biomass produced hydrothermal carbon ("HTC"), paper mill waste, distillery slop, barley waste, packaging waste, waste streams from food and beverage industry.	These materials are typically landfilled or combusted for heat and power today.	Facility where the waste was generated.
Energy Crops	Switchgrass, miscanthus, bamboo, hybrid willow, hybrid poplar.	These crops allow for utilization of marginal land.	Farm in which energy crop was grown.
Hurricane and Natural Disaster Waste	Downed trees and debris (treetops, slash, stumps).	These materials are typically landfilled today.	Debris staging area or landfill from which it was sorted and diverted.
Sorted Biogenic Construction and Demolition ("C&D") Waste	Sorted wood waste.	These materials are typically landfilled today.	Debris staging area or landfill where it was sorted and diverted.

Separated Food Waste	Coffee grounds, paper-based material (plates, cups, coffee filters, napkins).	These materials are typically landfilled today.	Waste staging area or landfill where it was sorted and diverted.

As it relates to forestry logging residues, the current definition of forest residues in the 45VH2 GREET User Manual from the DOE is overly restrictive and introduces ambiguity:

> "… forest logging residue with no significant market value, such as bark, branches, cutter shavings, leaves, needles, and pre-commercial thinnings (i.e., not milling residues from industrial processing or whole trees)"[15]

The Treasury, IRS, and DOE should be cognizant of the critical need for offtake of this material from forests across the nation and as such clarify the distinction between "pre-commercial thinnings" and the restriction on "whole trees". The definition of "whole trees" is ambiguous as pre-commercial thinnings or pulpwood generated can include small "whole" trees or diseased "whole" trees. Likewise, the definition of "no significant market value" is ambiguous as the utilization of forestry logging residues like pulpwood begets some market value for the material. Pulpwood and pre-commercial thinnings are low quality fiber and other material generated through sustainable forest management to alleviate overcrowding, which hinders the growth of larger trees and increases a forest's susceptibility to devastating fires. This material is also generated through Federal, state, and local habitat management, and there is a critical need for the offtake of this material across the nation.

In many western states, like California, historical mismanagement has led to overcrowding in forests that are increasingly prone to devastating forest fires. The State of California and U.S. Forest Service MOU on the stewardship of California's Forest and rangelands includes the goal to treat 1 million acres of forest and wildlands annually by 2025. As highlighted in the MOU, the use and offtake of the material generated in the thinnings is critical to supporting sustainable treatment.[16] Today, currently only about 20% of the material generated in forestry management in California is beneficially utilized for commercial purposes.[17]

In many southeastern states, the closure of pulp and paper mills increasingly threatens the ability to support sustainable forestry like with major International Paper and Georgia Pacific Plants closing.[18,19] Without an alternative outlet for this material, thinnings and active management on hardwood stands would no longer be economically feasible, reducing the ability to properly manage forests. This would result in unhealthy and low-quality timber stands that will take decades

[15] Department of Energy, Guidelines to Determine Well-to-Gate GHG emissions of Hydrogen Production Pathways using 45VH2-GREET 2023, December 2023. https://www.energy.gov/sites/default/files/2023-12/greet-manual_2023-12-20.pdf
[16] https://www.gov.ca.gov/wp-content/uploads/2020/08/8.12.20-CA-Shared-Stewardship-MOU.pdf
[17] https://biomassmagazine.com/articles/pathways-for-carbon-negative-biomass-fuels
[18] https://www.marketwatch.com/story/international-paper-to-cut-about-900-jobs-as-a-results-of-production-shutdowns-14e732f9 & https://www.reliableplant.com/Read/14527/international-paper-closes-pulp-mill-in-louisiana,
[19] https://www.reliableplant.com/Read/31453/georgia-pacific-pulping

to recover. In addition, offtake of this material is also necessary to support habitat management operations.

To support the utilization of this material, The restriction on the use of "whole trees" and material with "no significant market value" should be modified to be a restriction on the use of saw timber quality logs to reflect industry best practices that material be used for the highest and best use.[20] It should also include trees that have naturally fallen down due to wind, old age, disease, etc.

Recommendation 6: To minimize complexity in reporting and verification, the Treasury and IRS should allow for contractual metering readings for the verification of CO2 capture and sequestration, feedstock consumption, and electrical production rates to substantiate the lifecycle emission rate of the power.

Biopower with or without CCS should be allowed to utilize the same verification methods as the hydrogen plant as described above. Just as metering of key parameters such as electricity and natural gas consumption as well as hydrogen production and carbon sequestrations will serve the basis of determining lifecycle emissions rate for the qualified clean hydrogen facility, so should these meter readings be used to verify the lifecycle emission rate for the power produced by the biopower with or without CCS and claimed through the EACs. This will allow for verification not only of the source of the power generation through EACs, but also the lifecycle emission rate associated with the EACs.

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Thank you for the opportunity to submit these comments. We welcome the opportunity to meet with the Treasury Department and the IRS to discuss these issues in greater detail and to answer any questions that you may have.

Respectfully submitted,

Fidelis New Energy, LLC

[20] https://insights.carbon-direct.com/hubfs/Gated%20assets/Report_Sustainable-Biomass-Sourcing.pdf