Wabash Valley Resources LLC
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VIA Electronic Submission on Regulations.Gov

Department of the Treasury
Internal Revenue Services

Re: Comments on IRS Notice 2022-58.

To Whom It May Concern:

Wabash Valley Resources LLC (WVR) is a leader in the hydrogen production industry that seeks out and develops innovative, dependable, and effective solutions to manufacture, store, and deliver hydrogen and ammonia energy. Thank you for the opportunity to provide general comments on the newly enacted clean hydrogen production credit under § 45V.

.01 Credit for Production of Clean Hydrogen.

Question (1)(a): Section 45V defines "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?

Answer: Question 1(a) includes a footnote (3), that describes well to wheels emissions to include "…*emissions associated with feedstock growth, gathering, and/or extraction*…"

WVR agrees with inclusion of emissions related to feedstock for hydrogen, unless if such a feedstock is a waste or a refuse of another industrial operation. If an output from an economic industrial process shall continue to be generated regardless of if its economic value goes to zero, then it cannot be a product or a by-product for purposes of lifecycle analysis ("LCA") for greenhouse gas emissions but is, instead, a waste; and "waste products have no emissions allocated." IPHE Hydrogen Production Analysis Task Force, "Methodology for Determining the Greenhouse Gas Emissions Associated with the Production of Hydrogen," Section 6.3.3.7 at p. 33 (Version I – Oct. 2021) (hereinafter, "IPHE HPTF Working Paper," attached as Attachment 4).

Table 1 summarizes the feedstock categories and emission estimation methodologies to be included in the LCA. It is important to reiterate that these emissions estimation methodologies are for upstream and process emissions to produce a feedstock and emissions during the hydrogen production process from any feedstock should be allocated to the hydrogen.

Feedstock Category for Hydrogen Production	Definition	Direct Emissions Estimation Methodology
Primary Product(s)	Main product(s) of the production process with **elastic supply**	Allocation of (1) upstream emissions that include feedstock gathering and extraction and (2) production process emissions.
By-Products	Secondary product with **inelastic supply** and significant economic value	Allocation of only the production process emissions to directly produce the feedstock; No upstream emissions for gathering and extraction of feedstock
Wastes and Residuals	Secondary product with **inelastic supply** which would be produced even if such product had little to no economic value	No upstream emissions for gathering and extraction of feedstock and no process emissions.

WVR posits that a material is a waste in any of the following situations: (1) the producers of a product consider it a residue or undesirable result of production and will continue to produce it irrespective of the economic value generated from that material, (2) federal agencies such as the Department of Commerce, the Department of State, or the Federal Energy Regulatory Commission have concluded the material is a waste, or (3) federal or state taxing authorities exempt such material sales from taxes because it is a waste.

One such example of a material that therefore is a waste and should be expressly incorporated into the lifecycle analysis (LCA) greenhouse gas emissions framework as such is the use of petroleum coke (petcoke) to produce hydrogen in the United States. For that use, such petcoke should be considered a waste rather than a byproduct for LCA purposes both because there are sound precedents for doing so, as well as important policy reasons for doing so. First, the International Union of Pure and Applied Chemistry defines petroleum coke as "[a] solid, carbonaceous ***residue*** produced by thermal decomposition of heavy petroleum fractions or cracked stocks, or both." *See Compendium of Chemical Terminology*, 2nd ed. (the "Gold Book") (1997) (emphasis added). As a residue, it is not a useful product but, instead, is a waste to be disposed of in one form or another.

As with academia, the U.S. refining industry also considers petcoke a waste. As the California Court of Appeal concluded more than thirty years ago, oil refiners like Union Oil (now known as Chevron) view petcoke as a waste because it is an undesirable fuel source in the United States.[1] *See, e.g., Union Oil Co. v. State Bd. of Equalization*, 224 Cal.App.3d 665, 667-68 & 672 (1990) (exempting sales of petcoke from state sales and use taxes).

Technology vendors to the refining industry recognize that petcoke is undesirable to refiners as they continually seek to maximize residue conversion efficiencies to maximize profitable petroleum products and to minimize residue such as petcoke. One such technology is the UOP Uniflex Process developed by a Honeywell International subsidiary.[2] This process results in one-third the residue yield as compared to conventional delayed coking technologies, and that residue is a usable "pitch" rather than undesirable petcoke. *See* Gillis, et al., "Upgrading Residues to Maximize Distillate Yields with UOP Uniflex Process," Journal of the Japan Petroleum Institute, Vol. 53:33-41 (2010) at Section 4.1 on p. 37 (indicating a change from more than 30% petcoke in the distillation process of delayed coking to less than 10% pitch from Uniflex) (attached as Attachment 3). Clearly, if petcoke was a valuable product, vendors supplying technology to petroleum refiners would not develop, market, and sell technologies that virtually eliminate petcoke from the refining process.

The U.S. Department of State has recognized that petcoke is effectively a waste, finding that, "[i]n contrast with the premium products the refinery produces, coke is an undesirable co-product." U.S. Department of State, Bureau of Ocean and International Environmental and Scientific Affairs, Final Environmental Impact Statement for the Keystone XL Project (Jan. 2014), Appendix U: Lifecycle Greenhouse Gas Emissions of Petroleum Products from WCSB Oil Sands Crudes Compared with Reference Crudes at Section 4.2.3.1 on p. 40 (hereinafter, "Keystone XL FEIS Appendix U," attached as Attachment 2). Notably, if the IRS' sister agency – the State Department – has already concluded that petcoke is a waste rather than a co-product, IRS should do so as well in its framework for LCAs used in meeting the 45V requirements.

In addition to the State Department, multiple other federal agencies acknowledge that petcoke is an undesirable waste in the United States. More than forty years ago, the U.S. Department of Commerce concluded that use of petcoke as a fuel was virtually non-existent due to stringent environmental considerations that existed in the 1970s and that have only gotten more stringent since then. *See* U.S. Department of Commerce, Final Rule, 44 Fed. Reg. 36375 (June 29, 1979) (eliminating the non-energy end-use requirement in 15 C.F.R. Part 377 that had previously applied to exports of petcoke). Similarly, the Federal Energy Regulatory Commission (FERC) of the DOE has defined petcoke as a waste for purposes of rate benefits and exemptions that have been available to small power producers and cogeneration facilities since March of 1980. *See* 18 C.F.R. 292.202(b)(8) (adopted as a Final Rule in 45 Fed. Reg. 17959 (Mar. 20,

[1] In many circumstances, petcoke and other waste are "sold" by producers of that material at ***negative prices*** because there is no one willing to pay a price to take the material away.

[2] *See* Honeywell UOP's website: https://uop.honeywell.com/en/industry-solutions/refining/residue-upgrading.

1980)). The very purpose of these regulations that have been in place within the DOE for more than forty years was to encourage the use of waste as a fuel for the U.S. electrical grid, and in doing so, FERC made a distinction between oil, natural gas, and coal on the one hand (which is not an eligible fuel for purposes of these regulations) and waste like petcoke on the other (which is eligible for such preferential treatment). Just as FERC did more than forty years ago, the IRS should incentivize the beneficial reuse of petcoke waste in LCA methodologies that are used for purposes of the proposed 45V regulations.

Adding to the weight of authority treating petcoke as a waste are federal and state tax laws. In the Energy Policy Act of 2005, the U.S. Congress determined that it was advisable to provide tax credits to certain qualifying gasification projects where, among other things, such qualifying projects included the gasification of "petroleum residues," which includes waste like petcoke. *See* 26 U.S.C. § 48B(a), (c)(2), & (c)(8). Just as Congress recognized the value of encouraging the gasification of waste products such as petcoke, IRS should encourage the use of petcoke in the production of hydrogen by acknowledging hydrogen production technologies such as WVR's that sequester carbon dioxide through the use of petcoke. In addition to federal tax law, state courts such as those in California have acknowledged that petcoke is merely a waste that is exempt from sales and use taxes when sold for use as a fuel. *See Union Oil*, 224 Cal.App.3d at 671-72.

The LCA methodologies for meeting the 45V requirements should assign an allocation of little to no upstream emissions from the creation of petcoke because petcoke is a waste. There are at least two reasons for this.

Here, as discussed above, refineries that produce petcoke consider it to be an undesirable waste, *see Union Oil*, 224 Cal.App.3d at 667-68, and the federal government already agrees with this view, *see* Keystone XL FEIS Appendix U at Section 4.2.3.1 on p. 40; *see also* 26 U.S.C. § 48B(c)(7) & 18 C.F.R. § 292.202(b)(8).

Second, if a component of the LCA for a hydrogen production process has been assigned an allocation of little to no emissions in an upstream production process, it is only logical that the same emissions allocation should flow through to any downstream production processes. Otherwise, emissions that have already been allocated to another component at the upstream point of calculation will be double-counted if emissions are thereafter allocated to the same component at a downstream point of calculation. Such double-counting is to be avoided in LCA frameworks. *See* IPHE HPTF Working Paper at Section 2 on p. 10.

Finally, to the extent any LCA attributes any upstream emissions from the creation of petcoke that is utilized in a hydrogen-producing technology that also employs carbon capture and sequestration, that LCA methodology must include a credit for the emissions being avoided by use of this technology. *See, e.g.,* IPHE HPTF Working Paper at Section 5.3.7 on p. 14. This is particularly true with petcoke given the near certainty that produced petcoke would otherwise be combusted overseas in China or elsewhere. *See, e.g.,* OCI Report attached as Attachment 1. However, petcoke emissions that are sequestered in connection with hydrogen production

should be accounted for in any LCA methodology analyzing such a process to maximize the potential societal benefits of that process through application of any regulations for 45V.

Congressional goal of the 45V is to mitigate carbon dioxide-equivalent emissions as compared to existing emissions during hydrogen production. WVR, as a company that intends to sequester the carbon dioxide created from its hydrogen production processes, supports the congressional goal and encourages IRS to develop the regulations for 45V—in a manner that effectuates the goal of mitigating emissions compared with existing/baseline emissions. To do so, any LCA that is used to meet the 45V standards must acknowledge and incorporate into its methodology a framework that embraces and encourages the beneficial reuse of waste in the production of hydrogen.[3]

WVR appreciates the opportunity to provide comments on the LCA methodologies used in reaching the proposed CHPS and looks forward to continuing to work productively with DOE to encourage the production of hydrogen from waste petcoke that would otherwise be combusted.

Sincerely,

Wabash Valley Resources LLC

[3] Environmental groups such as Oil Change International have criticized industry for not doing more to encourage and develop technologies to gasify and sequester carbon from waste products such as petroleum coke. *See, e.g.*, Oil Change International, *Petroleum Coke: The Coal Hiding in the Tar Sands*, at p. 22 (Jan. 2013) (included as Attachment 1).