4 November 2022

Assistant Secretary Lily Batchelder
Department of Treasury
1500 Pennsylvania Avenue NW
Washington DC, 20005

Re: Notice 2022-49, Request for Comments on Certain Energy Generation Incentives – 45Y tax credit must strengthen, not diminish, Justice40

Dear Assistant Secretary Batchelder:

We appreciate this opportunity to weigh in on the IRS and the Treasury Department's implementation of many of the new energy tax credits established by the Inflation Reduction Act. Our comments focus on the Clean Electricity Production Tax Credit (45Y) and how this new policy must strengthen, not diminish, the Biden Administration's commitment to environmental justice (EJ).

The Inflation Reduction Act is many things, but it is first and foremost a tax bill, with the majority of new climate investments coming in the form of tax credits. In designing the implementation of these credits, the Treasury and the IRS should look to the framework of Justice40 and the Biden Administration's "whole of government" approach to climate justice —or else risk rendering both of these principles moot.

In the past, electricity production tax credits (PTCs) have singled out specific energy technologies for support without regard for either their emissions or effect on community health. For decades, electricity from open- and closed-loop biomass, trash incinerators, and landfill gas have enjoyed special carveouts as part of the prevailing PTC regime. These facilities, in their siting and effects on community health, are among the most visible and reprehensible evidence of environmental racism and injustice.[1] Mislabeled as renewables, these biomass and biogas power sources are often worse for the climate than their fossil fuel competitors.[2]

Now, due to the Inflation Reduction Act, there is a chance to finally interrupt this pattern of subsidized harm as the new 45Y technology-neutral tax credit kicks in after 2024. Only facilities that can demonstrate a net greenhouse gas emissions rate of zero or lower on a lifecycle basis will be eligible. Simply by measuring lifecycle emissions accurately and on a climate-relevant timeline, the Biden administration has an opportunity to protect frontline communities from billions in new subsidies for false solutions. Blocking these facilities from claiming tax credits will lower emissions, reduce harm in overburdened communities, and protect the integrity of President Biden's Justice40 commitment.

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[1] Commission for Racial Justice, "Toxic Wastes and Race in the United States," (New York, New York: United Church of Christ, 1987), http://www.reimaginerpe.org/files/toxics-racerace87.pdf
[2] Tangri, N. (2021). https://eartharxiv.org/repository/view/2050/

We therefore urge the Treasury and the IRS to consider the recommendations of the White House Environmental Justice Council (WHEJAC)[3], the mandate of Justice40, and climate relevant timeframes as the new 45Y is developed. Our response to the following RFI questions expands on how these considerations should influence the Treasury's methodology.

IRA Addition of the Clean Electricity Production Credit (§ 45Y)

(2) Section 45Y(b)(2)(C)(i) requires the Secretary to annually publish a table that sets forth the greenhouse gas emissions rates for types or categories of facilities. What should the Treasury Department and IRS consider in publishing this table, including considerations around scope and the factors?

In determining what technologies should qualify as zero emissions for the purposes of 45Y, the Treasury and the IRS should be guided by the following three principles:

1.) Measure full lifecycle emissions, including significant indirect emissions,[4] on a climate-relevant timeline, such as the Biden Administration's commitment to 2035 energy sector decarbonization.

2.) Set the baseline for measuring lifecycle emissions reductions against alternative practices that offer the greatest potential climate and justice benefits.

3.) Commit to complete transparency in data collection and publication, including the use of disaggregated data.

It is crucial that calculations of greenhouse gas emissions rates include a full accounting of lifecycle emissions. Failing to honestly account for all upstream, downstream, and significant indirect emissions associated with electricity generation will not stop the unaccounted greenhouse gasses from contributing to the climate crisis. Calculations must be conducted with an eye to how 45Y will function as a key tool in the U.S. efforts to reduce power sector carbon intensity. The science is clear that we must rapidly reduce our CO_2e emissions, so accounting of net emissions must include a climate relevant timeline. A ten year scope is most appropriate, ensuring climate relevant emissions reductions and aligning with President Biden's 2035 goal of a zero carbon power sector.

Data transparency is the key to verification and a prerequisite to instill public confidence in regulatory systems. Data should be based on actual measurements, not modeled estimates, and verified through multiple methods whenever possible (e.g., *in situ* and satellite measurements). Data should be published in completely disaggregated form: each GHG should be reported separately, and the combination into CO_2e should be based on the latest IPCC

[3] White House Environmental Justice Council Final Recommendations: Justice40 Climate and Economic Justice Screening Tool & Executive Order 12898 Revisions. May 21, 2021 https://www.epa.gov/sites/default/files/2021-05/documents/whiteh2.pdf

[4] This is required by the definition of lifecycle greenhouse gas emissions found in section 211(o)(1)(H) of the Clean Air Act (42 U.S.C. 7545(o)(1)(H))) https://uscode.house.gov/view.xhtml?req=(title:42%20section:7545%20edition:prelim)

Global Warming Potential figures. Critically, direct emissions must be reported separately from indirect emissions, which have much higher uncertainties.

Often, net emissions calculations will consider the impact of potential emissions reductions from utilizing a feedstock compared to other alternatives. This is **only** appropriate with a fair accounting against a suite of alternatives. Only comparing utilization emissions against a limited scope of alternatives has often, intentionally or not, excluded practices that offer the greatest potential climate and justice benefits. For example, comparing the net emissions of utilizing landfill methane gas only against the alternatives of flaring or burning the gas onsite will offer a skewed and incorrect perspective of the climate impact. It is more accurate to compare utilization against alternatives that include diverting organic waste from landfills (so less methane is produced in the first place). This will offer a more accurate understanding of actual lifecycle emissions and climate impact.

Applying these principles to applicant technologies is a clear path to reducing both emissions and environmental injustice. If the new system of tax credits is truly meant to be technology neutral, then many of the power sources that have historically benefitted from the PTC should be excluded:

Woody Biomass

Most biomass energy in the US is derived from wood. Wood-burning power plants emit roughly 50% more carbon dioxide than coal plants, per unit of energy generated, yet many renewable energy policies provide the same incentives for biomass energy as for clean, non-emitting sources of energy such as wind and solar. The new clean energy tax credit created in the IRA provides an opportunity to realign incentives to support those that truly offer a climate benefit rather than continuing to perversely incentivize more climate pollution with our clean energy dollars.

While many policies treat biomass energy as "carbon neutral," these are political determinations, not scientific. The EPA's Science Advisory Board, the IPCC, and numerous other scientific bodies all concur that woody biomass energy should not be assumed carbon neutral, even if the biomass is thought to be produced "sustainably."[5] The assumption behind "carbon neutrality" is that plants will eventually grow back and re-sequester the equivalent carbon that was emitted during combustion (or alternatively, that wastes would otherwise decay anyway and eventually release the equivalent amount of carbon into the atmosphere). While this theory might apply under very limited circumstances to certain short-lived crops or wastes, it is not relevant to trees due to their long carbon cycles. In a changing climate, natural

[5] Beddington, J. et al. *Letter from scientists to the EU parliament regarding forest biomass*. Available at: http://empowerplants.files.wordpress.com/2018/01/scientist-letter-on-eu-forest-biomass-796-signatories-as-of-january-16-2018.pdf (2018); IPCC Task Force on National Greenhouse Gas Inventories, Frequently Asked Questions, Q2-10 https://www.ipcc-nggip.iges.or.jp/faq/faq.html; USEPA Science Advisory Board (3/5/19), "SAB review of Framework for Assessing Biogenic CO2 Emissions from Stationary Sources (2014)," https://sab.epa.gov/ords/sab/f?p=114:12:14471656505544

reforestation is not a given; parts of the U.S. are already transitioning from forest to scrub landscape.

Even assuming the forest is allowed to regrow, it can take many decades to centuries for tree stands to grow back and re-sequester the carbon emissions that are released within minutes through combustion. Furthermore, while biomass proponents frequently claim that only residues, such as tree tops and limbs, are used for biomass energy, *even if this claim were true*, burning residues is not carbon neutral within a meaningful timeframe to mitigate climate change.[6] Laganiere, et al. (2017), found that burning any type of wood to generate electricity, including harvest residues (unless they would have been burned for disposal anyway), results in a carbon debt of over a century compared to natural gas.[7] A more appropriate comparison, in keeping with Biden's pledge of a carbon-free power sector by 2035, would be to non-emitting renewable energy.

The IRA requires the Secretary to annually publish greenhouse gas emissions rates for types or categories of facilities "taking into account lifecycle greenhouse gas emissions, as described in section 211(o)(1)(H) of the Clean Air Act." That section requires that *all* direct GHG emissions throughout the full fuel cycle, both from fossil and biogenic fuels, be counted, as well as significant indirect emissions. Given that every step in the chain of biomass energy production – from logging, fuel processing, transportation, fuel storage and handling, and ultimately combustion – results in significant greenhouse gas emissions and other pollution, net emissions from wood-burning power plants will never be equal to or less than zero within a climate relevant timeframe. Therefore, power plants that use woody biomass fuel should be categorically excluded from qualifying for the clean energy tax credit.

Solid Waste Incineration

Incinerators are the dirtiest way to either manage waste or produce electricity. A recent meta-review of electricity production externalities found that "waste-to-energy" incineration has the greatest quantified negative externalities.[8] The smokestack pollutants from incinerating solid waste can be the largest contributor of toxic air emissions in surrounding communities. For example, in Baltimore, a single incinerator accounts for over a third of the city's point source air pollution. Compared to coal plants, incinerators emit 150% more carbon dioxide per unit of energy, and significantly higher levels of co-pollutants, including heavy metals, mercury, dioxins, and other air toxics. The consequences of incinerator pollution predominantly harm

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[6] Booth, M.S. Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy. *Environmental Research Letters*, Feb. 21, 2018, at https://iopscience.iop.org/article/10.1088/1748-9326/aaac88

[7] Laganiere, J. et al. Range and uncertainties in estimating delays in greenhouse gas mitigation potential of forest bioenergy sourced from Canadian forests, *GCB Bioenergy* (2017)9, 358–369, at https://onlinelibrary.wiley.com/doi/epdf/10.1111/gcbb.12327

[8] Sovacool, B. et al, The hidden costs of energy and mobility: A global meta-analysis and research synthesis of electricity and transport externalities, *Energy Research & Social Science*, 2021, https://www.sciencedirect.com/science/article/pii/S2214629620304606

environmental justice communities: 79% of all MSW incinerators in the U.S. are located in communities of color or low-income communities.[9]

The Clean Air Act definition of lifecycle greenhouse emissions requires that the Treasury consider all direct emissions from incinerators, both the fossil and biogenic. This full accounting of emissions will clearly reveal that incinerators do not meet the requirements of 45Y. In fact, incinerators are significantly dirtier than the grid average - per unit of electricity generated, they emit 3.8 times as much GHG – 1.9 times as much fossil carbon dioxide, 15 times as much nitrogen dioxide & methane, and 66 times as much biogenic carbon emissions.[10] This disparity will only worsen as the electric grid decarbonizes.

In addition to stack emissions, the CAA requires direct and indirect emissions from all stages related to the full fuel lifecycle to be counted, "from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer." When municipal waste is the "fuel," the upstream emissions impacts are enormous. Burning these materials, rather than recovering them through reuse, recycling, or composting destroys most of their embedded energy. Recycling materials saves three to five times more energy than burning them generates, while significantly reducing air pollution. The EPA estimates that at least 75% of the materials we put into incinerators and landfills can be reused, recycled, or composted, all of which would result in significant avoided emissions. Any net greenhouse gas emission analysis of waste incineration should use these solid waste management approaches (waste prevention, reuse, recycling, and composting) as the basis for comparison.

The exclusion of waste incinerators from 45Y must also extend to other thermal technologies, such as pyrolysis and gasification of plastics and other solid wastes, which have similar or higher emissions profiles.[11] These technologies produce fuels that require further refining, and thus are even more carbon intensive than conventional incineration. The high lifecycle emissions of all forms of waste incineration should preclude these technologies from qualifying for 45Y.

Methane gas from landfills (landfill gas)

Landfill gas collection creates a perverse incentive that can increase landfill emissions rather than abating them. Moisture is the key ingredient, without which garbage does not decompose and form methane. So landfill gas generation is highest in the so-called working face, the uncovered sections of a landfill that are exposed to rain and where the incoming wastes are still fresh, with lots of moisture. But gas collection requires that landfill sections be covered, exerting negative pressure through perforated pipes drilled vertically into the waste. When the cell is uncovered, oxygen from the surface is also drawn into the pipes, creating a flammable mixture

[9] Baptista, A. et al (2019). U.S. Municipal Solid Waste Incinerators: An Industry in Decline (Tishman Environment and Design Center, The New School). https://www.no-burn.org/wp-content/uploads/2021/11/CR_GaiaReportFinal_05.21.pdf
[10] Tangri, N. (2021). https://eartharxiv.org/repository/view/2050/
[11] Rollinson, A., Oladejo, J. (2020). Chemical Recycling: Status, Sustainability, and Environmental Impacts. Global Alliance for Incinerator Alternatives. doi:10.46556/ONLS4535

of methane and oxygen. Taken together, this creates a fatal paradox: gas collection systems only really work well in sections of the landfill when little gas is generated, and do not function properly where most of the gas is released. This paradox is why the IPCC concluded that landfill gas capture rates are as low as 20%.[12]

Landfill operations that minimize both GHG emissions and the risk of pollutants spreading into nearby communities prioritize dryness, which results in uneconomically low energy value landfill gas. So landfill operators are incentivized to abandon best practices and delay covering landfills for ten or more years, increasing the moisture needed for higher concentrations of commercially usable methane gas. Some landfill operators recirculate leachate or add water to the landfill to increase methane generation. These tactics increase the economics of their operation, but rapidly undermine any climate benefit of the captured landfill gas, as the uncovered landfills can emit more CO_2e than the landfill gas displaces. Recent advances in airborne optical scanning have upended the landfill industry's claims of high landfill gas collection efficiencies and offsets from utilizing landfill gas for energy.[13]

Even if landfill gas collection had higher collection efficiencies, there is an inherent incompatibility between a climate response of monetizing landfill gas versus actually reducing landfill emissions by decreasing the amount of organic waste that ends up in the landfill.[14] The Secretary's analysis of facilities combusting landfill gas should include the emissions resulting from landfill operations maximizing high energy value landfill gas versus alternative emissions reduction tactics, including programs to reduce food waste; organic waste diversion programs, e.g., to compost; biostabilization of residual waste before landfilling; and biocover of landfills.[15] Organic waste diversion to compost alone reduces methane emissions by 78% on average; when combined with the other measures mentioned, reduction averages 95%, far greater than landfill gas collection systems.[16]

Methane gas from livestock manure digesters (factory farm gas)

Factory farm gas is produced by collecting manure in football field sized lagoons. The economies of scale required for this process significantly favor large-scale industrial animal production via concentrated animal feeding operations (CAFOs) over more environmentally friendly agriculture practices. This creates a market distortion that incentivizes livestock owners to increase herd size and density, concentrating and increasing methane emissions (along with co-pollutants from factory farms) rather than encouraging regenerative practices that could

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[12] Peter Anderson, "Some Essential Facts about Landfill Gas Emissions" https://nrccongress.org/wp-content/uploads/2021/12/ART-LFG-MSW-Mgt-Reply19-2.pdf
[13] Riley Duren et al., California's methane super-emitters, Nature (November 6, 2019) https://www.nature.com/articles/s41586-019-1720-3
[14] Sierra Club https://www.sierraclub.org/sites/www.sierraclub.org/files/landfill-gas-report.pdf
[15] GAIA. Clean Development Mechanism Funding for Waste Incineration: Financing the demise of waste worker livelihood, community health, and climate. no-burn.org/wp-content/uploads/Clean-Development-Mechanism-Flyer.pdf
[16] Changing Markets Foundation, et al. Methane Matters: A comprehensive approach to methane mitigation (2022) http://changingmarkets.org/wp-content/uploads/2022/03/CM-WEB-FINAL-REPORT-METHANE-MATTERS-1-1.pdf

actually decrease the overall climate impact of animal agriculture. The lack of any meaningful federal regulation of CAFO emissions has compounded this issue, as there is little to no accountability for CAFO operators making bold claims of zero or net negative emissions from factory farm biogas. In reality, the perverse incentive to increase methane biogas emissions for capture and sale could actually increase the climate impact of livestock.

Factory farm gas has gained eligibility for significant state and federal 'clean' fuel incentives due in part to the incorrect classification as a byproduct rather than a coproduct, which allows the industry to shirk a full and honest accounting of life cycle emissions. For example, California's application of GREET (CA-GREET3.0) to measure the carbon intensity of biomethane from animal manure considers the gas a byproduct, which removes much of its lifecycle emissions – such as producing animal feed, enteric fermentation, trucking livestock, fuel combustion at the livestock facility, emissions from digestate – from the scope of carbon accounting. This has allowed the industry to gain eligibility for incentives that far outstrip any purported climate benefit.

The Secretary must evaluate factory farm gas as a coproduct. It is crucial that analysis covers the full lifecycle emissions, including the leakage rate of anaerobic digesters for both methane and nitrous oxide, the emissions from producing animal feed and the animals themselves, and the indirect emissions anticipated from incentivizing increased herd sizes by creating a profit stream from animal waste for CAFO operators, when the Secretary publishes the greenhouse gas emissions rates for electricity produced from combusting factory farm gas.

(4) Section 45Y(b)(2)(C)(ii) provides that, in the case of any facility for which an emissions rate has not been established by the Secretary, a taxpayer that owns such facility may file a petition with the Secretary for a determination of the emissions rate with respect to such facility. What procedures should be provided by the Treasury Department and the IRS for taxpayers to file such a petition? What should the Secretary consider when making such determinations?

The Secretary should rely on the same principles for evaluating individual petitioners as they should for maintaining the annually updated facility table–that is, consideration of emissions on a climate-relevant timeline with reductions measured against alternative practices offering the greatest potential climate benefits.

If this provision is not carefully implemented, individual petitions could emerge as a major loophole, allowing standalone facilities to skirt unfavorable determinations in the published table with pleas of special circumstances. As a general rule, the Secretary should avoid considering individual petitions–particularly if the applications are based on notoriously unreliable third party "sustainable forestry" certifications or other unverified (and likely unverifiable) claims about the carbon intensity of feedstocks.[17]

[17] Sierra Club, The SFI 2022 Forest Certification Standards Select Issues Review (Dec. 2021), at https://www.sierraclub.org/sites/www.sierraclub.org/files/SFI%202022%20Standards%20Analysis.pdf

The Secretary has all of the information they need to disallow the false solutions that have traditionally benefited from the PTC simply based on existing evidence. Entertaining individual petition applications based on claims about feedstock carbon intensity would open Pandora's box. The result would be an unmanageable administrative burden for the Treasury and the IRS, which would either be forced to verify these claims directly or else parse the claims of individual applicants and all manner of third-party certifiers. This creates considerable potential for abuse by operators seeking to circumvent the basic realities of stack emissions and climate relevant lifecycle carbon accounting.

Conclusion:

The Biden Administration has acknowledged that the U.S. response to the climate crisis must not perpetuate its ongoing legacy of environmental racism. Moving forward, 45Y will be an important piece of US climate incentives, so it is crucial for this PTC to be aligned with the whole-of-government approach required by Justice40. Although the eligibility criteria for 45Y is limited to CO_2e, there are significant pollution and sustainability issues with the combustion based energies discussed above.

The siting of woody biomass processing and power plants, MSW incineration, landfilling, and CAFOs has targeted low wealth and BIPOC (Black, Indigenous, and people of color) communities. As a result, these communities face disproportionate health and safety risks. Woody biomass facilities release nitrogen oxides, volatile organic compounds, heavy metals, and particulate matter into surrounding communities, which are ozone and PM2.5 precursors[18] that increase risks of asthma, heart attacks, and stroke.[19] Because of these impacts, including higher risk of Covid-19 mortality in communities with elevated PM 2.5 levels, Massachusetts recently revoked the permit for a biomass power plant proposed in an environmental justice community in Springfield, Mass.[20] Landfills contribute to cycles of economic disparity[21] and leachate can carry nitrate, phosphate, ammonium, and oxides into groundwater. MSW incinerators increase health risks in surrounding communities, emitting high levels of pollutants known to significantly increase the lifetime risk of chronic respiratory disease, heart disease, and stroke,[22] and research indicates that community respiratory problems near the Hartford, CT

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[18] Jonathan J Buonocore, Parichehr Salimifard, Drew R Michanowicz, and Joseph G Allen, "A decade of the U.S. energy mix transitioning away from coal: historical reconstruction of the reductions in the public health burden of energy," 16 Environmental Research Letters (2021). https://iopscience.iop.org/article/10.1088/1748-9326/abe74c

[19] Booth, M.S. Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal, (2014), https://www.pfpi.net/wp-content/uploads/2014/04/PFPI-Biomass-is-the-New-Coal-April-2-2014.pdf

[20] MA Dept. of Envl. Protection. Letter to Victor Gatto, Palmer Renewable Energy, LLC, April 2, 2021, at https://www.pfpi.net/wp-content/uploads/2021/04/Palmer-Renewables-Revocation-Final-1.pdf

[21] Maheshi Danthurebandara, Stevan Passel, Dirk Nelen, Yves Tielemans, and Karel Van Acke, "Environmental and Socioeconomic Impacts of Landfills", Linnaeus ECO-TECH (2013). https://www.researchgate.net/publication/278738702_Environmental_and_socio-economic_impacts_of_landfills

[22] Health Research Board, et al., Health and Environmental Effects of Landfilling and Incineration of Waste – A Literature Review. 2003, Dublin: Health Research Board. https://arrow.tudublin.ie/cgi/viewcontent.cgi?article=1002&context=schfsehrep

incinerator are correlated to the sulfur dioxide emissions from the Hartford incinerator.[23] CAFOs emit ammonia, hydrogen sulfide, and volatile organic compounds into surrounding communities, causing higher cases and severity of respiratory illnesses, as well as nausea, headaches, and other health conditions.[24] Merely living in proximity to CAFOs lowers life expectancy.[25]

The historic role of federal policy in subsidizing these dirty energies in EJ communities, through PTC or other incentives, elevates the importance of meaningfully centering Justice40 in the design and implementation of 45Y. A well designed methodology for emissions rate calculations, that incorporates our above recommendations, will not only have a huge impact on the U.S. climate goals, but also improve the alignment of tax policy with Justice40.

Sincerely,

Friends of the Earth

Global Alliance for Incinerator Alternatives

Partnership for Policy Integrity

Center for Biological Diversity

Center for a Competitive Waste Industry

Food & Water Watch

[23] Stewart, J, Mitchell, M, et all. Environmental Justice and Health Effects of Urban Air Pollution February (2015). Journal of the National Medical Association 107(1):50-58. DOI:10.1016/S0027-9684(15)30009-2

[24] N. Domingo et al., Air Quality-Related Health Damages of Food, 118 PNAS e2013637118, 1 (2021), https://www.pnas.org/content/pnas/118/20/e2013637118.full.pdf

[25] Julia Kravchenko, Sung Han Rhew, Igor Akushevich, Pankaj Agarwal, and H Kim Lyerly, “Mortality and Health Outcomes in North Carolina Communities Located in Close Proximity to Hog Concentrated Animal Feeding Operations”, 79 North Carolina Medical Journal 278 (2018). https://www.ncmedicaljournal.com/content/ncm/79/5/278.full.pdf