Aviva Aron-Dine, Acting Assistant Secretary for Tax Policy
Department of Treasury
1500 Pennsylvania Avenue
NW Washington DC, 20005

Re: REG-119283-23, Section 45Y Clean Electricity Production Credit and Section 48E Clean Electricity Investment Credit

Dear Acting Assistant Secretary for Tax Policy, Aviva Aron-Dine,

The 45Y production tax credit (PTC) and the 48E investment tax credit (ITC) for clean electricity are perhaps the most crucial provisions of the entire Inflation Reduction Act (IRA) for decarbonizing the power sector. But the success or failure of these incentives hinges entirely upon responsible implementation. Simply by upholding its statutory duty to accurately measure lifecycle emissions, the Treasury Department has an opportunity to both protect communities and fight the climate crisis.

For decades, heavily polluting practices like burning wood, trash, and methane biogas have been subsidized through tax credits, including the expiring renewable electricity tax credits that will be replaced by 45Y and 48E. These are some of the most harmful fuels in our energy mix for both our communities and climate. The responsible implementation of 45Y and 48E is an opportunity to correct past wrongs and end taxpayer support for these harmful technologies. We outline below the greatest climate and justice risks in Treasury's implementation, as well as recommendations for responsible and accurate lifecycle emission analysis.

Climate and Justice Risks for 45Y and 48E:

Woody Biomass

Wood-burning power plants emit roughly 50% more carbon dioxide than coal plants, per unit of energy generated. While many policies inaccurately treat woody 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."[1] 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

[1] 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; US EPA 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

short-lived crops or wastes, it is not relevant to trees due to their long carbon cycles. In a changing climate, natural 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.[2] Laganiere, et al. (2017), found that burning any type of wood to generate electricity, including most harvest residues, results in a carbon debt of over a century compared to natural gas.[3]

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.[4] 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

[2] 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

[3] 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

[4] 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.[5]

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 and 48E. 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.[6] This disparity will only worsen as the electric grid decarbonizes.

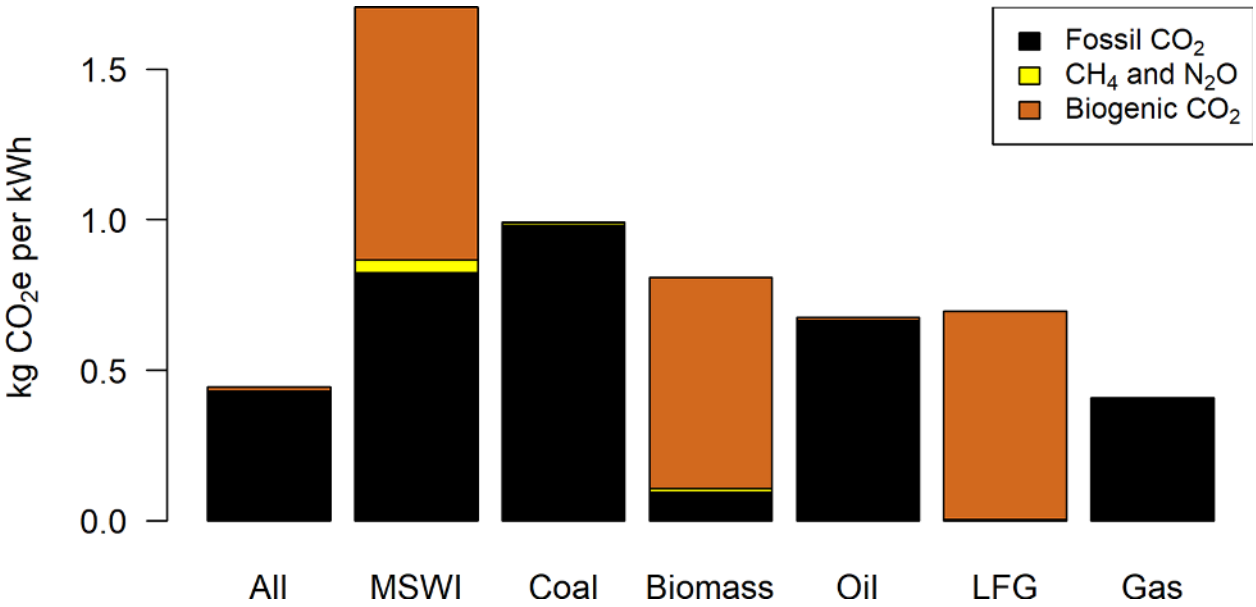

Figure 1. Generation-weighted mean national GHG emissions intensity by major fuel type for electricity. ("MSWI" is municipal solid waste incineration, "LFG" is landfill gas, and "Gas" is natural gas.)[7]

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

[5] 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

[6] Tangri, N. (2021). https://eartharxiv.org/repository/view/2050/

[7] Tangri N (2023) Waste incinerators undermine clean energy goals. PLOS Clim 2(6): e0000100. https://doi.org/10.1371/journal.pclm.0000100

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 and 48E must also extend to other new emerging thermal technologies, such as chemical recycling, pyrolysis and gasification of plastics, and other solid wastes, which have similar or higher emissions profiles.[8] 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 and 48E.

Methane gas from landfills (landfill gas)

Landfill gas collection creates a perverse incentive that can increase landfill emissions rather than addressing 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 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%.[9]

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.[10]

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.[11] The

[8] Rollinson, A., Oladejo, J. (2020). Chemical Recycling: Status, Sustainability, and Environmental Impacts. Global Alliance for Incinerator Alternatives. doi:10.46556/ONLS4535
[9] Peter Anderson, "Some Essential Facts about Landfill Gas Emissions" https://nrccongress.org/wp-content/uploads/2021/12/ART-LFG-MSW-Mgt-Reply19-2.pdf
[10] Riley Duren et al., California's methane super-emitters, Nature (November 6, 2019) https://www.nature.com/articles/s41586-019-1720-3
[11] Sierra Club https://www.sierraclub.org/sites/www.sierraclub.org/files/landfill-gas-report.pdf

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.[12] 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.[13]

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 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.

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[12] 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

[13] 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

Lifecycle Analysis Assumptions:

Treasury asked many important questions about how to evaluate the lifecycle emissions, including about how to consider counterfactual scenarios and “alternatives fates”. It is ***only*** appropriate to make these comparisons with a fair accounting against a suite of alternative best practices.

Solely 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, which reduces methane emissions from being produced in the first place by 78%.[14] Ensuring that Treasury studies a suite of ‘alternative fates’ will offer a more accurate understanding of actual lifecycle emissions and climate impact.

Book-and-Claim Poison Pill:

One of the most alarming prospects in Treasury’s notice of proposed rulemaking is the potential introduction of offsets through so-called book-and-claim accounting. This would allow new fossil gas power plants to qualify for tax incentives by purchasing tradable credits from methane production at landfills and factory farms. If this methane is granted the same outrageously negative carbon values that they garner under programs like the California Low Carbon Fuel Standard, then gas power producers would only have to purchase a small amount of credits to qualify for this incentive. This would turn the high bar of zero emissions into a minor inconvenience for polluters.

The inclusion of book-and-claim cuts against both the plain meaning of the IRA and its legislative intent. The purpose of Sections 45Y and 48E is to aid in the deployment of "qualified facilities" that can demonstrate zero emissions--not to incentivize the deployment of existing fossil fuel technologies that can demonstrate, often dubiously, emissions reductions elsewhere. Treasury acknowledges the lack of a reliable tracking system for these offset credits, though they attempt to propose some mild guardrails like deliverability, credit retirement, and first productive use requirements. But ultimately, there is no way to reconcile a standard for truly zero emission energy sources with book-and-claim accounting.

[14] 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

The proposed rule appears to differentiate between offsets in general and book-and-claim accounting for avoided methane.[15] This is a distinction without a difference. A smaller universe of avoided methane offsets from factory farms and other sources is a system of offsets nonetheless. The White House Environmental Justice Advisory Council (WHEJEC) specifically identified "carbon markets, including cap-and-trade" as a harmful approach for communities. The Treasury should heed this advice by excluding book-and-claim from its final rule.

Even accepting the basic premise of book-and-claim, its eligibility still poses a longer-term risk of emissions increases that Treasury must consider. Suppose a new methane gas project becomes eligible as a "qualified facility" under 45Y and monetizes the credit by purchasing biogas offsets. What will become of this facility after the ten-year span of the credit? It will be just another methane gas project, without any incentive to even buy offsets, potentially in operation for an additional 20 or 30 years. If this project would never have been constructed without subsidies, then an entire generation of emissions will have been locked-in inadvertently. This would be a perverse unintended consequence for climate legislation.

Conclusion:

Treasury has both the opportunity and responsibility to ensure that 45Y and 48E do not entrench a legacy of subsidizing toxic energy that worsens the climate crisis and harms communities. A well designed methodology for emissions rate calculations, that incorporates our above recommendations, have a huge impact on the U.S. climate goals, in addition to improving the alignment of the Inflation Reduction Act with Justice40.

The Biden Administration has acknowledged that the U.S. response to the climate crisis must not perpetuate its ongoing legacy of environmental racism. Although the eligibility criteria for 45Y and 48E are limited to CO2e, there are significant pollution and sustainability issues with the combustion based energies discussed above. Subsidizing these harmful energies with tax credits has exacerbated their pollution issues by creating a perverse incentive to concentrate and commodify pollution. More sustainable practices that would have reduced emissions at the source are effectively penalized.

Treasury's role as an arbiter of these credits requires it to ensure a rigorous lifecycle analysis that prevents these credits from becoming a harmful market distortion. This process will rightfully exclude eligibility of woody biomass, methane biogas, and trash incineration from the new tax credit.

Respectfully,

[15] 89 FR 47833 "*Offsets and offsetting activities that are unrelated to the production of electricity by the C&G Facility, including the production and distribution of any input fuel, may not be taken into account in the LCA"*

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350 Eugene
American Jewish World Service
Battle Creek Alliance
Bee Friendly Williamstown
Beyond Plastics Greater Boston
Beyond Plastics Greater Mankato Area
Beyond Plastics Onondaga Cortland Counties
Beyond Plastics Sullivan County NY
California Communities Against Toxics

Campaign for Renewable Energy
CASA
Center for Biological Diversity
Chess Angels Promotions
Clean Air Action Network of Glens Falls
Climate action Now Western Mass
Climate Communications Coalition
Climate Hawks Vote
Coastal Plain Conservation Group
Concerned Citizens of Franklin County (MA)

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Global Alliance for Incinerator Alternatives (GAIA)
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Pioneer Valley Project
Pipe Line Awareness Network for the Northeast, Inc.
pivot point
Plastic Ocean Project
Protect Our Woods

Rachel Carson Council
RESTORE: The North Woods
River Valley Organizing

Robeson County NC Cooperative for Sustainable Development
Save Massachusetts Forests
Science and Environmental Health Network
Sierra Club
SOBE Concerned Citizens
Sonoma County Climate Activist Network (SoCoCAN!)
SOS Save Our Sumter

Southern Forests Conservation Coalition
Springfield Climate Justice Coalition
Standing Trees
StopVTBiomass
The Enviro Show
The Moore Charitable Foundation
The Rachel Carson Council
The Story of Stuff Project
Tishman Environment and Design Center at The New School
Turtle Island Restoration Network

Unitarian Universalist Society of Greater Springfield
Unitarian Universalists for a Just Economic Community
Unite North Metro Denver
Upper Valley Affinity Group (Vermont)
US Environmental Watch
Valley Improvement Projects
Vermont Peace/Anti-war Coalition
Vermonters for a Clean Environment
Wendell State Forest Alliance
West Virginia Highlands Conservancy

Women's Earth and Climate Action Network
Zero Waste BC
Zero Waste Ithaca