To: **Secretary Jennifer M. Granholm** and **Administrator Michael S Regan**
U.S. Department of Energy / **Environmental Protection Agency**

Re: **U.S. Department of Energy Clean Hydrogen Production Standard (CHPS) Draft Guidance Developed to meet the requirements of the Bipartisan Infrastructure Law (BIL), Section 40315.**

Dear Secretary Jennifer Granholm and Administrator Michael Regan;

I am writing you in response to your request for comment regarding the Clean Hydrogen Production Standard Draft Guidance developed by the Department of Energy (DOE) in response to the Bipartisan Infrastructure Law (BIL), Section 40315 under SEC. 822. Clean Hydrogen Production Qualifications:

> "(a) IN GENERAL.—Not later than 180 days after the date of enactment of the Infrastructure Investment and Jobs Act, **the Secretary, in consultation with the Administrator of the Environmental Protection Agency** and after taking into account input from industry and other stakeholders, as determined by the Secretary, **shall develop an initial standard for the carbon intensity of clean hydrogen production that shall apply to activities carried out under this title**."

As the initial standard, I urge both Secretary Granholm and Administrator Regan to create a standard that differentiates and separates true clean hydrogen production from all other production processes that require legacy fossil fuels and or nuclear power. This is the chance for the DOE and EPA to establish a framework that is based on science, not on current fossil fuel and nuclear power industry pressures and false datapoints. Please do not create another label that fossil fuel industries to use and claim such as clean or even qualified clean.

Feedback areas

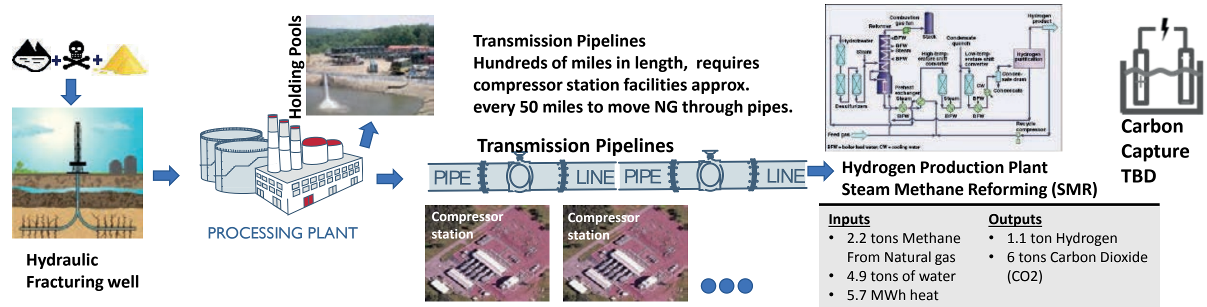
1) Data and Values for Carbon Intensity

a) Many parameters that can influence the lifecycle emissions of hydrogen production may vary in real-world deployments. Assumptions that were made regarding key parameters with high variability have been described in footnotes in this document and are also itemized in the attached spreadsheet "Hydrogen Production Pathway Assumptions." Given your experience, please use the attached spreadsheet to provide your estimates for values these parameters could achieve in the next 5-10 years, along with justification. **Attached Spreadsheet:** https://www.hydrogen.energy.gov/docs/chps-hydrogen-production-pathway-assumptions.xlsx

Missing Parameters

i. Full methane emissions of natural gas supply for both feedstock and energy provisioning for Hydrogen Production using Steam Methane Reforming (SMR).

Natural Gas Supply Chain for Feedstock & Energy for Hydrogen Production Plant (SMR)



Methane Emissions	Hydraulic Fracturing Wells	NG Proc Plant	Holding Pools	Compressor Station 1	Compressor Station 2	Compressor Station 3	Compressor Station ..	Compressor Station N	H2 Prod Plant
Venting	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Fugitive	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Combustion	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

ii. Assumptions regarding Carbon Capture and timeline are not realistic and ignore the real threats that the carbon capture and depositing into the ground pose. No long-term damage impact analysis has been performed and assumes carbon dioxide will remain in the ground without contaminating well water or decimating soil microbes.

iii. Attached spreadsheet completely disregards substantial Hazardous Air Pollutants (HAPs) emissions of NH3, 1,3-Butadiene, Acetaldehyde, Acrolein, Benzene, Ethylbenzene, Formaldehyde, Naphthalene, PAH, Propylene Oxide, Toluene, Xylenes, at each and every upstream facility starting at the hydraulic fracturing well all the way to the Hydrogen Production Plant. All of these emissions are toxic with several being recognized by the EPA as carcinogenic.

iv. Experience from natural gas industry companies is to underreport the emissions from the few facilities required to provide annual estimate updates. See attached EPA / NJDEP Comment analysis regarding substantial impossible underreporting values submitted by Tennessee Gas Pipeline for its Compressor Station 325 for the past 10 years.

v. No real values for full carbon intensity in supply chain for feedstock and energy as well as at the hydrogen production plant. Currently, no full carbon emissions exist, EPA only receives some methane and carbon dioxide emissions from some of the facilities in the supply chain. No assumptions or estimates can bridge the gulf of nonexistent data missing in the natural gas supply chain. Additionally, using CO2e as a method of combining methane with carbon dioxide emissions is flawed since it is based off of the 2009 Fourth Assessment Reporting (AR4) by the Intergovernmental Panel on Climate Change (IPCC) that used the carbon dioxide multiplier determined for methane 100 years from the actual emission time.

b) Lifecycle analysis to develop the targets in this draft CHPS were developed using GREET. GREET contains default estimates of carbon intensity for parameters that are not likely to vary widely by deployments in the same region of the country (e.g., carbon intensity of regional grids, net emissions for biomass growth and production, avoided emissions from the use of waste-stream materials). In your experience, how accurate are these estimates, what are other reasonable values for these estimates and what is your justification, and/or what are the uncertainty ranges associated with these estimates?

i. GREET Estimates as detailed by https://www.energy.gov/sites/default/files/2022-06/hfto-june-h2iqhour-2022-argonne.pdf entirely depend on the credibility of the companies providing estimate updates to EPA and State department of environmental protection. In research hundreds of natural gas expansion projects going back to the 1990s and contrasting company provided specifications to FERC (Federal Energy Regulatory Commission) with actual emissions updates to EPA, there is substantial disparity.

ii. EPA requires various HAPs reported that are not consistent with each state and there currently is no auditing of all facilities from well to gate for HAPs and GHG emissions. Where are the HAPs estimates in the GREET model for well to gate production?

iii. Even without accurate emissions and the estimates being underreported thereby rendering GREET pathways lowballed in emissions, the GREET model demonstrates that renewable local hydrogen production is clean hydrogen without carbon (GHG) intensity production. This should be a striking indicator that DOE pushing massive hydrogen infrastructure tied to the natural gas infrastructure is only going to substantially increase methane emissions and rapidly increase climate changes impacts to the United States over the next 10 years until the US finally figures out that large massive infrastructure must be minimized to the greatest extent by utilizing local distributed renewable powered hydrogen production. This can only be done if pursued at as many candidate homes and businesses. Renewable Hydrogen can be produced anywhere in the US, unlike the fossil fuels and nuclear 19th century energy models.

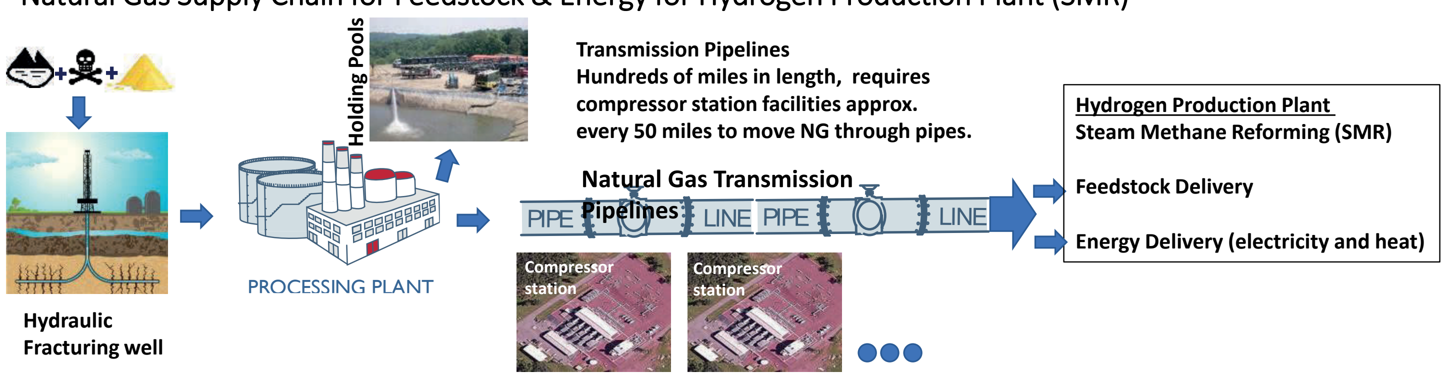
c) Are any key emission sources missing from Figure 1? If so, what are those sources? What are the carbon intensities for those sources? Please provide any available data, uncertainty estimates, and how data/measurements were taken or calculated.

i. Yes, there are key emission sources missing from figure 1. What about the holding pools where the hydraulic fracture shale waste is disposed? Not all methane nor other chemical emissions are removed and holding pools are not monitored for HAPs or GHG emissions.

ii. In states such as New Jersey, 95% of all electricity is produced by natural gas. These power plants are fed by the natural gas supply chain, from hydraulic fracturing wells to the processing plant, to the compressor stations along the transmission pipeline to the power plant end use target. Where are all of the compressor stations and the venting, combustion and fugitive emissions of methane, carbon dioxide and HAPs? Almost all stationary facilities in the natural gas supply chain utilize venting often to enable the flow of natural gas. Additionally, all combustion natural gas fired turbines used at compressor stations, wells and for power all emit unburned methane, carbon dioxide and HAPs in the exhaust.

iii. When looking at feedstock and energy (electricity), both are currently mostly provided by fossil fuels and to a lesser degree nuclear. This means the supply chain for both the feedstock and the energy must be fully reviewed as upstream to feedstock and upstream to energy provisioning.

Natural Gas Supply Chain for Feedstock & Energy for Hydrogen Production Plant (SMR)



iv. H_2 production is missing heat energy, which mostly is enabled through combustion of natural gas.
v. The only carbon capture proposed so far is the output from Steam Methane Reforming (SMR), but this isn't in place and does not reduce or minimize the methane emissions for enabling SMR. The White House Council on Environmental Quality CCUS Proposal includes building 77,000 miles of carbon dioxide pipelines supposedly to connect up all carbon dioxide outputs, even including from turbine exhaust. None of that exists at this point in time. No industrial specialist is going to provide DOE or EPA with any reliable data, especially after seeing how these specialists underreport and under estimate methane and HAPs emissions for every stationary facility. It doesn't exist and asking the energy industry for their experience is similar to asking the tobacco industry to detail how harmful tobacco is to a human's health. Similar to the tobacco industry, the energy industry has known for decades that their facilities cause climate change, substantial health and environmental impact; and emit thousands of tons of methane every year. Yet the energy industry has presented lowballed estimates, whitewashed health, environmental and warming potential impacts to the EPA, EIS and DOE. It is time for these agencies to start assessing, auditing and evaluating actual emissions nationwide and not rely on the companies profiting from this industry.

d) Mitigating emissions downstream of the site of hydrogen production will require close monitoring of potential CO_2 leakage. What are best practices and technological gaps associated with long-term monitoring of CO_2 emissions from pipelines and storage facilities? What are the economic impacts of closer monitoring?

i. Best practice is to mitigate the need for carbon capture from hydrogen production. There are currently three companies in the United States that provide turnkey safe hydrogen generation and storage for homes and businesses. Most of the United States is urban to rural areas with a number highly concentrated metropolis city area. Rural and urban areas can be built out so that all homes and business that have the capacity for a hydrogen production and storage are built over the next 5 years will directly reduce natural gas consumption while providing hydrogen fueling. Additionally, all gas stations are subsidized to build out as much renewable energy (wind, solar, geothermal) along with hydrogen production and storage, it will enable rapid shift to hydrogen fuel cell cars, SUVs and trucks.
ii. The current implementation of natural gas transmission pipelines demonstrates how flawed it is to ask the industry for best practices and mitigations. With all electric stationary facilities source emissions of methane and HAPs not even being tracked, yet many emitting more than 100 tons of methane every year and hundreds of pounds of benzine every year. Yet those facilities are not even in EPA's databases. They don't exist, yet even the small electric compressor stations smell like gas leaks 2,000 feet away on a winter morning at 7am (Example: Texas Eastern Transmission Corp.'s Freehold Compressor station located at 110 Weston Rd, Somerset, NJ 08873 is a 5,000hp electric compressor that emits methane and HAPs mixed with mercaptan smell like an intense gas leak at the driveway of the Franklin High School, 2000, feet away).
iii. There needs to be complete auditing of actual capacity transmission from start of pipeline to end output of pipeline that can be viewed independently by EPA for monitoring. Without this type of oversight, no data received from energy company can be trusted. There are many technological gaps since carbon capture is new and untested.

e) Atmospheric modeling simulations have estimated hydrogen's indirect climate warming impact (for example, see Paulot 2021). The estimating methods used are still in development, and efforts to improve data collection and better characterize leaks, releases, and mitigation options are ongoing. What types of data, modeling or verification methods could be employed to improve effective management of this indirect impact?

i. This is a concern and I wish that DOE would review this area more thoroughly. Hydrogen tends to rise quickly and even escape the earth's atmosphere. In contrast to methane warming potential and atmospheric feedback look as detailed in the following report indicates that Methane feedback is of substantial concern and "turbo charges" methane warming potential. https://royalsocietypublishing.org/doi/pdf/10.1098/rsta.2021.0104 "Methane emissions induce an atmospheric feedback by decreasing the hydroxyl concentration, thereby increasing methane's lifetime. The strength of this feedback factor, approximately 1.3–1.4, causes the lifetime of a marginal emission, known as the perturbation lifetime, to be significantly higher than the lifetime of methane already in the atmosphere [7,8]."

f) How should the lifecycle standard within the CHPS be adapted to accommodate systems that utilize CO2, such as synthetic fuels or other uses?

2) Methodology

a) The IPHE HPTF Working Paper (https://www.iphe.net/iphe-working-papermethodology-doc-oct-2021) identifies various generally accepted ISO frameworks for LCA (14067, 14040, 14044, 14064, and 14064) and recommends inclusion of Scope 1, Scope 2 and partial Scope 3 emissions for GHG accounting of lifecycle emissions. What are the benefits and drawbacks to using these recommended frameworks in support of the CHPS? What other frameworks or accounting methods may prove useful?

i. https://www.iphe.net/_files/ugd/45185a_ef588ba32fc54e0eb57b0b7444cfa5f9.pdf appears to be theoretical and follows the same flaws that DOE proposed CHPS has. It seems as though industry is pushing US Agencies and other country agencies to adopt standards that obscure the real impacts and emissions from large scale hydrogen production utilizing fossil fuels and nuclear energy. The industry has convinced agencies that the efficiency of small-scale localized hydrogen production is too costly and too inefficient to build out. Yet, if the full supply chain for feedstock and energy required for massive scale hydrogen production is fully assessed (including common venting in the natural gas well to transmission facilities), the efficiency of these large-scale decrease to be substantially less than small scall distributed and localized hydrogen production.

ii. Venting in the natural gas supply chain at every facility is common and substantial emissions each year, yet I don't see that detail in any of the frameworks and models. Tennessee Gas Pipeline Compressor Station 327 and Williams Transcontinental Compressor station 201 are two new electric compressor stations proposed in New Jersey where New Jersey and EPA have not bothered to include the methane emissions in the greenhouse gas inventory database. Yet both will emit more than 100 tons of methane every year. How many electric compressor stations exist in the natural gas supply chain currently and how many tons of methane and HAPs are emitted each year from those facilities associated with venting and fugitives? No agency can answer because no agency has the data. This completely throws off all existing data models coupled with the venting of facilities that are in the GHG database, but not including the venting emissions.

b) Use of some biogenic resources in hydrogen production, including waste products that would otherwise have been disposed of (e.g., municipal solid waste, animal waste), may under certain circumstances be calculated as having net zero or negative CO2 emissions, especially given scenarios wherein biogenic waste stream-derived materials and/or processes would have likely resulted in large GHG emissions if not used for hydrogen production. What frameworks, analytic tools, or data sources can be used to quantify emissions and sequestration associated with these resources in a way that is consistent with the lifecycle definition in the IRA?

i. The only way to effectively have a net zero of waste methane emissions is to utilize methane fuel cell. Combustion is not the answer.

c) How should GHG emissions be allocated to co-products from the hydrogen production process? For example, if a hydrogen producer valorizes steam, electricity, elemental carbon, or oxygen co-produced alongside hydrogen, how should emissions be allocated to the co-products (e.g., system expansion, energy-based approach, mass-based approach), and what is the basis for your recommendation?

d) How should GHG emissions be allocated to hydrogen that is a by-product, such as in chlor-alkali production, petrochemical cracking, or other industrial processes? How is byproduct hydrogen from these processes typically handled (e.g., venting, flaring, burning onsite for heat and power)?

3) Implementation

a) How should the GHG emissions of hydrogen commercial-scale deployments be verified in practice? What data and/or analysis tools should be used to assess whether a deployment demonstrably aids achievement of the CHPS?

   i. Use the EPA OGI (Optical Gas Imaging) standards for measuring actual emissions from locations.
   ii. Utilize satellite methane emissions monitoring to rapidly identify concentration points.
   iii. Require energy companies to full account for total capacity reporting of natural gas flowing through the pipelines and distribution end point capacities. Do not allow just estimate emissions from energy companies anymore. We need solid cross referenceable methods to fully audit methane and carbon dioxide emissions individually.

b) DOE-funded analyses routinely estimate regional fugitive emission rates from natural gas recovery and delivery. However, to utilize regional data, stakeholders would need to know the source of natural gas (i.e., region of the country) being used for each specific commercial-scale deployment. How can developers access information regarding the sources of natural gas being utilized in their deployments, to ascertain fugitive emission rates specific to their commercial-scale deployment?

   i. The regional abstraction of GHG emissions from energy company estimates has to stop immediately. Methane has overtaken carbon dioxide in warming potential because 1: Emissions are substantially understated; and 2. Localized immediate and short term warming potentials are completely ignored (since the US only reviews 100 year old methane warming potential as a reference); 3. As state above, methane has an atmospheric feedback loop that we have no idea to what extent that feedback has exacerbated the warming potential of current methane concentrations in the US; 4. NOAA atmospheric readings demonstrate rapid increase in methane concentrations in the US (not related to cattle) that completely contradicts the EPA methane emissions estimates that erroneously depict methane reducing each year; and 5. Most US Agencies review methane using the CO2e 100-year Model combining methane with carbon dioxide which completely eliminates the ability to effectively monitor, model and audit methane emissions and disables any true warming potential increase caused directly by increased methane concentrations.
   ii. I encourage DOE in collaboration with the EPA to create a warming potential division that focuses solely on methane emissions, concentrations and warming potentials across the United States. We can't effectively fight warming and climate change unless we are targeting true measurements of both carbon dioxide and methane separately.

c) Should renewable energy credits, power purchase agreements, or other market structures be allowable in characterizing the intensity of electricity emissions for hydrogen production? Should any requirements be placed on these instruments if they are allowed to be accounted for as a source of clean electricity (e.g. restrictions on time of generation, time of use, or regional considerations)? What are the pros and cons of allowing different schemes? How should these instruments be structured (e.g. time of generation, time of use, or regional considerations) if they are allowed for use?

i. The emphasis of energy credits should be 80% focused on distributed localized hydrogen production from renewable energies.

ii. The DOE and EPA should target large subsidies for enabling Homes, businesses and gas stations to rapidly shift to renewable sources and hydrogen storage. An average home costs $90,000 and a gas station would cost close to $500,000. On startup of systems, they should be enabled to initially utilize the grid to fill the hydrogen and enable the renewable sources to replenish the hydrogen storage. The storage can also be apportioned for a percentage allocated as grid storage, which will directly improve grid resilience.

iii. New Hampshire is one of many states that is behind other states in terms of deploying clean hydrogen and renewable energy. Please consider using the IRA funds to rapidly build out states like New Hampshire that have low density population and plenty of area for integrated renewables and hydrogen storage. This is the pathway for rapid hydrogen deployment.

d) What is the economic impact on current hydrogen production operations to meet the proposed standard (4.0 kgCO2e/kgH2)?

i. The goal should be clean renewable hydrogen, not carbon produced hydrogen. This goal as stated in the current CHPS is a ruse by the fossil fuel industry for expanding natural gas within the US. If we invest and switch to renewable generated hydrogen at homes, business and gas stations; it will directly reduce demand on natural gas, coal and oil. It would also rapidly launch hydrogen fuel cell vehicles in the US. While there are many electric cars on the road today in the US, we will reach a plateau because it is unrealistic to build charging stations across the nation that enable a person to wait hours as their car recharges.

ii. There should be no subsidies for carbon produced hydrogen and only just what the current offered tax rebate. Whereas, renewable generated hydrogen should have at least an 80% subsidy. That cost may seem high, but it pales in terms of the destruction catapulting from the increased methane emissions and HAPs from the US natural gas supply chain. Very short sighted to focus on carbon produced hydrogen.

4) Additional Information

a) Please provide any other information that DOE should consider related to this BIL provision if not already covered above

1. **The label <u>"Clean Hydrogen"</u> should only be used for hydrogen production methods and approaches that utilize renewable sources of energy and only water as the single source feedstock.**

2. **All methods of hydrogen production that require additional feedstock sources and or utilize energy sources excluding renewable sources should have labels based on the energy input source and additional feedstock sources required.** For example, for coal, natural gas, and oil used for feedstocks and or energy sources, the hydrogen production should be labeled as **<u>"Carbon Produced Hydrogen"</u>**. For Nuclear fission methods without carbon feedstock, the hydrogen production should be labeled as **<u>"Nuclear Fission produced Hydrogen"</u>**.

   None of these methods constitute Clean Hydrogen both from a perspective of the production site as well as the upstream feedstock and energy sources.

3. **The supply chain for feedstocks** such as methane have excessive hazardous air pollution (HAPs) and greenhouse gas (GHG) emissions through the entire supply chain and currently is not monitored and substantially underreported from the energy companies involved in enabling the feedstock methane from the natural gas supply chain. None of the considerable emissions of HAPS throughout the entire upstream natural gas supply chain are taken into consideration for the current Clean Hydrogen Label, which is a gross flaw.

4. **Carbon Intensity should not be measured in terms of a false carbon equivalence of CO2e.**
As stated above, IPCC AR4 2009 CO2e multiplier (25) for methane is based off methane emitted 100 years ago. When an energy company proposes a new natural gas compressor station and claims it vents 3,181 CO2e tons each year (FERC CP20-493 CS-327), it completely obfuscates that actual methane emissions. Since CS-327 is an electric compressor station, the methane percentage in the natural gas can be used to reverse calculate the actual methane emissions (which FERC did not receive from TGP)

Tennessee Gas Pipeline Company CP20-493 East 300 Upgrade Project Compressor Station CS-327; 960 Burnt Mead Rd, Hewitt, NJ 07421 Site ID: 654715; PI Number 32640

Kinder Morgan / Tennessee Gas Pipeline East 300 Upgrade Project	TGP CP20-493				NJDEP N.J.A.C. 7:27-17.9
	CS-327 Emission Sources		CS-327	CS-327	Thresholds
Air Contaminant	Fugitive	Venting	Emission Totals Tons per year	Emission Totals Pounds per year	Pounds per year
VOC	0.04	0.25	0.280736	561.4729	
2,2,4-Trimethylpentane	0.000635997	0.00394444	0.00458	9.160874	
Benzene	0.000471868	0.00292652	0.003398	6.796778	6
Ethylbenzene	0.000000671	0.00012724	0.000148	0.295512	19
n-Hexane	0.008144861	0.050514285	0.058659	117.3183	
Toluene	0.000369288	0.00229032	0.00266	5.319217	
Xylenes	0.00020516	0.0012724	0.001478	2.955121	
Total HAPs	0.01	0.06	0.071218		
CO_2	0.018464419	0.114516011	0.13298		
Methane (CH_4) Actual	19.72	122.3031	142.0231		
CO2e GWP 100-Year	513	3181	3694		

The actual application only included the CO2e 100-year numbers Fugitive: 513; and venting: 3181.
While this compressor station is being built currently, it will not exist in the EPA GHG inventory of station sources.

5. **Warming Potential of Methane**

The follow chart is based off of IPCC AR6 latest Methane warming potential data for Fossil Fuel Methane (https://github.com/chrisroadmap/ar6/blob/main/data_input/metrics/ch4_co2_response_functions.csv).

Derived from raw data from IPCC AR6 Working Group Fossil Fuel Methane GWP CO2 equivalency based on year since Time of Emission										
Year	**ToE**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
GWP	**120**	**116.52**	**115.36**	**114.07**	**112.53**	**111.06**	**109.35**	**107.97**	**105.32**	**103.56**
Year	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
GWP	**101.40**	**99.59**	**98.04**	**96.11**	**93.85**	**91.86**	**89.59**	**87.97**	**86.10**	**84.35**
Year	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
GWP	**82.73**	**80.53**	**78.80**	**77.20**	**75.98**	**74.57**	**72.92**	**71.38**	**70.15**	**68.77**
Year	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
GWP	**67.38**	**66.34**	**64.89**	**63.96**	**62.81**	**61.71**	**60.66**	**59.65**	**58.69**	**57.53**
Year	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**
GWP	**56.64**	**55.80**	**54.88**	**54.09**	**53.11**	**52.51**	**51.59**	**51.01**	**50.18**	**49.44**
Year	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**
GWP	**48.92**	**48.14**	**47.47**	**46.82**	**46.37**	**45.76**	**45.16**	**44.58**	**44.02**	**43.44**
Year	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**
GWP	**43.08**	**42.56**	**42.05**	**41.53**	**41.05**	**40.58**	**40.16**	**39.71**	**39.26**	**38.82**
Year	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**
GWP	**38.45**	**38.04**	**37.67**	**37.42**	**37.08**	**36.68**	**36.37**	**35.98**	**35.68**	**35.32**
Year	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**
GWP	**35.01**	**34.66**	**34.37**	**34.09**	**33.75**	**33.49**	**33.22**	**32.94**	**32.64**	**32.39**
Year	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**
GWP	**32.14**	**31.88**	**31.63**	**31.38**	**31.15**	**30.88**	**30.66**	**30.42**	**30.20**	**29.98**

I urge the DOE and EPA to immediately change how methane is measured pertaining to emissions so that it is measured as tons per year of methane. Not CO2e nor any other aggregate falsely indicating an equivalence with carbon dioxide.

I also urge DOE and EPA to focus on the past 20 years of methane emissions, the next 5 years of methane emissions to determine what extent the atmospheric feedback loop has been triggered thereby increasing the concentration of methane in the atmosphere.

Warming potential is based on local concentration combined with global concentration. If you reveiew NOAA atmospheric readings, you will see localized concentrations in the US that are much higher than the global concentrations and increasing rapidly. I am sure will not find this is due to increased cows, but rather increased natural gas transmission.

If we are not taking seriously the warming potential increasing directly caused by methane, then we will continue to be surprised by the rapid increases in climate change and disruptive weather events.

We can't have one "Clean Hydrogen" label to fit all of types of dirty hydrogen production methods.

I urge the DOE and EPA to collaboratively put together an education and awareness program that sets out to correct the false disinformation that both elected leaders and energy companies are promoting such as clean natural gas. Natural gas has exponentially ramped up warming potential in the US. The energy companies are pushing this initiative when we have better approaches that will rapidly reduce the use of coal, oil and natural gas.

I very much appreciate your consideration. I wish I could spend more time putting this comment together more succinctly, but I do this on my own spare time.

Sincerely,

Kirk Frost