Bakken Energy LLC is a clean hydrogen production company with its principal offices in Westlake Village California and Bismarck North Dakota. Our vision is to be the primary source of clean hydrogen for heavy duty vehicles in the upper plains, a large region that stretches from the upper Mississippi to the foothills of the Rocky Mountains in Montana. Industry sources estimate that trucking represents 9% of the total GHG emitted in the United States. To replace the diesel fuel consumed, we estimate are that nearly 50 billon kilograms of clean hydrogen must be produced and be omnipresent to ensure availability. The purpose of our response is to provide a practical guide to the successful execution of the Inflation Reduction Act clean hydrogen program.

As the Department of Energy Loan Program Office is well aware, together with our tribal partners, we have targeted production of over 350 million kilograms of clean hydrogen per year using the vast natural gas production from the Bakken Formation some of which is currently being flared and some of which is on tribal lands. Our current development is on hold pending greater clarification on the regulations for measuring hydrogen production carbon intensity under the GREET model.

In order for us to unlock the potential of these projects, the following must be true. We must have an offtake agreement in place with a creditworthy counterparty, we must secure various forms of natural gas (standard and renewable), our facilities must be operational and we must secure financing from the DOE at investment grade rates and from third party equity sources at reasonable market returns.

Offtake. There are 2 primary offtake markets we can serve that would provide the foundation for a broader set of markets, the power sector and the long-haul trucking sector. There are three ways our clean hydrogen would be selected by the power sector: (1) hydrogen fuel cost parity on a heat rate basis (MMBTU) with natural gas or other baseload alternatives (2) government mandate or (3) customer mandate. To date only the cost parity option is financeable at this stage as options (2) and (3) do not exist. Option (2) may become more relevant as an EPA mandate but that at best is years away and will require GREET pathways for natural gas-based clean hydrogen production to qualify as 'low GHG' hydrogen per the proposed Clean Air Act Section 111 rule. Option (3) has been discussed but not implemented by those in the power sector we could serve.

Because of the unique geology of North Dakota our current estimated variable cost of production is less than $1 per kilogram of hydrogen. In order to repay our proposed DOE loan and provide an adequate market return to equity investors in our project, we would require approximately $2.50 per kilogram making our target realized price $3.50 before production tax credits. At $.50 per kilogram our hydrogen fuel cost would be equivalent to standard natural gas thus providing the utility with a clean fuel at essentially the same cost to the utility and ultimate the rate payers. Thus a $3 production tax credit is necessary for us to penetrate the power market. A $1 production tax credit would result in a $2.50 per kilogram required price which would make our clean hydrogen too expensive for power use short of a government or customer mandate.

The power market is particularly attractive as an offtake because the customers are investment grade utilities and at a set location. The ten-year period of the production tax credit would cover the period of the 2030's while other slower developing applications of clean hydrogen such as transportation are being adopted.

The long- haul trucking market is the natural successor to the power market as the largest consumer of hydrogen in replacement for diesel. Unlike power, it requires a complex web of distribution as well as storage and liquefaction which can be a major component of the customer end costs. However, after the 10- year production tax credit period during which the project's debt would be repaid, we believe that the project can remain viable as an unlevered commodity clean hydrogen producer for the next 20 year balance of the useful life of the project given our intrinsically low variable production cost of clean hydrogen. At today's prices that would require delivering hydrogen from plant gate to dispensing units for approximately $4.50 per kilogram. This should be possible with the critical mass provided by the power customer jump start and infrastructure to be built including hydrogen pipelines along with advances in hydrogen transportation, liquefaction and dispensing.

Summary on Offtake. The key to unlocking the power market and building the critical mass to serve the long-haul transportation market is for natural gas- based hydrogen production projects to achieve the $3 production tax credits. Otherwise, clean hydrogen will end up as a niche market and there will not be the production volume to address the diesel trucking market.

Recommendations. The following recommendations are clarifications or modifications to the proposed rulemaking relating to the credit for production of clean hydrogen and energy credit as established and amended by the inflation Reduction Act of 2022.

Section IX. Renewable Natural Gas and fugitive Sources of Methane.
(1) We recommend that a renewable natural gas pathway for livestock manure be adopted as an early priority and that such pathway follow the proven and successful California program which appropriately measures dairy RNG at an average, negative carbon intensity of -283 grams of CO_2e per megajoule. The large negative CO_2 equivalent intensity value is due to the increased potency of methane as a greenhouse gas over carbon dioxide.

(2) We recommend that the book-and-claim system for renewable natural gas be allowed to be virtual as well as physical. The virtual system could specify regional requirements but we would recommend that requirements follow a distance measure from use rather than the regional grid concept used in the EAC system. A virtual system option would mitigate leakage from the transportation of the renewable natural gas from source to use that would otherwise be incurred in a strictly physical system.

III Rules of General Applicability. Special Rules *versus* VI Procedures for Verification of Qualified Clean Hydrogen Production and Sale or Use. C. Requirements for sale or use attestation

(1) We agree with provision section 1.45-2(b) (1) anti- abuse provision whereby …" the ***primary*** purpose of the production and sale and use of qualified clean hydrogen is to obtain the benefit of the section 45V credit in a manner that is wasteful, such as the production of qualified clean hydrogen that the taxpayer knows or has reason to know will be ….used to produce hydrogen".

(2) However, provision section 1.45V-5(d)(1) suggests a much more stringent standard that "However, a verifiable use includes neither (i) use of hydrogen to generate electricity that is then directly or indirectly used in the production of more hydrogen…."

(3) Background: Our cleanest, lowest cost designs use a captive hydrogen fired cogeneration plant to provide the steam and energy to run our hydrogen production given our remote location This design provides the three pillars of clean supply, hourly matching and deliverability, Alternative electricity and steam cogeneration plants such as biomass are more expensive and generate CO2 which must then be captured and sequestered. More broadly as hydrogen is adopted in projects around the country, hydrogen production dependent of grid sources will include hydrogen generation which would be difficult to monitor. Not an issue for us but for others

(4) Recommendation. For section 1.45V-5(d)(1) adopt a less stringent threshold to accommodate practical uses of hydrogen in power and steam generation such as no more than 30% hydrogen production can be used for electricity to generate hydrogen production.

V Procedures for determining Lifecycle Greenhouse Gas Emissions rates for Qualified Clean Hydrogen A.GREET MODEL "background data"

(1) "Background data" or fixed assumptions includes upstream methane loss rates

(2) We recommend that the DOE create a taskforce to develop the standards by which adequate monitoring can be achieved such that upstream methane losses can be measured with sufficient accuracy to measure levels different than background data.

(3) Our clean hydrogen production projects require Responsibly Sourced Gas which industry suppliers claim can be delivered at 1/7th the leakage specified in the GREET model.

(4) Measuring and thereby incenting clean hydrogen production companies and gas extraction companies to minimize leakage is good public policy

We urge the Treasury to move quickly on these clarifications so that projects can remain viable from a funding perspective.