August 3rd, 2022

To Commissioners Scripps, Peretick, and Phillips and all relevant MPSC Staff,

This comment is submitted out of concern for the implications of the study being advanced by ICF through the Michigan Public Service Commission working group on the resource termed "Renewable Natural Gas." In initial drafts, I intended to focus on granular changes to the report to better address its limitations. But in every effort I came back to the same basic conclusion, which needs to be stated clearly in the record of this group.

In every meeting on this topic, ICF has defended the limited scope of their report, claimed ignorance on everything outside of that scope, and punted responsibility to the Michigan Public Service Commission in repeated reference to the scope of their contract. They claim that the report is not intended to answer every question, but defend the accuracy of its sole conclusion: *RNG is a cost-effective greenhouse gas reduction strategy.*

I contend that that conclusion, as stated, is unsupported by the report's methodology, and consideration of any more expansive methodology indicates it is more likely to be false than true.

There are key methodological limits to the report which myself and other stakeholders have stated in meetings, presentations, and comments. Those are:

1. Failure to assess the marginal cost of distribution infrastructure for pipeline injection
2. Failure to assess properly the cost comparison and trade-offs with electrification
3. Failure to assess the emissions and health impact of fuel sources
4. Failure to assess impacts on the agricultural and waste management sectors

I will describe in this comment why I believe that those failures present solid reasons to question ICF's sole conclusion, and even point in the opposite direction. But first I will express what I believe is an appropriate re-framing of the report's conclusion.

To be more accurate, ICF would need to define its conclusion with a level of granularity that reflects the narrow methodology of the report. I expect that ICF will be fully unwilling to properly caveat their conclusions based on their responses in stakeholder meetings. If that is the case, it will be incumbent upon the Commission to provide such framing to the Legislature to ensure the report's contents will not be improperly used in legislative and regulatory contests. The language I would recommend is included on page 8 of this comment.

I believe this sort of caveat would help to properly frame the report's findings. However, in answer to the legislature's primary line of inquiry into the potential of RNG as a greenhouse gas reduction tool, it is equally valid to make a clear statement - RNG provides little, if any, potential for GHG reductions.

To explain this, I will look at each of the four areas of methodological limitation I outline above and what they indicate, even upon a cursory look, about RNG's potential. After doing this, I will summarize my recommendations for adding appropriate caveats and framing to the report, as well as specific recommended changes to the content of the report itself.

1. **Failure to assess the marginal cost of distribution infrastructure for pipeline injection**

In its report, ICF cites as an "opportunity" for RNG that the distribution infrastructure for gas as an end use product is already there. This framing is improper, because it ignores the fact that gas distribution infrastructure is not a static, one-time expense, but requires continuous investment. It would be equally valid to argue, on the barrier side, that relying on RNG for pipeline injection creates a continued need to invest in the distribution infrastructure for gas in parallel to the electric distribution infrastructure, sorely needed in Michigan, and stretching ratepayer dollars further. ICF might argue that this is simply a matter of subjective framing. I would argue that there is an objective answer to which framing is correct, based on projections of demand for end-use gas.

The ICF report envisions up to 150 tBtu of production potential in the feasible scenario by 2050. EIA data[1] estimates that Michigan delivered 618,333 million cubic feet of natural gas to end users in 2020, not associated with electricity. Using EIA's average of 1,037 Btu per cubic foot,[2] this amounts to 641.7 tBtu. RNG potential in 2050 only represents 23% of that figure. At present, the per tBtu infrastructure cost of delivering RNG is X over 641.7 where X is the total annual cost of maintaining distribution infrastructure.

Let's envision two scenarios. In scenario 1, Michigan fully divests from utilization of fossil gas for direct end use by 2050 - an incredible accomplishment from a climate perspective. Now, assuming we have reached the full feasible potential of RNG outlined in the report, we still need to distribute the RNG to its end uses. If the hard cost of maintaining the distribution infrastructure doesn't drop, the per unit cost of delivering RNG has gone from X over 641.7 over X to X over 150 - more than quadrupling the per unit cost.

This is, of course, a heavily simplified version of the problem. If RNG production existed in this scenario it would of course require vast scale-backs of gas distribution infrastructure. But for the per unit cost of delivery to remain stable, the cost of distribution infrastructure would need to fall proportionally to the reduction in fossil gas use. It is hard to envision the business case for a gas distribution utility in this scenario where distribution infrastructure is reduced to less than 1/4 of its previous scale.

And this leads to scenario 2 - the more likely one in my mind. RNG is green-lit as an effective GHG reduction tool. As a result, gas utilities argue for the required distribution investments. But

[1] https://www.eia.gov/dnav/ng/NG_CONS_SUM_DCU_SMI_A.htm
[2] https://www.eia.gov/tools/faqs/faq.php?id=45&t=8

keeping the per unit costs low requires maintaining a substantial amount of flow of fossil gas in the system. Now, let's say fossil gas use is reduced 50% from 2020 levels by 2050, which would be inadequate to climate goals. The delivery cost of RNG still effectively doubles, as it relies primarily on the rate of fossil gas consumption. The Commission will be forced to choose between an increasingly high per-unit infrastructure cost to deliver RNG or continuing to green light the usage of fossil gas, which is properly regarded as a contributor to climate change.

A proper analysis of this problem would need to look at how X (gas distribution infrastructure amortized annual cost) changes in scenario 1, scenario 2, and everything in between. At a high level, it appears to me that the most likely way to keep delivery cost low is the continued use of fossil gas at a level incompatible with climate action. This alone indicates to me that the proper answer to the legislature's question is that RNG for pipeline injection is *likely* to not be an effective climate solution, because of the contradictory signal it sends about continued fossil gas utilization. It also indicates towards biogas-to-electricity as the only application of this technology that does not create this infrastructure problem.

2. Failure to assess properly the cost comparison and trade-offs with electrification

In comparing the cost per unit of abatement between RNG and electrification, ICF presents a comparison that is broad to the point of uselessness. The causes of this have been well-discussed by other stakeholders in the work group, so I will not repeat them here. Suffice it to say that there is a lack of regionally specific data to provide a viable cost comparison which leads to the use of an abatement cost range of $0 to $1000 per tCO_2e. Notably, ICF highlights "practical infrastructure constraints, whether local or system-wide" as one of the factors influencing the wide cost range for achieving emissions reductions. I believe this is centrally true for electrification, and relevant to the first point.

The choice to enable and support RNG for pipeline injection as a viable climate solution directly impacts the cost efficiency of electrification due to the creation of a split incentive on distribution infrastructure investment. I have the greatest familiarity with DTE Energy's service territory as regards the quality of electric infrastructure, so will use that to primarily make this point.

The expanding crisis of electric distribution infrastructure quality and service equity between ratepayers has taken up more attention in recent rate cases. In particular, many parties and the Commission have focused attention on the problem of substantial portions of southeast Michigan's service territory continuing to be served by the outdated and aging 4.8 kV system. The persistent argument by DTE Energy against modernization is the staggering capital cost, in comparison to the more "cost effective" method of simply catching up on delinquent tree trimming and basic maintenance. The challenge with this, as highlighted by numerous expert witnesses, including myself and Commission staff, is that it leaves those communities with demonstrably poorer service. And critical to this conversation, it presents substantial obstacles to the integration of electric vehicles, distributed generation, storage, smart grid controls - and electrification.

In parallel, DTE gas customers have seen subsequent increases of $188.5 Million in 2019, $110 Million in 2020, and $84 Million in 2021. In describing the need for the 2021 rate case, despite a global pandemic, DTE Gas states:

"The primary reasons DTE Gas's costs will exceed its revenues are the ***extensive infrastructure and IT investments****… along with the additional projected O&M required to ensure the reliability of its system, the safety of its customers, and compliance with State and Federal requirements."*[3]

These trends indicate a fundamental tension: with affordability of utilities already being at crisis levels for low-income people, and reliability and safety issues increasing, the capacity to maintain two parallel distribution systems without overtaxing the rate base is diminishing. And in that tension arises a critical question: if it is fiscally untenable to maintain these parallel systems at an appropriate level of quality, should one be prioritized while the other is phased out? In this context, the cost analysis of electrification could change radically, as one must begin to factor in the *avoided* cost of gas distribution achieved through decommissioning of the infrastructure.

Certainly, the scope of this RNG study is not designed to answer such profound and fundamental questions, and raises many others: how does one phase out a distribution infrastructure in pieces large enough to matter for cost efficiency, but small enough to allow for a phased and non-disruptive transition? How should such a process be managed to respect community autonomy? How will equity be maintained for communities who lack the resources to cover electricity cost increases and building electrification? But the limited scope of the study also has an effect of studiously *ignoring* such a fundamental question in the framing of opportunities and barriers, and runs the risk of communicating to legislators and regulators the unspoken assumption that we can, and should, continue using social resources to keep two parallel infrastructures running without considering the value of focusing on one - and that it should be the one where complete decarbonization of the resources behind it is possible.

This narrow study, ordered by the legislature, presents an opportunity to open up these wider questions that must be addressed if we are to achieve decarbonization, protect affordability, and maintain a safe and reliable infrastructure for delivering essential resources to Michigan's communities. The framing of its presentation should not eschew that opportunity, but lean into it, encouraging the legislature to broaden its view.

3. Failure to assess the emissions and health impact of fuel sources

ICF makes the bewildering choice to frame the potential to perpetuate or exacerbate health and environmental impacts from RNG feedstocks as an "opportunity" in their report. There is no other way to describe this but deeply insulting and directly harmful to communities presently bearing the brunt of harms from landfills, industrial agriculture, and polluting energy generation.

[3] https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000KF6jbAAD - pg 31

From the perspective of a community faced with that potential for harm, the opportunity framing is ridiculous. But even from an industry perspective, the idea that that potential harm represents an "opportunity" is also hard to wrap one's head around. Policy that forces industry to internalize the cost of those harms, or pass more rigorous inspections, certainly doesn't help the industry to develop faster and at a lower cost. From either direction, this framing is hard to justify.

This choice stands out even further from the complete lack of analysis of the emissions and health impact of feedstocks. When considering the fact that RNG will potentially be able to access renewable energy credits from the State of Michigan under current energy legislation, the lack of a health impact analysis means that even tacit approval of RNG creates a situation in which the State of Michigan could be actively incentivizing pollution from feedstock production in communities. There is no more illustrative example than the Detroit Trash Incinerator[4], which has perpetuated environmental injustice in Detroit for decades while receiving renewable energy credits. This is a case-in-point example of a failure to evaluate the full cost of an energy choice. And to put a finer point on it - this narrowness of framing represents an explicit and conscious choice by industry to *externalize* the cost of health harms onto adjacent communities. ICF as a long-established industry consultant has no grounds to claim ignorance here, and must be made to clearly acknowledge this gap in methodology, and describe it as *essential* to address if we are to truly know if RNG is a "cost-effective" method of GHG abatement.

Other stakeholders have spoken more extensively and expertly than myself on the deficiency of the GHG abatement model chosen by ICF, so I will limit my comment on that front to reiterating that a combustion-based analysis fails to meaningfully evaluate GHG reductions, especially in the case of feedstocks which are known sources of GHG emissions, likely need to be reduced in economy-wide GHG reductions, and have clear pathways for doing so.

4. Failure to assess impacts on the agricultural and waste management sectors

The final, and possibly most significant, methodological failure is the studious ignorance of the impact on an economic sector arising from monetization of its waste streams. Responding to health and environmental justice concerns, ICF states in their report:

"At present, there is no clear indication that RNG policies or RNG production will impact industry trends related to CAFOs or contribute to the expansion of CAFOs in Michigan."

A 2020 research study published by IOP Publishing Ltd found a number of issues with the climate claims of RNG.[5] In summary:

> 1) RNG from intentionally produced methane, even from climate-neutral CO_2 sources, has substantial climate impacts at methane leakage levels observed in the existing, mature biogas industry

[4] https://www.ecocenter.org/our-work/climate-action-energy-equity/air-quality/breathe-free-detroit
[5] https://iopscience.iop.org/article/10.1088/1748-9326/ab9335/meta#erlab9335s3

(2) for any meaningful system scale, RNG is likely to be derived from intentionally produced methane

The upshot here is that the limited production capacity of RNG creates a pressure to *increase* methane production for RNG to reach scale, and that fundamentally alters the GHG analysis. ICF's analysis does not project increases in RNG feedstock production and in so doing preserves its claim that it is not overstating climate benefits. But it also ignores the potential to *reduce* baseline methane production in many feedstocks. Organic material currently being trucked to central landfills may be better managed through more localized compost collection systems, and animal waste from CAFOs may be reduced through policy aimed at shifting food production standards.

The report's fixation on evaluating alternatives purely in the context of the energy sector, while arguably a reasonable approach in light of the MPSC's general scope of authority, fails to consider the ways that RNG development interacts with agriculture and waste management. This highlight from the REAMP Network's report on transforming agriculture in the Midwest[6] highlight a slew of federal policy developments, including some led by Michigan's own Senators and Representatives, aimed at reducing climate emissions in the agriculture sector. Meanwhile, the report highlights:

"To keep up with the demand for meat, the number of CAFOS in the RE-AMP footprint increased from 5,000 in 2011 to over 7,000 CAFOS in 2019. By 2019, 35 percent of the total CAFOS in the U.S. were in the RE-AMP footprint."

It also highlights that CAFOs themselves are a driver of climate emissions with a shift from dry to liquid manure systems. While ICF claims that there is "no clear indication" that RNG will have any impact on CAFO development, it seems a studious avoidance of common sense to assert that the monetization of a waste stream in a growing industry would have anything but a positive effect on growth. The same logic applies when considering more localized collection and composting of organic waste in comparison to trucking the same waste to centralized landfills, and the effect centralized RNG at landfills could veer in one direction over the other.

Conclusion & Recommendation

The legislative directive to the Commission states:

Sec. 1002. (1) From the funds appropriated in part 1 for public service commission renewable natural gas study, the public service commission must conduct a study into the potential for renewable natural gas development in this state. The study shall do all of the following:

[6] https://www.reamp.org/wp-content/uploads/2022/01/Transforming-Agriculture-in-the-Midwest.pdf

(a) Identify existing and potential sources of renewable natural gas in this state and provide, to the greatest extent possible, an estimate of the energy content and greenhouse gas abatement potential of these sources.
(b) Estimate the cost per unit of heat, should the potential sources of renewable natural gas identified in subdivision (a) be utilized to the greatest practical extent.
(c) Estimate the greenhouse gas emission reduction, per unit of heat, that would be achieved should the potential sources of renewable natural gas in subdivision (a) be utilized to the greatest practical extent.
(d) Compare the estimated per-unit cost savings of greenhouse gas emission reductions estimated for RNG sources to the estimated per-unit cost savings likely to be achieved by comparable use of other carbon abatement technologies, including, but not limited to, hydrogen blending, building electrification, and similar technologies.
(e) Estimate the production potential by applicable feedstock sources for renewable natural gas in this state.
(f) Identify barriers to developing and utilizing renewable natural gas in this state.

(2) The commission shall identify and engage interested stakeholders in the development of the study provided for in subsection (1). The commission may engage an independent contractor to conduct the study under the commission's direction.
(3) By July 30, 2022, the commission shall submit a draft report on the study to interested stakeholders for comment to the commission. By September 30, 2022, the commission shall submit a final report to the standing committees of the senate and house with primary jurisdiction over energy and environmental issues.

Based on the data ICF has presented and attempts by stakeholders to correct haps in the methodology, I believe the following conclusions can be said to be uncontroversially true:

- RNG energy potential is extremely marginal in Michigan
- RNG demonstrates extremely marginal GHG reduction potential in MI
- RNG cost-effectiveness comparison is dubious without further research
- RNG has potential to continue or increase associated social harms

I think that even with the methodologic limitations, the Commission would be within reason to advise the legislature of the marginality and complicating factors of RNG development in complying with the intent of the legislation. I think that failure to provide a clear set of conclusions does the legislature a disservice, in that the Commision has the expertise to offer some interpretation of the data to inform policymaking regarding RNG and its alternatives.

As stakeholder meetings have not indicated any willingness on ICF's part to alter or amend its report, I am requesting that the Commission, or staff, provide a letter or comment framing the report in its submission. I have provided my own recommendation for this language below in the hopes that doing so makes doing such a task easier. That recommended language is provided on the following page separated from other content.

Recommended Framing for ICF Report

This report finds that Renewable Natural Gas may play some small role in achieving greenhouse gas reductions in the context of sustainable waste management, but production potential is very small - amounting to less than 25% of 2020 gas use in Michigan by 2050. It is likely that onsite biogas-to-electricity is the most viable use of methane for energy production purposes.

The study utilizes a narrow methodology to accomplish a cost comparison to other forms of abatement using available data, a short time frame, and limited financial resources. As with all abatement measures, there are complex systems analysis questions at play. A full assessment of the potential of RNG would require, at minimum, a long-term analysis of the range of possible per unit costs associated with maintaining a gas distribution infrastructure for the sole purpose of delivering RNG to end users, a regionally-relevant analysis of the per unit abatement costs of electrification, a life cycle analysis of emissions from RNG feedstocks, and an analysis of RNG's potential to act as an incentive for continued or expanded production of GHG-emission causing feedstocks such as organic landfill waste or animal manure which might otherwise be reduced through policy. Given the constraints of time and resources, as well as the Commission's scope of authority, the Commission did not conduct these analyses.

Nonetheless, legislators and regulators in the State of Michigan should be aware of the limits of this study to inform climate planning, infrastructure investment, and incentivization of particular technologies over others. We urge the legislature to enable us to conduct a holistic decarbonization analysis with proper funding and timeline to address these gaps in methodology, engage other departments in a holistic analysis of GHG mitigation, and ensure equity in implementation.

Despite methodological limits, this study suffices to indicate the marginality of RNG and the substantial barriers to its implementation. A more expansive dive into the subject may reveal greater feasibility, but is more likely to indicate in the other direction. There are a wide range of GHG reduction strategies beyond RNG which may deliver greater benefits at a lower cost without exacerbating social harms.

In addition, I have two specific recommendations on the opportunities and challenges section that I believe are better-supported than the present framing of these issues by ICF, which I believe are reasonable requests for the Commission to make.

Infrastructure: In addition to noting the “opportunity” of existing infrastructure, there must be mention on the “challenge” side noting the need for Commission to continue approving gas distribution system investments on a continuous basis for the life span of RNG facilities in order to avoid stranded assets, an uncertain prospect without better projections of electrification rates.

Environmental Impacts: It is essential to shift the bullet on environmental impacts from “opportunity” to “challenge” in every instance. This is both about honoring the fact that there are current health harms being laid on communities, and adding incentive to the production of those harms should be viewed as a threat to be managed. It further acknowledges that policy aimed at ensuring those protections properly adds requirements, restrictions, and cost to RNG development, and is more likely to impede than encourage development.

Thank you for your consideration.,

Jackson [redacted]