Introduction

The Michigan Public Service Commission (MPSC) hosted a second stakeholder meeting on April 20, 2022 as part of the ongoing Michigan Renewable Natural Gas (RNG) Study. MPSC Staff solicited clarification questions during the workshop. For questions that were not explicitly addressed during the workshop, MPSC Staff requested that those questions be submitted via email by the close of business on April 21, 2022. The sections below include the clarification questions submitted, and responses that were prepared by ICF. MPSC Staff hope that these responses will be helpful to stakeholders, and that they are considered as part of any comments submitted on topics including, but not limited to the study inputs, assumptions, and methodologies, alternative greenhouse gas (GHG) abatement technologies, and competing uses of RNG feedstocks.

Clarification Questions from 2nd Stakeholder Meeting

Questions From Strategen (on behalf of NRDC)

1. **What were the price points used for denoting "lower biomass prices" and "moderate biomass prices?" in Section 3, RNG Supply Scenarios?**

ICF response: As outlined for each feedstock in the *Thermal Gasification of Biogenic or Renewable Resources* in Section 3, the biomass price in the Achievable scenario is $40/dry ton and for the Feasible scenario the biomass price is $60/dry ton.

2. **It appears that the technical, achievable, and feasible potentials have already been determined. Was this analysis conducted specifically for this Michigan RNG inventory study or is this an analysis that was determined elsewhere (through another study/studies) and will then be applied to screen the RNG potential in Michigan? Please provide all sources and analysis that demonstrates how each of the technical, achievable, and feasible potentials were developed.**

Staff response: MPSC Staff is working with ICF to develop Michigan specific parameters. The outcome of this study was and is not predetermined.

ICF response: The technical potential is based on the maximum biomass available in Michigan that could be used to produce RNG. The Achievable and Feasible scenarios apply various constraints and assumptions for each feedstock that influence the level of feedstock utilization relative to the maximum technical potential. ICF developed these parameters specifically for Michigan, based on consultation with MPSC Staff. The RNG potential included in the supply scenarios are based on an assessment of resource availability. In a competitive market, that resource availability is a function of multiple factors, including but not limited to demand, feedstock costs, technological development, and the policies in place that might support RNG project development. ICF assessed the RNG resource potential of the different feedstocks that could be realized, given the necessary market considerations (without explicitly defining what those are).

3. **Please provide the sources used for developing the performance and cost considerations assumptions in the levelized cost of gas analysis for each of the RNG resources identified in Section 4 of the study (e.g., tables 14, 15, 16, 17, 19, 20, 21, 22, 23, 24).**

ICF response: Production cost estimates are based on ICF's analysis of data from more than three dozen projects, and experience working with project developers and other participants in the RNG production supply chain, including equipment providers, utilities, project investors, and RNG end users. While project specific data are confidential, ICF's analysis has been vetted by various stakeholders in the RNG community through more than a dozen projects and analyses.

ICF will incorporate, to the extent that they are relevant to the study, other provided sources or reference points to include in the RNG production cost estimates as part of our analysis.

4. **What is the real discount rate used for calculating the levelized costs of energy?**

ICF response: ICF uses a discount rate of 8%.

Questions from MFAEP

Questions related to a GHG analysis of feedstocks to determine the biogas derived from them, the construction and operation of the biodigester, and transportation of the biogas would mitigate climate change compared to burning fossil gas.

5. **I've looked at the ICF RNG Feasibility Study ICF conducted for the City of Austin (2020)[1] and found a remarkable lack of transparency. On pages 58-59, ICF discusses the accounting method. Are these the methods and assumptions that ICF will use in the GHG LCA analysis for the MI RNG Study? Will ICF use the Greet model as the "most commonly relied on resource for the LCA? Will ICF follow the IPCC guidelines and not include CO2 emissions when accounting for biogas LCA GHG? Will you assume the biomass source as carbon neutral?**

ICF response: ICF will be using accounting methodologies consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines and other established governing bodies as it relates to GHG emissions accounting. ICF will provide GHG emission reduction estimates using two accounting approaches: combustion and lifecycle. The combustion approach will be consistent with IPCC guidelines, where the CO_2 emissions from the combustion of fuels sourced from biogenic renewable feedstocks will be considered zero. ICF will also apply a lifecycle accounting approach, consistent with the GREET model, developed by Argonne National Laboratory. By way of background, the GREET model is primarily a process-based lifecycle analysis approach, often referred to as a so-called attributional lifecycle analysis (as opposed to a so-called consequential lifecycle analysis approach). ICF uses the GREET model because it is publicly available, consistently updated, and provides transparent access to primary data sources.

[1] Renewable Natural Gas Feasibility Study for the City of Austin, July 2020. Available online here.

6. **Will ICF make available its spreadsheets for the GHG LCA? The summary chart in the Austin study does not provide the detail needed to understand how ICF came to its conclusions (see p. 67 of Austin Study).**

ICF response: ICF will provide background data and analysis used to estimate RNG supply potential, production cost estimates, GHG emission reductions and abatement costs.

7. **How will the methodology and assumptions for the Michigan study GHG LCA differ from the Austin study?**

ICF response: ICF will be using accounting methodologies consistent with IPCC guidelines. Where appropriate, the lifecycle emissions estimates will be tailored to reflect Michigan-specific circumstances.

8. **The Austin study provides a wealth of economic information for all the costs related to construction, operation, and delivery of the biogas. Why did give the GHG analysis such a minimal presence in that report?**

Staff Response: The Austin study was a separate report developed under a different scope of work. ICF is focused on meeting the requirements found in the Michigan scope of work and has discussed in the answers to the above questions the details that will be provided in the work that is ultimately completed for the Michigan Public Service Commission.

9. **I believe we can trust that the MPSC wants to know if biogas actually can be used to mitigate climate change. It is 2022, 8 years from when we must have reduced our carbon emissions by 43% to have a livable planet. Why does ICF at this point in time continue to focus on the economic benefits of RNG rather than its GHG mitigation potential? This is an important question. We need to know ICF's answer.**

Staff Response: Staff and DTMB crafted the scope of work for ICF's report to accomplish the MPSC's goals as tasked by the legislature and Public Act 87 of 2021.

ICF response: ICF is addressing the issues outlined in the scope of work, which was prepared by DTMB and MPSC, and is based on Public Act 87 of 2021. That scope states that the purpose of the Michigan RNG Study is to "assess the theoretical, feasible, and achievable potential for renewable natural gas development for injection into natural gas pipelines or use as a transportation fuel and carbon abatement in this state. The primary goal of the RNG Study is to provide critical data and analysis about future development and use of RNG to inform policy considerations by the Michigan Senate and House. This data and analysis will be used by Michigan's utilities and the MPSC as they consider how RNG will fit into net zero carbon emissions goals."

10. **Does ICF agree that a true and accurate climate mitigation analysis should have as much emphasis as the financial benefits in this study that will inform the MPSC of whether biogas will benefit all of the people of Michigan?**

ICF response: ICF is tasked with ensuring that we fulfill the terms of our contract and address the issues outlined in the scope of work of said contract. ICF notes that the scope of work was prepared by DTMB and MPSC and is based on Public Act 87 of 2021.

Questions from Consumers Energy

11. What were the price points used for denoting "lower biomass prices" and "moderate biomass prices" in the Inputs, Assumptions, and Methodologies section of ICF's presentation?

ICF response: As outlined for each feedstock in the *Thermal Gasification of Biogenic or Renewable Resources* in Section 3, the biomass price in the Achievable scenario is $40/dry ton and for the Feasible scenario the biomass price is $60/dry ton.

12. What metric will ICF be using to compare all of the different "alternatives to RNG"? $/ton CO2e abatement, or something else?

ICF response: ICF will assess the cost-effectiveness of RNG as a GHG emission reduction measure in dollars per unit of GHG emission reductions, measured in metric tons of carbon dioxide equivalent ($/t$CO_2$e).

13. Is ICF saying that the "dry ton" of feedstock is dictating levels of "feasible" vs. "economic"? That may not create a relevant delineation, as projects do not always incur a biomass "cost."

ICF response: The dry ton biomass price refers to a feedstock constraint in the supply scenarios for some feedstocks (e.g., agricultural residues, energy crops and forestry residues). Based on the modeling that underpins the DOE's Billion Ton Study, the $/dry ton price reflects the cost of obtaining biomass (as measured in tons). At lower prices fewer biomass resources are available, while at higher prices more biomass is presumed to become available. ICF then applies additional constraints on the available biomass at a particular price point based on the scenario parameters (e.g., agricultural residues in the Achievable scenario utilizes 30% of available biomass at $40/dry ton).

ICF respectfully disagrees with the assertion that "projects do not always incur a biomass 'cost'". In ICF's formulation of the levelized cost of energy for RNG from certain feedstocks that are assumed to be gasified, there will be biomass cost.

14. Is ICF accounting for Michigan's O2 specifications?

ICF response: MPSC staff have communicated to ICF the oxygen and other impurity limits in MPSC-regulated pipelines.