**In the Matter of**
**CenterPoint Energy Natural Gas Innovation Act (NGIA)**
**Innovation Plan**

**Petition of CenterPoint Energy**

# EXHIBIT K: INTERESTED PARTIES MEETING MATERIALS

# PART 2 OF 3

**Docket No. G-008/M-23-215**

**June 28, 2023**

# CenterPoint Innovation Plan
# Regulatory Stakeholders Meeting 1 Agenda

**FRIDAY, OCTOBER 7, 9:00AM-12:00PM ET**

**Zoom Meeting:** Please click here to access the meeting or you can go to www.zoom.us and enter meeting ID 898-2708-9534; Passcode 256497

## Pre-reads

- September 23 Stakeholder Meeting Summary
  - Also see attached summary of innovation plan requirements from NGIA
- Excel file with list of projects proposed via RFI responses – title, project category, short description
- Slide deck from meeting 1, including proposed shortlist of NGIA pilots

## Agenda

**9:00AM** **Welcome and intros, process plan, agenda review**

- Welcome from CenterPoint Energy
- Introductions
- Agenda, ground rules, regulatory parties process plan

**9:15AM** **Recap of first all stakeholders meeting**

- Brief review of process plan and current state of determining resources for inclusion in the innovation plan (CenterPoint/ICF)
- Review feedback received in first meeting
- Solicit thoughts from regulatory stakeholders on the first all stakeholders meeting
  - Any items that deserve follow-up from this group?

**9:45AM** **How CenterPoint Energy is developing its innovation plan from a regulatory standpoint (i.e., how it intends to meet the requirements of NGIA and apply the frameworks adopted by the Commission in Docket 21-566).**

- Process for detailed analysis of potential innovative resources
- CIP/NGIA coordination -- How do we determine what belongs in CIP versus NGIA?

**10:30AM** **BREAK**

**10:45AM** **What are regulatory parties' criteria for a successful innovation plan from CenterPoint Energy (in other words, what would need to be true of the plan**

**at the point of filing to increase the likelihood of interested parties' support)?**

- GPI to facilitate and take notes on screen

**11:30AM** **What do participants want to discuss in the next two regulatory meetings?**

**12:00PM** **ADJOURN**

# CenterPoint Energy Innovation Plan Regulatory Stakeholder Meeting

## Friday, October 7, 2022

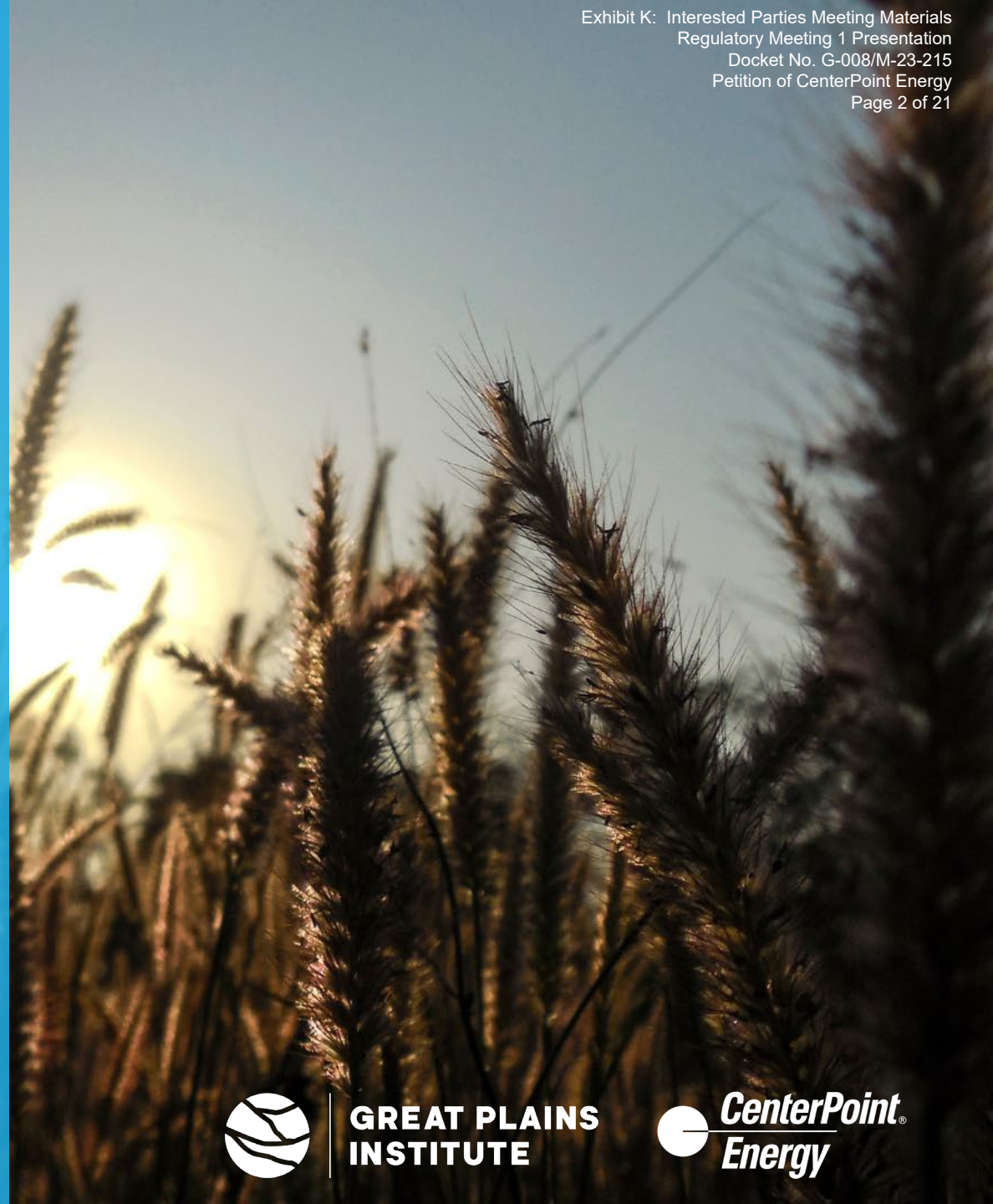
## - Virtual Meeting -

GREAT PLAINS INSTITUTE

CenterPoint Energy

# Welcome

Emma Ingebretsen,
Senior Project Manager,
Decarbonization Projects,
CenterPoint Energy



GREAT PLAINS INSTITUTE

CenterPoint Energy

# Today's Agenda

| | |
|---|---|
| 9:00AM | Welcome, intros, process plan |
| 9:15AM | Recap of first all-stakeholders meeting (September 23rd, 2022) |
| 9:45AM | Presentation: How CenterPoint Energy is developing its innovation plan from a regulatory standpoint. |
| 10:30AM | Break |
| 10:45AM | Facilitated discussion: What are regulatory parties' criteria for a successful innovation plan from CenterPoint Energy? |
| 11:30AM | Facilitated discussion: What do participants want to discuss in the next two regulatory meetings? |
| 12:00PM | Adjourn |

GREAT PLAINS INSTITUTE

CenterPoint Energy

# Meeting Ground Rules

1. Respect the time. Our time together is limited and valuable. Please be mindful of the time and of other's opportunity to participate.
2. Please use "raise hand" feature. We have a large group this morning, to help make space to hear from as many stakeholders as possible, please use the "raise hand" feature to indicate you would like to participate in the conversation.
3. Respect each other. Help us to collectively uphold respect for each other's experiences and opinions, even in difficult conversations. We need everyone's wisdom to achieve better understanding and develop robust solutions.
4. Enable honesty through non-attribution. Outside of this group, you may share what was said and who was present, but please refrain from sharing who said what without first obtaining permission. All meeting notes and materials will also adhere to this.

# Regulatory Stakeholder Process Plan

**This is the first of three meetings expected to take place through Spring 2023.**

- **Meeting 1 (today):**
  - Level-set on feedback from the first all-stakeholders meeting
  - Discuss how CenterPoint Energy is developing its innovation plan from a regulatory standpoint
  - Understand what would constitute a successful first innovation plan for CenterPoint Energy, according to regulatory stakeholders
- **Meeting 2 (December 2022):**
  - ICF/CenterPoint Energy will present on the analysis of shortlisted projects
  - Discuss any opportunities for improvement that regulatory parties might observe related to the analysis of shortlisted projects, project portfolio development, etc.
- **Meeting 3 (February 2023):**
  - Identify any remaining regulatory issues and points of consensus and disagreement
  - Additional discussion on any outstanding issue as needed

# Recap of first all stakeholders meeting

Peter Narbaitz
Director, Energy Markets & Planning, ICF

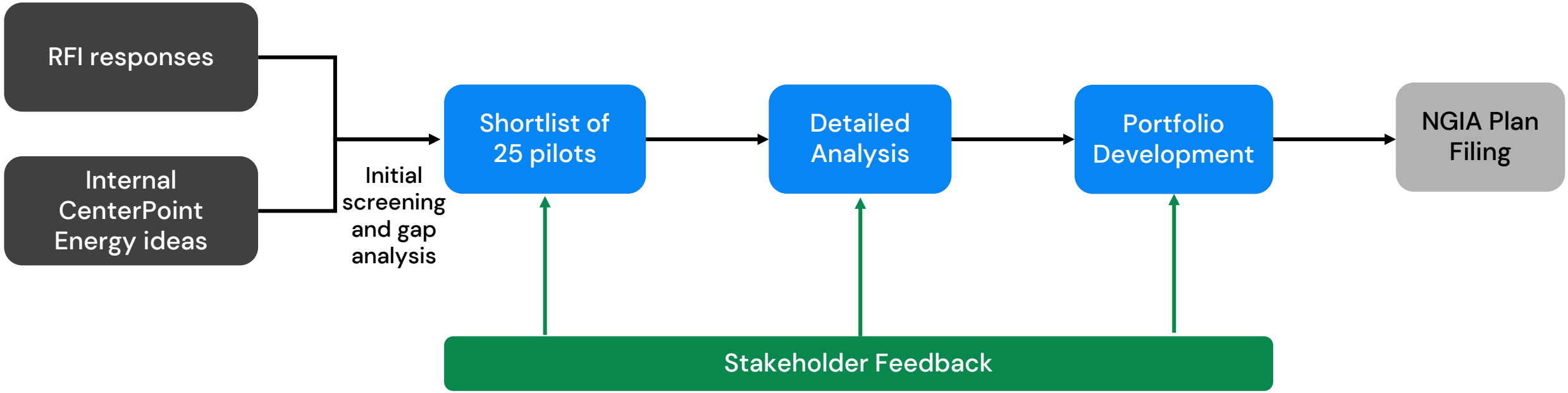
10/07/2022

# Agenda

## Recap of first all stakeholders meeting

- Brief review of process plan and current state of determining resources for inclusion in the innovation plan (CenterPoint/ICF)
- Review feedback received in first meeting
- Solicit thoughts from regulatory stakeholders on the first all stakeholders meeting
    - Any items that deserve follow-up from this group?

# Overview of NGIA Innovation Plan Development Process




Focus of the first stakeholder meetings is the initial screening and gap analysis: have we missed anything on the shortlist of measures that will proceed to detailed analysis?

# Overview of draft pilot shortlist (to be further narrowed to 25)

| # | Pilot | Innovation Category |
|---|---|---|
| 1 | RNG Proposal - Anaerobic Digestion of Organic Materials | RNG/Biogas |
| 2 | RNG Proposal -Anaerobic Digestion of East Metro Food Waste | RNG/Biogas |
| 3 | RNG Archetype – WRRF | RNG/Biogas |
| 4 | RNG Archetype - Dairy Manure | RNG/Biogas |
| 5 | RNG Archetype – Food Waste | RNG/Biogas |
| 6 | RNG Archetype - Landfill Gas | RNG/Biogas |
| 7 | RNG Archetype - Prairie Grass Blending with Swine Digesters | RNG/Biogas |
| 8 | Green Hydrogen Blending into Natural Gas Distribution System | Hydrogen/Ammonia |
| 9 | Green Hydrogen Archetype - Industrial Facility Electrolyzer Pilot | Hydrogen/Ammonia |
| 10 | Industrial Methane and Refrigerant Leak Reduction Program | Carbon Capture |
| 11 | Urban Tree Carbon Offset Program | Carbon Capture |
| 12 | Archetype Carbon Capture Project for Industrial Facility | Carbon Capture |
| 13 | Carbon Capture through Methane Pyrolysis at Industrial Facility | Carbon Capture |
| 14 | Carbon Capture for Commercial Buildings | Carbon Capture |
| 15 | New Networked Geothermal Systems Pilot | District Energy |
| 16 | Decarbonizing Existing District Energy Systems | District Energy (plus Carbon Capture, Strategic Electrification, Energy Efficiency, RNG/Biogas, Power-to-Hydrogen) |
| 17 | New District Energy System | District Energy (plus Carbon Capture, Strategic Electrification, Energy Efficiency, RNG/Biogas, Power-to-Hydrogen) |
| 18 | Industrial Electrification Incentive Program | Strategic Electrification |
| 19 | Residential and Commercial Heat Pump Water Heaters | Strategic Electrification |
| 20 | Commercial hybrid heating pilot | Strategic Electrification |
| 21 | Residential deep energy retrofit + electric ASHP pilot (with gas backup) | Strategic Electrification (plus Energy Efficiency) |
| 22 | Small/medium business GHG audit pilot | Energy Efficiency (plus Carbon Capture, Strategic Electrification) |
| 23 | Residential Gas Heat Pump | Energy Efficiency |
| 24 | Gas Heat Pump for Commercial Buildings | Energy Efficiency |
| 25 | Neighborhood Weatherization Blitzes | Energy Efficiency |
| 26 | High Performance Building Envelope Initiative | Energy Efficiency |
| 27 | Solar Thermal Heating for C&I | Energy Efficiency |
| 28 | Industrial GHG Audit Pilot | Energy Efficiency (plus Carbon Capture, Strategic Electrification, Power-to-Hydrogen, RNG/Biogas) |

- We reviewed these category by category in first stakeholder meeting
- Some of these pilots combine multiple RFI responses
- This is a list for more detailed analysis, not a guarantee that all of these end up in NGIA portfolio
- Research and development projects are captured in a separate category with less planned evaluation

# Key take aways from stakeholder feedback received in/after first meeting

## General feedback

- Many respondents did not see gaps in the draft shortlist of innovative pilots
- Desire for more details – on pilots, on combined NGIA portfolio, etc.
- Desire to ensure that NGIA resources are deployed to their best and highest use cases

## Feedback on specific pilots

- Some clarifications made on specific RFI responses & suggestions for inclusion on shortlist
- Concern on inclusion of gas efficiency measures
- Concerns surrounding long-term viability of RNG
- Support for networked geothermal system pilot(s)
- Questions on whether IRA or other new funding sources impact NGIA

## Feedback on additional specific considerations for innovation plan

- Identify ways to get community input and advice on NGIA pilots
- Ensure NGIA pilots support key groups like multi-family sector and environmental justice communities
- Need to include funding for market development, including workforce and contractor development, in first NGIA plan
- Clarity on the impact on gas rates

# Thoughts from regulatory stakeholders on the first all stakeholders meeting

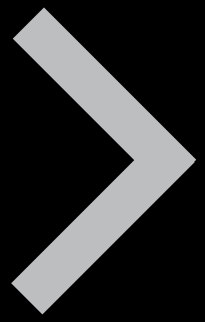
- We want to solicit your thoughts and feedback
- Any items that deserve follow-up from this group?

# How CenterPoint Energy is developing its innovation plan from a regulatory standpoint

Peter Narbaitz
Director, Energy Markets & Planning, ICF

10/07/2022

# Agenda



How CenterPoint Energy is developing its innovation plan from a regulatory standpoint (i.e., how it intends to meet the requirements of NGIA and apply the frameworks adopted by the Commission in Docket 21-566).

- Process for detailed analysis of potential innovative resources
- CIP/NGIA coordination –– How do we determine what belongs in CIP versus NGIA?

# Evaluation Criteria Framework

| | Pilot 1 | Pilot 2 | Pilot 3 |
|---|---|---|---|
| **Perspectives** | | | |
| NGIA Utility Perspective | | | |
| NGIA Participants Perspective (including specific impacts on low- and moderate-income participants) | | | |
| NGIA Nonparticipating Customers Perspective (including specific impacts on low- and moderate-income customers) | | | |
| Effects on Other Energy Systems and Energy Security | | | |
| **Environment** | | | |
| GHG Emissions | | | |
| Other Pollution (including any environmental justice costs or benefits) | | | |
| Waste reduction and reuse (including reduction of water use) | | | |
| Policy (e.g., natural gas throughput, renewable energy goals) | | | |
| **Socioeconomic** | | | |
| Net Job Creation | | | |
| Economic Development | | | |
| Public Co-Benefits | | | |
| Market Development | | | |
| **Innovation** | | | |
| Direct Innovation Support | | | |
| Resource Scalability and Role in a Decarbonized | | | |

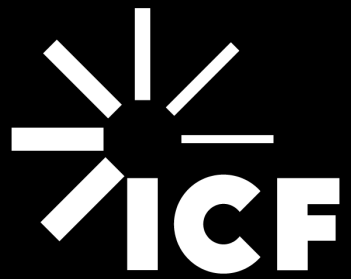
# Process for detailed analysis of potential innovative resources

- CenterPoint and ICF will take the shortlisted pilots and flesh out the assumptions for each (e.g. project size, technology included, expected program design)
  - Some RFI responses provide significant details, in other cases we will rely on external sources to build up the details on pilots for evaluation
  - CenterPoint may reach back out to RFI respondents for additional information
- ICF will complete the detailed analysis, following the evaluation framework from previous slide
  - Some evaluation criteria will be quantitative, other parts will be qualitative
  - Perspectives: the NGIA legislation & PUC approved frameworks define the cost-benefit analysis framework and key parameters
  - GHG Emissions: Per PUC framework will use lifecycle emissions for all pilots, and GREET for RNG
  - Socioeconomic: Net job creation will be assessed using IMPLAN model
- Plan to review results of this detailed analysis on the short list of pilots in second set of stakeholder meetings, to get your feedback and refinements before building NGIA portfolio

# CIP/NGIA coordination: How to determine what belongs in CIP versus NGIA?

To be eligible for inclusion in innovation plans, utilities must:

- Demonstrate that proposed energy efficiency and strategic electrification investments are not included in the utility's current CIP Triennial Plan, and state whether the utility does or does not intend to include any of the proposed investments in future CIP Triennial Plans;
- For proposed energy efficiency and strategic electrification investments in measures that have been included in past CIP plans, provide historical measure level performance data since 2010; and
- Clearly demonstrate why the proposed energy efficiency and strategic electrification investments could not reasonably be included in the utility's conservation improvement program.



## Get in touch with us:
## Peter Narbaitz

613.520.1845
Peter.Narbaitz@icf.com

icf.com

linkedin.com/company/icf-international/

twitter.com/icf

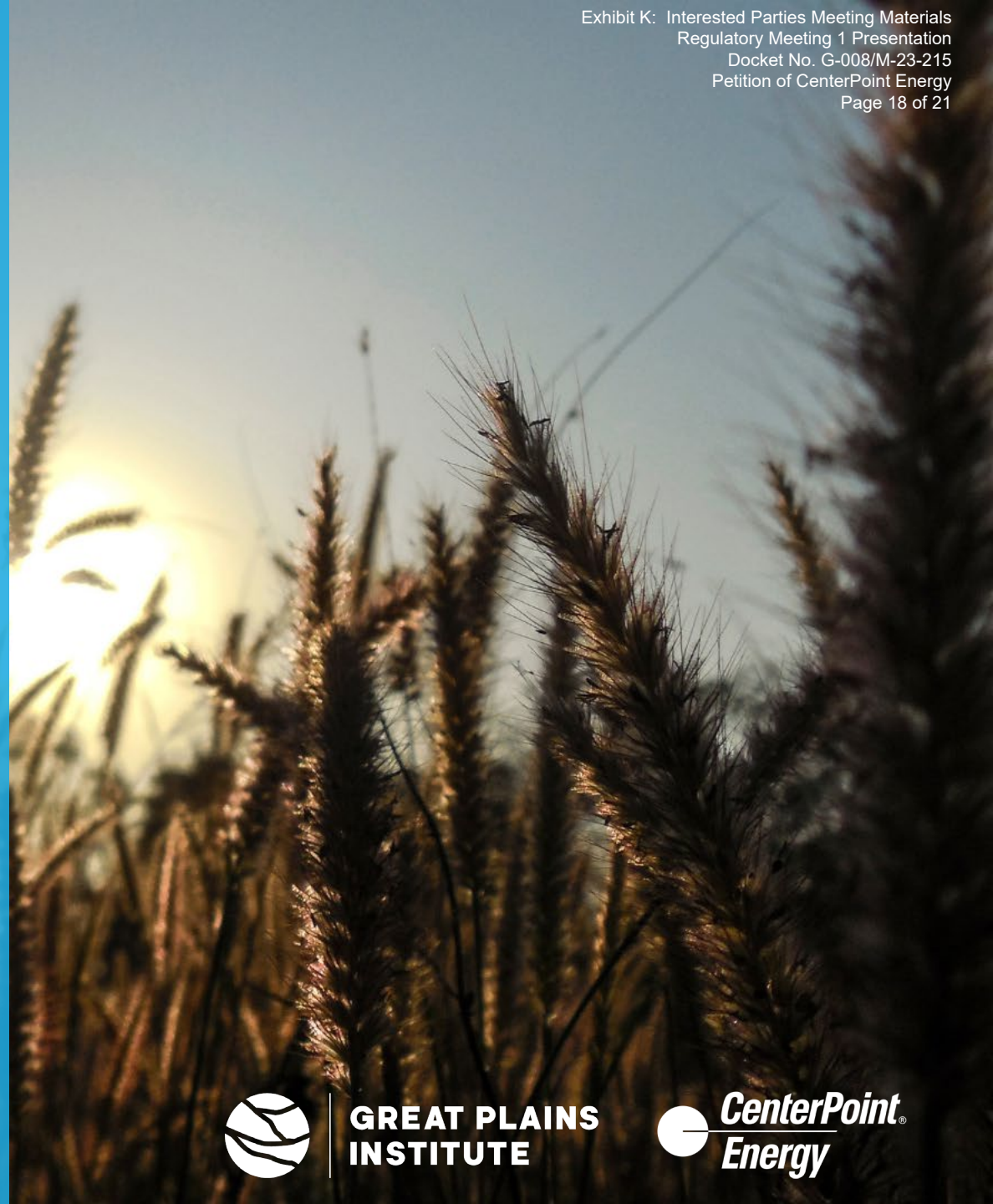
https://www.facebook.com/ThisIsICF/

**About ICF**

ICF (NASDAQ:ICFI) is a global consulting and digital services company with over 7,000 full- and part-time employees, but we are not your typical consultants. At ICF, business analysts and policy specialists work together with digital strategists, data scientists and creatives. We combine unmatched industry expertise with cutting-edge engagement capabilities to help organizations solve their most complex challenges. Since 1969, public and private sector clients have worked with ICF to navigate change and shape the future.

# - Break -

## Please return at 10:30AM



GREAT PLAINS INSTITUTE

CenterPoint Energy

# Questions for stakeholders:

- **As a regulatory party, what are your criteria for a successful innovation plan from CenterPoint Energy?**
  - i.e., What would need to be true of the plan at the point of filing to increase the likelihood that you, as a regulatory party, would support it?

# Questions for stakeholders:

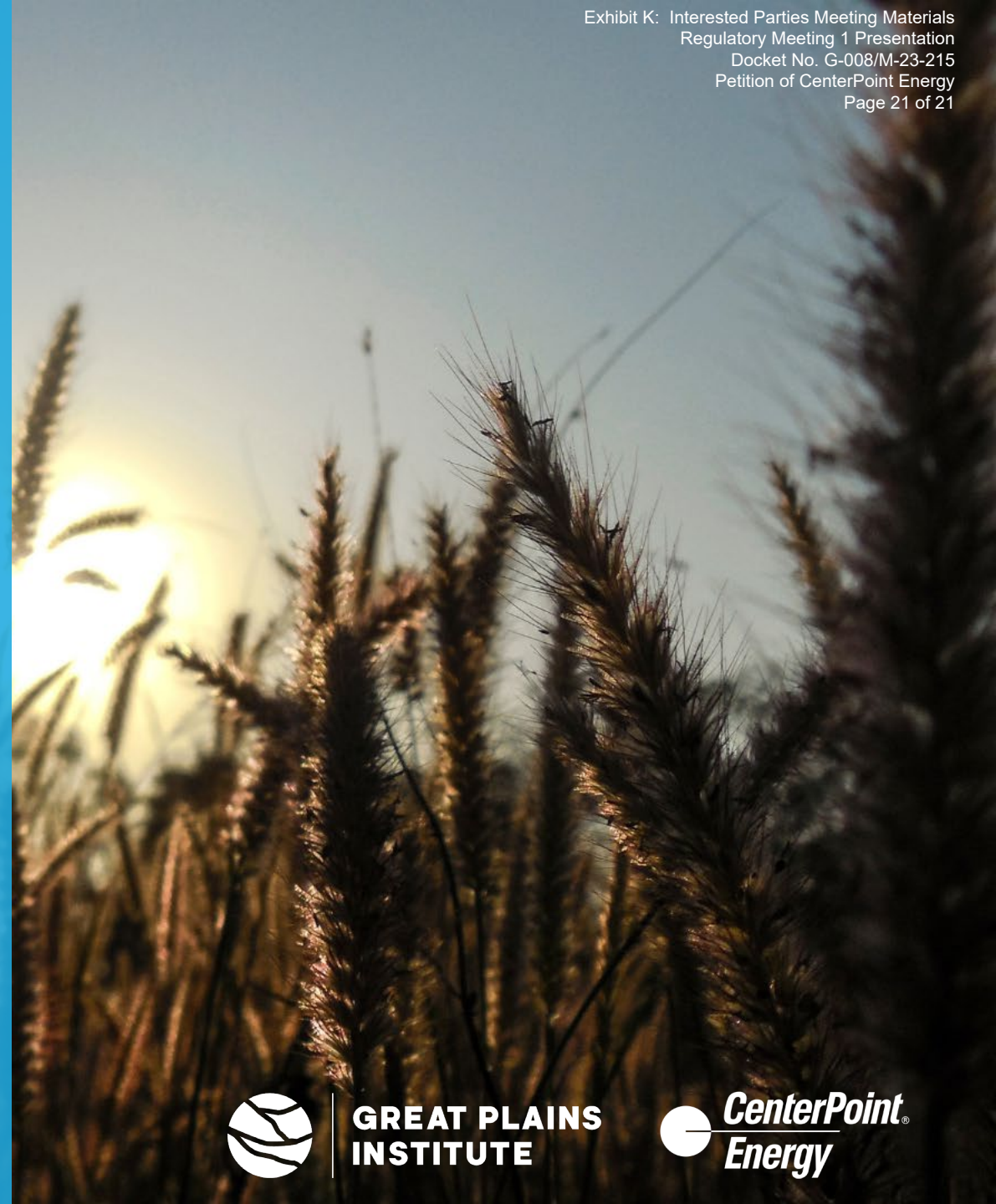
- What do you want to discuss in the next two regulatory stakeholder meetings?

GREAT PLAINS INSTITUTE

CenterPoint Energy

# Wrap-up and Next Steps

- Thank you for participating in today's discussions!
- The next regulatory stakeholder meeting will take place in December 2022. We will share the date once it has been determined.
- We will be sending out notes from today's meeting in the next week or two once we've had a chance to organize them.
- CenterPoint Energy is open to additional discussions and engagement beyond these meetings – if you have questions or comments, please contact InnovationPlan@CenterPointEnergy.com



GREAT PLAINS INSTITUTE

CenterPoint Energy

# CenterPoint Energy Innovation Plan

## Regulatory Stakeholder Meeting 1

Friday, October 7, 9:00am-12:00pm ET

***Meeting Summary and Notes***

# Meeting Context and Summary

## Context

On Friday, October 7, 2022, CenterPoint Energy (CenterPoint), with technical support from ICF and facilitative support from the Great Plains Institute (GPI), hosted the first of three planned regulatory stakeholder meetings that will inform the development of CenterPoint's first innovation plan. The meeting was held in an online format via Zoom.

CenterPoint is preparing its voluntary innovation plan in accordance with the Natural Gas Innovation Act (NGIA), which was signed into law by Governor Walz on June 26, 2021. The full text of NGIA is available here. Additional information regarding innovation plans and natural gas utility regulation changes can be found in the following two Minnesota Public Utilities Commission (Commission) dockets:

| | |
|---|---|
| **Docket No. G-999/CI-21-565** | In the Matter of a Commission Evaluation of Changes to Natural Gas Utility Regulatory and Policy Structures to Meet State Greenhouse Gas Reduction Goals |
| **Docket No. G-999/CI-21-566** | In the Matter of Establishing Frameworks to Compare Lifecycle Greenhouse Gas Emissions Intensities of Various Resources, and to Measure Cost-Effectiveness of Individual Resources and of Overall Innovation Plans |

This regulatory stakeholder meeting built upon CenterPoint's September 23, 2022 all-stakeholders meeting, but was intended more specifically for an audience that plans to participate in the regulatory process. The primary goals of this meeting were as follows:

- Discuss how CenterPoint Energy is developing its innovation plan from a regulatory standpoint, and
- Understand what would constitute a successful first innovation plan for CenterPoint, according to regulatory stakeholders.

## Meeting Summary

The meeting began with a level-setting overview of the first all-stakeholders meeting, including a summary of how CenterPoint Energy (CenterPoint) plans to develop its first innovation plan using an initial list of project ideas that were proposed in a public request-for-information process and by CenterPoint internally. The first all-stakeholders and regulatory stakeholders meetings were intended to support the initial screening and gap analysis phase of plan development, which CenterPoint will use to develop a shortlist of approximately 25 pilot strategies that will be analyzed in greater detail for potential inclusion in its first innovation plan.

The second stakeholder meetings will focus on the results of this more detailed analysis, and the third stakeholder meetings will focus on final selection of projects for inclusion in the innovation plan filing and allocation of budget among those projects.

CenterPoint described the following key takeaways from the first all-stakeholders meeting:

- **General feedback:**
  - Many respondents did not see gaps in the draft shortlist of innovative pilots
  - Desire for more details on pilots, combined NGIA portfolio, etc.
  - Desire to ensure that NGIA resources are deployed to their best and highest use cases
- **Feedback on specific pilots:**
  - Some clarifications made on specific RFI responses and suggestions for inclusion on the shortlist of 25 pilot projects
  - Concern on inclusion of gas efficiency measures (i.e., gas heat pumps)
  - Concerns surrounding long-term viability of RNG
  - Support for networked geothermal system pilot(s)
  - Questions on whether IRA or other new funding sources impact NGIA
- **Feedback on additional specific considerations for innovation plan:**
  - Identify ways to obtain community input and advice on NGIA pilots
  - Ensure NGIA pilots support key groups, including the multi-family sector and environmental justice communities
  - Need to include funding for market development (including workforce and contractor development) in the innovation plan
  - Clarity on the impact on gas rates

CenterPoint shared that they intend to treat this initial regulatory stakeholder meeting, the first all-stakeholders meeting (September 23, 2022), and any feedback received via the meeting attendee survey (sent to attendees of both this meeting and the first all-stakeholders meeting), as a final opportunity for stakeholders to suggest additional pilot strategies for inclusion in CenterPoint's first innovation plan. CenterPoint emphasized that it will remain open to innovative suggestions, but later suggestions may instead be considered for inclusion in subsequent plan iterations.

CenterPoint also discussed how to best coordinate strategies between the Conservation Improvement Program (CIP), which was recently updated under the Energy Conservation and Optimization Act (ECO Act), and NGIA. CIP allows for energy efficiency and conservation opportunities, but energy efficiency is also considered an innovative resource under NGIA.

Because of this overlap, the Commission has adopted the following guidance for utilities proposing energy efficiency and strategic electrification projects in their innovation plans:

- Demonstrate that proposed energy efficiency and strategic electrification investments are not included in the utility's current CIP Triennial Plan, and state whether the utility does or does not intend to include any of the proposed investments in future CIP Triennial Plans;
- For proposed energy efficiency and strategic electrification investments in measures that have been included in past CIP plans, provide historical measure level performance data since 2010; and
- Clearly demonstrate why the proposed energy efficiency and strategic electrification investments could not reasonably be included in the utility's conservation improvement program.

Following the NGIA and innovation plan introduction, summary of key topics from the first all-stakeholders meeting, and discussion of the distinction between CIP-eligible and NGIA-eligible strategies, GPI facilitated an open discussion focused on identifying regulatory parties' criteria for a successful innovation plan from CenterPoint. The discussion also provided an opportunity for clarifying questions about CenterPoint's plan development process.

Below, we have summarized regulatory stakeholders' stated criteria for success (in addition to requirements stated in NGIA and in Commission orders). The summary and notes that follow include perspectives shared in response to these questions from both in-person and virtual participants. Attendees were also encouraged to share their perspectives in the post-meeting survey and were invited to contact CenterPoint with any additional ideas or questions at InnovationPlan@centerpointenergy.com.

## Regulatory Stakeholders' Criteria for Success for the Innovation Plan

The following criteria were stated by one or more regulatory stakeholders at the October 7 meeting and have been summarized and consolidated by GPI staff based on the meeting notes. Note that these items were discussed but the group did not attempt to come to consensus on any item described below. These criteria are not listed in any order of prioritization or ranked in any order of importance.

1. **Suggested criteria for selecting projects to be included in the innovation plan:**
    a) Focus on long-term emissions reduction potential when identifying which projects to prioritize.
    b) Proposed innovative resources should not simply reflect what strategies are easiest and most available in 2022 but consider technologies and approaches that could become available within the plan's 5 year period. This is especially important for the industrial sector.
        i. Note: The annual reporting process associated with the innovation plan could be a good opportunity to track and document potential shifts in technological feasibility and possibly seek permission to modify an innovation plan.

c) Important to test technologies that are scalable, and that at scale could replace the gas system and make significant progress towards net zero carbon emissions by 2050.

d) Interest in consideration for pilots that would take advantage of the opportunities for efficiency gains in carbon recovery from waste resources including organics and recycling.

e) Include a broad range of investments in the plan—need solutions that we don't yet know about, or that are not yet well developed.

**2. Supporting information desired to be included in the innovation plan:**

a) Would like to see a wedge analysis that displays a long-term vision and trajectory towards decarbonization, beyond just the five years for each innovation plan. Should display the different contributions and greenhouse gas reductions of certain strategies.

(1) Note: This is included in the list of proposed projects as a "Decarbonization Pathways Analysis." It is currently listed as a potential research and development initiative.

b) Want to know what the avoided greenhouse gas emissions (and the avoided costs associated with avoiding those emissions) would be for the proposed innovative resources, and how those emissions reductions compare across strategies.

c) Need to protect ratepayers from initiatives that are not cost-effective, and rates that would be unjust and unreasonable. Desire to see how CenterPoint considers the cost-effectiveness of pilot projects it pursues, and how the long-term effects of those pilot projects could influence rates.

d) Describe how gas heat pump technologies are being considered, and how they do or do not fit within NGIA and Minnesota's Efficient Technology Accelerator.

e) Interest in clarity regarding how granular project data will be and how any available AMI data is being used to support projects (i.e., how measurements obtained from meter data will be used to see actual effects).

f) Information on how workforce and market development will be considered in the innovative resources (i.e., how CenterPoint is/is not integrating workforce and market development programs).

**3. Suggested considerations for innovation plan development and implementation:**

a) Reduction in GHG emissions should be key metric for pilot evaluation.

b) Would like to see what sort of innovation NGIA can drive, with innovative projects becoming more permanent fixtures of CenterPoint's resource mix. As CenterPoint develops its pilots, it should also consider how to add aspects to the pilots that will facilitate better understanding of the market, resource potential, etc. to drive long-term success.

c) CenterPoint should build the data needed to expand pilots as it works on those pilots, allowing successful pilots to improve and expand, if warranted, in a timely manner.

d) For the "Neighborhood Weatherization Blitz" strategies, consider going beyond the described approach to reach folks that may not be considered low-income.

e) Would like to see further consideration of where the CIP/NGIA boundary does (or does not exist), including the possibility of complementary incentives from local governments.

# Meeting Notes

*Notes are in an alphanumeric format for reference purposes only; the numbers and letters do not indicate any prioritization or ranking.*

## I. Introductory Notes

1. CenterPoint is open to smaller ad-hoc meetings to discuss specific key items.
2. Please let CenterPoint know of any groups or individuals that should be engaged but are not participating.
   a) CenterPoint can reach out to these stakeholders.
   b) Want all relevant parties at the meetings.
3. This is the first of three meetings planned for the regulatory stakeholder group.
   a) GPI is offering a participation stipend on behalf of CenterPoint to help under-represented groups and groups with under-represented perspectives attend the next set of meetings (All-Stakeholders Meeting 2 and Regulatory Stakeholders Meeting 2).
      i) More information on the process for applying for this stipend to come.

## II. Recap of and discussion about the first all-stakeholders meeting (September 23, 2022)

1. Focus of the first stakeholder meetings: initial screening of 28 shortlisted projects and gap analysis of potential projects that had not yet been considered
   a) Goal: Identify if any potential projects are missing from CenterPoint's shortlist
   b) After identifying the shortlist, CenterPoint will conduct additional, detailed analysis of the potential pilots, which will be used to inform innovation plan filing
2. Three key phases of stakeholder feedback
   a) Currently developing the shortlist of approximately 25 pilots
      i. Receiving stakeholder feedback to inform this
      ii. Shortlist is currently 28 projects. CenterPoint will likely narrow this list to 25.
   b) Detailed analysis
   c) Portfolio development
3. CenterPoint is targeting December for the next set of stakeholder meetings, but dates have not yet been established.
4. Once CenterPoint completes the detailed analysis, is there a possibility that they will revisit the shortlist of pilots?
   a) There is a degree of flexibility, but CenterPoint envisions a linear process towards plan finalization.
   b) CenterPoint does not plan to include all 25 shortlisted pilots in its innovation plan filing.

i. The analysis will help CenterPoint select the most appropriate pilots for inclusion.
ii. Want all possible technologies represented in the shortlist.
iii. Current phase of innovation plan development is relatively high-level—more specific program and pilot design aspects will be developed later.

c) Because this is CenterPoint's first innovation plan, the plan development process needs to allow for some flexibility, but this flexibility should not inhibit plan filing.
i. Portfolio will have interdependencies.
ii. At this point in the plan development process, CenterPoint is trying to capture every potential idea to prevent needing to make last-minute changes
iii. Ideas submitted later could be considered in potential future modifications to the portfolio for this first innovation plan, future innovation plans, etc.

5. Up to 10% of NGIA funding can be reserved for research and development projects.
a) Research and development initiatives are listed separately for consideration; they are not being considered for the shortlist of pilot projects.
b) Research and development projects will not necessarily be subject to the same level of analysis as pilots being considered for plan inclusion.
i. Research and development could be a variety of initiatives—study, lab-scale proof-of-concept of a technology, etc.
ii. Some research and development initiatives may have modest greenhouse gas reduction potential, but they are not necessarily intended to be reflective of the innovation plan's broader greenhouse gas-reducing portfolio.

6. Reviewed 28 pilots on current shortlist at first meeting by category with attendees of first all-stakeholders meeting.
a) Some of the 28 pilots combine multiple separate RFI responses associated with similar technologies.
b) Inclusion on this initial shortlist does not guarantee inclusion in CenterPoint's innovation plan portfolio
c) Some pilots are currently listed as "archetypes" and may be filed as archetypes in the plan because individual projects will need to go through an RFP process (most pilot projects will likely be subject to an RFP process). Other pilots may be specific projects/initiatives, and thus are not listed as archetypes.
i. In some cases, the "archetype" designation may be resource-specific: For example, RNG from dairy manure has a lot of potential variability, so it may be based more on averages/projected calculations, while approaches related to efficiency may be more specific.
ii. CenterPoint wants as many implementation details as possible in the plan, but obtaining certain details can be more or less practical or accurate for certain resources.

7. Key takeaways from stakeholder feedback during/after the first all-stakeholders meeting:
*a) General feedback*
i. Many respondents did not see gaps in the draft shortlist of innovative pilot
ii. Desire for more details on pilots, combined NGIA portfolio, etc.
iii. Desire to ensure that NGIA resources are deployed to their best and highest use cases
*b) Feedback on specific pilots*

i. Some clarifications made on specific RFI responses and suggestions for inclusion on the shortlist
ii. Concern on inclusion of gas efficiency measures
iii. Concerns surrounding long-term viability of RNG
iv. Support for networked geothermal system pilot(s)
v. Questions on whether IRA or other new funding sources impact NGIA

*c) Feedback on additional specific considerations for innovation plan*

i. Identify ways to get community input and advice on NGIA pilots
ii. Ensure NGIA pilots support key groups like multi-family sector and environmental justice communities
iii. Need to include funding for market development—including workforce and contractor development—in first innovation plan
iv. Clarity on the impact of gas rates

8. What concerns related to the inclusion of gas efficiency measures were brought up at the first all-stakeholders meeting?
   a) Attendees did not specifically identify gas heat pumps, but they seemed to be the area of concern
   b) Interest in further stakeholder discussion about the distinctions between the Conservation Improvement Program (CIP) and NGIA.
      i. Under CIP, gas measures generally relate to replacing less efficient technology with new, more efficient technology. It is worth considering the role of NGIA here and whether this perspective also fits under NGIA (or does not).

## III. How CenterPoint Energy is developing its innovation plan from a regulatory standpoint (i.e., how it intends to meet the requirements of NGIA and apply the frameworks adopted by the Commission in Docket 21-566).

**Process for detailed analysis of potential innovative resources**

1. The Commission-approved innovative resource evaluation criteria framework contains the following four categories (some more qualitative or quantitative than others) for analysis. The analysis will be holistic, and some criteria may be more or less applicable to certain pilots. With support from ICF, CenterPoint will complete the detailed analysis of shortlisted pilots in accordance with the evaluation framework.
   a) *Perspectives:* Analytical approaches such as an energy savings analysis, energy cost savings analysis, cost-benefit analyses, etc. that help identify several perspectives related to the pilot, including utility perspectives, participant perspectives, and the perspectives of nonparticipating customers.
      i. NGIA legislation Commission-approved frameworks define the cost-benefit analysis framework and key parameters.
   b) *Environment:* Emissions benefits, greenhouse gas assessment, and other potential environmental benefits.

i. Will use lifecycle emissions for all pilots, and the Argonne National Labs Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies (GREET) model for RNG initiatives.

c) *Socioeconomic:* Net job creation and other economic benefits and/or public co-benefits.
   i. Net job creation will be assessed using the IMPLAN model.

*d) Innovation:* Innovative resource development and scalability.
   i. Likely to be a qualitative discussion.

2. The evaluation frameworks were established by the Commission and had their own docket.
3. CenterPoint plans to review the results of this detailed analysis on the shortlist of pilots in second set of stakeholder meetings
4. CenterPoint will develop assumptions for each shortlisted project (e.g., project size, technology included, expected program design, etc.)
   a) Some RFI responses provided significant details than can inform these assumptions, but others will require external sources to build upon the proposed approach to allow for evaluation.
   b) CenterPoint may reach back out to RFI respondents for additional information.
   c) CenterPoint will get feedback and refine pilots before building its innovation plan portfolio.
5. Who should attendees direct feedback (on the analysis and process) to?
   a) In addition to providing feedback at this meeting, CenterPoint encourages interested parties to provide feedback via the dedicated innovation plan email address: innovationplan@centerpointenergy.com
   b) Evaluation frameworks were established by the Commission, and the frameworks had a separate docket.
6. How will CenterPoint apply Commission-approved evaluative frameworks to archetype pilots, for which CenterPoint does not yet know exactly what the specific project will be? How can the framework be applied to an initiative with unknown details?
   a) Analysis will be based on the best available information.
   b) CenterPoint will develop key assumptions (e.g., project size, technology included, expected program design, etc.) for each shortlisted pilot to help address this.
   c) Evaluative frameworks require that CenterPoint use actual values where possible, and reasonable assumptions where actual values are not possible or practical.
7. Some innovative resources/technologies have more or less variability than others. For example, hydrogen projects likely have much less variability in greenhouse gas emissions reductions than do dairy manure-based RNG projects. This means that it is more difficult to establish what is “typical” for some projects, and there is a resource-dependent component.
   i. CenterPoint is required to provide a range of GHG emissions reductions (rather than a single number), which will help account for this challenge.

**CIP/NGIA coordination: How to determine what belongs in CIP vs. NGIA?**

1. For an energy efficiency resource to be eligible for inclusion in innovation plans under NGIA, utilities must:

a) Demonstrate that proposed energy efficiency and strategic electrification investments are not included in the utility's current CIP Triennial Plan, and state whether the utility does or does not intend to include any of the proposed investments in future CIP Triennial Plans;
b) For proposed energy efficiency and strategic electrification investments in measures that have been included in past CIP plans, provide historical measure level performance data since 2010; and
c) Clearly demonstrate why the proposed energy efficiency and strategic electrification investments could not reasonably be included in the utility's conservation improvement program.

2. Potential projects that were removed from consideration in CenterPoint's list of potential NGIA projects due to their similarity to CIP standards were sent to CenterPoint's CIP planning team.
   a) CenterPoint is considering these strategies as part of its next CIP Triennial Plan, which is currently in development.
3. What are some of the projects that were proposed for inclusion in CenterPoint's innovation plan, but have instead been redirected for consideration under CIP?
   a) Range of 15-20 projects
   b) Primary guiding principles were whether the proposed project (or something very similar to it):
      i. Was offered in CIP,
      ii. Would be cost-effective under the CIP framework,
      iii. Has been included in energy efficiency programs in other states or by other utilities, and
      iv. Would typically be expected to be in an energy efficiency program, or was it something more innovative?
   c) It is also worth noting that CIP will be expanding to include new electrification measures enabled by the ECO act; with this expansion, there is a possibility that some strategic electrification projects will fit well under CIP.

## IV. As a regulatory party, what are your criteria for a successful innovation plan from CenterPoint Energy?

***i.e., What would need to be true of the plan at the point of filing to increase the likelihood that you, as a regulatory party, would support it?***[1]

1. Reduction in GHG emissions should be key metric for pilot evaluation
2. Could CenterPoint clarify what they mean by "archetype"?
   a) Essentially an example project.
      i. For certain topics (e.g, RNG, hydrogen), CenterPoint did not receive specific RFI responses from industrial facilities proposing a highly specific project.

[1] This question was posed by facilitators to help determine stakeholders' criteria for success for the purposes of discussion in this meeting; it was not intended to determine formal support such as through a sign-on process.

b) RFI was intended to serve as a high-level gathering of ideas for inclusion in the analysis and, if appropriate, further comparison in CenterPoint's NGIA portfolio. A subsequent competitive process will help identify specific projects.
c) The analysis of archetype projects will still be based on reasonable assumptions.

3. One of the shortlisted projects related to completion of a wedge analysis. Minneapolis Clean Energy Partnership has indicated an interest in this form of analysis in general due to the way that a wedge analysis can display a long-term vision and trajectory towards decarbonization, beyond just the five years for each innovation plan.
   a) A wedge analysis displays the different contributions and greenhouse gas reductions of certain strategies.
      i. Can provide a longer-term analysis broken down by strategies/technologies.
   b) Conducting a wedge analysis specific to what CenterPoint proposes in their innovation plan can display the plan's potential impact.
   c) Could be considered a research and development project.
   d) The proposed wedge analysis was an internally proposed idea (proposed by CenterPoint).
      i. Proposed as a "Decarbonization Pathways Analysis" and is listed as a potential research and development initiative.
   e) This information should be available with CenterPoint's innovation plan portfolio as another way to represent the initiatives that informed the portfolio.
   f) Wedge analysis displays different contributing metrics and how they reduce GHG emissions
4. Because each innovation plan is active for five years (remaining active until the late 2020s), CenterPoint's portfolio should not simply reflect what strategies are easiest and most available in 2022.
   a) CenterPoint's portfolio each year will not necessarily be static; some projects could be modified in the future based on evolving opportunities and technologies.
   b) One purpose for including "archetype" projects is that CenterPoint expects economics associated with some projects to be reasonable, even if they have not yet identified specific projects.
      i. CenterPoint is allocating for potential future archetype project opportunities that may require further development but does not want to leave unallocated funding for future decisions several years out.
      ii. Archetypes allow CenterPoint to identify what the initiative will be, and those initiatives can be developed as specific projects in greater detail later.
   c) This is an especially significant consideration for some of the innovative resources in the industrial sector.
   d) CenterPoint could propose an update to its innovation plan within the plan's five year active period but does not plan on depending on that strategy.
   e) The annual reporting process associated with the innovation plan could be a good opportunity to track and document potential shifts in technological feasibility
   f) CenterPoint should not remove certain ideas that may be feasible in the future from consideration for plan inclusion.

5. To expand upon the discussion question, what would "support" on this initiative look like? Regulatory stakeholders are committed to providing feedback, but it is unclear what "support" would be, beyond simply participating in the process.
    a) Note: This attendee is referring to a GPI-phrased question (*What would need to be true of the plan at the point of filing to increase the likelihood that you, as a regulatory party, would support it?*)
    b) The goal of this meeting is simply to identify what stakeholders want to see in the plan.
    c) CenterPoint wants to use this engagement process to prepare for the regulatory approval process at the Commission.
        i. CenterPoint wants to hear major regulatory stakeholder concerns before filing so that it can address as many of those concerns upfront as possible.
    d) CenterPoint is interested in stakeholder feedback regarding assumptions used in the analysis phase of plan development.
6. There is a need to protect ratepayers from initiatives that are not cost-effective, and rates that would be unjust and unreasonable. Desire to see how CenterPoint considers the cost-effectiveness of pilot projects it pursues, and how the long-term effects of those pilot projects could influence rates.
7. It is important that CenterPoint maintain a focus on long-term emissions reduction potential when identifying what projects to prioritize.
    a) Important to test technologies that are scalable, and that at-scale could replace the gas system and make significant progress towards net zero carbon emissions by 2050.
    b) Some pilots under consideration meet this criterion well (e.g., geothermal networks)—more than one pilot should be considered in this area, but others do not meet this criterion well (e.g., fuel blending).
    c) A project listed as one individual pilot on the shortlist could be a large initiative with substantial funding, several locations, etc. in the filed innovation plan.
8. Interest in consideration for pilots that would take advantage of the opportunities for efficiency gains in carbon recovery from waste resources including organics and recycling.
    a) Carbon could be repurposed here to directly supplant fossil fuel carbon.
    b) Potential for the recovery of carbon from existing sources.
    c) California's biodiesel to RNG model would account for 20% of California's natural gas use.
9. Interest in including a broad range of investments in the plan—"We will need solutions that we don't yet know about, or that are not yet well developed."
10. One eventual goal is to see what sort of innovation NGIA can drive, with innovative projects becoming more permanent fixtures of CenterPoint's resource mix. As CenterPoint develops its pilots, it should also consider how to add aspects to the pilots that will facilitate better understanding of the market, resource potential, etc. to drive long-term success.
    a) CenterPoint should build the data needed to expand pilots as it works on those pilots, allowing the pilots to become even better over time.

11. Interest in clarity regarding how granular project data will be and how the AMI network is being used to support projects (i.e., how measurements obtained from meter data will be used to see actual effects)
12. Gas heat pumps could fit under the Energy Conservation and Optimization Act (ECO Act) or NGIA as an efficiency measure or as a fuel switching measure. Want to ensure that the innovation plan describes how these technologies are being considered and how they do or do not fit within NGIA as well as Minnesota's Efficient Technology Accelerator.
    a) Many of these strategies were included as research and development initiatives in CIP, but were not found to be cost effective, so they may work better in NGIA
    b) Some organizations will have a difficult time supporting initiatives that will create new pathways to gas use, even if those pathways improve the efficiency of that gas use.
    c) Would installation of a gas heat pump with a traditional air conditioning system reduce gas usage overall?
        i. This depends on the specific heating/cooling loads.
        ii. Gas heat pump technologies under development are not necessarily uniform—some provide space cooling while others provide space water heating but not cooling (so the consumer would still use electricity for air conditioning).
        iii. For a strategy to be useful in NGIA, it must result in a reduction in gas loads
    d) Competition—gas heat pumps will need to compete with electric air source heat pumps for inclusion/prioritization in CenterPoint's plan based on a cost-benefit analysis.
    e) CenterPoint is currently just analyzing the technology to allow for comparison across other potential approaches.
13. The shortlisted "Neighborhood Weatherization Blitz" strategies would potentially qualify for consideration under dedicated low-income initiatives within CIP, but with additional geographic considerations. Is it worth considering going beyond the described approach to reach folks that may not be considered low-income?
        i. The Department of Commerce only allows for income eligibility to be determined by geography in certain instances in certain programs. Utilities are not allowed to offer something only to certain geographic locations without offering it across their full territory. However, the utility could establish income eligibility criteria. That could make a neighborhood blitz program more suitable for NGIA than CIP.
        ii. Increased incentives for specific neighborhoods have not been allowed in CIP.
        iii. CenterPoint will seek further clarification on this area with the CIP team at the Department of Commerce.
14. Value in further consideration of where the CIP/NGIA boundary does (or does not exist).
    a) NGIA offers an opportunity to be innovative and go beyond what was allowed under CIP.
    b) Worth considering what efficiency might look like in NGIA, based on the pilot responses.
    c) What role does NGIA have in incentivizing local government initiatives?
        i. Are there potential opportunities within NGIA for utilities to match or provide additional support when local governments implement their own innovative approaches (rebates, incentives, etc.)? For example, if a local government

establishes a program with bonus rebates, could the utility establish a program that would allow them to provide those same homeowners with additional financial support?

ii. If CenterPoint can do this, local governments may be incentivized to develop their own programming.

iii. CenterPoint included this for consideration in its neighborhood blitz pilot.

## V. What do you want to discuss in the next two regulatory stakeholder meetings?

1. CenterPoint currently plans to share its draft portfolio at the third regulatory stakeholder meeting to receive feedback.
2. Budgets—Could this be thought of as a revenue requirement for capital costs?
   a) For capital investment projects, it would be revenue requirement. However, the revenue requirement is averaged over the term of the plan
   b) How CenterPoint intends to seek cost recovery for innovation plan projects/resources and the ratepayer impacts of those costs are important to some parties.
   c) On capital projects: The term of each innovation plan is five years, but most capital investments would have a depreciation period significantly longer. Could revenue requirement costs included in plan be spread over a longer timeframe than plan term?
      i. There are some questions regarding what should be done with these costs at the end of the-five year innovation plan term: Currently unsure if the costs will roll into the next innovation plan, be addressed with a rate case, etc.
3. Interest in a conversation about cost recovery in the third regulatory stakeholder meeting.
4. Want to know what the avoided greenhouse gas emissions (and the avoided costs associated with avoiding those emissions) would be for the proposed innovative resources, and how those emissions reductions compare across strategies.
   a) NGIA statute requires intra-comparisons within the plan across resources—want to know more about how they compare.
   b) This will be a key topic of the second meeting
5. Workforce and market development, and how this will be considered in the innovative resources (i.e., how CenterPoint is/is not integrating workforce and market development programs).
   a) Workforce development could be included as part of some of the programs.
      i. Example: Adding a budget line-item to deep energy retrofits with air source heat pumps for training, contractors, etc. Few contractors in MN know how to do this work, so it is a key component of program success.
   b) Need enough contractors to ensure that the pilot can be carried out in a high- quality way, especially if the program will continue to be a large component of the CenterPoint's business moving forward.
      i. Critical that there are enough skilled workers to carry out the pilot.
      ii. Important aspect of program design and budget.

c) Given NGIA's inherent flexibility, this is an opportunity for CenterPoint to think creatively: initial pilots proposed in the first innovation plan may be focused on their potential to reduce greenhouse gas emissions, and in the future CenterPoint may need to dedicate additional funding to workforce development
d) High upfront investments can make reduce the cost-per-ton of greenhouse gas emissions reduced over time.

## VI. Wrap-up and next steps

1. Next regulatory stakeholder meeting will take place in December 2022 (exact date TBD)
2. CenterPoint/GPI will provide the notes from this meeting in the next 1-2 weeks.
3. CenterPoint is open to additional discussion
   a) Please complete the survey (link to be provided via email following this meeting)
   b) Dedicated innovation plan email address: Innovationplan@centerpointenergy.com
4. GPI offering a participation stipend on behalf of CenterPoint to reduce barriers to participation for under-represented groups and groups with under-represented perspectives. More information to come.

| Primary Innovation Category | # | Pilot | Brief Description | Rationale | Source |
|---|---|---|---|---|---|
| RNG | 1 | RNG Proposal - Anaerobic Digestion of Organic Materials | Respondent is proposing to build an anaerobic digestion (AD) facility that would be capable of processing at least 25,000 tons per year of organics to produce RNG and soil/agricultural products. | This is one of the few 'specific RNG projects' proposed in response to the RFI. It represents an interesting opportunity to partner with local government to develop what is expected to be low-carbon intensity RNG, as well as supporting a circular economy. | RFI #90 |
| | 2 | RNG Proposal - Anaerobic Digestion of East Metro Food Waste | Respondent is planning a system to recover organics from municipal solid waste and divert these materials to be delivered to a future anaerobic digestion facility to produce biogas or renewable natural gas. | This is one of the few 'specific RNG projects' proposed in response to the RFI. It represents an interesting opportunity to partner with local government to develop what is expected to be low-carbon intensity RNG, as well as supporting a circular economy. | RFI #18 |
| | 3 | RNG Archetype – WRRF | Archetype project using expectations for typical costs and GHG intensity of RNG from wastewater recovery facilities (WRRF), for evaluation and comparison in the shortlist. | The initial RFI did not receive many responses related to specific RNG projects. But CenterPoint would like to consider how different types of RNG would compare in its NGIA portfolio. Wastewater facilities represent a potential local source of RNG. | Gap Analysis |
| | 4 | RNG Archetype - Dairy Manure | Archetype project using expectations for typical costs and GHG intensity of RNG from dairy manure, for evaluation and comparison in the shortlist. | The initial RFI did not receive many responses related to specific RNG projects. But CenterPoint would like to consider how different types of RNG would compare in its NGIA portfolio. Dairy manure represents a 'negative' carbon intensity source of RNG. | Gap Analysis |
| | 5 | RNG Archetype – Food Waste | Archetype project using expectations for typical costs and GHG intensity of RNG from food waste, for evaluation and comparison in the shortlist. | The initial RFI did not receive many responses related to specific RNG projects. But CenterPoint would like to consider how different types of RNG would compare in its NGIA portfolio. Food waste represents a local source of potentially 'negative' carbon intensity of RNG, and there are expected to be additional opportunities beyond the two specific projects of this nature highlighted above. | RFI #46 and Gap Analysis |
| | 6 | RNG Archetype - Landfill Gas | Archetype project using expectations for typical costs and GHG intensity of RNG from landfill gas, for evaluation and comparison in the shortlist. | The initial RFI did not receive many responses related to specific RNG projects. But CenterPoint would like to consider how different types of RNG would compare in its NGIA portfolio. Landfills represent a potential local source of RNG. | Gap Analysis |
| Hydrogen/Ammonia | 7 | Green Hydrogen Blending into Natural Gas Distribution System | Hydrogen produced via electrolysis using renewable power would be injected into the gas distribution system. This would represent a next phase in the hydrogen blending pilot work CenterPoint has already begun. | This is an innovative opportunity to decarbonize CenterPoint's gas supply that merits further analysis and consideration for potential inclusion in the Company's NGIA portfolio. | #49, 52, and Gap Analysis |
| | 8 | Green Hydrogen Archetype for Industrial or Large Commercial Facility | CenterPoint could provide financial support for one or more industrial customers to install an electrolyzer and evaluate the use of green hydrogen in their facility. After pilot period, customer can keep the technology or CNP pays for it to be removed. Project may be combined with a screening study. | The initial RFI did not receive many responses related to specific hydrogen projects. But CenterPoint would like to consider how different opportunities to support 'hard to electrify' industrial customers would compare in its NGIA portfolio. | #24 and internal |
| Carbon Capture | 9 | Industrial Methane and Refrigerant Leak Reduction Program | Gas utility leak detection often stops at the site boundary, neglecting gas leaks inside the facility. An industrial leak detection and repair program could focus on these and potentially include refrigerant leaks as well. | This reduction of methane leaks falls under the NGIA's broad definition of carbon capture. This represents an interesting opportunity to target larger industrial customers who are expected to represent a higher proportion of overall customer methane leaks, and is expected to achieve very cost-effective GHG emission reductions. | #56 |
| | 10 | Urban Tree Carbon Offset Program | CNP could acquire City Forest Credits (CFC) Carbon + Credits that are generated from locally planted urban trees. These also help improve air quality, reduce stormwater runoff, reduce energy costs, and cool urban heat islands. | This proposed pilot falls under the NGIA's broad definition of carbon capture. This is one of a few 'nature-based offset' pilots proposed in response to the RFI. This pilot was shortlisted because there are established GHG emissions quantification protocols available for this 'nature-based' approach. This represents an interesting opportunity to partner with local government to develop what are expected to be cost-effective GHG emission offsets, and compare this opportunity to other potential components of CenterPoint's NGIA portfolio. | #44 |
| | 11 | Carbon Capture Archetype for Industrial or Large Commercial Facility | Archetype project using expectations for expected costs and emission reductions for a carbon capture project at an industrial facility, for evaluation and comparison in the shortlist. | The initial RFI did not receive any responses for specific industrial carbon capture projects. But CenterPoint would like to consider how different opportunities to support 'hard to electrify' industrial customers would compare in its NGIA portfolio, and carbon capture is one of the approaches contemplated for such applications. | #16 and 76 |
| | 12 | Carbon Capture through Methane Pyrolysis at Industrial or Large Commercial Facility | Archetype project using expectations for expected costs and emission reductions for a methane pyrolosis project at an industrial facility (converting natural gas to hydrogen while capturing carbon in solid form), for evaluation and comparison in the shortlist. | The initial RFI did not receive any responses for specific industrial carbon capture projects. But CenterPoint would like to consider how different opportunities to support 'hard to electrify' industrial customers would compare in its NGIA portfolio. This proposed pilot, where methane pyrolosis is conducted on-site at an industrial facility, falls under the NGIA's broad definition of carbon capture and is an approach being developed and piloted by several different companies. | Internal |
| | 13 | Carbon Capture Rebates for Commercial Buildings | Incentive program that would support the roll out of CleanO2's CarbinX units for carbon capture at CenterPoint commercial customers. CenterPoint is currently piloting this technology in CIP, and this funding could supplement potential CleanO2 CIP rebates that are being considered for the next triennial plan. | This technology has shown promise through existing CIP R&D funding, however, CleanO2 rebates CIP would be designed based on the energy savings benefits, not the GHG emission impacts. CenterPoint would like to consider how NGIA funding could provide additional support for the deployment of this technology and capture the emission reduction benefits of the technology. | Gap Analysis |
| District Energy | 14 | New Networked Geothermal Systems Pilot | This involves installation of a new 'distributed' geothermal system where individual customers would have a heat pump accessing a common water loop (instead of their own geothermal loops, or ASHPs). | This is an innovative opportunity being piloted by a few gas utilities in the U.S. that merits further analysis specific to Minnesota and consideration for potential inclusion in the Company's NGIA portfolio. | #30, 53, 86, and 101 |
| | 15 | Decarbonizing Existing District Energy Systems | This is focused on existing 'centralized' district energy systems, where a central plant heats or cools the water that gets circulated to the different buildings. The concept is first to explore a wide range of decarbonization options for these existing systems, followed by implementation support for promising options. | The initial RFI received responses ranging from hydrogen to geothermal systems to support decarbonization of existing district energy systems. These represent innovative opportunities to decarbonize district energy systems currently reliant upon natural gas, that merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. | #77 and Internal |
| | 16 | New District Energy System | This is focus on new 'centralized' district energy systems that are being proposed, leveraging geothermal heating and/or decarbonized gases. | This is an opportunity assess the launch of new district energy systems that either reduce or eliminate the need for natural gas, and consider these projects for potential inclusion in the Company's NGIA portfolio. | #36, 85, and internal |

| Primary Innovation Category | # | Pilot | Brief Description | Rationale | Source |
|---|---|---|---|---|---|
| Strategic Electrification | Strategic Electrification | Industrial Electrification Incentive Program | Pilot industrial heat pump systems to better understand potential energy and GHG reductions and engage a typically hard-to-reach sector. | This represents an opportunity to help engage industrial customers (who are often relatively hard to reach) and explore opportunities to leverage heat pumps in these facilities. Results could help inform future industrial strategic electrification efforts by identifying best practices, and help identify new ways to engage these customers. | #23 and 84 |
| | 18 | Commercial hybrid heating pilot | Target small and medium-sized business with the goal of analyzing, designing, and installing hybrid heating systems. | This would be a logical extension of some of the residential hybrid heating projects, providing useful insights into a potentially scalable decarbonization measure. | #50, 74, 96, and internal |
| | 19 | Residential deep energy retrofit + electric ASHP pilot (with gas backup) | This pilot program will comprise two components: first, performing deep energy retrofits using electric cold climate air source heat pumps to supplement heating in homes that have existing natural gas furnaces (so-called hybrid heating), and second, installing a series of hybrid heating systems in homes without deep energy retrofits to better understand performance in a more standard retrofit scenario. | The NGIA legislation requires CenterPoint to incorporate this kind of pilot into its Innovation Plan. | #29, 39, 89, 97, and internal |
| Energy Efficiency | 20 | Small/medium business GHG audit pilot | Local businesses would be proactively contacted and offered an audit, resulting in a clear and concise carbon reduction plan. | The NGIA legislation requires CenterPoint to incorporate this kind of pilot into its Innovation Plan. | #19, 27, 54, and 64 |
| | 21 | Residential Gas Heat Pump | Four manufacturers expected to deploy residential gas heat pump systems in 2023-24. The project team will survey the market and select several space heating and “combi” systems for field tests. | This represents an innovative emerging gas efficiency technology that has potential to become more cost-effective over time but may be currently too expensive relative to energy saivngs for application in CIP. | #73 and 93 |
| | 22 | Gas Heat Pump for Commercial Buildings | Demonstrate a gas heat pump offering space and/or water heating for commercial buildings (particularly in cold climates). | This represents an innovative emerging gas efficiency technology that has potential to become more cost-effective over time but may be currently too expensive relative to energy savings for application in CIP. | #71 and 73 |
| | 23 | Neighborhood Weatherization Blitzes | Engages a select local community through community-based outreach and local networking to drive deep energy savings. | Blitzes could greatly expand air sealing and insulation implementation beyond what may be possible with CIP alone (particularly in disadvantaged communities) and provide useful lessons learned and best practice data. The Grassroots Green Homes’ focus on decarbonization and disadvantaged communities may make it particularly relevant for NGIA. | #12, 35, and 99 |
| | 24 | Solar Thermal Heating for C&I | Explore new opportunities for solar heating in C&I applications. | Solar thermal is well established, but this is a different application that could help drive deep energy savings. Additionally, this could be applicable to a range of commercial and industrial (C&I) facilities as a custom measure. | #45 and internal |
| | 25 | Industrial and Large Commercial GHG Audit Pilot | Present different decarbonization strategies on a level basis for customers to evaluate and compare. | Intended to meet the "hard to electrify" industrial pilot requirement, this would expand beyond efficiency to also encapsulate things like carbon capture, hydrogen, RNG, or other abatement options. This could also help surface best practices in engaging these customers. | #20, 69, and 83 |

| # | Research and Development Project | Brief Description | Rationale | RFI # |
|---|---|---|---|---|
| 1 | Studies to support RNG market development | An R&D study to support the identification of potential RNG projects or address other barriers. | Several RFI responses have been grouped here with other similar proposals under the proposed shortlist archetype called 'Studies to support RNG market development'. Given the importance of low-carbon gases in the NGIA, CenterPoint feels that it could make sense to conduct a research and development study that supports the identification of potential projects or addresses other barriers. The Company is still establishing which study approaches might offer the best value, or address the most pressing concerns. | #2, 37, 38, 47, and 80 |
| 2 | Design a portal that partners potential projects with qualified developers | Allow larger commercial clients to offer to become RNG project feedstock suppliers. CNP could maintain a registry of qualified developers to assess the feasibility of volunteered projects. | This is an interesting market transformation initiative that could stimulate more RNG production in the state. Because it would not directly result in GHG reductions but instead is intended to further develop the RNG market in Minnesota and because it would likely be a lower cost than many other potential pilots, CenterPoint will continue to evaluate this as a potential R&D opportunity. | #100 |
| 3 | RFP Prep Study for Potential CenterPoint RNG Sites | Studies to identify availability, cost, and logistics needs for potential feedstock around specific CenterPoint cites that would be well situated to receive RNG. The idea is that by providing this information as a part of a future RFP, CenterPoint could more easily attract independent developers to the sites. | The initial RFI did not receive many responses related to specific RNG projects. CenterPoint anticipates that in the future it would run a longer RFP process to gather detailed proposals for additional specific RNG projects to consider in its NGIA portfolio. The Company believes that it can increase the number and quality of RFP responses by providing additional details to potential project developers. | Internal |
| 4 | Small-scale Biodigester at Customer Site | CenterPoint believes a customer may be interested in developing a small-scale anaerobic digester. Various feedstocks could be available (organics, turkey litter, etc) to generate biogas for use on-site. | This idea has been included for further consideration under this first NGIA plan's development because of the potential to engage and educate the public on this important technology. Plan would be to start with a feasibility study. | Internal |
| 5 | Utilization of Green Ammonia for Thermal Energy Applications | Ammonia will be produced using wind energy and then used for thermal energy applications within grain dryers, DDGS dryers, and a natural gas boiler within a district heating system. This will provide near-zero carbon thermal energy and displace fossil-based natural gas and propane. | This is an interesting opportunity to support innovative R&D conducted by local researchers. More details are required to understand the potential scale and cost of this work. CenterPoint will seek more information from the project respondent and further evaluate this opportunity. | #8 |
| 6 | Carbon Capture for Residential and Commercial Buildings | Program the would support roll out of CleanO2's CarbinX new version of units, which claim mitigation of up to 20 metric tons of CO2 emissions per year. R&D will be completed to evaluate the performance of the carbon capture system and investigate optimization pathways. | This is an opportunity to support R&D that could lead to an improved version of technology CenterPoint is already piloting. Given other sources of funding, the budgetary request from CenterPoint is modest. | #57 |
| 7 | Commercial Building and CHP Scale Carbon Capture Market Study and Pilot Field Testing | Study and develop and the current and future market for building-level and CHP system carbon capture through interviews, development of a local market (incorporation into products, selling through pipelines, or permanent sequestering means), incentivization of the installation of 2 to 6 carbon capture projects, field monitoring of performance, and the development of follow-up recommendations for future CenterPoint Energy actions. | This is an interesting opportunity to support innovative R&D that could lead to new emission reduction opportunities for CenterPoint customers. Some proposed details may need to be adjusted and CenterPoint will seek more information from the project respondent and further evaluate this opportunity. | #87 |
| 8 | Study of Decarbonizing Existing District Energy Systems | Support a feasibility study exploring different opportunities to reduce GHG emissions from existing district energy systems. | A study into this area is seen as a first step, and may be supported regardless of whether the NGIA portfolio assigns funding to support implementation in this area. | #10, 33, 77, and internal |
| 9 | Integrated Energy Systems (IES) for Self-Powered Single-family and Multifamily Residential HVAC and Water Heating | Better define opportunities and barriers associated with IESs | IESs have potential to balance energy grid supply and demand while exploiting energy resources in ways that reduce GHGs, improve operating cost and efficiencies, and provide resilient systems in the built environment. | #65 |
| 10 | Electrification Qualified Service Provider (eQSP) Program | The eQSP program is designed to develop and support a network of trade allies that help CenterPoint customers identify, quantify, fund, and implement targeted emissions reduction projects. | This may be an effective way to help expand adoption of GHG-reducing measures at scale. | #67 |
| 11 | CenterPoint Minnesota Net Zero Study | A study to help CenterPoint understand different pathways the Company could take for its gas utility business in Minnesota to reach net zero emissions by 2050. | As part of longer term planning, it will be important for CenterPoint to understand how different emission reduction strategies considered in the NGIA can combine to support the Company's emission reduction targets. | Gap Analysis |
| 12 | Support for Development of Thermal Gasification RNG Production Processes | Thermal gasification processes could allow for the production of RNG from additional feedstocks and significantly expand the available RNG supply. However, these processes are less established than anaerobic digestion for RNG production. CenterPoint is interested in potential opportunities to partner with other stakeholders to support research and development that advances this technology. | The main RFI response related to thermal gasification was too large in scale for this NGIA plan. Additionally, CenterPoint feels that this is an area likely best served by a coalition of interested funding partners. | Gap Analysis |
| 13 | Emerging Technology Strategic Incentives Fund | Incentive program supporting accelerated adoption of select emerging decarbonization measures. | This would focus on supporting market transformation for a small set of innovative measures that aren't currently fits for CIP. Whereas Minnesota Efficiency Technology Accelerator focuses on strategic engagement with the supply chain (reducing non-financial barriers), this would help promising Minnesota Efficiency Technology Accelerator measures actually get out into the market and create a commercialization plan. For NGIA, this could be an effective way to "try out" a number of promising measures in the real world and support market adoption of the best options. | #17 |

| # | Research and Development Project | Brief Description | Rationale | RFI # |
|---|---|---|---|---|
| 14 | Innovation Incubator | Given that the utility industry is facing complex issues and ever-increasing goals, utilities are being tasked with the need to innovate and change more rapidly than ever. The Innovation Incubator is designed to foster innovation and expedite the advancement of ideas and technologies across the market through meaningful change with rapid and agile pilot development and testing. | This may potentially be somewhat duplicative with Minnesota Efficient Technology Accelerator's efforts. Nonetheless, it has potential to help expand identification of new measures for both CIP and NGIA, so could be a potential R&D opportunity to consider. | #13 |
| 15 | Quantification of Existing and Future Nature-Based Carbon Capture | Respondent is presenting an idea for (1) establishing a baseline of existing nature-based carbon capture and (2) evaluation of future nature-based carbon capture options. Specifically, we propose establishing a baseline through the quantification of nature-based carbon capture from existing forested and grassland areas within CenterPoint's assets. Subsequently, we propose identifying, quantifying, and implementing future nature-based carbon capture projects through restoration efforts on CenterPoint's existing assets and partnering with third parties on mitigation solutions outside of CenterPoint's assets. Although this proposal is focused on CenterPoint's service area in Minnesota, this proposal could be expanded to incorporate CenterPoint's enterprise-wide assets. | This RFI response has been highlighted as a potential research and development study to identify the potential for CenterPoint lands to support carbon capture through nature-based solutions. More details are required, and CenterPoint would want to understand the GHG emissions quantification protocols for such an approach. | #63 |
| 16 | Integrated Energy Systems for Self-powered Single-family and Multifamily Residential HVAC and Water Heating | Integrated energy systems (IES) are an emerging approach to self-powered space heating, air conditioning, and water heating that integrate fuel-fired and electrically powered equipment with distributed energy resources (DER) energy storage. IES includes a myriad of equipment combinations such as traditional furnaces, water heaters and heat pumps, on-site power from small-scale or micro combined heat and power (mCHP) and renewable sources such as photovoltaics (PV), as well as electrical and thermal energy storage. When properly integrated and controlled, IESs can serve to balance energy grid supply and demand while exploiting multiple energy resources in ways that reduce greenhouse gases, improve overall operating cost and efficiencies, and provide resilient systems in the built environment. | This is an interesting opportunity to conduct research and development on emerging technologies of relevance to gas and electric utilities. CenterPoint needs to consider whether this is better funded through a coalition of interested parties, potentially as part of the the Low-Carbon Resources Initiative (LCRI). | #65 |
| 17 | High Performance Building Envelope Initiative | Address barriers and create a streamlined approach to improved envelope design/integration in new construction. | Widespread building shell improvements have potential to yield large decarbonization benefits. Although this project would likely have low direct GHG reductions, it could help establish a replicable framework for future builiding shell improvements. | #95 |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Biogas/Renewable Natural Gas | 2 | Minnesota's Renewable Natural Gas Potential | This project proposes to develop a spatial decision support system (SDSS) that visualizes Minnesota's RNG potential. This tool will be like Google Maps application, but rather than displaying travel routes, it will display the biomass distributions, potential/existing RNG production, economic statistics, natural gas infrastructure, and more. This SDSS tool can showcase the total RNG capability of local organizations, residencies, and companies that are suitable for production, along with current producers, thus providing a standardized and singular database system that ties Minnesotan geography with correspondent information on biomass characteristics, RNG potential, economic viability, and additional qualitative/quantitative data statewide. | Potential R&D opportunity | Studies to support RNG market development | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Study to support RNG market development'. Given the importance of low-carbon gases in the NGIA, CenterPoint feels that it could make sense to conduct a research and development study that supports the identification of potential projects or addresses other barriers. The Company is still establishing which study approaches might offer the best value, or address the most pressing concerns. |
| Biogas/Renewable Natural Gas | 4 | RNG from biogas | Respondent is a market leader in the equipment needed to separate, dry, and prepare biogas in the conversion to RNG so that it can be injected into local, intrastate, or interstate gas pipelines in North America. | Not currently pursuing | N/A | This respondent has been noted as a potential implementation partner related to RNG project development, to be notified of potential RFPs related to future NGIA pilots. No specific RNG projects were proposed in this application, but CenterPoint's intent is to assess the costs and benefits from 'archetype' projects representative of a few different potential RNG feedstocks. |
| Biogas/Renewable Natural Gas | 15 | Thermal Gasification RNG Project | RNG project producing 3 BCF/yr of pipeline-quality fuel for sale under a long-term (15+ year) agreement, as described below:<br><br>Projects underway using proven System 1000â„¢ thermal gasification technology.<br>Each System 1000â„¢ train produces ~3 BCF per year of RNG; scalable/reproducible.<br>CI score of -60 w/CO2 sequestration; near zero w/o CO2 sequestration.<br>Locally-sourced MN feedstock of waste woody biomass (1,000 tpd).<br>$400 million project cost; RNG price ~$35/mmBTU for initial facilities.*<br>3 years from design to commercial operations.**<br><br>Benefits to Utility<br>Meaningful decarbonization at utility scale.<br>Local gas supply to augment system reliability.<br>Positive impact on tax base and employment within service territory.<br><br>* RNG price to be validated upon site selection, EPC FEL3 pricing, local biomass feedstock costs, etc.<br>** Start of design begins at FEL 3/FEED start. | Not currently pursuing | N/A | This is an interesting opportunity to produce significant volumes of RNG. However, the project's scale and commercialization status of the technology meant that this proposal would be difficult to accommodate in the current NGIA plan. This technology's development will be monitored, for consideration in future NGIA plans, and there may be opportunities to support the technology development through R&D in NGIA plan. |
| Biogas/Renewable Natural Gas | 18 | Anaerobic Digestion of East Metro Food Waste | Organics (e.g., discarded food scraps) makes up over 20% of municipal solid waste, but these materials can be recovered to capture their resource value and reduce greenhouse gas emissions. Respodents are planning a system to recovery organics and divert these materials to be delivered to a future anaerobic digestion facility to produce biogas or renewable natural gas. Respondent is currently in a competitive procurement process with several vendors that may produce biogas, RNG and/or green hydrogen as a part of this project. | Added to preliminary NGIA shortlist | RNG Proposal -Anaerobic Digestion of East Metro Food Waste | This is one of the few 'specific RNG projects' proposed in response to the RFI. It represents an interesting opportunity to partner with local government to develop what is expected to be low-carbon intensity RNG, as well as supporting a circular economy. |
| Biogas/Renewable Natural Gas | 32 | RNG Projects in MN | Respondent is a platform company seeking to build, acquire, own and operate assets that eliminate methane emissions by producing RNG and other low carbon commodities from waste.<br><br>Although we do not have a specific RNG project in mind for this RFI, we would welcome the opportunity to develop RNG projects in MN with CenterPoint.<br><br>We have several RNG projects in development with feedstocks ranging from dairy manure to industrial wastewater. | Not currently pursuing | N/A | This respondent has been noted as a potential implementation partner related to RNG project development, to be notified of potential RFPs related to future NGIA pilots. No specific RNG projects were proposed in this application, but CenterPoint's intent is to assess the costs and benefits from 'archetype' projects representative of a few different potential RNG feedstocks. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Biogas/Renewable Natural Gas | 37 | Planning Toolkit for RNG and Biogas Project Development | Respondent proposes to provide critical technical support to CenterPoint Energy Minnesota Gas regarding the feasibility of RNG and biogas deployment from various resources by developing a toolkit that includes key components of project development, including 1) resources, 2) geographic location of the resources, 3) an optimization evaluation for project type (i.e., RNG vs biogas), and 4) a simplified GHG emissions calculator. The objective of the toolkit is to provide CenterPoint and its potential project partners the means to optimize project deployment in the context of the Natural Gas Innovation Act. | Potential R&D opportunity | Studies to support RNG market development | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Study to support RNG market development'. Given the importance of low-carbon gases in the NGIA, CenterPoint feels that it could make sense to conduct a research and development study that supports the identification of potential projects or addresses other barriers. The Company is still establishing which study approaches might offer the best value, or address the most pressing concerns. |
| Biogas/Renewable Natural Gas | 38 | Renewable Energy Match (REM) | Renewable Energy Match is a Geographic Information Systems (GIS)-based tool which analyzes the geospatial and financial feasibility of the following renewable energies: Solar Photovoltaic (PV) & Solar Thermal Energy (STE), Hydrogen, Geothermal (Low to High-Grade), Renewable Natural Gas (RNG), and Wind. | Potential R&D opportunity | Studies to support RNG market development | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Study to support RNG market development'. Given the importance of low-carbon gases in the NGIA, CenterPoint feels that it could make sense to conduct a research and development study that supports the identification of potential projects or addresses other barriers. The Company is still establishing which study approaches might offer the best value, or address the most pressing concerns. |
| Biogas/Renewable Natural Gas | 41 | Behind-The-Meter Renewable Energy | Respondent and other RNG developers would benefit from on-site renewable energy sources. On-site solar or wind facilities that sell power directly to projects for digester boilers and other energy needs could greatly improve the Carbon Intensity Score and increase project viability. The carbon intensity score is set by the GREET model, and determines the number of California (or other participating states) LCFS credits a project will generate. | Not currently pursuing | N/A | This respondent has been noted as a potential implementation partner related to RNG project development, to be notified of potential RFPs related to future NGIA pilots. No specific RNG projects were proposed in this application, but CenterPoint will consider the on-site renewables strategy recommended in potential RNG projects. |
| Biogas/Renewable Natural Gas | 42 | Energy Efficiency and CenterPoint MVR | Respondent's existing projects require NG to heat our digester boilers. We are disincentivized to reduce consumption as we have minimum volume requirements to CenterPoint. The elimination of that MVR would make renewable projects in the state more viable. | Not currently pursuing | N/A | This respondent has been noted as a potential implementation partner related to RNG project development, to be notified of potential RFPs related to future NGIA pilots. No specific RNG projects were proposed in this application, but CenterPoint will consider the barriers noted here as the Company looks to support a growing low-carbon fuels market. |
| Biogas/Renewable Natural Gas | 43 | BTU content of RNG | The BTU requirements of Centerpoint often do not align with RNG. This difference forces RNG developers to interconnect at CenterPoint TBS points, or directly to 3rd party transmission pipelines. This often increases lateral distances to the point that projects become unviable. | Not currently pursuing | N/A | This respondent has been noted as a potential implementation partner related to RNG project development, to be notified of potential RFPs related to future NGIA pilots. No specific RNG projects were proposed in this application, but CenterPoint will consider the barriers noted here as the Company looks to support a growing low-carbon fuels market. |
| Biogas/Renewable Natural Gas | 46 | Upgrading our existing facility to produce Pipeline Renewable Natural Gas | Respondent operates a food waste to renewable energy plant in northwest Wisconsin. Details of our facility are attached. The facility serves as an interceptor for over 20 food processors and distributors in and around the Twin Cities area. We have a dedicated transportation and logistics team to pick up and transport the materials to our plant.<br><br>The feedstocks for our plant are wastes from food processing. The risks inherent in the sustainable production of biogas have all been addressed through our technical and operational experience. The facility has been in operations for the past 10 years with a full complement of competent operation and maintenance personnel. Our team is fully conversant with the intricacies of biogas production and has demonstrated conversion of 80-90% of the feed carbon to biogas with myriad variable food processing wastes.<br><br>We are adding gas upgrading equipment to recover the methane as RNG, co2 for food processing and sulfides as elemental sulfur.<br><br>The gas will supplant over 130,000 metric tons of CO2 from fossil fuel gas in a year. | Added to Shortlist - Incorporated into a pilot project archetype | RNG Archetype – Food Waste | This RFI response would help inform the proposed shortlist pilot called 'RNG Archetype - Food Waste.' In addition, the respondent has been noted as a potential implementation partner related to RNG project development, to be notified of potential RFPs related to future NGIA pilots. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Biogas/Renewable Natural Gas | 47 | Ideas for Increased Biomethane Production | Establish a Program to Divert Landfilled Food to Biomethane<br>Energy production from organic wastes although technically and socially attractive, lags behind other forms of energy. Unlike western Europe, infrastructure needs to be developed to completely to realize the potential. There are several steps that need to be taken to complete the development. They are as follows:<br>1. Identify and establish amenability of various locally available residual materials as feedstocks for biogas.<br>2. Identify and quantify roadblocks to source available materials<br>3. Identify strategies to convert locally available materials to feedstocks for AD.<br>4. Establish cost benefit analyses as compared to other mitigation measures â€“ POTW disposal, composting, land disposal, incineration, landfilling. | Potential R&D opportunity | Studies to support RNG market development | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Study to support RNG market development'. Given the importance of low-carbon gases in the NGIA, CenterPoint feels that it could make sense to conduct a research and development study that supports the identification of potential projects or addresses other barriers. The Company is still establishing which study approaches might offer the best value, or address the most pressing concerns. |
| Biogas/Renewable Natural Gas | 48 | JV to Develop a Renewable Natural Gas Plant | Respondent would be interested in a strategic partnership with CenterPoint Minnesota where we jointly invest in a renewable natural gas (RNG) project and Respondent acts as the primary or sole offtaker for a set number of years while CenterPoint ramps up their internal demand. From then-on, Respondent and CenterPoint can split the offtake as agreed upon by both parties. | Not currently pursuing | N/A | No specific RNG projects were proposed in this response, but this proposal is being considered to help inform several RNG pilot project archetypes including 'RNG Archetype - Food Waste', 'RNG Archetype - Dairy Manure' and 'RNG Archetype - Landfill Gas'. In addition, this respondent has been noted as a potential implementation partner related to RNG project development, to be notified of potential RFPs related to future NGIA pilots. |
| Biogas/Renewable Natural Gas | 80 | Maximizing Minnesota Renewable Natural Gas (RNG) Opportunities | One category under the NGIA involves the development of RNG projects. Our idea involves performing a screening and evaluation/ranking of potential RNG opportunities based on digital overlay of CNP's gas lines with potential RNG opportunities associated with significant agricultural, wastewater treatment plant, solid waste, and/or wood sources within Minnesota. Respondent would promote efficiency through automation and utilization of various digital solutions including our Origination tool designed to evaluate techno-economic factors associated with green technology projects. Identified sites could then be ranked based on a series of preferential criteria which would demonstrate both maximization of stakeholder value and environmental benefit. | Potential R&D opportunity | Studies to support RNG market development | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Study to support RNG market development'. Given the importance of low-carbon gases in the NGIA, CenterPoint feels that it could make sense to conduct a research and development study that supports the identification of potential projects or addresses other barriers. The Company is still establishing which study approaches might offer the best value, or address the most pressing concerns. |
| Biogas/Renewable Natural Gas | 90 | Anaerobic Digestion of Organic Materials | Respondent is proposing to build an anaerobic digestion (AD) facility. In its Request for Proposals, the respondent requested proposals for a facility capable of processing a minimum of 25,000 tons per year of organics to produce energy and beneficial soil and agricultural products. The respondent is currently evaluating proposals. | Added to preliminary NGIA shortlist | RNG Proposal - Anaerobic Digestion of Organic Materials | This is one of the few 'specific RNG projects' proposed in response to the RFI. It represents an interesting opportunity to partner with local government to develop what is expected to be low-carbon intensity RNG, as well as supporting a circular economy. |
| Biogas/Renewable Natural Gas | 100 | Design a portal that partners potential projects with qualified developers | CenterPoint should allow for larger commercial clients to come forward and suggest "I think I could become an RNG project feedstock supplier". CenterPoint should also maintain a registry of qualified developers that can assess the feasibility of volunteered projects. | Potential R&D opportunity | Design a portal that partners potential projects with qualified developers | This is an interesting market transformation initiative that could stimulate more RNG production in the state. Because it would not directly result in GHG reductions but instead is intended to further develop the RNG market in Minnesota and because it would likely be a lower cost than many other potential pilots, CenterPoint will continue to evaluate this as a potental R&D opportunity. |
| Biogas/Renewable Natural Gas | CNP Internal-11 | Small-scale biodigester at Customer Site | Customer has interest in developing a small-scale anaerobic digester. Various feedstocks available (organics, turkey litter, etc) but much of it already being used, so would likely have to be relatively small scale. | Potential R&D opportunity | Small-scale Biodigester at Customer Site | This idea has been included for further consideration under this first NGIA plan's development because of the potential to engage and educate the public on this important technology. Plan would be to start with a feasibility study. |
| Biogas/Renewable Natural Gas | CNP Internal-17 | RNG Potential Study - Mankato, Alexandria, Other Sites? | CenterPoint Energy has identified several locations in our service territory that would be optimal for RNG project interconnection. The project would identify availability, cost, and logistics needs for potential feedstock around those sites to identify i) potential biogas production and ii) best feedstock policy. The idea is that by providing those as a part of a future RFP, we could more easily attract independent developers to the sites | Potential R&D opportunity | RFP Prep Study for Potential CenterPoint RNG Sites | This idea has been grouped with other similar proposals under the proposed shortlist archetype called 'Study to support RNG market development'. Given the importance of low-carbon gases in the NGIA, CenterPoint feels that it could make sense to conduct a research and development study that supports the identification of potential projects or addresses other barriers. The Company is still establishing which study approaches might offer the best value, or address the most pressing concerns. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Biogas/Renewable Natural Gas | CNP Internal-5 | Carbon-negative energy - RNG and H2 production & CCS using biogenic carbon | This LLNL report looks at different approaches to achieve negative carbon emissions.<br><br>https://www.llnl.gov/news/new-lab-report-outlines-ways-california-could-reach-goal-becoming-carbon-neutral-2045#:~:text=This%20groundbreaking%20study%2C%20%E2%80%9C%20Getting%20to%20Neutral%3A%20Options, energy%20programs%20work%20and%20the%20Laboratory%E2%80%99s%20Carbon%20Initiative. | Not currently pursuing | N/A | This idea has not been included for further analysis under this first NGIA plan's development. Information in this study may be used to inform project design/implementation |
| Biogas/Renewable Natural Gas | CNP Internal-8 | Biomass Boiler Upgrades | One customer has a large biomass burner - absorption chiller is connected to it. Currently it's not operating consistently, upgrades needed. Upgrades would help it run consistently to reduce other natural gas heating sources. | Not currently pursuing | N/A | Biomass combustion does not meet the definition of biogas under NGIA. |
| District Energy | 10 | Feasibility Analysis and Market Assessment of Clean District Energy Opportunities for CenterPoint Energy | Respondent would propose to conduct feasibility studies for converting two existing district energy systems in CenterPoint territory to operate with large-scale heat pumps and solar heating. These studies will provide guidance on the economic viability of clean district energy projects in a college campus or downtown setting. Additionally, a market analysis will determine the potential to apply clean district energy solutions to campuses and downtown areas throughout CenterPoint Energy's service area and identify low hanging fruit for potential district energy projects. | Potential R&D opportunity | Study of Decarbonizing Existing District Energy Systems | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Stydy of Decarbonizing Existing District Energy Systems'. The initial RFI received responses ranging from hydrogen to geothermal systems to support decarbonization of existing district energy systems. These represent innovative opportunities to decarbonize district energy systems currently reliant upon natural gas, that merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |
| District Energy | 30 | District Energy: Networked Geothermal | Pilot or pilots to deploy networked geothermal systems that utilize a network of ground-source heat pumps and can serve 20 to 40 residential/commercial customers. | Added to Shortlist - Incorporated into a pilot project archetype | New Networked Geothermal Systems Pilot | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'New Networked Geothermal Systems Pilot.' This is an innovative opportunity being piloted by a few gas utilities in the U.S. that merits further analysis specific to Minnesota and consideration for potential inclusion in the Company's NGIA portfolio. |
| District Energy | 36 | Pathway to Net Zero Through Aquifer Thermal Energy Storage | A new, low-carbon district energy system utilizing aquifer thermal energy storage can serve as an innovative pilot project for CenterPoint Energy's first Innovation Plan. Planned for the east side of Minneapolis, the district energy system can deliver a low-carbon alternative to traditional gas-dependent building heating services and provide a pathway to achieving net-zero carbon for the neighborhood. The energy system design has the potential to be replicated throughout CenterPoint's service territory and serve as a regional demonstration project. The system will provide a unique opportunity for families living in affordable and public housing to access affordable, low-carbon energy. | Added to Shortlist - Incorporated into a pilot project archetype | New District Energy System | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'New District Energy System.' This is an opportunity assess the launch of new district energy systems that either reduce or eliminate the need for natural gas, and consider these projects for potential inclusion in the Company's NGIA portfolio. |
| District Energy | 53 | District Geothermal Network | Respondent supported the site selection phase for Eversource in it's District Energy Pilot, taking place in Framingham, MA. This pilot is repeatable, particularly in northern cooler states, as a means of moving swaths of customers off fossil fuel heating. This approach avoids a building-by-building approach. | Added to Shortlist - Incorporated into a pilot project archetype | New Networked Geothermal Systems Pilot | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'New Networked Geothermal Systems Pilot.' This is an innovative opportunity being piloted by a few gas utilities in the U.S. that merits further analysis specific to Minnesota and consideration for potential inclusion in the Company's NGIA portfolio. |
| District Energy | 77 | Decarbonizing a district energy system | Implementing energy efficiency improvements to Respondent's and district energy system, and implementing a carbon capture system at the plant | Added to Shortlist - Incorporated into a pilot project archetype | Decarbonizing Existing District Energy Systems | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Decarbonizing Existing District Energy Systems'. The initial RFI received responses ranging from hydrogen to geothermal systems to support decarbonization of existing district energy systems. These represent innovative opportunities to decarbonize district energy systems currently reliant upon natural gas, that merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| District Energy | 86 | Geothermal Neighborhood | The two joint respondents propose to collaborate with CenterPoint Energy to implement a utility-owned geothermal district ground loop. The project would strategically target a new construction development in the territory and would consist of four stages and gates to ensure feasibility and cost effectiveness are met at each point: planning and modeling, site selection, design and construction, and measurement and verification. The goal of the project is to test whether utility-ownership of district ground loops is a viable solution to the electrification of heating by providing savings to connected customers and benefits to CenterPoint Energy. | Added to Shortlist - Incorporated into a pilot project archetype | New Networked Geothermal Systems Pilot | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'New Networked Geothermal Systems Pilot.' This is an innovative opportunity being piloted by a few gas utilities in the U.S. that merits further analysis specific to Minnesota and consideration for potential inclusion in the Company's NGIA portfolio. |
| District Energy | 101 | District Residential Geothermal Systems | Establish centralized geothermal loops that surrounding existing and new residential and commercial buildings could connect to when switching from natural gas heating. Geothermal systems can be up to 60% more efficient than standard conventional boiler systems. This would be a partnership between cities and the county to identify streets and central areas that would be a good fit for this technology. It could be geared to many sectors depending on the funding and availability. More details to be determined. Project has not been developed yet. | Added to Shortlist - Incorporated into a pilot project archetype | New Networked Geothermal Systems Pilot | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'New Networked Geothermal Systems Pilot.' This is an innovative opportunity being piloted by a few gas utilities in the U.S. that merits further analysis specific to Minnesota and consideration for potential inclusion in the Company's NGIA portfolio. |
| District Energy | CNP Internal-10 | District heat expansion w/ carbon-neutral fuels | Customer has the potential to expand their district steam to a hospital and the school district. Potential interest in doing this if there was a carbon neutral source of the energy. Easy construction of steam pipes: within quarter of a mile, and through open fields. Could be hydrogen, ammonia or biogas as fuel. | Added to Shortlist - Incorporated into a pilot project archetype | New District Energy System | This idea has been grouped with other similar proposals under the proposed shortlist archetype called 'New District Energy System'. This is an opportunity assess the launch of new district energy systems that either reduce or eliminate the need for natural gas, and consider these projects for potential inclusion in the Company's NGIA portfolio. |
| District Energy | CNP Internal-23 | Geothermal Heat Pump on Existing District Energy System | Use the Darcy Systems technology at one of our customer's district energy systems. | Added to Shortlist - Incorporated into a pilot project archetype | Decarbonizing Existing District Energy Systems | This internal idea has been grouped with other similar proposals under the proposed shortlist archetype called 'Decarbonizing Existing District Energy Systems'. The initial RFI received responses ranging from hydrogen to geothermal systems to support decarbonization of existing district energy systems. These represent innovative opportunities to decarbonize district energy systems currently reliant upon natural gas, that merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |
| Energy Efficiency | 11 | Energy Retrofits in Manufactured Homes | Respondent proposes the development of an Energy Efficient Retrofit program for Manufactured Housing. Manufactured homes serve as an important piece of the affordable housing stock in Minnesota, and also an area of substantial energy savings potential with efficiency retrofits such as duct sealing, increased insulation, direct-install measures, and equipment replacement. Manufactured housing programs in other states deliver significant energy savings, but also provide non-energy benefits by reducing the expenditures in income-constrained households and providing additional comfort, while reducing greenhouse gas emissions. Manufactured homes are currently under-represented in other types of EE programs. | Consider for CIP instead of NGIA | N/A | These kinds of retrofits are established but underutilized. Particularly since manufactured housing has been included in the CIP low-income weatherization program in the past, this idea seems like a better fit for consideration in CIP. |
| Energy Efficiency | 12 | Grassroots Green Homes | This pilot engages a select local community through community-based outreach and local networking to connect residents and businesses to appropriate CenterPoint Energy programs to increase participation among eligible customers, leveraging local leaders, residents, and businesses to push each other and work together to reach uniquely designed goals that best fit the pilot site's needs. | Added to Shortlist - Incorporated into a pilot project archetype | Neighborhood Weatherization Blitzes | Although this is largely focused on expanding the reach of CIP, the focus on decarbonization and disadvantaged communities may make it particularly relevant for NGIA. |
| Energy Efficiency | 13 | Innovation Incubator | Given that the utility industry is facing complex issues and ever-increasing goals, utilities are being tasked with the need to innovate and change more rapidly than ever. The Innovation Incubator is designed to foster innovation and expedite the advancement of ideas and technologies across the market through meaningful change with rapid and agile pilot development and testing. | Potential R&D opportunity | Innovation Incubator | This may potentially be somewhat duplicative with Minnesota Efficient Technology Accelerator's efforts. Nonetheless, it has potential to help expand identification of new measures for both CIP and NGIA, so could be a potential R&D opportunity to consider. |
| Energy Efficiency | 14 | Real Estate Education & Outreach | The Real Estate Education and Outreach pilot builds and tests a new marketing channel for existing energy efficiency programs through two separate marketing avenues: marketing to the real estate professionals and to the customers through real estate professionals. The pilot will establish a network for real estate professionals that complete training to then receive marketing materials for promoting their business. Materials and promotional items will be shared with new homeowners to direct them to incentives for pursuing efficiency and electrification upgrades. | Consider for CIP instead of NGIA | N/A | This is essentially a new marketing approach for CIP, so it likely makes more sense to consider it for that program rather than NGIA. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Energy Efficiency | 17 | Emerging Technology Strategic Incentives Fund | The Emerging Technology Strategic Incentives Fund is an incentives program that would support emerging energy efficiency and electrification measures through a highly targeted, intensive, and time-limited approach that would be designed to achieve technology-specific objectives in order to accelerate adoption of the targeted technologies. | Potential R&D opportunity | Emerging Technology Strategic Incentives Fund | This would focus on supporting market transformation for a small set of innovative measures that aren't currently fits for CIP. Whereas Minnesota Efficient Technology Accelerator focuses on strategic engagement with the supply chain (reducing non-financial barriers), this would help promising Minnesota Efficient Technology Accelerator measures actually get out into the market and create a commercialization plan. For NGIA, this could be an effective way to "try out" a number of promising measures in the real world and support market adoption of the best options. |
| Energy Efficiency | 35 | Matching Bonus Rebate Program for Local Governments | Local governments are increasingly spending their funds to encourage energy efficiency, particularly via "bonus rebates" stacked on top of typical CIP rebates. To further encourage local government funding of conservation, particularly for weatherization and envelope measures, CenterPoint could utilize NGIA funding to "match" what a local government contributes in additional financial incentives. In effect, the traditional CIP rebate PLUS the local government incentive PLUS the CenterPoint matching bonus rebate with NGIA funding EQUALS a triple rebate for a homeowner, dramatically reducing the cost of a project, increasing participation, and incentivizing local government involvement. | Added to Shortlist - Incorporated into a pilot project archetype | Neighborhood Weatherization Blitzes | This RFI response has been grouped with other proposals related to weatherization under the pilot called "Neighborhood Weatherization Blitzes" for consideration in NGIA. In general CenterPoint would prefer to consider general increases to rebates, and general partnerships with cities, rather than limiting bonus rebates to specific cities. |
| Energy Efficiency | 45 | Energy Efficiency Solutions | Given existing electrical grid capacities, decarbonization of cold climate building heating loads cannot be accomplished through straight electrification. CenterPoint Energy has a clear opportunity to incentivize passive solar thermal energy solutions within industrial facilities with high carbon heating loads driven by occupant and process safety. Natural gas demand and GHG emission can be reduced within public and private industrial processes that require high exhaust and associated makeup air rates. Depending on hours of operation, specifics of code or process required exhaust rates, and existing facility orientation, passive solar thermal preheating of ventilation can reduce natural gas demand and GHG emission. | Added to Shortlist - Incorporated into a pilot project archetype | Solar Thermal Heating for C&I | This RFI response has been grouped with other internal proposals under the proposed shortlist pilot called 'Solar Thermal Heating for C&I'. Solar thermal space and water heating applications are likely to require a fair amount of customization based on building-specific factors, but merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |
| Energy Efficiency | 58 | New Homes with Natural Gas Characteristics | The new homes with natural gas characteristics is an adaptive, market supported program model. It supports builders, raters, and utilities with flexible incentive structure and minimal administrative burden, and supports market-facing certification systems, public engagement opportunities, and participation from affordable housing and starter home builders. As your partner and consultant, we can leverage local presence and national expertise in residential new homes program design to deliver a superior customer experience. By removing barriers and creating efficiencies, we can successfully increase program engagement, attribution, and participant satisfaction while delivering a program with a strong value proposition for raters, builders and homebuyers. | Consider for CIP instead of NGIA | N/A | Because efficiency in new home construction is already included in CIP, this appears to represent more of an incremental improvement to an existing offering. It seems very relevant to CIP, but the potential applicability to NGIA is less clear. |
| Energy Efficiency | 59 | Healthier Homes | There is a strong correlation between housing quality and health outcomes. The built environment and surrounding neighborhood are key social determinants of health and are disproportionately adverse in areas with affordable housing, contributing directly to the prevalence of asthma, COPD and respiratory issues, and contributing to difficulty in managing their treatment. As we have seen especially over the last two years, lower income communities are disproportionately affected by health issues; those with less are affected more. To directly address this disparity, the Healthier Homes program reaches patients with respiratory issues in low-income communities to improve their indoor environs. | Consider for CIP instead of NGIA | N/A | This seems like a better fit for CIP. It is a program-type that CenterPoint Energy has been able to offer through energy efficiency programs in other states. |
| Energy Efficiency | 60 | Strategic Energy Management (SEM) | Through a strategic energy management (SEM) program, we work with participants over a 12-month, cohort-based program using a structured process to help them adopt a strategic approach to managing energy. Through SEM, participants can achieve 5 percent or more first-year energy savings through low/no cost, behavioral, and operations and maintenance changes, while also improving other critical business objectives such as production, safety or quality. Respondent's SEM programs, while focused on helping participants save electricity and/or natural gas, measure GHG. Through these programs we have seen significant GHG savings in SEM programs that have a focus on emission reduction. | Consider for CIP instead of NGIA | N/A | This seems like a better fit for CIP. It is potentially quite cost-effective and builds on CenterPoint's existing programs for large customers. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Energy Efficiency | 61 | Foodservice Energy Monitoring Program | Commercial foodservice (CFS) operators have traditionally been reluctant to replace existing equipment with newer and more efficient models for reasons including cost and concerns over the new equipment being able to prepare the food as expected. This proposed idea will demonstrate to the restaurant owners and operators the value of efficient cooking equipment and promote advanced CFS equipment by installing a foodservice energy monitoring system (FEMS) at CenterPointâ€™s commercial foodservice demonstration test kitchen. The test kitchen is managed by Ann Lovcik in Minneapolis for CenterPoint Energy. The software tool combined with gas and electric meters and temperature sensors provides the ability to cook the exact same product on multiple appliances to show live energy use of each along with estimated annual costs. | Consider for CIP instead of NGIA | N/A | Because this is more about improving customer education to promote energy-efficient cooking appliances, it's unlikely to have many direct GHG reductions. Additionally, it's a fairly well-defined project that doesn't really seem to fall into the R&D category. Overall, this seems like a better fit for CIP as a way to increase participation. |
| Energy Efficiency | 62 | Adiabatic Humidification | High pressure adiabatic humidification systems represent the latest in medical facility engineering. Adiabatic humidification systems allow water particles to be better absorbed by the surrounding air, improving indoor air management. An adiabatic humidification system ensures water remains pure, clean and free from biological contaminants.<br><br>The maintenance of optimal humidity levels has been demonstrated to improve patient comfort and wellbeing and also to significantly reduce the levels of HAIâ€™s (healthcare-associated infections).<br><br>Converting from steam to adiabatic humidification can drastically improve a facilityâ€™s energy footprint through higher efficiency, along with offering the potential for free cooling which can substantially reduce operating costs. | Consider for CIP instead of NGIA | N/A | This has been included in CIP as a custom measure, so it's unclear if it may be eligible for NGIA. |
| Energy Efficiency | 68 | Nano-particles to Improve Heat Transfer | Respondent uses nano-particles that are suspended in a stable state to increase the speed of heat transfer, by heating up (or removing heat from) the fluid and transferring energy in a shorter amount of time, thereby requiring significantly less energy. Respondent's technology is most suitable for closed-loop heating and cooling systems where efficiency is achieved by diminishing run-times of associated equipment. This process will extend the life of the HVAC equipment while keeping maintenance costs low. Respondent's technology is one of the top measures for buildings to improve energy efficiency, save on energy bills, and cost-effectively reduce greenhouse gas emissions. | Consider for CIP instead of NGIA | N/A | This has been included in CIP as a custom measure, so it's unclear if it may be eligible for NGIA. This technology is also currently being considered for CIP application as part of a Minnesota CARD grant. |
| Energy Efficiency | 70 | Multi-Family Controls | We propose implementation of a program or prescriptive measure to assist multi-family properties with centralized heating systems capable of implementing temperature limits and/or monitoring the heating demand of individual residences, for the purpose of encouraging energy consciousness among residents. These systems can take the form of thermostats that prevent temperatures above a specified setpoint or are connected to a central hub that logs heating time. This may be provided as a measure addition to CenterPoint Energy's existing Multi-Family Building Efficiency (MFBE) program. | Consider for CIP instead of NGIA | N/A | As noted in the proposal, this could be a useful addition to CenterPoint Energy's existing Multi-Family Building Efficiency (MFBE) program. Since MFBE is already established, this seems to better fit for CIP instead of NGIA. |
| Energy Efficiency | 71 | Gas Engine-driven Heat Pumps for Commercial Buildings | This project will demonstrate a natural gas engine-driven heat pump (GEHP) offering high efficiency heating and cooling for commercial buildings that can achieve efficiencies over 100% (COPs>1). These systems are similar to electric vapor compression heat pump designs, but use a high-efficiency natural gas engine to drive the compressor which significantly reduces electric demand. GEHPs also use engine heat recovery, like cogeneration systems, to supplement heating output and maintain efficiency at low ambient temperatures. As a result, GEHPs are well suited for cold climates. GEHPs have significant markets in Asia and Europe, but are under-utilized in the U.S. market. | Added to Shortlist - Incorporated into a pilot project archetype | Gas Heat Pump for Commercial Buildings | This represents an innovative emerging gas efficiency technology that has potential to become more cost-effective over time but may be currently too expensive relative to energy savings for application in CIP. This will be consider along with other RFI responses related to natural gas heat pumps for the commercial sector. |
| Energy Efficiency | 72 | Targeted Steam | Buildings heated via steam boilers and distribution systems have higher energy demand than similar buildings with alternative, readily available heating technologies. We propose implementation of a program that will:<br>1. Identify high-consumption, natural gas-heated buildings utilizing steam boiler systems, and<br>2. Provide targeted design assistance and incentives for upgrades to higher-efficiency gas heating options or electrification via heat pumps.<br>This program would target commercial and multi-family buildings utilizing steam systems, as they face common challenges that lead to increased use of natural gas. These buildings have high savings potential but need special assistance in identifying viable upgrade avenues. | Consider for CIP instead of NGIA | N/A | This RFI response represents a potentially new approach to targetting customers for energy efficiency improvements. However, given that these improvements fall under CIP, this new implementation approach seems like a better fit for consideration in CIP. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Energy Efficiency | 73 | Thermolift | Thermolift technology is a type of natural gas driven heat pump. Thermolift technology leverages the Hofbauer cycle, where hydrogen is moved in and out of a low and high temperature state. This unit can create up to 140-degree water as well as produce refrigeration level cooling.<br>This project would target commercial, residential and multi-family residential buildings that utilize standard hot water heat and also have potential additional cooling or refrigerant loads. These buildings have high savings potential due to their hot water needs and can find extremely high coefficient of performance values from Thermolift technology. | Added to Shortlist - Incorporated into a pilot project archetype | Gas Heat Pump for Commercial Buildings, Residential Gas Heat Pump | This represents an innovative emerging gas efficiency technology that has potential to become more cost-effective over time but may be currently too expensive relative to energy savings for application in CIP. This will be consider along with other RFI responses related to natural gas heat pumps for the residential and commercial sectors. This technology has been awarded a Minnesota CARD grant for a demonstration, but no site has been found yet. |
| Energy Efficiency | 78 | Strategic Process Optimization | Respondent's SPO gives process operators the tools to make manual adjustments to minimize energy use and cost without adverse impact to process operations.<br><br>SPO is a data driven process that helps to establish staff ownership in the process. SPO involves four steps:<br>1.Data Mining<br>2.Selective Data Reduction (SDR)<br>3.Statistical Data Analysis and AI<br>4.Operator Desktop<br><br>The SPO process will provide operators with real time process efficiency metrics and guidance to maintain optimal operation. | Consider for CIP instead of NGIA | N/A | This seems like a better fit for CIP. It is potentially quite cost-effective and builds on CenterPoint's existing programs for large customers. |
| Energy Efficiency | 88 | Support scaling of new mobile home units | Provide incentives for, and on-bill financing to, facilitate adoption of new manufactured homes. On May 16th, the US Department of Energy will announce the first update to the manufactured home standard since 1994. These homes will be significantly more efficient than the previous generation of homes but will come at a price premium. This program would cover the price differential for new homes under this new standard, provide on-bill financing to ensure accessibility of these housing units, and, for low-income households, utilize pre-weatherization dollars for manufactured homes that would otherwise be deferred. | Consider for CIP instead of NGIA | N/A | Manufactured housing has been included in CIP in the past (though more often for weatherization retrofits). Particularly since many of the efficiency benefits from the new standard will apply to both gas and electricity, it's unclear if covering the full incremental cost of new homes would be the best use of NGIA funds, though it would certainly benefit income-qualified customers. Exploring a pre-weatherization CIP rebate might be an effective alternative approach. |
| Energy Efficiency | 91 | Commercial Dishmachines | Commercial dishmachines use hot water for three different purposes: to fill and top off their tanks, to rinse dishes with fresh water, and for special maintenance functions such as auto-clean and auto-delime. Energy recovery systems capture effluent waste heat and re-use the captured energy to preheat incoming cold water for its eventual use as final rinse water. Conveyor dishwashers are one of the largest consumers of water and energy in a large commercial food service and have the potential to reduce gas, electricity and water use of older legacy dishwashers by at least half by replacing legacy conveyor dish machines with advanced, energy recovery dish machines. | Not currently pursuing | N/A | Already included in CIP. |
| Energy Efficiency | 93 | Thermal Heat Pumps for Residential Space and Water Heating | Thermal Heat Pumps (THPs) represent a new fuel-fired equipment category replacing residential furnaces and water heaters, bringing decarbonization and low operating costs at unseen levels of gas efficiency, achieving over 1.3 system COP in laboratory conditions.<br><br>While several commercial market THPs are available, there are four manufacturers expected to deploy residential systems in 2023-24. The project team will survey the market and review lab and field data to analyze the systems, selecting ~2 products for residential field tests. Ten â€˜combi- space and water heating THP systems will be deployed in Minnesota homes to evaluate and prove performance. | Added to Shortlist - Incorporated into a pilot project archetype | Residential Gas Heat Pump | This represents an innovative emerging gas efficiency technology that has potential to become more cost-effective over time but may be currently too expensive relative to energy savings for application in CIP. This will be consider along with other RFI responses related to natural gas heat pumps for the residential sector. |
| Energy Efficiency | 95 | High Performance Building Envelope Initiative | Minnesota is not currently on track to meet its GHG reduction targets. High performing commercial building envelopes are a critical part of the effort to reduce GHG emissions, but are rarely incorporated into new commercial construction, especially in small and medium-sized buildings. There are many market barriers that limit the demand for high performance envelopes. This proposal outlines a multi-faceted strategy to address these barriers and start the process of creating a more focused and streamlined approach to high performance building envelope design and integration into new commercial construction in Minnesota. | Potential R&D opportunity | High Performance Building Envelope Initiative | Widespread building shell improvements have potential to yield large decarbonization benefits. Although this project would likely have low direct GHG reductions, it could help establish a replicable framework for future building shell improvements. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Energy Efficiency | 99 | Neighborhood Weatherization Blitzes | Deliver a community wide gas savings program focused on air sealing and insulating through intense community/neighborhood blitz, block-by-block, with a goal of retrofitting 1,000 homes per year. Using community-based marketing by engaging community partners including: cities, faith-based organizations, schools, etc. CenterPoint Energy could review data to determine target communities/neighborhoods, create criteria to identify the type of homes that would be the best candidates, conduct on-site or virtual audits, make recommendations, and provide a list of qualified contractors. Potential for workforce development by hiring and training a team of contractors just for this. | Added to Shortlist - Incorporated into a pilot project archetype | Neighborhood Weatherization Blitzes | This could help scale up air sealing and insulation improvements beyond what may be possible with CIP alone (particularly in disadvantaged communities) and provide useful lessons learned and best practice data. |
| Energy Efficiency | CNP Internal-13 | drain-water heat recovery | drain-water heat recovery preheats incoming "city-water" a bit, thus lowering the load on the water heater. It is currently in the TRM and is estimated to save 25% on a customer's water heating consumption. However, it is not currently cost-effective so it might need some extra help from NGIA (or Minnesota Efficient Technology Accelerator). | Consider for CIP instead of NGIA | N/A | This is a promising technology that comes very close to fitting into CIP. It could be worthwhile to explore opportunities to incorporate DWHR into new construction projects, deep energy retrofits, or other large projects where the technology might be more cost-effective. However, it's not a high priority for NGIA because it's so close to fitting into CIP and because it's less innovative than other potential measures. |
| Energy Efficiency | CNP Internal-19 | Solar thermal for DHW on 30 unit multi-family building | Budget proposal for solar panel thermal domestic hot water heating on a 30-plex low-income multifamily building. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | Solar thermal for domestic hot water is well established (it works well, though it often tends to be expensive). While the focus on benefiting lower income customers is great, it seems like this may be a better fit as part of something like a deep energy retrofit.<br><br>Incorporated into the Deep Energy Retrofit + Hybrid Heating archetype |
| Energy Efficiency | CNP Internal-20 | Solar Thermal - Hot Water and Steam for Campuses and Industrial Customers | Phoenix Solar Thermal's unique approach to the market allows for flexibility of a project's development and execution by maximizing the value of the systems integration to produce steam and/or hot water to achieve substantial green house gas (GHG) and carbon dioxide ($CO_2$) emissions, with no investment required.<br><br>https://phoenixsolarthermal.com/ | Added to Shortlist - Incorporated into a pilot project archetype | Solar Thermal Heating for C&I | Solar thermal is well established, but this is a different application that could help drive deep energy savings. Additionally, this could be applicable to a range of C&I facilities as a custom measure. |
| Energy Efficiency | CNP Internal-21 | Solar Steam - Solar Thermal for Campuses/Industrial in "extreme climates" | SolarSteam's technology is specifically designed to operate in extreme climates. Our system uses an array of lightweight solar curved (trough) mirrors inside a transparent enclosed structure to concentrate the sun's thermal energy onto a receiver. The concentrated sunlight is used to directly heat pressurized water to produce steam or hot water that can be utilized for industrial purposes. SolarSteam's system can accept boiler feed water and generate steam at temperatures up to 550°C and 110 bar. A transparent membrane enclosure increases efficiency by protecting the solar field from harsh weather conditions and uses innovative construction designs to keep the structures and mirrors clean, which has been a major issue for concentrated solar technology in the past. Keeping the collectors sheltered reduces capital cost by allowing for lightweight materials that don't require rigid foundations and expensive controls. SolarSteam's concentrated solar generators have been adapted to work alongside the customer's existing boilers providing supplementary renewable heat. Such plug-and-play hybrid integration will allow for a constant thermal energy supply while improving performance and saving on operational costs by reducing fuel consumption and environmental impacts. | Added to Shortlist - Incorporated into a pilot project archetype | Solar Thermal Heating for C&I | Solar thermal is well established, but this is a different application that could help drive deep energy savings. Additionally, this could be applicable to range of C&I facilities as a custom measure. |
| Energy Efficiency | CNP Internal-6 | Coordination with Affordable Housing Partners for Deep Energy Retrofits Pilot | CenterPoint Energy has worked with affordable housing developers on CIP projects in the past, particularly through our Non-profit Affordable Housing prorgam. Once housing developer has 2-3 more Passiv Houses in the works, there may be a role for them in implementation of our Deep Energy Retrofits pilot. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | CenterPoint currenlty provides some Passiv House support through CIP, but there has been limited uptake. CenterPoint could explore how Passiv House could be better supported through NGIA as part is its evaluation of the required deep energy retrofit/strategic electrification pilot. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Carbon Capture | 16 | Screening Study to Establish CCUS Demonstration Projects | Respondent proposes to conduct a screening and planning study to (a) identify suitable sites for a capture demonstration, (b) research promising technologies and vendors for capture technologies, (c) find and characterize methods and locations for use or long-term storage of the captured CO2 and (d) develop basic design, pro forma economic analyses and funding plans for 1 to 3 possible CCUS demonstrations. | Added to Shortlist - Incorporated into a pilot project archetype | Archetype Carbon Capture Project for Industrial Facility | The initial RFI did not receive any responses for specific industrial carbon capture projects. But CenterPoint would like to consider how different opportunities to support 'hard to electrify' industrial customers would compare in its NGIA portfolio, and carbon capture is one of the approaches contemplated for such applications. A study may be required to help CenterPoint and/or industrial customers better understand specific opportunities for carbon capture project's in the Company's service territories. |
| Carbon Capture | 22 | Clean Hydrogen via Shock Wave Heating | Respondent brings a new energy paradigm to clean hydrogen via shock wave heating. Using the pressure in pipelines, shock wave dynamics can heat gases to temperatures sufficient to crack methane (CH4), creating only hydrogen (H2) and solid carbon (C). The innovation uses no water, generates no direct CO2, is low cost, requires no new regional infrastructure, and can move quickly to market. Respondent removes high-cost and time roadblocks, accelerating the hydrogen transition. | Not currently pursuing | N/A | This proposed approach was not seen as a good fit for NGIA as the proposed carbon capture appears to occur on the gas distribution system, rather than on-site at a customer's facility. |
| Carbon Capture | 28 | Combined Heat and Power Exhaust Carbon Capture Plant | As part of the ongoing relationship between Respondent and a Wastewater Treatment Facility, we have identified an opportunity to develop a new technology to potentially reduce the CO2 impact/emissions from combusting biogas in our CHPs. The carbon capture technology is designed to capture CO2 from exhaust gas streams and convert it to useful solid products. Establishing a closed cycle in this way distinguishes this approach from other carbon capture technologies that only separate CO2 as liquid or gas and leaves disposal unresolved. | Not currently pursuing | N/A | While this is an interesting project with a lot of potential, CenterPoint Energy will be prioritizing specific demonstration projects that fall within our service territory. We do not serve this facility. |
| Carbon Capture | 40 | Carbon Capture & Sequestration | Respondent and other RNG developers would benefit greatly from assistance with carbon capture and sequestration. Carbon pipelines are planned to pass through MN and CenterPoint could help interconnect projects to those pipelines. The Midwest Carbon Express proposed route has a branch that terminates approximately 50 miles from 9 existing and future Respondent facilities. https://www.wctrib.com/news/local/drive-for-carbon-pipeline-easements-underway-in-west-central-minnesota | Not currently pursuing | N/A | This is an interesting opportunity to capture carbon emissions and reduce the carbon intensity of RNG production. However, the project's scale and status mean that this concept would be difficult to support through the current NGIA plan. This project's development will be monitored, for consideration in future NGIA plans. |
| Carbon Capture | 44 | Urban Tree Carbon Offset Program | Respondent supports CenterPoint's intention of achieving its Net Zero goals through active measures to reduce emissions and minimal reliance on carbon offsets. For the remaining emissions that CenterPoint must offset with carbon credits, Respondent proposes that CenterPoint acquire our City Forest Credits (CFC) Carbon+ Credits that are generated from locally planted urban trees. Our Carbon+ Credits not only offset carbon emissions - they also support CenterPoint's focus on community vitality and local initiatives by improving air quality, reducing stormwater runoff to protect local waterways, reducing energy usage and costs incurred by CenterPoint's customers and cooling our urban heat islands. | Added to preliminary NGIA shortlist | Urban Tree Carbon Offset Program | This proposed pilot falls under the NGIA's broad definition of carbon capture. This is one of a few 'nature-based offset' pilots proposed in response to the RFI. This pilot was shortlisted because there are established GHG emissions quantification protocols available for this 'nature-based' approach. This represents an interesting opportunity to partner with local government to develop what are expected to be cost-effective GHG emission offsets, and compare this opportunity to other potential components of CenterPoint's NGIA portfolio. |
| Carbon Capture | 51 | Nature-based Solution to Offset Carbon Footprint | A nature-based solution (NbS) like a passive treatment wetland using biochar within the wetland substrate is a potential solution to manage stormwater and increase carbon sequestration simultaneously. Quantifying carbon sequestration increase using this method is achieved by inventorying increase in natural capital and resulting ecosystem services achieved through the NbS, and quantifying those ecosystem services through an appropriate methodology, such as Habitat Equivalency Analysis. Measuring NbS-related increases in ecosystem services can support the potential to impact communities by increasing access to â€œgreen,â€minimizing climate change impacts, and potentially enhancing aesthetic and real estate values. | Not currently pursuing | N/A | This proposed pilot falls under the NGIA's broad definition of carbon capture. This is one of a few 'nature-based offset' pilots proposed in response to the RFI. This pilot was not shortlisted because there is more uncertainty and less established protocols and guidance related to GHG emissions quantification for this 'nature-based' approach. The opportunity will be monitored for potential inclusion in future NGIA plans. |
| Carbon Capture | 56 | Methane and Refrigerant Leak Reduction Program | Large industrial facilities typically use a lot of natural gas. The gas utility monitors and repairs leaks before the meter. However, leak detection often stops at the site boundary, and we know there can be gas leaks inside the facility. Leak sweeps should be implemented to reduce gas and methane usage, which is a much more potent gas than carbon dioxide. Taking a holistic approach, a leak detection and repair program could include refrigerant leaks as well to further reduce environmental impact. | Added to preliminary NGIA shortlist | Industrial Methane and Refrigerant Leak Reduction Program | This reduction of methane leaks falls under the NGIA's broad definition of carbon capture. This represents an interesting opportunity to target larger industrial customers who are expected to represent a higher proportion of overall customer methane leaks, and is expected to achieve very cost-effective GHG emission reductions. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Carbon Capture | 57 | Carbon Capture for Residential and Commercial Buildings | The proposed project will investigate the carbon capture effectiveness and waste heat recovery efficiency of CleanO2's next-generation CarbinX units (version 4.0) which claims mitigation of up to 20 metric tons of CO2 emissions per year. R&D will be completed to evaluate the performance of the carbon capture system and investigate optimization pathways by varying the flue gas stream characteristics and studying the use of alternate sorbent materials. | Potential R&D opportunity | Carbon Capture for Residential and Commercial Buildings | This is an opportunity to support R&D that could lead to an improved version of technology CenterPoint is already piloting. Given other sources of funding, the budgetary request from CenterPoint is modest. |
| Carbon Capture | 63 | Quantification of Existing and Future Nature-Based Carbon Capture | Respondent is presenting an idea for (1) establishing a baseline of existing nature-based carbon capture and (2) evaluation of future nature-based carbon capture options. Specifically, we propose establishing a baseline through the quantification of nature-based carbon capture from existing forested and grassland areas within CenterPoint's assets. Subsequently, we propose identifying, quantifying, and implementing future nature-based carbon capture projects through restoration efforts on CenterPoint's existing assets and partnering with third parties on mitigation solutions outside of CenterPoint's assets. Although this proposal is focused on CenterPoint's service area in Minnesota, this proposal could be expanded to incorporate CenterPoint's enterprise-wide assets. | Potential R&D opportunity | Quantification of Existing and Future Nature-Based Carbon Capture | This RFI response has been highlighted as a potential research and development study to identify the potential for CenterPoint lands to support carbon capture through nature-based solutions. More details are required, and CenterPoint would want to understand the GHG emissions quantification protocols for such an approach. |
| Carbon Capture | 76 | Working with Nature in Aqueous Carbon Capture | Respondent brings a breakthrough innovation in carbon capture. Using a non-toxic solvent (water), and the natural pressure gradient of the earth, Respondent's technology works with nature, offering a cost-efficient system capable of reducing CO2 capture costs, parasitic energy, and scaling limitations. Respondent's technology is modular and scalable; the design is flexible, serving diverse industry sectors. Respondent's technology's flexibility in design allows the extension of CCUS/CCS across a wide variety of industry sectors, including offshore and onshore and innovative use alternatives. | Added to Shortlist - Incorporated into a pilot project archetype | Archetype Carbon Capture Project for Industrial Facility | The initial RFI did not receive any responses for specific industrial sites interested in carbon capture projects. The applicant's technology, along with other options for industrial carbon capture, will be considered as part of the "Archetype Carbon Capture Project for Industrial Facility". |
| Carbon Capture | 87 | Commercial Building and CHP Scale Carbon Capture Market Study and Pilot Field Testing | Study and develop and the current and future market for building-level and CHP system carbon capture through interviews, development of a local market (incorporation into products, selling through pipelines, or permanent sequestering means), incentivization of the installation of 2 to 6 carbon capture projects, field monitoring of performance, and the development of follow-up recommendations for future CenterPoint Energy actions. Installations would include at least one large building (usage over 100,000 therms/year) and as much as one combined-heat and power (CHP) system. | Potential R&D opportunity | Commercial Building and CHP Scale Carbon Capture Market Study and Pilot Field Testing | This is an interesting opportunity to support innovative R&D that could lead to new emission reduction opportunities for CenterPoint customers. Some proposed details may need to be adjusted and CenterPoint will seek more information from the project respondent and further evaluate this opportunity. |
| Carbon Capture | 102 | Boiler Flue Gas Carbon Capture | Expand the size of boilers that could benefit carbon capture. Look at ways to offset carbon emissions for critical gas processes that will have limited decarbonization/electrification options. This may be a consideration for a district energy plant that may have to have a natural gas boiler to provide redundancy. No specific project has been identified at this time, but is being considered as a carbon reduction strategy in the future. | Not currently pursuing | N/A | This RFI response was not related to a specific project. CenterPoint is interested in supporting its customers investigations of emission reduction opportunities for district energy systems, and carbon capture would be included as one of the strategies that could be considered in the pilot called 'Decarbonizing Existing District Energy Systems'. It should be noted that carbon capture on a back-up boiler is expected to be a relatively expensive approach - given the limited run time (and hence emission reductions) for such a capture unit. |
| Carbon Capture | CNP Internal-16 | Carbon Capture for CNP NG Backup Power Generation | Is there an opportunity for carbon capture on CNP's backup generators? | Not currently pursuing | N/A | Carbon capture unlikely to be cost-effective when only operated intermittently, for back-up generation. |
| Carbon Capture | CNP Internal-18 | Carbon Capture - District Energy Systems | Could the modern electron or other h2 or carbon capture technology be used on the District Energy systems in our service territory to reduce carbon emissions?<br><br>https://modernelectron.com/ | Added to Shortlist - Incorporated into a pilot project archetype | Decarbonizing Existing District Energy Systems | This internal idea has been grouped with other similar proposals under the proposed shortlist archetype called 'Decarbonizing Existing District Energy Systems'. The initial RFI received responses ranging from hydrogen to geothermal systems to support decarbonization of existing district energy systems. These represent innovative opportunities to decarbonize district energy systems currently reliant upon natural gas, that merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |
| Carbon Capture | CNP Internal-3 | Methane Pyrolysis Demonstration Projects at Industrial Customer Sites | The Modern Electron technology (https://modernelectron.com/) is a carbon capture technology being piloted by other utilities.<br><br>This could have a good application at a hard to electrify industrial customer. | Added to Shortlist - Incorporated into a pilot project archetype | Carbon Capture through Methane Pyrolysis at Industrial Facility | This idea has been expanded to a proposed shortlist archetype called 'Carbon Capture through Methane Pyrolysis at Industrial Facility'. There are several technologies that use this process that could be considered for carbon capture at an Industrial Facility. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Power-to-Ammonia | 8 | Utilization of Green Ammonia for Thermal Energy Applications | Ammonia will be produced using wind energy and then used for thermal energy applications within grain dryers, DDGS dryers, and a natural gas boiler within a district heating system. This will provide near-zero carbon thermal energy and displace fossil-based natural gas and propane. | Potential R&D opportunity | Utilization of Green Ammonia for Thermal Energy Applications | This is an interesting opportunity to support innovative R&D conducted by local researchers. More details are required to understand the potential scale and cost of this work. CenterPoint will seek more information from the project respondent and further evaluate this opportunity. |
| Power-to-Ammonia | 9 | Production of Nitrogen Fertilizer from Wind-Generated Ammonia | Green nitrogen fertilizer will be produced. Hydrogen and ammonia will be generated using wind power. Ammonia will then be used to capture carbon dioxide and used to produce a refined nitrogen fertilizer product which can be more easily be stored and transported. The process will significantly reduce GHG emissions associate with fertilizer production, agriculture, and biofuel production. | Not currently pursuing | N/A | Because the production of the nitrogen fertilizer is outside of the state of Minnesota, no CenterPoint natural gas is displaced, and there is no other nexus to CenterPoint's Minnesota system, this was not seen as a good fit for CenterPoint's NGIA plan. |
| Power-to-Ammonia | 26 | Power-to-Ammonia | Ammonia is an important chemical to Minnesota's agricultural sector in that it used directly and indirectly for fertilization and in ethanol production. A pilot unit producing low-carbon ammonia may have immediate off takers among farmers and in corn-ethanol facilities looking to reduce their carbon intensity and GHG emissions. | Not currently pursuing | N/A | This proposed approach was not seen as a good fit for NGIA's 'Power-to-Ammonia' category because the displaced emissions would be from existing out-of state ammonia production and there would not be reductions of emissions from the use of CenterPoint's products. |
| Power-to-Hydrogen | 5 | Local hydrogen production from RNG | Our point of use hydrogen generators are a paridigm changer in the hydrogen industry. We have installed over 60 systems world wide in a number of hydrogen gas use applications including mobility along with glass manufacturing, steel and semi-conductor manufacturing, foods, etc. Unique is our ability to capture CO2 from our process. | Not currently pursuing | N/A | This RFI response did not include a specific project idea. This respondent has been noted as a potential vendor related to hydrogen and electrolyzer technologies, to be notified of potential RFPs related to future NGIA pilots. |
| Power-to-Hydrogen | 24 | Power-to-Hydrogen Industrial | To maximize the use of existing assets in furthering the development of renewable energy, power-to-hydrogen pilot opportunities can focus on higher levels of hydrogen blending in natural gas combustion turbines. The main body of this proposal focuses on the option for identifying industrial customers interested in and suitable for piloting adoption of green hydrogen. | Added to Shortlist - Incorporated into a pilot project archetype | Green Hydrogen Archetype - Industrial Facility Electrolyzer Pilot | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Green Hydrogen Archetype - Industrial Facility Electrolyzer Pilot'. This is one of options targeting 'hard to electrify' industrial customers, a category that CenterPoint must cover in its first Innovation Plan filing. |
| Power-to-Hydrogen | 25 | Power-to-Hydrogen Power Gen | To maximize the use of existing assets in furthering the development of renewable energy, power-to-hydrogen pilot opportunities can focus on higher levels of hydrogen blending in natural gas combustion turbines. The main body of this proposal focuses on the option for blending in combustion turbines. | Not currently pursuing | N/A | This respondent has been noted as a potential service provider related to hydrogen and electrolyzer technologies, to be notified of potential RFPs related to future NGIA pilots. However, at this time the concept proposed here of hydrogen blending for power generation has not been included for further analysis under this first NGIA plan. This is based in part on expectations for high costs, other significant research and development efforts already covering this area, and the likelihood that customers with combustion turbines are likely to be exempt from CIP/NGIA. |
| Power-to-Hydrogen | 33 | Power-to-Hydrogen Potential Study for Existing District Heating Systems in Minneapolis | Minneapolis is home to a number of existing fossil gas-fired district steam systems. To decarbonize these systems, an alternative must be found for the traditional fossil gas. CenterPoint's current power-to-hydrogen pilot along the Minneapolis Riverfront represents a potential fuel source alternative that may be able to scale up to meet the needs of larger thermal energy customers. This proposed feasibility study would assess the technical and economic potential of scaling up the current pilot to provide sufficient quantity of green hydrogen via a dedicated pipeline to 100% replace fossil gas in legacy district energy systems. | Potential R&D opportunity | Study of Decarbonizing Existing District Energy Systems | This is an interesting opportunity to support the City of Minneapolis in their investigation of opportunities to decarbonize their existing district steam systems. More details are required to understand the potential scale and cost of this work. This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Decarbonizing Existing District Energy Systems'. The initial RFI received responses ranging from hydrogen to geothermal systems to support decarbonization of existing district energy systems. These represent innovative opportunities to decarbonize district energy systems currently reliant upon natural gas, that merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |
| Power-to-Hydrogen | 49 | Minnesota Decarbonization Project | Respondent proposes to help CenterPoint lower the carbon intensity of natural gas delivered on its system through the use of green hydrogen production by utilizing Respondent's 1.2-GW of renewable energy assets in Minnesota. | Added to Shortlist - Incorporated into a pilot project archetype | Green Hydrogen Blending into Natural Gas Distribution System | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Green Hydrogen Blending into Natural Gas Distribution System'. This is an innovative opportunity to decarbonize CenterPoint's gas supply that merits further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Power-to-Hydrogen | 52 | Power to Hydrogen | Respondent proposes planning, design, and installation of hydrogen production sites distributed across CenterPoint Energy's service territory. The hydrogen would be produced via electrolysis using off-peak renewable electric power procurement, storage using metal hydride technology, and blending through grid injection at either applicable customer sites (such as universities, hospitals, or large industrials) or at Hydrogen Hubs. Hydrogen Hubs may be operated for direct injection into CenterPoint Energy's distribution system or produce hydrogen tanks for distribution to customers. | Added to Shortlist - Incorporated into a pilot project archetype | Green Hydrogen Blending into Natural Gas Distribution System | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'Green Hydrogen Blending into Natural Gas Distribution System'. This is an innovative opportunity to decarbonize CenterPoint's gas supply that merits further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |
| Power-to-Hydrogen | 75 | Zero-emission Hydrogen | Respondent is a renewable hydrogen project developer based in the US. Respondent has nearly a decade of renewable energy development experience throughout North America. We bring this expertise to the difficult to decarbonize industrial, transportation and power sectors through the development and supply of zero-carbon hydrogen. We focus on origination, procurement, project development, financial structuring, construction, and operations of renewable hydrogen projects to serve our customers. | Not currently pursuing | N/A | This respondent has been noted as a potential vendor related to hydrogen and electrolyzer technologies, to be notified of potential RFPs related to future NGIA pilots. The most detailed information in this response focuses on hydrogen blending in gas turbines. However, at this time the concept proposed here of hydrogen blending for power generation has not been included for further analysis under this first NGIA plan. This is based in part on expectations for high costs, other significant research and development efforts already covering this area, and the likelihood that customers with combustion turbines are likely to be exempt from CIP/NGIA |
| Power-to-Hydrogen | 79 | BioCat Methane from CO2 and Green Hydrogen to Decarbonize Natural Gas Grid | Respondent provides a decarbonized fuel alternative to fossil gas in Minnesota using a microorganism called Archaea. Through a biomethanation process, carbon dioxide from landfill, dairy, swine, waste water treatment or other biogas processes, and hydrogen generated using renewable power are synthesized using this biological catalyst. The resulting BioCat Methane produced through the respondent's proprietary process is of a quality that can be delivered through or stored by the State's existing gas infrastructure, making this synthetic methane a drop-in replacement for fossil natural gas. This gas can be used as long term energy storage when curtailed renewable power is used in the process. | Not currently pursuing | N/A | This proposal has not been included for further analysis under this first NGIA plan's development. This is an interesting technology and CenterPoint Energy would like to monitor its development. At this time, the level of technology development risk, required funding, and intended NGIA project types contributed towards this decision. |
| Power-to-Hydrogen | CNP Internal-15 | Facilities under constructions or being remodeled for potential project sites. | CenterPoint Energy is currently building new facilities in Little Falls and Champlin. It sounds like these facilities will have solar installations. Is there an opportunity to do small power-to-hydrogen at these sites? Additionally, there are several sites in various stages of remodels. | Not currently pursuing | N/A | This idea has not been included for further analysis under this first NGIA plan's development. We will keep these locations in mind as potential sites for implementation of specific technologies as relevant. |
| Power-to-Hydrogen | CNP Internal-2 | Power-to-Hydrogen demonstration project at customer site | CenterPoint Energy pays for total cost of installation and evaluation of the technology - after pilot period, customer can keep the technology or CNP pays for it to be removed (similar to CleanO2) | Added to Shortlist - Incorporated into a pilot project archetype | Green Hydrogen Archetype - Industrial Facility Electrolyzer Pilot | This proposal has been included for further analysis under this first NGIA plan's development. This is one of options targeting 'hard to electrify' industrial customers, a category that CenterPoint must cover in its first Innovation Plan filing. |
| Power-to-Hydrogen | CNP Internal-4 | Fusion Fuel | This is a technology that uses micro-electrolysers to produce hydrogen. CenterPoint Energy could install Fusion Fuel system in parking lot next to the current hydrogen pilot - take advantage of the water treatment that already exists.<br><br>https://www.fusion-fuel.eu/ | Not currently pursuing | N/A | This respondent has been noted as a potential service provider related to hydrogen and electrolyzer technologies, to be notified of potential RFPs related to future NGIA pilots. However, smaller micro-electrolyzers would be expected to have lower efficiency and higher costs compared to other larger options so CenterPoint plans to focus its evaluation of blending projects on larger systems. |
| Power-to-Hydrogen | CNP Internal-9 | Convert Boiler to burn Hydrogen | Identify customer sites to convert boilers to burn hydrogen | Added to Shortlist - Incorporated into a pilot project archetype | Decarbonizing Existing District Energy Systems | This internal idea has been grouped with other similar proposals under the proposed shortlist archetype called 'Decarbonizing Existing District Energy Systems'. The initial RFI received responses ranging from hydrogen to geothermal systems to support decarbonization of existing district energy systems. These represent innovative opportunities to decarbonize district energy systems currently reliant upon natural gas, that merit further analysis and consideration for potential inclusion in the Company's NGIA portfolio. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Special Projects: Commercial EE and GHG Assessment | 19 | Thermal Energy Assessment and Recognition Program | This program would use benchmarking data to identify commercial buildings with significant room for improvement in thermal performance. The auditing and recognition program would leverage energy data made available by benchmarking ordinances (Minneapolis, Edina, and St. Louis Park) to identify buildings with high thermal energy usage per square. Those benchmarked small-to-medium businesses with high thermal EUI would be proactively contacted and offered a free or reduced cost ASHRAE Level 1 or better audit, resulting in a set of thermal efficiency recommendations. Businesses that implement recommendations and improve their efficiency would be recognized in partnership with Hennepin County's Efficient Buildings Collaborative. | Added to Shortlist - Incorporated into a pilot project archetype | Small/medium business GHG audit pilot | This represents one approach to the required small/medium sized commercial GHG audit pilot. CenterPoint will consider this in their design of that pilot. |
| Special Projects: Commercial EE and GHG Assessment | 27 | Small/Medium Business Direct Install | Direct install program for small and medium businesses that covers a simple assessment of the premise and most of the cost of the installation of energy efficient / GHG reducing equipment. | Added to Shortlist - Incorporated into a pilot project archetype | Small/medium business GHG audit pilot | This represents an approach to the required small/medium sized commercial GHG audit pilot. CenterPoint will consider this in their design of that pilot. |
| Special Projects: Commercial EE and GHG Assessment | 54 | Commercial GHG Assessment Program | A Commercial GHG Assessment Program would be a cost-effective, scalable offering to provide small- and medium-sized business with their carbon footprint in an easy to understand one-page report using an automated software platform. To provide direction for each siteâ€™s carbon reduction efforts, we would conduct an energy audit that results in a carbon reduction plan. This plan will include action items the site can carry out for energy efficiency, beneficial electrification, or renewable energy opportunities, to get to energy use carbon free. | Added to Shortlist - Incorporated into a pilot project archetype | Small/medium business GHG audit pilot | This represents on approach to the required residential deep energy retrofits and strategic electrification pilot. CenterPoint will consider this in their design of that pilot. |
| Special Projects: Commercial EE and GHG Assessment | 64 | GHG Assessment | This idea will leverage CenterPoint Energy's existing programs to include additional recommendations for reducing GHG emissions. For example, a customer looking for recommendations to replace a natural gas furnace would only get recommendations for a condensing furnace as part of a current program. This program would allow auditors to provide alternate air source heat pump recommendations and compare the GHG emissions between the two.<br><br>The program would also target new customers, focusing on the largest gas users first to maximize the program's effectiveness. A Standalone GHG Assessment Program can also be offered cost-effectively. | Added to Shortlist - Incorporated into a pilot project archetype | Small/medium business GHG audit pilot | This could be effective in building on an existing efficiency framework to promote other decarbonization measures. CenterPoint will consider this in their design of the required small/medium sized commercial GHG audit pilot. |
| Special Projects: Innovative Resources for Large Industrial Customers | 20 | Industrial Project Development: Decarbonization + Electrification + Efficiency | This program positions CenterPoint Energy as the go-to resource for your industrial customers as they pursue any/all decarbonization strategies. Using a project development approach that evaluates total carbon and thermal loads, Respondent can present competing decarbonization strategies on a level basis for customers to evaluate and compare. Customers can choose which strategy best meets their business objects. CenterPoint can claim the impact from implementation to the program with the highest and best use (i.e. eligible efficiency to CIP, electrification to ECO, etc.). | Added to Shortlist - Incorporated into a pilot project archetype | Industrial GHG audit pilot | This represents one potential approach to the required industiral hard to electrify pilot. CenterPoint will consider it in its design of that pilot program. |
| Special Projects: Innovative Resources for Large Industrial Customers | 83 | Developing an Industrial User Decarbonization Outreach Program | One innovation plan category under the NGIA involves providing innovative resources for large industrial customers. Our idea/proposal under this category involves working with CNP to develop an industrial user decarbonization outreach program. In concept, this program would seek to maximize the many innovative clean energy opportunities within Minnesota including use of biogas/agricultural partnerships. The program would also seek to educate users on grant programs available. Opportunities such as decarbonization incentives for decreasing reliance on natural gas would also be evaluated. Given the respondent's significant presence in the Future Energy marketplace, we are uniquely qualified to lead CNP through this program-development process. | Added to Shortlist - Incorporated into a pilot project archetype | Industrial GHG audit pilot | This was one of several submissions focused on industiral GHG audits and will be combined with those for further consideration. |
| Special Projects: Residential Deep Energy Retrofits and Heating Electrification | 29 | Deep Energy Retrofit Pilot | Respondent proposes a pilot program that performs deep energy retrofits using electric cold climate air source heat pumps to supplement heating in homes that have existing natural gas furnaces. Four comparable homes will be selected to receive deep energy retrofits designed to reduce heating loads by 20%, 40%, 60%, and +80%. This data will be used to determine the cost, energy savings, and most suitable equipment required to meet each tiered reduction. Knowing these values will help inform CenterPoint Energy what levels of incentives will be needed in a commercialized program to encourage customers to make these types of improvements. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | This represents on approach to the required residential deep energy retrofits and strategic electrification pilot. CenterPoint will consider this in their design of that pilot. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Special Projects: Residential Deep Energy Retrofits and Heating Electrification | 39 | Pairing Residential Deep Energy Retrofits and Heating Electrification Special Project with Minneapolis Energy Disclosure Policies | Respondent has a number of residential energy disclosure policies in effect that were adopted with the intent to increase transparency regarding energy use and cost information in housing decisions. These policies can also be leveraged to identify housing within the City that has high gas use, noted envelope deficiencies, and other possible indoor air quality issues. The respondent could partner with CenterPoint Energy in helping to identify the specific housing units and addresses that meet criteria for ideal participants in the Residential Deep Energy Retrofits and Heating Electrification Program special project. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | This represents on approach to the required residential deep energy retrofits and strategic electrification pilot. CenterPoint will consider this in their design of that pilot. |
| Special Projects: Residential Deep Energy Retrofits and Heating Electrification | 89 | Deep Energy Retrofits - Performance-based Demonstration | Deep energy retrofits (DER) are a critical path to achieving maximum GHG and energy use reductions in existing homes, however there are steep barriers and lack of clarity in DER definitions for existing homes. This pilot idea deploys DERs in 50-100 homes utilizing a performance path to meet aggressive home heating load targets and installing dual fuel ASHPs to maximize efficiency, GHG reduction and fuel flexibly. By employing this pilot, CenterPoint would be able to understand market barriers, implementation costs, energy savings, and GHG savings, while developing home-type DER packages that can be cost effectively scaled. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | This represents on approach to the required residential deep energy retrofits and strategic electrification pilot. CenterPoint will consider this in their design of that pilot. |
| Special Projects: Residential Deep Energy Retrofits and Heating Electrification | 97 | Reside Right: Deep Energy Exterior Retrofits | We propose to pilot a program targeted at the residential siding market to advance exterior envelope technologies and market penetration using existing sales channels. The program contains both a market-facing component as well as a technology advancement component. For customers already planning an aesthetic upgrade / residing of their home, demonstrate integration of currently available technologies such as InSoFast exterior insulated wall panel to increase R-value as part of the aesthetic upgrade. Our manufacturing partner InSoFast currently offers R 7.5 and R10 exterior retrofit solutions for residential and commercial buildings, commercially available at Menard's superstores. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | This represents on approach to the required residential deep energy retrofits and strategic electrification pilot. CenterPoint will consider this in their design of that pilot. |
| Strategic Electrification | 23 | Greening of industrial process heating and cooling | A pilot utilizing a geothermal heat pump system to provide process heating and cooling for industrial applications. The pilot would utilize a groundwater-enabled system to provide heating and cooling to an industrial customer currently using natural gas-fired processes. The system could offset current load requirements by supplementing the process needs in a pre-heating application, or it could provide the full load heating requirements depending on type of process and its associated temperature requirements. The system could also provide cooling with the inherent cooling potential of the wells. Applications range from 500 thousand Btuh to 10 MMBtuh, depending on process requirements. | Added to Shortlist - Incorporated into a pilot project archetype | Industrial Electrification Incentive Program | This represents an opportunity to help engage industrial customers (who are often relatively hard to reach) and explore opportunities to leverage heat pumps in these facilities. Results could help inform future industrial strategic electrification efforts by identifying best practices, and help identify new ways to engage these customers. |
| Strategic Electrification | 50 | Strategic Electrification: Direct Install Program for Small and Medium Businesses | Respondent proposes a direct install program assisting small and medium-sized businesses to analyze, design, and install hybrid heat pumps for 135 projects over the five-year program. These businesses are 65% of the commercial stock in the Midwest (CBECs) but lack resources and expertise to invest in decarbonization. These buildings are frequently served by packaged single zone or split systems that can upgrade to hybrid heat pumps with a one-for-one replacement. Hybrid heat pumps allow the electric heat pumps to function when they are most efficient and then use natural gas at the coldest temperatures to avoid excessive electrical costs. | Added to Shortlist - Incorporated into a pilot project archetype | Commercial hybrid heating pilot | This is one of several proposals received related to commercial hybrid heating, which is a promising GHG reductions approach for small and medium sized commercial facilities. It has been combined with the others in a commercial heating pilot archetype. |
| Strategic Electrification | 65 | Integrated Energy Systems for Self-powered Single-family and Multifamily Residential HVAC and Water Heating | Integrated energy systems (IES) are an emerging approach to self-powered space heating, air conditioning, and water heating that integrate fuel-fired and electrically powered equipment with distributed energy resources (DER) energy storage. IES includes a myriad of equipment combinations such as traditional furnaces, water heaters and heat pumps, on-site power from small-scale or micro combined heat and power (mCHP) and renewable sources such as photovoltaics (PV), as well as electrical and thermal energy storage. When properly integrated and controlled, IESs can serve to balance energy grid supply and demand while exploiting multiple energy resources in ways that reduce greenhouse gases, improve overall operating cost and efficiencies, and provide resilient systems in the built environment. | Potential R&D opportunity | Integrated Energy Systems for Self-powered Single-family and Multifamily Residential HVAC and Water Heating | This is an interesting opportunity to conduct research and development on emerging technologies of relevance to gas and electric utilities. CenterPoint needs to consider whether this is better funded through a coalition of interested parties, potentially as part of the the Low-Carbon Resources Initiative (LCRI). |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Strategic Electrification | 66 | Heat Pump Water Heaters | Heat pump water heaters can be more efficient per BTU of heat delivered to water, as compared to natural gas water heaters. Respondent proposes a $600 rebate for replacing a natural gas water heater with an electric heat pump water heater, with an estimated energy savings of 10.5 DTh annually per unit. This will impact general electrification and reduce the number of fuel-burning end-use equipment in Minnesota. It would add to CenterPoint Energy's options and offerings available to both residential and commercial customers, and could potentially target low-income customers with a higher rebate. | Not currently pursuing | N/A | This idea has not been included for further analysis under this first NGIA plan's development. We have determined that a market transformation approach would be the best way to increase penetration of HPWHs and a full-fledged HPWH market transformation program is unlikely to be a good fit for NGIA. |
| Strategic Electrification | 67 | Electrification Qualified Service Provider (eQSP) Program | The eQSP program is designed to develop and support a network of trade allies that help CenterPoint customers identify, quantify, fund, and implement targeted emissions reduction projects. | Potential R&D opportunity | Electrification Qualified Service Provider (eQSP) Program | This may be an effective way to help expand adoption of GHG-reducing measures at scale. |
| Strategic Electrification | 69 | Industrial Audit Program | CPE currently includes under the NGEA umbrella an option for industrial customers to receive an energy audit. The Industrial Audit Program could be added as a standalone or included as a part of the NGEA to provide outreach for industrial customers and deliver viable electrification recommendations to industrial customers, working in tandem with CPE's Key Account Managers. Through this program, recommendations for customers would focus on high-efficiency electric replacement options, which would result in maximum GHG emissions reductions while maintaining peak product output. Incentives could be offered to customers for any projects completed within one year of report delivery date. | Added to Shortlist - Incorporated into a pilot project archetype | Industrial GHG audit pilot | This represents one potential approach to the required industiral hard to electrify pilot. CenterPoint will consider it in its design of that pilot program. |
| Strategic Electrification | 74 | VRF | Variable Refrigerant Flow (VRF) technology is underutilized in today's market despite being commercially available. VRF systems work similarly to heat pumps in that they run a typical air conditioning cycle both forwards and backwards, effectively transferring heat from outside to inside and vice versa, depending on the cooling and heating needs of the building. The compressors in these systems are variable speed, resulting in more efficient heating and cooling based on actual demand required. While in full or partial heat recovery mode, the outside compressors do not have to run at full load resulting in energy savings. | Added to Shortlist - Incorporated into a pilot project archetype | Commercial hybrid heating pilot | This is one of several proposals received related to commercial hybrid heating, which is a promising GHG reductions approach for small and medium sized commercial facilities. It has been combined with the others in a commercial heating pilot archetype. |
| Strategic Electrification | 82 | Heat Pumps for Strategic Electrification | Strategic electrification should generally include an electrically driven heat pump to increase the temperature of a waste heat source (exhuast, wastewater, refrigeration) and transfer it to a heating load. Renewable energy can be integrated into heat pumps projects as well. Industrial applications have historically been somewhat limited in the United States for economic reasons, but can provide substantial GHG and energy reduction benefits in the right application.<br><br>In the context of strategic electrification, Respondent would complete an assessment focused on identifying waste heat sources that would be appropriate for use in a heat pump to offset natural gas. As a part of this assessment high level road mapping of complete natural gas elimination can be considered. Respondent can provide the engineering, design, and commissioning of any identified heat pump projects. | Consider for CIP instead of NGIA | N/A | Because this approach uses waste heat to offset gas heating, it may fall more into a more traditional heat recovery measure under CIP |
| Strategic Electrification | 84 | Industrial Electrification with Heat Pumps | This project proposes to identify the potential for industrial heat pumps to displace natural gas for the creation of process heat for small and medium size industrial CenterPoint customers. This project will classify applicable industrial loads in CenterPoint's service territory, survey existing industrial heat pump systems available to meet these loads and estimate the potential energy savings and GHG reductions. The project will pilot industrial heat pump systems to validate this potential and engage a typically hard-to-reach sector. The project will also afford the opportunity to engage small and medium industrial customers on additional energy efficiency and emissions reduction opportunities | Added to Shortlist - Incorporated into a pilot project archetype | Industrial Electrification Incentive Program | This represents an opportunity to help engage industrial customers (who are often relatively hard to reach) and explore opportunities to leverage heat pumps in these facilities. Results could help inform future industrial strategic electrification efforts by identifying best practices, and help identify new ways to engage these customers. |
| Strategic Electrification | 85 | Customer Geothermal District Energy Pilot Project | Respondent proposes a District Energy pilot project that would provide energy for adjacent businesses with the capacity to expand to homes and buildings in South Minneapolis. The first phase would be the strategic electrification of the 5.4-acre campus with a Central Geothermal heat pump system while also continuing the energy efficiency and deep energy retrofits that have been ongoing. | Added to Shortlist - Incorporated into a pilot project archetype | New District Energy System | This RFI response has been grouped with other similar proposals under the proposed shortlist archetype called 'New District Energy System.' This is an opportunity assess the launch of new district energy systems that either reduce or eliminate the need for natural gas, and consider these projects for potential inclusion in the Company's NGIA portfolio. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Strategic Electrification | 96 | Hybrid geothermal/supplemental boiler HVAC for commercial buildings | A pilot hybrid heating and cooling system that integrates geothermal/groundwater heat pump (GHP) technology with high efficiency supplemental boilers to supply the heating and cooling requirements in a commercial building HVAC application (e.g., school or office). The goal would be to electrify the baseload heating needs by utilizing a GHP system, thereby eliminating onsite carbon emissions while also capturing the economic benefits of GHP's much higher heating efficiency (COP 4-6). Supplemental boilers would provide the incremental heating capacity needed to meet peak demand during the highest heating loads during the year. | Added to Shortlist - Incorporated into a pilot project archetype | Commercial hybrid heating pilot | This is one of several proposals received related to commercial hybrid heating, which is a promising GHG reductions approach for small and medium sized commercial facilities. It has been combined with the others in a commercial heating pilot archetype. |
| Strategic Electrification | 98 | Cold Climate Airsource Heat Pumps with Manufactured Home Parks | Greenhouse gas emissions and energy costs may be reduced by retrofitting manufactured (trailer) homes with cold climate Air Source Heat Pumps (ccASHPs). The Manufactured Home Community Redevelopment (MHCR) grant program and loans from Northcountry Cooperative Foundation are tools to help finance this transition. Respondent has deep connections with Minnesota's park residents & managers, as well as non-profit organizations, weatherization service providers and utilities that serve them. There is an excellent opportunity to create â€œblitzâ€outreach programs with manufactured home parks within CenterPoint's service territory to make meaningful energy savings with ccASHPs in predominantly the low-income sector. | Consider for CIP instead of NGIA | N/A | As with other manufactured home RFI responses, this idea seems like a better fit for consideration in CIP. This proposal was also unclear as to whether the manufacturered homes would remain gas customers and avoid contributing to electric peaks, requirements under NGIA. |
| Strategic Electrification | CNP Internal-12 | ASHP for reheating | Customer could turn off boiler during the summer if they utilize ASHP for reheating in the summer. | Added to Shortlist - Incorporated into a pilot project archetype | Commercial hybrid heating pilot | This is a well-defined concept, that may have potential application in the commercial space. |
| Strategic Electrification | CNP Internal-14 | M&V for hybrid heating systems with existing electric smart meters and gas billed data | Use electric Smart Meters to collect before and after billed data (hourly from electric and monthly from gas) to do a billed data regression analysis on before and after energy consumption for residential hybrid space heating systems (ASHP + cond. furnace). Keep in mind that furnaces aren't very sensitive to hourly climate fluctuations, but ASHPs certainly are. Thus, the enhanced granularity of the electric smart meters is exactly what would be useful for measuring ASHPs. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | Consider incorporating into the other hybrid heating pilot projects |
| Strategic Electrification | CNP Internal-22 | Rebates for Air Source Heat Pumps | Administer residential rebate program for Air Source Heat Pumps - internal administration of a rebate program analogous to CIP rebates. | Added to Shortlist - Incorporated into a pilot project archetype | Residential deep energy retrofit + electric ASHP pilot with gas backup | This could fall into either the idea to create rebates based on GHG reductions, or into a residential hybrid heating pilot program |
| Strategic Electrification | CNP Internal-7 | City Pilot - Heat Pump Water Heaters | Several municipalities in CenterPoint Energy's service territory are working on a pilot to encourage installation of heat pump water heaters. Is there a role for NGIA in this effort? | Added to Shortlist - Incorporated into a pilot project archetype | Residential and Commerical Heat Pump Water Heaters | HPWHs are an established technology, so this could be an effective way to expand strategic electrification efforts if potential concerns about maintaining a gas connection are addressed. |
| Will consider all innovative resources | 81 | Developing and Maximizing CenterPoint Energy Decarbonization Strategy | Being both a leader in both the sustainability and technology/digital innovation markets, the Respondent can provide significant value to CNP through assisting with development and implementation of comprehensive decarbonization strategy. The strategy could be developed through facilitation of a series of workshops, and would consider broad green technology opportunities including hydrogen, ammonia, carbon capture and biogas/RNG. Respondent would utilize its Digital Tool developed to inform the process in identifying locations/projects/partners to maximize probability of implementation success. This tool was recently utilized to develop a comprehensive hydrogen strategy for a major U.S. gas company. | Not currently pursuing | N/A | This proposal has not been included for further analysis under this first NGIA plan's development. The proposal was open ended, and CenterPoint will keep these options in mind as the Company pursues other pilots and R&D projects. |
| Will consider all innovative resources | CNP Internal-1 | Custom NGIA Rebates | Program would operate similar to CIP custom rebates, but rebate would be determined by a $/Ton GHG reduced figure, rather than $ per Dth. It would be used for smaller customer projects that reduce GHG emissions from fossil gas using any of the NGIA Innovative Resources. Allows ongoing flexibility to evaluate customer projects as they come up. Project would have to pass the NGIA societal test in order to be rebated. Energy efficiency and electrification projects would have to run through CIP Custom first. They would be eligible for NGIA custom rebates if they did not pass CIP custom tests. | Not currently pursuing | N/A | Although this could be an effective way to begin to shift to a focus on GHG rather than therm reductions and incentivize a variety of different measures, it was expected that the NGIA plan requirements a more specific allocation of funding for its approval. |
| Does Not Qualify | 3 | Renewable DME from Biogas | Respondent is focused on decarbonizing the global propane industry while laying the foundation for green hydrogen. We accomplish this by producing renewable dimethyl ether (rDME). rDME can be made from raw, non-pipeline quality biogas and can reduce the carbon footprint of transportation as 1) a blending agent with LPG/propane and 2) a hydrogen carrier to power the growing fuel-cell electric vehicle market. Respondent proposes support for a manure->biogas->rDME co-located project that can go to both end markets, displacing fossil propane that is a byproduct of natural gas processing and fossil hydrogen from natural gas reforming. | Not currently pursuing | N/A | As the focus of this proposal is reducing the GHG intensity of propane supplies, and no natural gas consumption is displaced, this was not seen as a good fit for CenterPoint's NGIA plan. |

| Primary Innovative Resource | Submission Number from Response Form | Proposal Title | Brief Description of Project or Idea | Final Screening Decision | Name of pilot or R&D project for purposes of shortlist consideration (including Combined/Modified pilots) | Rationale for Screening Decision |
|---|---|---|---|---|---|---|
| Does Not Qualify | 21 | Voluntary Gas Program & Development Fund | Respondent proposes an idea to develop and launch a voluntary program with CenterPoint Energy that allows CenterPoint Energy's residential and commercial customers to immediately address their carbon emissions from their natural gas use while also supporting the long-term reduction of greenhouse gas emissions in Minnesota. The voluntary program can be designed to intentionally complement and enhance CenterPoint Energy's Innovation Plan by raising additional funds through a per therm premium which can be used to augment the rate-base funding provided for the Innovation Plan or to establish a separate and additional Development Fund. | Not currently pursuing | N/A | This is a proposal for a green tariff which CenterPoint Energy is exploring as a standalone initiative in the future. |
| Does Not Qualify | 55 | Renewable Natural Gas Consumer Opt-In Framework Research and Development | Respondent is presenting an idea for research and development of a framework for CenterPoint consumers to opt-in to use renewable natural gas (RNG) instead of gas from conventional geologic sources. This proposal idea includes quantification of the greenhouse gas reductions that CenterPoint would realize from sourcing natural gas from RNG facilities. Respondent would research and assist in developing a voluntary program that involves residential and commercial customers opting-in to pay a slightly higher utility fee to support offsetting GHG emissions comparable to existing utility programs such as Xcel Energy's Windsource Program, NicorGas TotalGreen Program, or Summit Utilities Voluntary RNG Program. | Not currently pursuing | N/A | This is a proposal for a green tariff which CenterPoint Energy is exploring as a standalone initiative in the future |
| Does Not Qualify | 92 | Library Cold-Climate Air-Source Heat Pump with Variable Refrigerant Flow Pilot Project | Respondent is actively planning a project to pilot the conversion of an existing library's HVAC system to that of a cold-climate electric air-source heat pump (ccASHP) with variable refrigerant flow (VRF). The original library under consideration for this conversion (approximately 15,000 sqft) is at present an all-electric facility. As such, this pilot would fall into the energy efficiency submission category. A final decision on target location has not yet been made however, and alternative library locations of a similar size are also currently being evaluated, and so this project could also fall under the strategic electrification submission category. | Not currently pursuing | N/A | The project as-proposed is sited at an existing all-electric facility and therefore does not meet the statutory requirements to be included in an NGIA innovation plan. |
| Does Not Qualify | 94 | Library Geothermal Heat Exchange Heat Pump with Variable Refrigerant Flow Pilot Project | The respondent is actively planning a project to pilot the conversion of an existing library's HVAC system to that of a geothermal ground-source heat exchange heat pump (also known as 'Darcy System') with variable refrigerant flow (VRF). The original library under consideration for this conversion (approximately 15,000 sqft), is at present an all-electric facility. As such, this pilot would fall into the energy efficiency submission category. A final decision on target location has not yet been made however, and alternative library locations of a similar size are also currently being evaluated, and so this project could also fall under the strategic electrification submission category. | Not currently pursuing | N/A | The project as-proposed is sited at an existing all-electric facility and therefore does not meet the statutory requirements to be included in an NGIA innovation plan. |
| n/a | 1 | n/a | This Submission Number was used due to testing RFI online submission form, no project actually submitted | n/a | n/a | n/a |
| n/a | 6 | n/a | This Submission Number was used due to testing RFI online submission form, no project actually submitted | n/a | n/a | n/a |
| n/a | 7 | n/a | This Submission Number was used due to testing RFI online submission form, no project actually submitted | n/a | n/a | n/a |
| n/a | 31 | n/a | This Submission Number was used due to testing RFI online submission form, no project actually submitted | n/a | n/a | n/a |
| n/a | 34 | n/a | This Submission Number was used due to testing RFI online submission form, no project actually submitted | n/a | n/a | n/a |

# CenterPoint Innovation Plan Stakeholder Meeting 2 Agenda

**FRIDAY, FEBRUARY 24, 8:30AM-12:00PM CT**

## Draft Agenda

| | |
|---|---|
| **8:30AM** | **Welcome, introductions, agenda review** |
| **8:45AM** | **Presentation and Discussion: pilot project designs that CenterPoint used for its analysis** |
| **10:15AM** | **Break** |
| **10:30AM** | **Presentation: pilot project analysis high-level draft results** |
| **11:15AM** | **Q&A and Discussion: pilot project analysis high-level draft results** |
| **11:55AM** | **Next Steps** |
| **12:00PM** | **ADJOURN** |

# Summary of Draft Detailed Analysis on Pilots Under Consideration for CenterPoint Energy's Innovation Plan

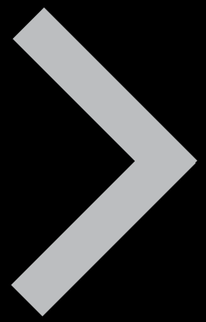
Peter Narbaitz
Director, Energy Markets & Planning, ICF

2/24/2023

# Disclaimer

IMPORTANT NOTICE: REVIEW OR USE OF THIS REPORT BY ANY PARTY OTHER THAN THE CLIENT CONSTITUTES ACCEPTANCE OF THE FOLLOWING TERMS. Read these terms carefully. They constitute a binding agreement between you and ICF Resources, LLC ("ICF"). By your review or use of the report, you hereby agree to the following terms. Any use of this report other than as a whole and in conjunction with this disclaimer is forbidden. This report may not be copied in whole or in part or distributed to anyone. This report and information and statements herein are based in whole or in part on information obtained from various sources. ICF makes no assurances as to the accuracy of any such information or any conclusions based thereon. ICF is not responsible for typographical, pictorial or other editorial errors. The report is provided AS IS. NO WARRANTY, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IS GIVEN OR MADE BY ICF IN CONNECTION WITH THIS REPORT. You use this report at your own risk. ICF is not liable for any damages of any kind attributable to your use of this report.

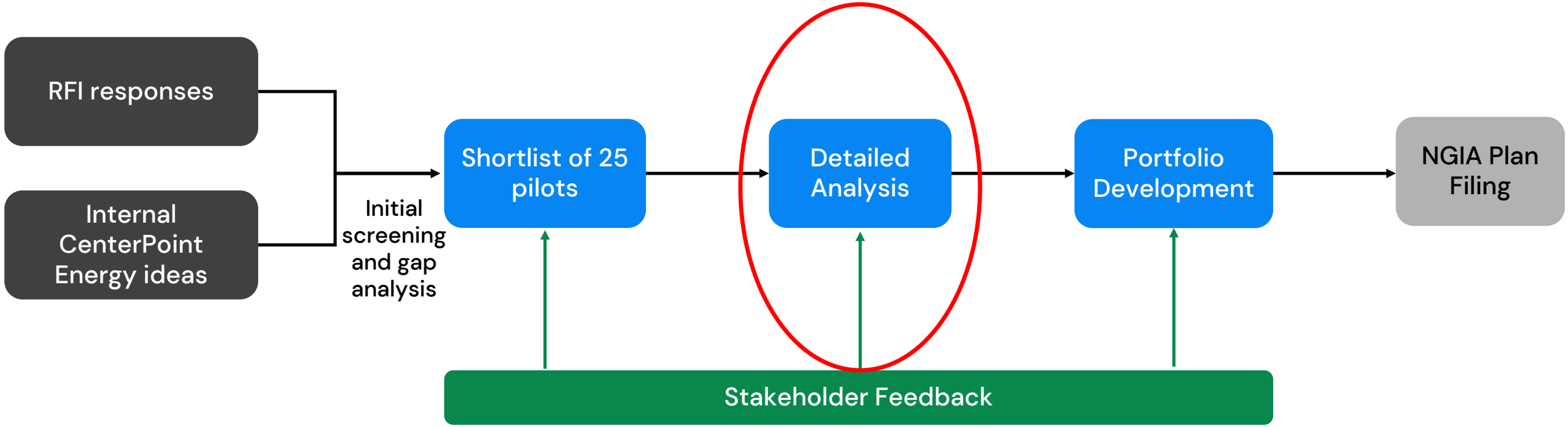
# Agenda



- Overview of NGIA innovation plan development process and detailed analysis
- Review of pilot project designs
- Break
- Review of pilot project analysis framework and high-level draft results
- Open discussion
- Next steps

# Overview of NGIA Innovation Plan Development Process and Detailed Analysis

# Overview of NGIA Innovation Plan Development Process




Focus of this second stakeholder meeting is the draft detailed analysis: should any of the pilot structures (e.g. programmatic approach) or assumptions (e.g. costs, energy savings, GHGs, etc) be refined before we proceed to develop potential portfolios?

# Reminder of pilot shortlist

| # | Pilot | Innovation Category |
|---|---|---|
| 1 | RNG Proposal - Anaerobic Digestion of Organic Materials | RNG/Biogas |
| 2 | RNG Proposal -Anaerobic Digestion of East Metro Food Waste | RNG/Biogas |
| 3 | RNG Archetype – WRRF | RNG/Biogas |
| 4 | RNG Archetype - Dairy Manure | RNG/Biogas |
| 5 | RNG Archetype – Food Waste | RNG/Biogas |
| 6 | RNG Archetype - Landfill Gas | RNG/Biogas |
| 7 | Green Hydrogen Blending into Natural Gas Distribution System | Hydrogen/Ammonia |
| 8 | Green Hydrogen Archetype - Industrial Facility Electrolyzer Pilot | Hydrogen/Ammonia |
| 9 | Industrial Methane and Refrigerant Leak Reduction Program | Carbon Capture |
| 10 | Urban Tree Carbon Offset Program | Carbon Capture |
| 11 | Archetype Carbon Capture Project for Industrial Facility | Carbon Capture |
| 12 | Carbon Capture through Methane Pyrolysis at Industrial Facility | Carbon Capture |
| 13 | Carbon Capture for Commercial Buildings | Carbon Capture |
| 14 | New Networked Geothermal Systems Pilot | District Energy |
| 15 | Decarbonizing Existing District Energy Systems | District Energy (plus Carbon Capture, Strategic Electrification, Energy Efficiency, RNG/Biogas, Power-to-Hydrogen) |
| 16 | New District Energy System | District Energy (plus Carbon Capture, Strategic Electrification, Energy Efficiency, RNG/Biogas, Power-to-Hydrogen) |
| 17 | Industrial Electrification Incentive Program | Strategic Electrification |
| 18 | Commercial hybrid heating pilot | Strategic Electrification |
| 19 | Residential deep energy retrofit + electric ASHP pilot (with gas backup) | Strategic Electrification (plus Energy Efficiency) |
| 20 | Small/medium business GHG audit pilot | Energy Efficiency (plus Carbon Capture, Strategic Electrification) |
| 21 | Residential Gas Heat Pump | Energy Efficiency |
| 22 | Gas Heat Pump for Commercial Buildings | Energy Efficiency |
| 23 | Neighborhood Weatherization Blitzes | Energy Efficiency |
| 24 | Solar Thermal Heating for C&I | Energy Efficiency |
| 25 | Industrial GHG Audit Pilot | Energy Efficiency (plus Carbon Capture, Strategic Electrification, Power-to-Hydrogen, RNG/Biogas) |

- We reviewed these at a high-level in the first stakeholder meeting
- This was the list for more detailed analysis, not a guarantee that all of these end up in NGIA portfolio
- Two projects shifted to R&D from this shortlist
- Research and development projects are captured in a separate category with less planned evaluation

# What are we talking about when we say detailed analysis?

- The end goal for the detailed analysis is to populate the NGIA evaluation framework pictured here for each of the shortlisted pilots
- Some evaluation criteria will be quantitative, other parts will be qualitative
- To calculate the cost-benefit tests required, for each pilot we needed to establish a range of parameters
  - For example, the number of participants, level of gas savings, costs (equipment, installation, utility program admin, incentives, etc.), increase in electricity consumption, measure lifetime, RNG carbon intensity, etc.
  - These 'pilot-level parameters' will be combined with 'system-level parameters' defined by NGIA legislation (e.g. gas retail rate, commodity cost, GHG-intensity of electricity, discount rate, etc.) in order to complete the cost-benefit analysis

| | Pilot 1 | Pilot 2 | Pilot 3 |
|---|---|---|---|
| Perspectives | | | |
| NGIA Utility Perspective | | | |
| NGIA Participants Perspective (including specific impacts on low- and moderate-income participants) | | | |
| NGIA Nonparticipating Customers Perspective (including specific impacts on low- and moderate-income customers) | | | |
| Effects on Other Energy Systems and Energy Security | | | |
| Environment | | | |
| GHG Emissions | | | |
| Other Pollution (including any environmental justice costs or benefits) | | | |
| Waste reduction and reuse (including reduction of water use) | | | |
| Policy (e.g., natural gas throughput, renewable energy goals) | | | |
| Socioeconomic | | | |
| Net Job Creation | | | |
| Economic Development | | | |
| Public Co-Benefits | | | |
| Market Development | | | |
| Innovation | | | |
| Direct Innovation Support | | | |
| Resource Scalability and Role in a Decarbonized System | | | |

# Pilot Profile spreadsheet available to all stakeholders

- Each of the pilots has a tab in the spreadsheet
- Orange cells contain pilot-level inputs to be pulled into analysis
- Tabs also sometimes contain calculations specific to the individual pilot
- Pilot qualitative evaluation details also captured at bottom of profiles
- Key parameters include:
  - Participation level
  - Natural gas savings
  - Changes in electricity consumption
  - Measure life
  - Utility program costs (internal, external, incentives, etc.)

**Pilot Details Worksheet**
*CNP19 - Residential deep energy retrofit + electric ASHP pilot (with gas backup)*

Click here to go back to the list of all pilots

Project: Innovation Plan Assessment Tool

*Enter all relevant inputs, otherwise leave blank*

DESCRIPTION

| | |
|---|---|
| Pilot Project Code: | CNP19 |
| Pilot Project Name: | *Residential deep energy retrofit + electric ASHP pilot (with gas backup)* |
| Customer Class/ Sector: | C&I & Res |
| Low-Income Community Benefit? | Yes |
| Target Area: | Territory-wide |
| Primary Innovative Resource Category: | Strategic Electrification |

*Select primary Innovation Category. Others can be listed here:* Energy efficiency

**Pilot Description:**
Three-phase program targeting single family and multifamily buildings.
Phase 1: Energy Modeling - Modeling of different combinations of building types and energy conservation strategies, including innovative/emerging weatherization measures
Phase 2: Demonstration Projects – Based on results of modeling, we'd select host sites to field test selected technologies and measure performance. This would target up to 42 participants and cover the full cost of installation and monitoring.
Phase 3: Broader Deployment of Successful Strategies from Phase 2. Design, incentive levels and participation targets would be informed by Phase 2 results.

**Overview of Program/ Implementation Approach:**
The phase 1 building modelling would be used to develop a more detailed 'pilot program design' for phase, deciding on things like the different tiers of measures that the pilot should test (e.g. different levels of energy efficiency retrofit), the types of buildings to target, and recruiting participants. Phase 2 field testing would see contractors engaged to perform the different tiers of retrofits, install the ASHPs (with gas back-up remaining in place), and setting up the metering equipment. Phase 3 would also leverage external vendors to implement the program, with the general expectation that this would shift from a direct install program to an incentive program (targetting a higher number of customers), but the programmatic approach would be not settled until after phase 2. Plan currently targets both single family homes and multi-family homes, and would consider a mix of 'conventional' building shell retrofit technologies as well as a few emerging technology options.

**Other Comments / Information:**
Participation shown for years 4 and 5, for phase 3, is currently just a placeholder. CenterPoint will use phases 1 and 2 to inform what makes sense for phase 3 (e.g. level of insulation, level of incentives, etc.). But we are planning for the budget included below, based on the assumptions specified for phase 3 and the amount of NGIA budget CenterPoint estimates might make sense to focus here. Need these estimates in order to set aside some level of funding for phase 3.

**KEY PILOT-SPECIFIC INPUTS:**

| Pilot Year | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | |
|---|---|---|---|---|---|---|
| Calendar Year | 2024 | 2025 | 2026 | 2027 | 2028 | |
| Participating Units, Size A | 0 | 7 | 7 | 35 | 70 | *Incremental units added, annual (not cumulative).* |
| Participating Units, Size B | 0 | 14 | 14 | 70 | 140 | |
| Participating Units, Size C | 0 | 21 | 21 | 105 | 210 | |
| *Unit of Participation =* | Buildings retrofitted | | | | | |

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | USD (Nominal) Cost Unit: |
|---|---|---|---|---|---|---|
| Annual Total Utility Incremental Cost, Size A | $ 197,000 | $ 1,074,880 | $ 1,074,880 | $ 1,396,850 | $ 2,696,700 | total cost per year |
| Annual Total Utility Incremental Cost, Size B | $ 197,000 | $ 1,992,760 | $ 1,992,760 | $ 2,696,700 | $ 5,296,400 | total cost per year |
| Annual Total Utility Incremental Cost, Size C | $ 197,000 | $ 2,910,640 | $ 2,910,640 | $ 3,996,550 | $ 7,896,100 | total cost per year |

*These increment utility costs are what will co the Utility Cost, d Non Participant Cost tests to run pilot, any centive funding to support pr capital investme s made on select pilots.*

PILOT LIFE

| | | | |
|---|---|---|---|
| Average Lifetime for Savings/Pilot Tech, Size A | 30 | years | Weighted avg based on savings 40 years building shell, 15 ASHP. |
| Average Lifetime for Savings/Pilot Tech, Size B | 30 | years | |
| Average Lifetime for Savings/Pilot Tech, Size C | 30 | years | |

Calculations & Other Explanation:

| | | | |
|---|---|---|---|
| Avg. Dth/Participant Saved, Size A | 135 | Dth/Participant | Taking weighted average of single family homes and multi-family. |
| Avg. Dth/Participant Saved, Size B | 135 | Dth/Participant | |
| Avg. Dth/Participant Saved, Size C | 135 | Dth/Participant | |

**Excel profiles are longer than what is shown here**

# Review of pilot project designs

# RNG and biogas pilots

| # | Pilot | Description | Pilot Size | Pilot Scale (Dth/year) | Estimated Pilot Budget (total over pilot period*) |
|---|---|---|---|---|---|
| 1 | Hennepin County RNG Project - Anaerobic Digestion of Organic Materials | An RFI respondent (Hennepin County) is planning to build an anaerobic digestion (AD) facility that would be capable of processing at least 26,000 tons per year of organics to produce RNG and soil/agricultural products. CenterPoint Energy would enter into a contract with this producer to purchase a portion of the RNG - including the commodity and environmental attributes. | A | 8,288 | $ 608,263 |
| | | | B | 41,440 | $ 2,578,513 |
| | | | C | 82,880 | $ 5,041,326 |
| 2 | Ramsey/Washington R&E RNG Project - Anaerobic Digestion of East Metro Food Waste | An RFI respondent (Ramsey/Washington Recycling & Energy) is planning a system to recover organics from municipal solid waste and divert these materials to a future anaerobic digestion facility to produce RNG. CenterPoint Energy would enter into a contract with the RNG producer to purchase a portion of the RNG - including the commodity and environmental attributes. | A | 18,168 | $ 1,195,458 |
| | | | B | 95,762 | $ 5,806,927 |
| | | | C | 190,767 | $ 11,453,164 |
| 3 | RNG Archetype – Water Resource Recovery Facility (WRRF) | For Pilots 3-6, the "RNG Archetypes", CenterPoint Energy would purchase RNG - including the commodity and environmental attributes - from multiple RNG producers that have developed RNG projects using a variety of feedstocks. CenterPoint may also support RNG project development by directly investing in the biogas upgrading equipment (required to produce pipeline-quality RNG) for a limited number of RNG projects, to reduce developers' required capital. We have developed an estimate of expected carbon intensity for each type of feedstock to inform our analysis of potential GHG reductions from a portfolio of RNG purchases.<br><br>For the "RNG Archetypes" CenterPoint would plan to hold a competitive RFP process to assess actual RNG projects, ensure the company receives the best possible pricing / emission reductions, and then would select the ultimate portfolio of projects funded through the first NGIA plan. | A | 10,000 | $ 789,220 |
| | | | B | 300,000 | $ 19,245,230 |
| | | | C | 600,000 | $ 38,317,597 |
| 4 | RNG Archetype - Dairy Manure | | A | 10,000 | $ 1,989,220 |
| | | | B | 100,000 | $ 18,582,077 |
| | | | C | 200,000 | $ 37,006,199 |
| 5 | RNG Archetype – Food Waste | | A | 10,000 | $ 949,220 |
| | | | B | 250,000 | $ 20,079,442 |
| | | | C | 500,000 | $ 39,989,747 |
| 6 | RNG Archetype - Landfill Gas | | A | 100,000 | $ 4,537,699 |
| | | | B | 450,000 | $ 19,742,595 |
| | | | C | 900,000 | $ 39,301,145 |

*This represents the estimated utility pilot budget over the five-year period for CenterPoint's first NGIA plan. Some pilots could involve costs that stretch beyond 5 years (e.g. 10-year RNG contract, or a networked geothermal capital investment), but those additional costs are captured elsewhere.

# Power-to-hydrogen pilots

| # | Pilot | Description | Pilot Size | Pilot Scale (Electrolyzer Capacity Installed) | Estimated Pilot Budget (total over pilot period*) |
|---|---|---|---|---|---|
| 7 | Green Hydrogen Blending into Natural Gas Distribution System | CenterPoint Energy would develop a second hydrogen blending project. The project would be built on CenterPoint Energy property and would include installation of dedicated photovoltaic solar panels to power the electrolyzer. Hydrogen produced from the electrolyzer would be injected directly into the CenterPoint Energy distribution system as it is produced.<br><br>CenterPoint Energy would own all components of installed system, including electrolyzer and PV systems. This represents a next phase in CenterPoint Energy's hydrogen production work, gaining experience using dedicated renewables to produce hydrogen and in turn drive down the costs of the blending projects. | A | 1 MW | $2,131,530 |
| | | | B | 1 MW | $4,693,620 |
| | | | C | ** | |
| 8 | Green Hydrogen Archetype - Industrial Facility Electrolyzer Pilot | CenterPoint Energy would offer incentives covering a portion (100%, up to a max of $1.5 million) of the equipment and installation costs of green hydrogen production systems (electrolyzers) for on-site use by industrial or large commercial customers, displacing natural gas use by these facilities. These systems would be installed onsite for 1-3 customers, who would own and operate the systems. CenterPoint has not yet identified specific customers for the projects, so a 5 MW 'archetype' was chosen to assess to the pilot for the time being, considering that a number of existing customers should be large enough for that size of electrolyzer (some could be higher).<br><br>The projects would be expected to purchase renewable electricity from grid to supply the electrolyzers, and so even with potential IRA incentives and the upfront funding from CenterPoint Energy, participants in this pilot would be committing to a considerable cost increase in their electricity supply in order to decarbonize (part of) their heating load. Some additional programmatic support to identify potential sites and assist with feasibility studies for the projects is also envisioned. CenterPoint Energy would create a measurement and verification plan to monitor system performance for a period of time following installation. | A | 5 MW (1 facility) | $1,076,997 |
| | | | B | 10 MW (2 facilities) | $2,163,128 |
| | | | C | 15 MW (3 facilities) | $3,429,787 |

*This represents the estimated utility pilot budget over the five-year period for CenterPoint's first NGIA plan. Some pilots could involve costs that stretch beyond 5 years (e.g. 10-year RNG contract, or a networked geothermal capital investment), but those additional costs are captured elsewhere.
**Only including two sizes for this planned pilot for now, still investigating whether it would make sense to add a third size incorporating battery storage to increase capacity factors without (or less) grid electricity.

# Carbon capture pilots

| # | Pilot | Description | Pilot Size | Pilot Scale | Pilot Budget (total over pilot period) |
|---|---|---|---|---|---|
| 9 | Industrial Methane and Refrigerant Leak Reduction Program | Large industrial and commercial CenterPoint Energy customers would be encouraged to participate in this program, targeting between 25-50 new facilities per year. In their first year of participation, facilities would receive a 'sweep survey' to identify and quantify behind the meter methane leaks, as well as planning support to establish a systematic leak repair program. These services would be provided by a 3rd party vendor and fully funded through the pilot. The program would also offer incentives to partially offset the costs of repairing identified leaks. Program participants would also receive follow-up 'sweep surveys' every 2 years of the 5-year NGIA framework, as an approach to testing how well the impacts can be sustained. There is significant uncertainty on the level of leaks, as well as expectations that leak levels can vary widely between facilities. To that end, we have made conservative estimates of leak reductions, and ultimately actual leak levels (and impact of repairs) will be documented through the initial and follow up leak sweeps. | A | 50 facilities | $ 1,187,842 |
| | | | B | 125 facilities | $ 2,466,290 |
| | | | C | 250 facilities | $ 4,687,580 |
| 10 | Urban Tree Carbon Offset Program | CNP would purchase and retire City Forest Credits (CFC) Carbon+ Credits that are generated from locally planted urban trees. These also help improve air quality, reduce stormwater runoff, reduce energy costs, and cool urban heat islands. Pilot scales represent 25%, 50%, and 100% of the credits expected to be available from the RFI respondent. | A | 4,500 credits | $ 292,750 |
| | | | B | 9,000 credits | $ 536,500 |
| | | | C | 18,000 credits | $ 1,024,000 |
| 11 | Archetype Carbon Capture Project for Industrial Facility | CenterPoint Energy would offer incentives covering a portion (100% up to a max of $1.5 million) of the equipment and installation costs for carbon capture systems at 1 to 3 industrial or large commercial customers. These customers would own and operate the systems. CenterPoint has not yet identified specific customers for the projects, so an 'archetype' project size was chosen to assess to the pilot for the time being, considering that a number of existing customers should be large enough for that size of carbon capture unit here (some could be higher). Some additional programmatic support to identify potential sites, recruit participants, and assist with feasibility and Life Cycle Assessment (LCA) emissions studies for the projects is also envisioned. The LCA support is particularly important given that Minnesota is not in proximity to the main regions for geological sequestration of carbon, and so the focus will likely be on carbon 'utilization'. CenterPoint Energy would create a measurement and verification plan to monitor system performance for a period of time following installation. | A | 1 facility | $ 2,172,254 |
| | | | B | 2 facilities | $ 4,156,908 |
| | | | C | 3 facilities | $ 6,141,561 |
| 12 | Carbon Capture through Methane Pyrolysis at Industrial Facility | This has been re-assigned to be considered with the R&D projects, given the lack of data about technology performance and lifecycle carbon emission reductions from the by-product use. | | | |
| 13 | Carbon Capture for Commercial Buildings | CenterPoint Energy would offer prescriptive rebates to commercial customers that install CarbinX carbon capture systems at their facilities. These small-scale carbon capture units connect to existing natural-gas heating equipment, capture CO2 gas and convert it to a solid potassium carbonate, and work as an economizer, recapturing waste heat for use in the building (e.g. reducing natural gas consumption in addition to the carbon capture). The program would target up to 300 customers per year. Customers would own and operate CarbinX units, with standard support from the manufacturer. In addition to the manufacturer maintaining the units, they arrange for the potassium carbonate by-product to be collected on a regular basis, with customers earning revenue for its sale. | A | 340 CarbinX systems | $ 1,970,677 |
| | | | B | 675 CarbinX systems | $ 3,675,284 |
| | | | C | 1350 CarbinX systems | $ 7,245,568 |

# District energy pilots

| # | Pilot | Description | Pilot Size | Pilot Scale | Estimated Pilot Budget (total over pilot period*) |
|---|---|---|---|---|---|
| 14 | New Networked Geothermal Systems Pilot | CenterPoint Energy would explore the development of a new "Networked Geothermal" system to provide building heating and cooling for a neighborhood(s) in our service territory. This involves installation of a new 'distributed' geothermal system where individual customers would have a heat pump accessing a common water loop (instead of their own geothermal loops, or ASHPs). This pilot includes a feasibility study, planning and modeling, site selection, design and construction, and measurement and verification of a new networked geothermal system.<br>The proposed approach follows pilots being planned by gas utilities, including National Grid, in Massachusetts. CenterPoint Energy would own and operate the geothermal shared loop system, which would be installed in phases over the 5-year program period. Entire sections of the neighborhood(s) would be shifted off the natural gas distribution system at the same time. In addition to converting gas space and water heating to ground source heat pumps drawing on the shared loop, any other gas appliances would be converted to electric appliances. The pilot program would cover all of these upfront costs for customers, requiring only a roughly 5% co-payment / participant fee from customers in the participating neighborhood. Neighborhood(s) including a low-income community with varied loads (e.g. residential, retail, office, grocery, etc.) would be preferred. | A | 200-ton system capacity | $ 2,791,264 |
| | | | B | 500-ton system capacity | $ 6,207,158 |
| | | | C | 1000-ton system capacity | $ 11,188,673 |
| 15 | Decarbonizing Existing District Energy Systems** | CNP would provide incentives to help our customers decrease carbon emissions of their existing district energy systems via a variety of tactics (converting to hot water pipes, using green hydrogen, ground source heat pumps, renewable natural gas, carbon capture). Incentives would support feasibility or engineering studies and/or project implementation. CenterPoint Energy would provide an incentive in support of feasibility/engineering studies looking at opportunities to reduce emissions from existing district energy customers, with the utility planning to cover 20% of the total study cost up to a cap of $30,000.<br>While incentive approaches/structures to encourage customers to adopt the findings of these studies are still under consideration, CenterPoint is considering leveraging a similar approach to CIP custom programs, with incentives determined based on the minimum of three cost caps (in CIP, this is 1 year payback, 50% of incremental costs, or $5/Dth annual gas savings). CenterPoint expects the $/Dth cap to be the limiting factor for most projects considered under NGIA, and is considering higher incentive levels than the $5/Dth for NGIA incentives. Projects that are eligible for rebates in CIP would not be eligible for these NGIA rebates. | A | 1 district energy system project | $189,180 |
| | | | B | 2 district energy system projects | $676,830 |
| | | | C | 3 district energy system projects | $1,511,939 |
| 16 | New District Energy System | CenterPoint Energy would provide incentives for existing natural gas customers to install new centralized district energy systems using geothermal heat pumps or decarbonized gases. Depending on the specific approach, these customers could fall under district energy or strategic electrification categories. The cost/savings estimates included for this pilot are based on a specific RFI respondent that has already completed an engineering study for such a conversion. The additional participation units included in the pilot are an option to support additional customers to study and implement a similar approach over the 5-year NGIA plan window. The plan for study and implementation incentives would be the same as for pilot 15. | A | 1 new district energy system | $ 133,160 |
| | | | B | 2 new district energy systems | $ 271,690 |
| | | | C | 3 new district energy systems | $ 454,590 |

*This represents the estimated utility pilot budget over the five-year period for CenterPoint's first NGIA plan. Some pilots could involve costs that stretch beyond 5 years (e.g. 10-year RNG contract, or a networked geothermal capital investment), but those additional costs are captured elsewhere.
**Note – for now this pilot has been based on high-level assumptions surrounding potential energy efficiency improvements at a large district energy customer. However, this customer is already conducting and engineering study of decarbonization options, and CenterPoint hopes it is possible to update the costs/savings/approach before the NGIA plan filing.

# Strategic electrification pilots

| # | Pilot | Description | Pilot Size | Pilot Scale | Estimated Pilot Budget (total over pilot period) |
|---|---|---|---|---|---|
| 17 | Industrial Electrification Incentive Program | Vendor-implemented program that would pilot industrial electric heat pumps to improve efficiency of low-to-medium temperature industrial processes. Program would target up to 9 industrial customers and would cover the full cost of the equipment installation. Program would include a monitoring period to collect data on project performance. Planned phases:<br>• Phase 1: The program would begin with a study looking at technical potential, heat pump technologies to be used, and identification of potential customers who could pilot heat pump technologies.<br>• Phase 2: Installation at 3 - 9 facilities, including system design, installation and commissioning<br>• Phase 3: Measurement and verification of system performance, and analysis of results. | A | 3 facilities | $ 520,807 |
| | | | B | 6 facilities | $ 843,778 |
| | | | C | 9 facilities | $ 1,122,549 |
| 18 | Commercial hybrid heating pilot | Vendor-implemented program that would target small-to-medium commercial facilities. The program would provide incentives to retrofit existing HVAC rooftop units with hybrid heating systems. Hybrid heating systems use electric heat pumps to heat the building on warmer days, and switch to traditional gas heating under a specified outdoor air temperature.<br><br>The programmatic approach used here is based on a similar program run by ConEd in New York. This would be a direct install program from the perspective of vendor handling all aspects of the equipment installation, but the customer would pay the bulk of the vendor costs (60%), with CenterPoint Energy covering the remaining portion of installation costs (40%) and some program administration costs. A significant budget for monitoring/metering, analysis, and reporting on the system results is also included in the pilot funding.<br><br>This pilot would be conducted in coordination with ETA, which has chosen hybrid rooftop units as one of its focus technologies. ETA is focused on driving market transformation, but does not have the ability to offer customer incentives such as those included in this NGIA pilot, so there is a lot of natural synergy between both efforts. | A | 70 facilities | $ 3,782,865 |
| | | | B | 135 facilities | $ 6,454,988 |
| | | | C | 200 facilities | $ 9,127,110 |
| 19 | Residential deep energy retrofit + electric ASHP pilot (with gas backup) | Three-phase pilot program targeting single family and multi-family buildings to test a combination of deep energy retrofits and air-source heat pumps with gas back-up. Planned phases of pilot are:<br>• Phase 1: Study Scoping & Program Design - Modeling of different combinations of building types and energy conservation strategies, including innovative/emerging weatherization measures, and finalization of different 'Tiers' of energy retrofit for the pilot testing<br>• Phase 2: Demonstration Projects - Based on results of phase 1 modeling, we'd select host sites to field test selected technologies and measure performance. Pilot would cover the full cost of installation and monitoring, targeting 14 to 42 buildings.<br>• Phase 3: Broader Deployment of Successful Strategies from Phase 2 - Envision a shift to an on-going incentive program (e.g. not covering full installation costs), targeting 105 - 315 buildings. Final design, incentive levels, and participation targets would be informed by Phase 2 results. | A | 119 buildings | $ 6,460,093 |
| | | | B | 238 buildings | $ 12,215,187 |
| | | | C | 357 buildings | $ 17,970,280 |

# Energy efficiency pilots – part 1

| # | Pilot | Description | Pilot Size | Pilot Scale | Estimated Pilot Budget (total over pilot period) |
|---|---|---|---|---|---|
| 20 | Small/medium business GHG audit pilot | This pilot would expand the scope of CenterPoint Energy's Natural Gas Energy Analysis (NGEA) CIP energy audit to include audit information related to a business' GHG emissions and an assessment for additional GHG reduction measures such as electric air source heat pumps or hybrid heating systems, CarbinX carbon capture units, industrial heat pumps or solar thermal walls. The program would offer incentives for these measures (consistent with other NGIA program offerings), and recognize businesses who implement multiple measures as "energy leaders". Participation levels would be consistent with NGEA program goals, at approximately 250-300 customers per year. | A | 992 GHG audits (5% implement) | $ 997,149 |
| | | | B | 1,240 GHG audits (5% implement) | $1,207,811 |
| | | | C | 1,488 GHG audits (5% implement) | $ 1,448,473 |
| 21 | Residential Gas Heat Pump | Gas heat pumps represent an emerging technology category with the potential to replace residential furnaces and water heaters, offering an opportunity to lower GHG emissions and customer costs through higher efficiency. Gas heat pumps have achieved over 1.3 system Coefficient of Performance (COP) in laboratory conditions. While several commercial-sector gas heat pumps are already available, there are four manufacturers aiming to deploy residential systems in 2023-24. An initial pilot phase would include market research and analysis to prioritize which gas heat pump units should be included in the field testing. Outreach would be conducted to recruit CenterPoint customers to participate in the pilot, and contractors would be engaged to train them to install and maintain the heat pumps, with support from equipment manufacturers. The installations would be metered and trial data analyzed to develop reporting metrics that would better inform the opportunity for gas heat pumps to be part of future CIP or NGIA programs. This pilot would cover all the installation costs for participating customers. | A | 6 units | $491,446 |
| | | | B | 10 units | $609,076 |
| | | | C | 20 units | $903,152 |
| 22 | Gas Heat Pump for Commercial Buildings | This pilot involves a demonstration of gas heat pumps offering space and/or water heating for commercial buildings (particularly in cold climates). Natural gas fired heat pumps are an emerging new technology that allows natural gas heating, cooling, and water heating to exceed a COP of 1 and increase efficiency of gas end uses. There are many different types of gas fired heat pump under development, at various stages of readiness, and many different application types of this technology. Some companies have commercially available gas heat pumps in market, and they are typically utilized in commercial buildings with high hot water consumption such as multifamily, small commercial and/or recreational facilities.<br><br>As the technology is new to market and is not yet considered cost effective for CIP, this pilot involves demonstration site installations with equipment monitoring, energy savings documentation, understanding of costs and benefits and a resulting case study. Some sites could be available for site walk-throughs so that contractors, design firms and other technology specifiers can gain first-hand experience and exposure to the technology.<br><br>GAHPs are included in the Minnesota Efficient Technology Accelerator's (ETA) starter portfolio. That is a market transformation initiative that will work to accelerate adoption of emerging technologies. This NGIA pilot field demonstration would complement the strategy and planning work that will be completed within the ETA program, and could be completed in coordination with ETA. | A | 3 units | $ 680,257 |
| | | | B | 6 units | $1,139,825 |
| | | | C | 9 units | $ 1,661,893 |

# Energy efficiency pilots – part 2

| # | Pilot | Description | Pilot Size | Pilot Scale | Estimated Pilot Budget (total over pilot period) |
|---|---|---|---|---|---|
| 23 | Neighborhood Weatherization Blitzes | The "Neighborhood weatherization blitzes" proposes an intensive marketing and outreach approach to increase the participation in our existing CIP weatherization offerings. There is uncertainty in the effectiveness of this approach and start-up requires notable time and resource investment, so we will start with a Research & Development project to design and test different outreach campaigns to evaluate their effectiveness for consideration in CIP. | | | |
| 24 | Solar Thermal Heating for C&I | This pilot would offer incentives for customers who install transpired solar air systems, which help facilities that have large make-up air loads reduce their energy consumption. The pilot would offer commercial and industrial customers an incentive to partially offset the cost to install the solar wall. This assumes that the projects in question, which have relatively high upfront costs, would not be cost-effective enough to qualify for any CIP incentives (if any projects did qualify for CIP they would be directed to that program instead of NGIA). Support for initial feasibility study is also included.<br><br>While incentive approaches/structures to encourage customers to adopt the findings of these studies are still under consideration, CenterPoint is considering leveraging a similar approach to CIP custom programs, with incentives determined based on the minimum of three cost caps (in CIP, this is 1 year payback, 50% of incremental costs, or $5/Dth annual gas savings). CenterPoint expects the $/Dth cap to be the limiting factor for most projects considered under NGIA, and is considering higher incentive levels than the $5/Dth for NGIA incentives. Projects that are eligible for rebates in CIP would not be eligible for these NGIA rebates. | A | 10 projects | $ 329,495 |
| | | | B | 15 projects | $ 469,743 |
| | | | C | 25 projects | $ 750,238 |
| 25 | Industrial GHG Audit Pilot | Expansion of existing CIP Process Efficiency and Commercial Efficiency programs. This would build off the existing CIP programs, enhancing those energy audits to include GHG emissions context/data, as well as emission reduction opportunities. Additional GHG reduction measures might include electric heat pumps or hybrid heating systems, CarbinX carbon capture units, industrial heat pumps or solar thermal walls. Audit participation levels would be consistent with Process Efficiency and Commercial Efficiency.<br><br>The program would offer specialized incentives to help customers implement audit recommendations. A new 'custom incentive stream' would be established for specific types of technologies that have not traditionally been cost-effective under CIP but could leverage funding from NGIA to help them proceed. Incentive levels expected to take a similar approach to outline in pilot 24 above. There are a number of types of opportunities identified in past CIP audits, where recommendations are not typically implemented. The focus categories would be:<br>1. Electric heat pumps for certain process hot water needs (including reviewing and applying appropriate new technologies)<br>2. Heat recovery opportunities for process hot water/ process cooling and winter makeup air heating<br>3. Process efficiency improvements through improved process heat exchange / integration | A | 5 projects | $ 945,005 |
| | | | B | 10 projects | $ 1,277,010 |
| | | | C | 15 projects | $ 1,609,015 |

# Q&A

# Break

# Review of pilot project analysis high-level draft results

*-Draft quantitative results*
*-Qualitative implications*
*-R&D plan*

# Pilot names

| Pilot Key / # | Short-Hand Name | Full Pilot Name |
|---|---|---|
| CNP01 | Hennepin County RNG | Hennepin County RNG Project - Anaerobic Digestion of Organic Materials |
| CNP02 | Ramsey-Washington RNG | Ramsey-Washington RNG Project - Anaerobic Digestion of East Metro Food Waste |
| CNP03 | RNG Archetype – WRRF | RNG Archetype – WRRF |
| CNP04 | RNG Archetype - Dairy | RNG Archetype - Dairy Manure |
| CNP05 | RNG Archetype - Food Waste | RNG Archetype – Food Waste |
| CNP06 | RNG Archetype - Landfill Gas | RNG Archetype - Landfill Gas |
| CNP07 | Hydrogen Blending | Green Hydrogen Blending into Natural Gas Distribution System |
| CNP08 | Industrial Hydrogen | Green Hydrogen Archetype - Industrial or Large Commercial Facility Electrolyzer Pilot |
| CNP09 | Industrial Methane Leaks | Industrial Methane and Refrigerant Leak Reduction Program |
| CNP10 | Urban Tree Offsets | Urban Tree Carbon Offset Program |
| CNP11 | Industrial Carbon Capture | Archetype Carbon Capture Project for Industrial or Large Commercial Facility |
| CNP13 | Commercial Carbon Capture | Carbon Capture Rebates for Commercial Buildings |
| CNP14 | Networked Geothermal | New Networked Geothermal Systems Pilot |
| CNP15 | Existing District Energy | Decarbonizing Existing District Energy Systems |
| CNP16 | New District Energy | New District Energy System |
| CNP17 | Industrial Electrification | Industrial Electrification Incentive Program |
| CNP18 | Commercial Hybrid Heating | Commercial hybrid heating pilot |
| CNP19 | Res. Deep Energy Retrofits | Residential deep energy retrofit + electric ASHP pilot (with gas backup) |
| CNP20 | Sm./Med C&I GHG Audit | Small/medium business GHG audit pilot |
| CNP21 | Res. Gas Heat Pumps | Residential Gas Heat Pump |
| CNP22 | Com. Gas Heat Pumps | Gas Heat Pump for Commercial Buildings |
| CNP24 | C&I Solar Thermal | Solar Thermal Heating for C&I |
| CNP25 | Large C&I GHG Audit | Industrial and Large Commercial GHG Audit Pilot |

# Lifetime GHG emission reductions

This metric represents the net reduction in greenhouse gas emissions over the lifetime of the measures implemented in a pilot. While the relevant types of emissions vary by pilot, the general components are 1) net emissions reductions from project-related changes in consumption of natural gas and electricity, and 2) reduced emissions from pilot-specific lifecycle emissions calculations (e.g. carbon intensity of RNG, carbon capture savings, etc.). More specifics on the calculations are provided below.

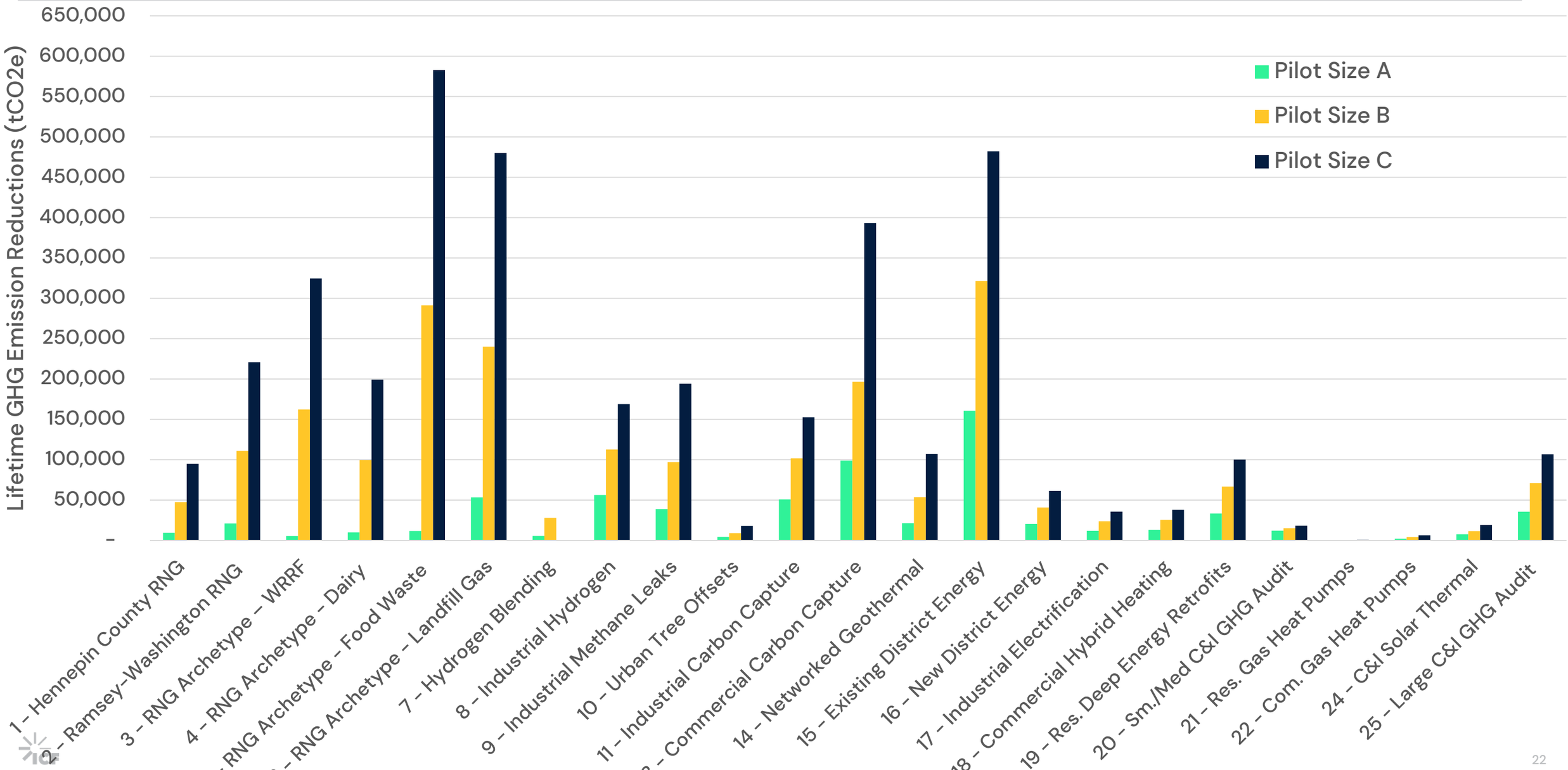
Lifetime GHG Emissions Reduction (tCO2e) = [*(1) Net electricity savings/additions impact* + *(2) Net natural gas lifecycle emissions impact* + *(3) Net lifecycle GHG savings* ] x *Measure life* x *Number of participating units*

(1) Net electricity savings/additions impact (tCO2e per participant) = *Annual kWh saved/added per participant* x Electric emissions factor (*tCO2e per kWh)*

(2) Net natural gas lifecycle emissions impact (tCO2e per participant) = *Average annual Dth saved per participant* x *Geologic gas lifecycle emissions factor (tCO2e per Dth)*

(3) Net lifecycle GHG savings (tCO2e per participant) = *other lifecycle GHG savings (annual tCO2e savings per participant)*

# Scale of lifetime GHG emission reductions by pilot – draft results



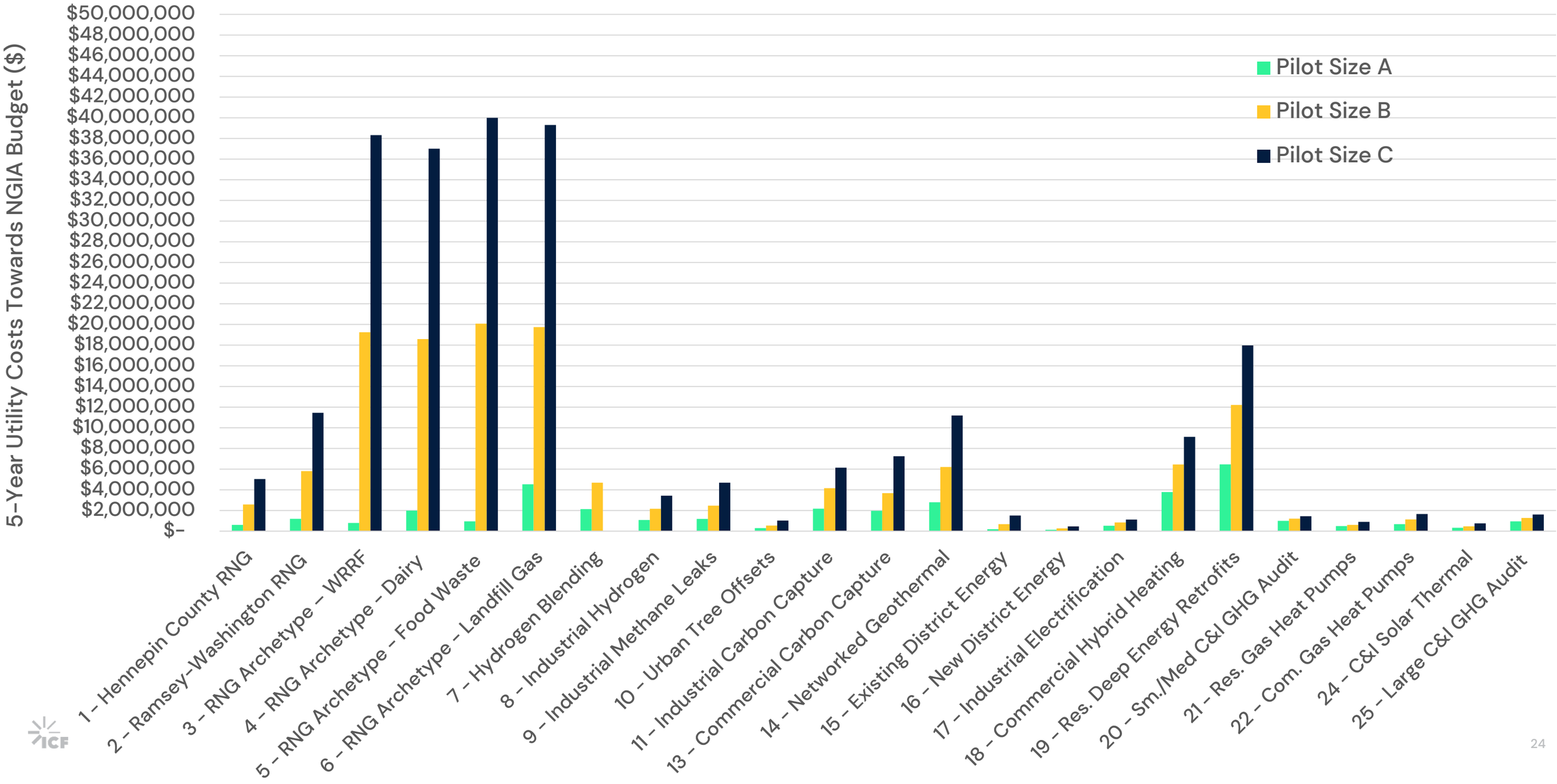
# 5-Year utility costs towards NGIA budget

This metric represents the cost for different pilots that will count against the statutory cost-caps established for CenterPoint Energy's spending under NGIA. While the relevant types of costs vary by pilot, the three main cost components are the budget for CenterPoint Energy staff and vendors to deliver the pilots, incentive payments to customers, and any revenue requirements for capital investments made as part of certain pilots. Then, based on the NGIA framework, the pilot costs compared to the cost caps would account for some expected utility savings, such as reduced natural gas commodity costs. More specifics on the calculations are provided below.

5-years utility costs towards NGIA budget ($2024-$2028) = *Net incremental O&M costs ($)*
+ *Annual revenue requirement for capital projects ($)*
+ *Incentives ($)*
- *Natural gas commodity savings ($)*

Note – Slide 39 in appendix shows these specific values

# Scale of budgets by pilot and size options – draft results



# Emission reduction costs

For each of the emission reduction cost metrics showcased here, we take a different cost metric and divide it by the same lifetime GHG emissions.

Utility cost perspective includes only costs the utility will pay and excludes costs paid by participants or others. This perspective is highly sensitive to the level of participant incentive selected. This perspective also does not include benefits of GHG or other pollutant reductions.

The total (net) pilot impacts looks to capture 'all the value and cost streams' that have been quantified in this analysis. It includes costs the utility, to the participant, and the value of GHG and other pollutant savings.

The equipment and installation costs simply looks at the total upfront cost to purchase and install the relevant technology, stripping out the impacts of different incentive levels and/or supplemental pilot budgets for programmatic support (like program administration, marketing and customer recruitment, etc). This perspective may help better understand the ongoing cost of a technology at scale separately from start-up administrative costs.

# Emission reduction costs (continued)

- Lifetime emission reduction cost from utility perspective ($2023/tCO2e) = [*UCT test costs ($2023) – UCT test benefits ($2023)*] / *Lifetime GHG emissions reduction (tCO2e)*

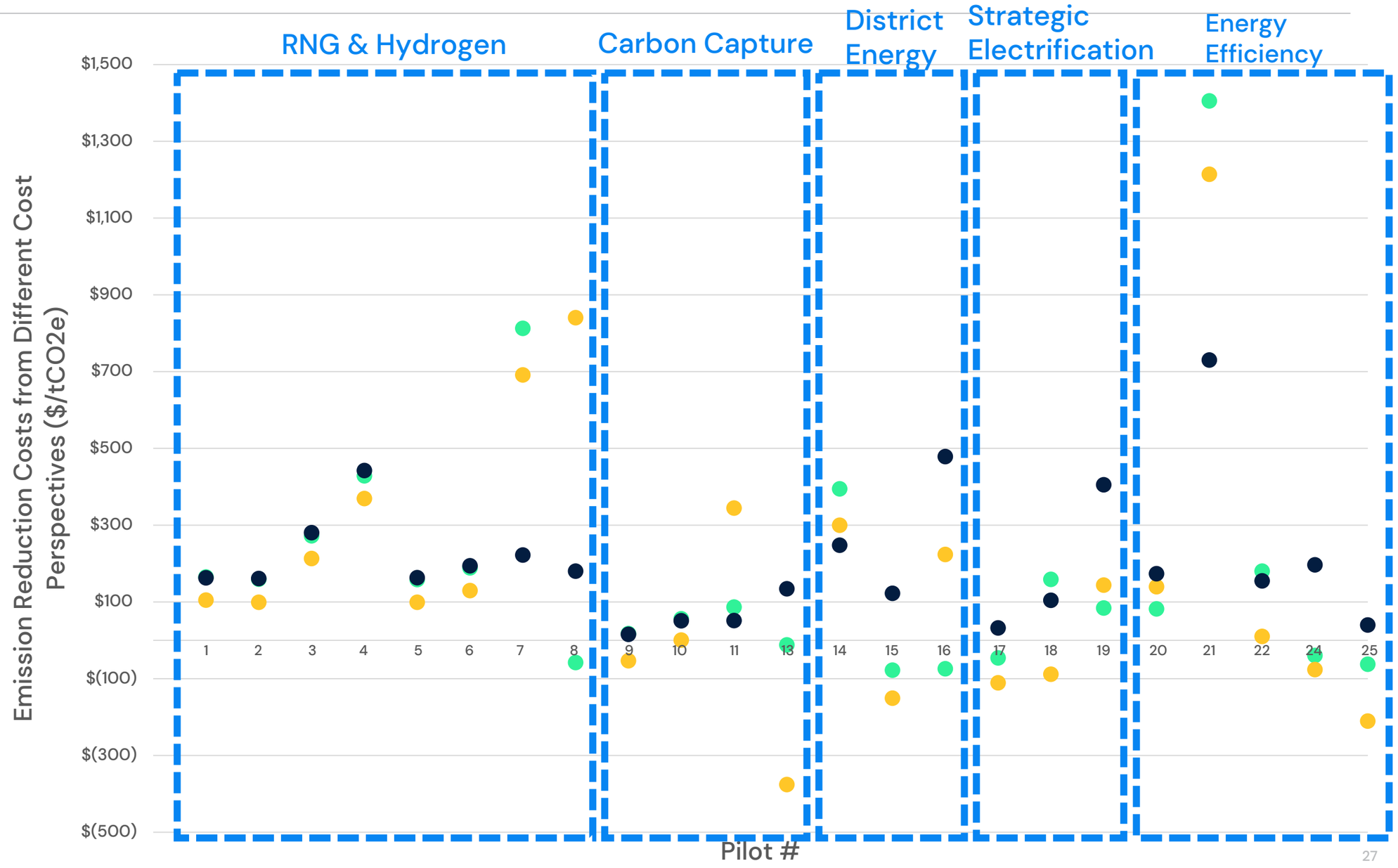
- Lifetime emission reduction cost from total (net) pilot impacts perspective ($2023/tCO2e) = [*UCT test costs ($2023) + PCT test costs ($2023) – UCT test benefits ($2023) - PCT test benefits ($2023) + social cost of GHG emission reductions ($2023) + social cost of non-GHG emission reductions ($2023) + third party funding ($2023)* ]/ *Lifetime GHG emissions reduction (tCO2e)*

- Lifetime emission reduction cost from equipment and installation (technology) perspective ($2023/tCO2e) = *Equipment and installation costs ($2023) / Lifetime GHG emissions reduction (tCO2e)*

# Emission Reduction Costs (Pilot Size B) – draft results

Note – Slide 40 in appendix shows these specific values, and Slide 37 shows same chart with outliers removed

- Lifetime Emission Reduction Cost from Utility Perspective ($/tCO2e)
- Lifetime Emission Reduction Cost from Total (Net) Pilot Impacts Perspective ($/tCO2e)
- Lifetime Emission Reduction Cost from Equipment and Installation (Technology) Perspective ($/tCO2e)



# Snapshot of notable pilot projects from NGIA 'perspectives'

- NGIA Utility Perspective
  - Costs from utility perspective vary based on range of factors, including if customers are contributing part of the installation costs (e.g. lower utility contribution) and projects reductions in gas throughput (commodity cost savings lower UCT)

- NGIA Participants Perspective (including specific impacts on low- and moderate-income participants)
  - Networked geothermal and res. deep energy retrofit pilots could be targeted towards low- and moderate-income customers/neighborhoods
  - A number of industrial and commercial focused pilots may help participants achieve their own corporate GHG reduction goals making them more competitive with GHG-conscious customers
  - Some pilot projects, such as energy efficiency, will reduce customer costs, while others, such as hydrogen, will increase them

- NGIA Nonparticipating Customers Perspective (including specific impacts on low- and moderate-income customers)
  - Rate impacts to be discussed in the third round of stakeholder meetings
  - RNG and hydrogen blending projects will reduce the GHG intensity of gas, reducing the GHG emissions from all CenterPoint Energy customers
  - Hennepin County RNG includes an anaerobic digestion facility proposed in an Environmental Justice 'area of concern'. Hennepin County has initiated community engagement activities to evaluate the potential for disproportionate adverse impacts and consider ways to reduce those impacts from the project. Hennepin County will continue the community engagement process as the project progresses.

- Effects on Other Energy Systems and Energy Security
  - Reliance on locally produced RNG and green hydrogen reduces dependence on out-of-state geologic gas which may have benefits for energy security, and is a decarbonization approach built off existing energy infrastructure
  - The two pilots involving hybrid heating systems, and the two pilots involving gas heat pumps, would explore decarbonization opportunities that can help mitigate growth in winter electric peak demand from space heating electrification

# Snapshot of notable pilot projects for environmental criteria

- GHG Emissions
  - Quantitative results include both lifetime GHG savings (tCO2e) and the social cost (value) of GHG emissions (reductions)
  - RNG projects capture and recover methane (higher global warming potential than CO2) and put that gas to productive use

- Other Pollution
  - Quantitative results also include the social cost (value) of non-GHG air pollutants emissions (reductions)
  - Anaerobic digestion of dairy manure can improve agricultural practices that harm water quality, air quality, and local odors
  - The industrial methane leak detection and repair program could also identify refrigerant leaks, to further reduce environmental and GHG impacts

- Waste reduction and reuse (including reduction of water use)
  - Hennepin County's RNG project has the potential to be a state model for organics recycling and beneficial use; this and the other 'food waste' RNG projects can help to demonstrate an effective use of anaerobic digestion in MN to process residential and commercial source-separated organics (as opposed to landfilling)
  - All RNG pilots, digestion of organic materials for energy production is effective way to decarbonize waste

- Policy (e.g., natural gas throughput, renewable energy goals)
  - The RNG, hydrogen, networked geothermal, strategic electrification, new district energy, solar thermal, and potentially the C&I GHG audit pilot increase use of renewable energy
  - All pilots except carbon capture pilots and urban tree planting decrease geologic gas throughput

# Snapshot of notable pilot projects from socioeconomic criteria

- Net Job Creation
  - IMPLAN modelling to quantify the net job creation from pilots is still on-going

- Economic Development
  - The hydrogen pilots allow local firms and workers to gain experience in hydrogen, which is a growing industry
  - A number of projects support improved industrial competitiveness in Minnesota, by helping industry become more efficient, while other pilots could entice corporate R&D teams to concentrate their initial decarbonization efforts at Minnesota facilities
  - Pilots seeking higher IRA incentives would follow wage/labor IRA requirements
  - The networked geothermal pilot would represent a large-scale build out of a new type of utility infrastructure
  - CenterPoint Energy is planning to include budget for workforce development to support various projects at the portfolio level

- Public Co-Benefits
  - The first two RNG pilots have the additional benefit of supporting local municipalities
  - In the Urban Tree offset pilot, new street trees will shade homes and buildings, reducing cooling and heating costs over time; in addition to sequestering carbon, these trees also increase the stormwater infiltration rate of the urban soils and promote habitat diversity throughout the city

- Market Development
  - Many pilots may be located through CenterPoint Energy's service territory; projects may have a significant impact on individual customer's GHG emissions helping them achieve their GHG emissions goals and supporting their competitiveness with GHG-conscious customers

# Snapshot of notable pilot projects from innovation criteria

- Direct Innovation Support
  - Many of the pilots are small-scale field testing, with most or all of costs covered for CenterPoint Energy customers, in order to better understand an emerging technology and how it could be scaled
  - Hennepin County's RNG project has the potential to be a state model for organics recycling and beneficial use
  - The RNG pilots provide CenterPoint Energy with experience in purchasing low-carbon fuels, and the hydrogen blending and new district energy pilots provide experience with a different way of providing energy
  - Carbon capture and hydrogen pilots explore emerging options to reduce emissions from hard to electrify industrial end-uses
  - The residential deep energy retrofit pilot (including hybrid heating) could help answer questions on balance of energy efficiency retrofits vs. strategic electrification, while also supporting testing of new building retrofit technologies

- Resource Scalability and Role in a Decarbonized System
  - Hybrid heating targets the largest residential and commercial sector uses of natural gas and in the 2021 Minnesota G21 study the 'electrification with gas back up' scenario had smallest total cost increase by 2050
  - All deep emission reductions pathways rely on a lot of decarbonized gases to reach emission reduction targets:
    - All scenarios in the 2021 Minnesota G21 study use all available biomethane resources, and hydrogen blending, before tapping into more expensive decarbonized gases.
    - Even in the G21 high electrification case, 2050 RNG demand in Minnesota would be much greater (50-100 times) than the annual volume of decarbonized gas production assumed in the detailed analysis
  - Residential and commercial hybrid heating and gas heat pumps were selected for the Minnesota Efficient Technology Accelerator's (ETA) starter portfolio, and taking a collaborative approach with the Center for Energy and Environment (CEE) on these pilots offers can amplify the effects of both NGIA and ETA.
  - Hydrogen and carbon capture are expected to be important tools in a decarbonized energy system; through IRA and IIJA the federal government has invested heavily in scaling up and reducing the costs of hydrogen production and carbon capture

# Research & Development (R&D) Approach

- Research and Development (R&D) distinction:
  - Relatively smaller in scale research projects or studies
  - Uncertain, difficult to quantify, or nominal GHG benefits

- Approach to selecting R&D projects
  - Initial Innovation Plan filing will:
    - Include investments up to 10% of total incremental Innovation Plan costs for R&D
    - Specify R&D projects to be funded in first 1-2 years of plan (these will be presented in the third public engagement meeting)
    - Reserve funding for R&D in future years in a general R&D budget
  - Annual Status Reports will:
    - Report progress/results of completed R&D
    - Propose R&D to be implemented in the upcoming year
  - External R&D proposals accepted by CenterPoint on an on-going basis for consideration

# Full list of potential R&D projects under consideration

| Primary Innovative Resource | Reference #/Source | Project Title |
|---|---|---|
| Biogas/Renewable Natural Gas | 2 | Minnesota's Renewable Natural Gas Potential |
| Biogas/Renewable Natural Gas | 37 | Planning Toolkit for RNG and Biogas Project Development |
| Biogas/Renewable Natural Gas | 38 | Renewable Energy Match (REM) |
| Biogas/Renewable Natural Gas | 47 | Ideas for Increased Biomethane Production |
| Biogas/Renewable Natural Gas | 80 | Maximizing Minnesota Renewable Natural Gas (RNG) Opportunities |
| Biogas/Renewable Natural Gas | 100 | Design a portal that partners potential projects with qualified developers |
| Biogas/Renewable Natural Gas | CNP Internal-11 | Small-scale Biodigester at University Campus |
| Biogas/Renewable Natural Gas | CNP Internal-17 | RNG Potential Study |
| Biogas/Renewable Natural Gas | Post-Stakeholder Meeting - 108 | Sustainable Hydrogen Production Using the Sandwich Gasifier |
| Biogas/Renewable Natural Gas | Gap Analysis | Support for Development of Thermal Gasification RNG Production Processes |
| Carbon Capture | 57 | Carbon Capture for Residential and Commercial Buildings |
| Carbon Capture | 63 | Quantification of Existing and Future Nature-Based Carbon Capture |
| Carbon Capture | 87 | Commercial Building and CHP Scale Carbon Capture Market Study and Pilot Field Testing |
| Carbon Capture | Post-Stakeholder Meeting - 106 | Carbon Utilization – Novel Technology |
| Carbon Capture | CNP Internal-3 | Carbon Capture through Methane Pyrolysis at Industrial Facility |
| District Energy | 10 | Feasibility Analysis and Market Assessment of Clean District Energy Opportunities for CenterPoint Energy |
| District Energy | 33 | Power-to-Hydrogen Potential Study for Existing District Heating Systems in Minneapolis |
| Energy Efficiency | 13 | Innovation Incubator |
| Energy Efficiency | 17 | Emerging Technology Strategic Incentives Fund |
| Energy Efficiency | 95 | High Performance Building Envelope Initiative |
| Neighborhood Weatherization Blitzes | | |
| Power-to-Ammonia | 8 | Utilization of Green Ammonia for Thermal Energy Applications |
| Power-to-Ammonia | Post-Stakeholder Meeting - 105 | Green Ammonia - Novel Technology |
| Strategic Electrification | 65 | Integrated Energy Systems for Self-powered Single-family and Multifamily Residential HVAC and Water Heating |
| Strategic Electrification | 67 | Electrification Qualified Service Provider (eQSP) Program |
| Power-to-Hydrogen | Post-Stakeholder Meeting - 107 | Green Hydrogen and CO2 --> RNG |
| General | Gap Analysis | CenterPoint Minnesota Net Zero Study |

# Q&A and Discussion: pilot project analysis high-level draft results

# Questions for participants

- Do you have any clarifying questions (seeking to better understand what was presented)?
- Was there anything that was surprising to you?
- Do you have any questions or initial take-aways from the draft analysis results?

## Get in touch with us:
## Peter Narbaitz

613.520.1845
Peter.Narbaitz@icf.com

icf.com

linkedin.com/company/icf-international/

twitter.com/icf

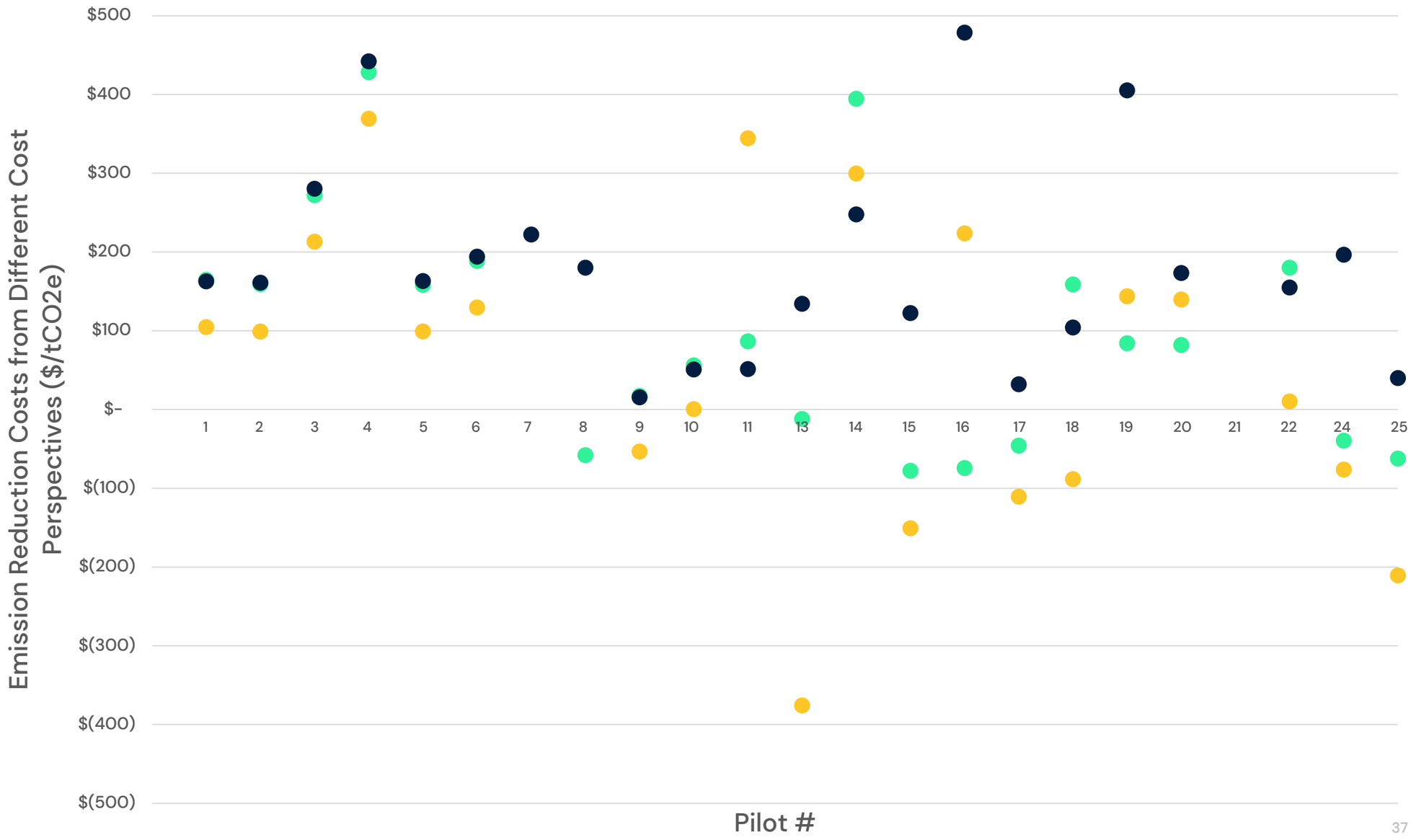
https://www.facebook.com/ThisIsICF/

**About ICF**

ICF (NASDAQ:ICFI) is a global consulting and digital services company with over 7,000 full- and part-time employees, but we are not your typical consultants. At ICF, business analysts and policy specialists work together with digital strategists, data scientists and creatives. We combine unmatched industry expertise with cutting-edge engagement capabilities to help organizations solve their most complex challenges. Since 1969, public and private sector clients have worked with ICF to navigate change and shape the future.

# Emission Reduction Costs (Pilot Size B) – removing outliers

- Lifetime Emission Reduction Cost from Utility Perspective ($/tCO2e)
- Lifetime Emission Reduction Cost from Total (Net) Pilot Impacts Perspective ($/tCO2e)
- Lifetime Emission Reduction Cost from Equipment and Installation (Technology) Perspective ($/tCO2e)



# Lifetime GHG emission reductions by pilot (tCO2e)

| # | Pilot | Pilot Size A | Pilot Size B | Pilot Size C |
|---|---|---|---|---|
| 1 | RNG Proposal – Organics 1 | 9,500 | 47,500 | 95,000 |
| 2 | RNG Proposal – Organics 2 | 21,041 | 110,906 | 220,935 |
| 3 | RNG Archetype – WRRF | 5,409 | 162,284 | 324,568 |
| 4 | RNG Archetype - Dairy | 9,958 | 99,585 | 199,169 |
| 5 | RNG Archetype - Food Waste | 11,655 | 291,386 | 582,773 |
| 6 | RNG Archetype - Landfill Gas | 53,355 | 240,096 | 480,191 |
| 7 | Hydrogen Blending | 5,599 | 27,993 | - |
| 8 | Industrial Hydrogen | 56,330 | 112,661 | 168,991 |
| 9 | Industrial Methane Leaks | 38,831 | 97,077 | 194,154 |
| 10 | Urban Tree Offsets | 4,500 | 9,000 | 18,000 |
| 11 | Industrial Carbon Capture | 50,865 | 101,731 | 152,596 |
| 13 | Commercial Carbon Capture | 99,029 | 196,601 | 393,202 |
| 14 | Networked Geothermal | 21,471 | 53,677 | 107,355 |
| 15 | Existing District Energy | 160,731 | 321,463 | 482,194 |
| 16 | New District Energy | 20,441 | 40,882 | 61,323 |
| 17 | Industrial Electrification | 11,896 | 23,792 | 35,688 |
| 18 | Commercial Hybrid Heating | 13,279 | 25,609 | 37,940 |
| 19 | Res. Deep Energy Retrofits | 33,380 | 66,760 | 100,139 |
| 20 | Sm./Med C&I GHG Audit | 12,138 | 15,172 | 18,207 |
| 21 | Res. Gas Heat Pumps | 235 | 391 | 783 |
| 22 | Com. Gas Heat Pumps | 2,154 | 4,307 | 6,461 |
| 24 | C&I Solar Thermal | 7,687 | 11,531 | 19,218 |
| 25 | Large C&I GHG Audit | 35,560 | 71,120 | 106,680 |

# 5-Year Utility Costs Towards NGIA Budget ($)

| # | Pilot | Pilot Size A | Pilot Size B | Pilot Size C |
|---|---|---|---|---|
| 1 | RNG Proposal – Organics 1 | $ 608,263 | $ 2,578,513 | $ 5,041,326 |
| 2 | RNG Proposal – Organics 2 | $ 1,195,458 | $ 5,806,927 | $ 11,453,164 |
| 3 | RNG Archetype – WRRF | $ 789,220 | $ 19,245,230 | $ 38,317,597 |
| 4 | RNG Archetype - Dairy | $ 1,989,220 | $ 18,582,077 | $ 37,006,199 |
| 5 | RNG Archetype - Food Waste | $ 949,220 | $ 20,079,442 | $ 39,989,747 |
| 6 | RNG Archetype - Landfill Gas | $ 4,537,699 | $ 19,742,595 | $ 39,301,145 |
| 7 | Hydrogen Blending | $ 2,131,530 | $ 4,693,620 | $ - |
| 8 | Industrial Hydrogen | $ 1,076,997 | $ 2,163,128 | $ 3,429,787 |
| 9 | Industrial Methane Leaks | $ 1,187,842 | $ 2,466,290 | $ 4,687,580 |
| 10 | Urban Tree Offsets | $ 292,750 | $ 536,500 | $ 1,024,000 |
| 11 | Industrial Carbon Capture | $ 2,172,254 | $ 4,156,908 | $ 6,141,561 |
| 13 | Commercial Carbon Capture | $ 1,970,677 | $ 3,675,284 | $ 7,245,568 |
| 14 | Networked Geothermal | $ 2,791,264 | $ 6,207,158 | $ 11,188,673 |
| 15 | Existing District Energy | $ 189,180 | $ 676,830 | $ 1,511,939 |
| 16 | New District Energy | $ 133,160 | $ 271,690 | $ 454,590 |
| 17 | Industrial Electrification | $ 520,807 | $ 843,778 | $ 1,122,549 |
| 18 | Commercial Hybrid Heating | $ 3,782,865 | $ 6,454,988 | $ 9,127,110 |
| 19 | Res. Deep Energy Retrofits | $ 6,460,093 | $ 12,215,187 | $ 17,970,280 |
| 20 | Sm./Med C&I GHG Audit | $ 997,149 | $ 1,207,811 | $ 1,448,473 |
| 21 | Res. Gas Heat Pumps | $ 491,446 | $ 609,076 | $ 903,152 |
| 22 | Com. Gas Heat Pumps | $ 680,257 | $ 1,139,825 | $ 1,661,893 |
| 24 | C&I Solar Thermal | $ 329,495 | $ 469,743 | $ 750,238 |
| 25 | Large C&I GHG Audit | $ 945,005 | $ 1,277,010 | $ 1,609,015 |

# Emission Reduction Costs from Multiple Perspectives ($/tCO2e)

## All Values for Pilot Size B

| # | Pilot | Lifetime Emission Reduction Cost from Utility Perspective ($/tCO2e) | Lifetime Emission Reduction Cost from Total (Net) Pilot Impacts Perspective ($/tCO2e) | Lifetime Emission Reduction Cost from Equipment and Installation (Technology) Perspective ($/tCO2e) |
|---|---|---|---|---|
| 1 | RNG Proposal – Organics 1 | $ 165 | $ 105 | $ 163 |
| 2 | RNG Proposal – Organics 2 | $ 159 | $ 99 | $ 161 |
| 3 | RNG Archetype – WRRF | $ 272 | $ 213 | $ 280 |
| 4 | RNG Archetype - Dairy | $ 428 | $ 369 | $ 442 |
| 5 | RNG Archetype - Food Waste | $ 158 | $ 99 | $ 163 |
| 6 | RNG Archetype - Landfill Gas | $ 189 | $ 129 | $ 194 |
| 7 | Hydrogen Blending | $ 813 | $ 691 | $ 222 |
| 8 | Industrial Hydrogen | $ (58) | $ 840 | $ 180 |
| 9 | Industrial Methane Leaks | $ 17 | $ (53) | $ 15 |
| 10 | Urban Tree Offsets | $ 56 | $ 0 | $ 51 |
| 11 | Industrial Carbon Capture | $ 87 | $ 344 | $ 51 |
| 13 | Commercial Carbon Capture | $ (12) | $ (376) | $ 134 |
| 14 | Networked Geothermal | $ 394 | $ 300 | $ 248 |
| 15 | Existing District Energy | $ (78) | $ (151) | $ 122 |
| 16 | New District Energy | $ (74) | $ 224 | $ 478 |
| 17 | Industrial Electrification | $ (46) | $ (111) | $ 32 |
| 18 | Commercial Hybrid Heating | $ 159 | $ (88) | $ 104 |
| 19 | Res. Deep Energy Retrofits | $ 84 | $ 144 | $ 405 |
| 20 | Sm./Med C&I GHG Audit | $ 82 | $ 140 | $ 173 |
| 21 | Res. Gas Heat Pumps | $ 1,405 | $ 1,214 | $ 730 |
| 22 | Com. Gas Heat Pumps | $ 180 | $ 10 | $ 155 |
| 24 | C&I Solar Thermal | $ (40) | $ (76) | $ 196 |
| 25 | Large C&I GHG Audit | $ (62) | $ (211) | $ 40 |

# Resources Included in NGIA

- Renewable Natural Gas (RNG) & Biogas
  - Must be from biomass
  - Distinction is pipeline quality or not
- District Energy
  - From solar thermal or ground-source
- Energy efficiency
  - Does not include “investments” that can reasonably be included in the Conservation Improvement Program
- Power-to-hydrogen & power-to-ammonia
  - Produced using a carbon-free power source
- Strategic electrification
  - Cannot add to electric peak
  - Customer must still use gas (partial electrification only)
- Carbon Capture
  - Very broad definition

## Special Requirements for the First Plan

- All utilities
  - Costs must be 50%+ for RNG, biogas, power-to-hydrogen or power-to-ammonia (low carbon fuels)
- CenterPoint Only
  - Residential deep energy retrofit + electric ASHP pilot (with gas backup)
  - Industrial hard-to-electrify pilot
  - Small/medium business GHG audit pilot
  - District energy pilot

# CenterPoint Energy Innovation Plan

## Public Engagement Meeting 2 Summary and Notes

**Friday, February 24th, 8:30AM-12:00 PM CT**

## Table of Contents

# Meeting Context and Summary

## Meeting Context

On Friday, February 24, 2022, CenterPoint Energy (CenterPoint), with technical support from ICF and facilitative support from the Great Plains Institute (GPI), hosted the second of three planned public engagement meetings that will inform the development of CenterPoint's first innovation plan. The meeting was held in an online format via Zoom.

CenterPoint is preparing its voluntary innovation plan in accordance with the Natural Gas Innovation Act (NGIA), which was signed into law by Governor Walz on June 26, 2021. The full text of NGIA is available here. In addition, the innovation plan will be evaluated by the Minnesota Public Utilities Commission (Commission) in accordance with the framework approved in Commission Docket No. 21-566.[1]

The first public engagement meeting, which took place on September 23, 2022, provided attendees with an overview of the legislative and regulatory context for natural gas utility innovation plans in Minnesota. It also provided an opportunity for participants to provide feedback on an initial list of 28 pilot project ideas and several research and development initiatives to be evaluated for inclusion in the innovation plan.[2] More details about that meeting are included in the Meeting 1 summary and notes.[3]

In advance of this second public engagement meeting, CenterPoint and ICF further refined the list of pilot projects down to 23 and conducted a detailed analysis of each of those projects. The analysis included a profile of assumptions for each of the pilot projects, organized in a spreadsheet that was sent to all registrants in advance of the February 24 meeting. The analysis was designed to look at the qualitative criteria, which represent some, but not all, of the NGIA evaluation framework categories developed under Docket No. 21-566, and listed below. Notably, the final selections for pilots to include in the innovation plan will be decided based on a combination of quantitative and qualitative factors.

[1] Docket No. G-999/CI-21-566. "In the Matter of Establishing Frameworks to Compare Lifecycle Greenhouse Gas Emissions Intensities of Various Resources, and to Measure Cost-Effectiveness of Individual Resources and of Overall Innovation Plans."

[2] Due to the smaller budget for research and development and greater uncertainty about the likely effects of these initiatives on greenhouse gas emissions reductions, research and development initiatives will not be subject to as detailed an analysis as potential pilot projects.

[3] https://airtable.com/shrzEkaPgghbXVdva/tblCg3frZs5eAhKfz/viwL68BswfecTGjoZ/recmP2N741RaguLos/fld9jMuW4cXQ7NnUh/attz2TvNGjDnMmoyo

### NGIA EVALUATION FRAMEWORK

| | |
|---|---|
| **Perspectives** | NGIA utility perspective |
| | NGIA participants perspective (including specific impacts on low- and moderate-income participants) |
| | NGIA nonparticipating customers perspective (including specific impacts on low- and moderate-income participants) |
| | Effects on other energy systems and energy security |
| **Environment** | Greenhouse gas (GHG) emissions |
| | Other pollution (including any environmental justice costs or benefits) |
| | Waste reduction and reuse (including reduction of water use) |
| | Policy (e.g., natural gas throughput, renewable energy goals) |
| **Socioeconomic** | Net job creation |
| | Economic development |
| | Public co-benefits |
| | Market development |
| **Innovation** | Direct innovation support |
| | Resource scalability and role in a decarbonized system |

## Meeting Summary

Nearly 100 individuals representing state and local governmental agencies, private businesses, non-profit organizations, trade groups, organized labor, and community organizations attended the meeting. The goals for this second public engagement meeting were as follows:

1. Orient participants to the analysis spreadsheet and structure.
2. Build a shared understanding of and solicit feedback on the 23 pilot project designs that CenterPoint utilized for its analysis of innovative resources for potential inclusion in the innovation plan.
3. Build a shared understanding of and solicit feedback on the high-level draft results of the analysis, focusing on the evaluation metrics approved by the Commission.

The meeting contained two different presentations and opportunities for feedback – first, CenterPoint and ICF presented and solicited feedback on each of the pilot project designs that were used to inform the analysis; second, CenterPoint and ICF presented and solicited feedback on the analysis results. Staff from the Great Plains Institute facilitated Q&A and discussion throughout the meeting.

Below, we have captured key feedback themes from the meeting. The notes that follow capture the full details of the meeting, including comments shared both orally and written into the meeting chat. Attendees were also encouraged to share their perspectives in the post-meeting

survey and were invited to contact CenterPoint with any additional ideas or questions at InnovationPlan@centerpointenergy.com.

## FEEDBACK THEMES:

- **Understanding the pilot profiles and analysis**: In general, participants had several clarifying questions about the pilot profiles and analysis results but needed more time to provide in-depth feedback. These clarifying questions are captured in the notes that follow.

- **CIP/NGIA coordination:** Some participants had questions about how CenterPoint is approaching innovation plan projects that might also qualify for inclusion in its portfolio of energy efficiency offerings under the Conservation Improvement Program. This issue was referred to the separate set of meetings that are taking place amongst regulatory parties.[4]

- **Research and development:** Some attendees wanted more information about how CenterPoint has determined which pilot projects should be evaluated as full pilot projects for potential inclusion in the innovation plan, versus those that are being considered for inclusion in the plan's research and development (R&D) budget. CenterPoint clarified that, in the absence of statutory or regulatory authority, it has defined R&D projects to be those that are generally 1) relatively smaller in scale research projects or studies; and 2) projects that are uncertain, difficult to quantify, or have nominal GHG benefits. Moreover, CenterPoint noted that its proposal for use of the R&D budget would allow funding over shorter time frames (1–2 years) to account/allow for opportunities and ideas that could arise during the 5-year period of the innovation plan. This issue was also referred for further discussion among regulatory parties.

- **Understanding NGIA constraints:** Some participants thought it would be helpful for CenterPoint, when they file the innovation plan, to clarify how the constraints in the NGIA statute (including the requirement that at least 50 percent of costs must be for low-carbon fuels) have influenced their selections.

- **Understanding pilot cost timelines:** Some attendees sought clarification about how CenterPoint was considering pilot project costs, given that innovation plans have a 5-year timeline, but some pilot projects would have project lifetimes beyond 5 years. CenterPoint clarified that the "Estimated Pilot Budget (total over pilot period)" column presented in the slides for each project type represents the estimated utility pilot budget over the five-year period for CenterPoint's first NGIA innovation plan. CenterPoint further

[4] In this engagement process, there are 3 planned meetings for all interested parties, and an additional 3 meetings taking place specifically for parties that plan to participate in the regulatory proceeding to consider the innovation plan, once filed. The same content is being covered in both sets of meetings; the regulatory parties meetings are simply intended to provide a more focused venue for in-depth discussion of specific regulatory topics.

notes that some pilots could involve costs that stretch beyond this five-year period (e.g., longer-term contracts, capital investments, etc.), but those costs are captured elsewhere in the analysis.

# Meeting Notes

*Notes are in an alphanumeric format for reference purposes only; the numbers and letters do not indicate any prioritization or ranking.*

## Introductions and Agenda Overview

1. Introductions by GPI, CenterPoint, and ICF
2. Today's meeting is a chance for participants to look at CenterPoint's shortlist of 23 pilots considered for inclusion in the Company's innovation plan under NGIA.
    a. Shortlist was compiled by CenterPoint and ICF
    b. Pilot list is a draft, and today's meeting will cover the high-level draft analysis results
    c. Feedback is highly encouraged and appreciated
3. CenterPoint appreciates participants' involvement by responding to the Company's larger list of potential pilot projects list year
    a. This engagement process helped CenterPoint flesh out details, identify the data necessary for analytical inputs, etc.
4. Participants were asked to adhere to the following meeting ground rules:
    a. **Respect the time.** Please be mindful of the time and of others' opportunity to participate.
    b. **Please use "raise hand" and chat features.** To help make space to hear from as many participants as possible, please use the "raise hand" or chat features to indicate you would like to participate in the conversation.
    c. **Respect each other.** Help us to collectively uphold respect for each other's experiences and opinions, even in difficult conversations. We need everyone's wisdom to achieve better understanding and develop robust solutions.
    d. **Enable honestly through non-attribution.** Outside of this group, you may share what was said and who was present, but please refrain from sharing who said what without first obtaining permission. All meeting notes and materials will also adhere to this.

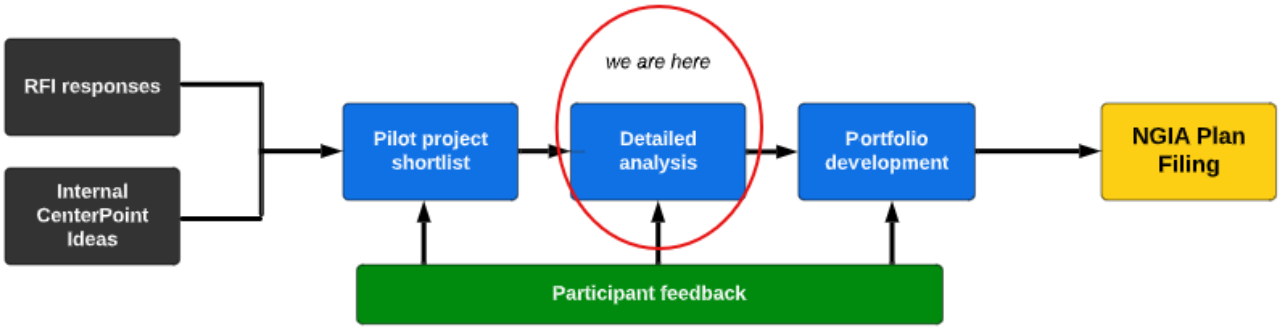
## Meeting Context and Purpose

1. The key purposes of this meeting are as follows:
    a. To provide transparency into the detailed assumptions used in development of CenterPoint's innovation plan
    b. Give participants an opportunity to provide essential input and feedback
    c. Orient participants to the NGIA Pilot Profile Workbook ("Workbook"), which will be sent out to participants following this meeting and is available here in the initiative's participant resource library, hosted through Airtable.

   i. Participants may submit questions and/or feedback related to the Workbook via the post-meeting survey, which will be included in an email following the meeting.
   ii. Please provide questions and feedback on the Workbook by March 10th.
2. Today's presentation includes DRAFT cost-benefit results which are subject to change as CenterPoint considers public input on pilot design and assumptions
3. CenterPoint will use both quantitative and qualitative measures along with public input to determine a final portfolio of pilots to include in its first innovation plan (anticipated Summer 2023).
   a. Quantitative results are just one consideration in the NGIA framework
   b. NGIA framework also explicitly requires qualitative considerations e.g., role of a pilot in a future decarbonized system, environmental justice, etc.)
4. CenterPoint has not yet made any final decisions regarding what pilots to include in their innovation plan portfolio.

## Overview of Innovation Plan Development

1. There are three points of stakeholder feedback in the Innovation Plan development process:
   a. Developing a shortlist of 25 pilots
   b. Conducting a detailed analysis
   c. Portfolio development
2. NGIA innovation plan development flow-chart:




3. Initial pilot project idea development:
   a. CenterPoint released a Request for Information (RFI) to hear feedback regarding potential pilots of interest from external parties
   b. Internal pilot project idea development
   c. Identified approximately 100 potential pilot projects
4. CenterPoint and ICF pared down this list of approximately 100 projects to a 25 pilot shortlist targeted for detailed analysis
   a. Shortlist was not a list of pilots to be definitively included in CenterPoint's innovation plan
   b. Meeting 1 focused on reviewing the shortlist at a high-level and receiving preliminary feedback.
   c. Two pilots have been removed from this shortlist since Meeting 1

   i. Moved to the research and development (R&D) project category
   ii. Will still be captured under the innovation plan development process
5. This meeting (Meeting 2) is the "detailed analysis" phase
   a. Shortlisted pilots are more fully fleshed out
   b. Pilot quantifications have been made where possible
   c. Shortlist of **23 projects** in this phase
6. Guiding question for detailed analysis phase: **Should any of the pilot structures (e.g., programmatic approach) or assumptions (e.g., costs, energy savings, GHGs, etc.) be refined before CenterPoint proceeds to develop potential portfolios?**
   a. Goal: Review/modify pilots as needed before portfolio development
7. What constitutes CenterPoint's "detailed analysis"?
   a. Evaluation criteria for the detailed analysis are provided in the NGIA framework (see the NGIA Evaluation Framework included in the *Meeting Context and Summary* section of this document)
   b. Detailed analysis goal: Populate the NGIA evaluation framework for each of the shortlisted projects
      i. Must analyze each pilot from every project category via both quantitative and qualitative evaluation criteria
      ii. Cost-benefit tests required for each pilot
      iii. Need to establish a range of parameters for the cost-benefit test for each pilot (e.g., # of participants in a pilot, program administration needs, costs, RNG carbon intensity, increase in electricity consumption, measure lifetime, etc.)
      iv. "Pilot-level parameters" will be combined with "system-level parameters" which are defined by the NGIA Frameworks Order (e.g., gas retail rate, commodity cost, GHG intensity of electricity, discount rate, etc.) in order to complete the cost-benefit analysis.
   c. This meeting is focused on pilot-level parameters.

## Discussion of Pilot Projects by Category

1. NGIA Pilot Profile Workbook: Excel spreadsheet containing…
   a. Description of each pilot, including pilot-specific inputs (orange cells) and calculations
   b. Qualitative evaluation details
   c. Key parameters
      i. Participation level
      ii. Natural gas savings
      iii. Changes in electricity consumption
      iv. Measure life
      v. Utility program costs (internal, external, incentives, etc.)
   d. Factors including job creation, lifecycle GHG emissions, etc.
2. Workbook helps define pilots at different deployment sizes/scales and cost categories (internal project delivery costs, external budgets, upfront costs, direct participant costs, etc.)

3. Note: There are hidden rows in the Workbook to streamline accessibility and comprehensibility. Participants may unhide these rows if desired.
4. *Question:* How do the costs align to the spreadsheet? What columns in the spreadsheet correspond with established pilot budget? What does the established pilot budget represent?
    a. *Answer:* the budget numbers (and/or $/tCO2) from out PPT slide cannot be directly found in the measure profile workbook. Because they are reduced by commodity cost savings and factors like that.
5. CenterPoint is required to use Argonne National Laboratory's Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model to conduct the pilot-specific GHG intensity analysis.
    a. ICF recently found a formula error in the model.
    b. Some carbon intensity lifecycle calculation are subject to change due to this discrepancy.
6. Note: The "Estimated Pilot Budget (total over pilot period)" column presented in the slides for each project type represents the estimated utility pilot budget over the five-year period for CenterPoint's first NGIA innovation plan.
    a. Some pilots could involve costs that stretch beyond this five-year period (e.g., longer-term contracts, capital investments, etc.), but those costs are captured elsewhere in the analysis.

## RNG and Biogas pilots

| Pilot # | Project Code | Pilot Name |
|---|---|---|
| 1 | CNP01 | RNG Proposal – Anaerobic Digestion of Organic Materials (Hennepin County) |
| 2 | CNP02 | RNG Proposal – Anaerobic Digestion of East Metro Food Waste |
| 3 | CNP03 | RNG Archetype – Water Resource Recovery Facility (WRRF) |
| 4 | CNP04 | RNG Archetype – Dairy Manure |
| 5 | CNP05 | RNG Archetype – Food Waste |
| 6 | CNP06 | RNG Archetype – Landfill Gas |

**RNG and Biogas discussion**

1. RNG/biogas pilots were analyzed at three different sizes/scales:
    a. Size A: small-scale
    b. Size B: mid-scale
    c. Size C: large-scale
2. Modeled 10-year contracts with RNG producers
    a. RNG developers take on a lot of risk given the lack of long-term price stability for this resource
        i. Most RNG that is competing for high prices in the market is selling into California's low-carbon fuel standard for transportation
    b. By offering longer-term contracts, CenterPoint can use their relative financial stability as a utility to get a better price.
3. Several categories of RNG/biogas pilots:

i. Local-scale food waste projects Pilot #1 (RNG proposal – anaerobic digestion of organic materials, Hennepin County), Pilot #2 (RNG proposal – anaerobic digestion of East Metro food waste)
ii. Specific RNG projects
iii. Not yet sure if CenterPoint could purchase all available RNG from these local facilities—various scales considered

b. Large-scale RNG projects supported by common RNG sources of interest (Pilots #3–6)
i. Potential RNG sources:
- Wastewater (Pilot #3, RNG archetype – water resource recovery facility, WRRF)
- Dairy manure (Pilot #4, RNG archetype – dairy manure)
- Food waste (Pilot #5, RNG archetype – food waste)
- Landfill gas (Pilot #6, RNG archetype – landfill gas)

ii. Larger in scale than Pilots #1 and #2
iii. Not based on any specific projects proposed by developers instead represent "archetypes" with estimated typical values for each RNG type
iv. CenterPoint will hold a competitive RFP process to try and attract the best possible project(s) under this category and depending on RFP responses may select more or less of particular RNG types than included in plan (e.g. if actual RFP responses for dairy RNG are less expensive or have lower GHG reduction than anticipated, CenterPoint could buy more dairy RNG)

4. Portfolio goal: Select the best combination of RNG projects for meeting CenterPoint's goals.
5. Note: CenterPoint proposes to allow flexibility for some capital investment in RNG projects in exchange for a reduced price, if that is of interest to developers, but has modeled simple RNG purchase deals for purposes of plan development

**RNG and Biogas Q&A**

7. *Question:* Is new build-out of pipeline infrastructure included in these costs?
   a. *Answer:* Some matter of line extension costs are typically considered within the expected costs, but those considerations are modest. The economics of these projects favor having as few extra infrastructure costs as possible.
8. *Question:* How frequently/often are new pilots considered?
   a. Answer: CenterPoint is always interested in hearing about new ideas. The window has closed for consideration of additional full-fledged pilots for this innovation plan, but there may be ways for CenterPoint to work new ideas into the implementation of pilots on the list. Please reach out to the provided email address (InnovationPlan@CenterPointEnergy.com) regarding additional pilot ideas. Note that R&D projects will be considered on a more frequent basis. Also note that the shortlisted pilots don't yet have (for example), specific facilities selected; factors more related to implementation will be decided through a competitive RFP process.

## Power-to-Hydrogen and Power-to-Ammonia Pilots

| Pilot # | Project Code | Pilot Name |
|---|---|---|
| 7 | CNP07 | Green Hydrogen Blending into Natural Gas Distribution System |
| 8 | CNP08 | Green Hydrogen Archetype – Industrial or Large Commercial Facility Electrolyzer Pilot |

**Power-to-Hydrogen and Power-to-Ammonia discussion**

1. Pilot #7 (green hydrogen blending into natural gas distribution system) would explore opportunities to blend hydrogen via an electrolyzer process and development of an on-site solar array to provide dedicated renewable electricity.
    a. CenterPoint already has a blending electrolyzer project in place.
    b. This project would develop a second electrolyzer in a new location, as would include construction of a dedicated renewable electricity source (solar PV)
    c. Potential pilot sizes:
        i. Size A: 1 MW of solar PV-powered electrolyzer capacity, used around 19% of the time
        ii. Size B: 1 MW of solar PV-powered electrolyzer capacity, used around 19% of the time, and grid electricity purchased through a green tariff program to supplement electrolyzer, used up to 95% of the time
        iii. Size C: No size C was developed for this pilot
2. Pilot #8 (green hydrogen archetype – industrial facility electrolyzer pilot) would allow CenterPoint to help an industrial customer purchase and install an electrolyzer. CenterPoint would help with these upfront costs, then the facility itself would commit to supporting ongoing operational costs.
    a. Would fulfill the NGIA requirement that innovation plans include a pilot that targets hard-to-electrify sectors.
    b. Hydrogen produced via electricity could replace some of the industrial facility's natural gas consumption, displacing emissions
    c. CenterPoint has not identified any specific industrial facilities for this pilot; pilot sizes are based on the energy needs of some of CenterPoint's larger industrial customers.
        i. Ideal industrial facilities for Pilot #8: facilities aiming to meet corporate targets, facilities that have a significant incentive to reduce their emissions, etc.
    d. IRA incentives for green hydrogen could potentially impact this pilot and were considered as part of the analysis.
    e. This idea came up in the gap analysis phase.

**Power-to-Hydrogen and Power-to-Ammonia Q&A**

1. *Question:* Is the only difference between Pilots #7A and #7B the cost of electricity?
    a. *Answer:* Yes, the difference mainly comes down to electricity purchases related to the size differences between the two potential deployment scenarios. Both scenarios would have the same amount of solar PV on site, same sized

electrolyzer, etc., but for Size B, the electrolyzer would run up to 95% of the time by using green tariff-purchased electricity to bridge the gap between electricity needs and the onsite solar PV generation capacity. The cost differences represent the increased electricity consumption related to pilot size. Pilot #7B (mid-scale) would have greater reductions in natural gas use (and, accordingly, higher natural gas commodity cost savings) than Pilot #7A (small-scale) because of the increased hydrogen use levels.

2. *Question:* In Pilot #8 (green hydrogen archetype – industrial facility electrolyzer pilot), would we expect the electricity costs to industrial customers to decrease over time? If so, how significantly?
    a. *Answer:* The green tariff programs that exist in MN right now (offered through Xcel Energy) have had modest incremental cost increases for electricity purchases. To produce hydrogen on ongoing basis, there will be a continued electric load added for Pilot #8, though some more efficient electrolyzers could be developed in the future.
    b. *Follow-up question:* How is the pilot incentivizing decarbonization if it is increasing costs?
    c. *Answer:* Pilot #8 would represent a cost increase for industrial customers. CenterPoint and IRA incentives will not cover the incremental cost increases that those customers are committing to, which is why it's important to find an industrial facility specifically who is willing to pay more to decrease emissions from their heating load.

## Carbon Capture Pilots

| Pilot # | Project Code | Pilot Name |
|---|---|---|
| 9 | CNP09 | Industrial Methane and Refrigerant Leak Reduction Program |
| 10 | CNP10 | Urban Tree Carbon Offset Program |
| 11 | CNP11 | Archetype Carbon Capture Project for Industrial or Large Commercial Facility |
| 13 | CNP13 | Carbon Capture for Commercial Buildings |

*Note:* There is no Pilot #12/CNP12 in this table because Pilot #12 (carbon capture through methane pyrolysis at industrial facility) has been removed from shortlist consideration and will instead be considered as an R&D initiative.

**Carbon capture discussion**

1. Carbon capture constitutes a broad category under NGIA legislation.
2. Possible that it will ultimately make sense to maintain some level of flexibility between industrial carbon capture and industrial hydrogen.
    a. Would grant CenterPoint the ability to follow whatever path an industry is favoring.
3. Pilot #9 (Industrial Methane and Refrigerant Leak Reduction Program) targets larger industrial customers and potentially large commercial customers
    a. Vendors running the program would send experts to the facility to conduct an audit to identify and quantify methane and refrigerant leaks

        i. Less information available on impacts of identifying refrigerant leaks because it is difficult to quantify refrigerant reduction benefits.
    b. Once facilities receive their leak assessment, the vendor would provide ongoing support through a leak repair program.
    c. Would include modest incentives to repair the leaks.
    d. Would include initial and follow-up assessments.
    e. Note: CenterPoint is not counting extra savings for subsequent leak assessments. There is substantial uncertainty about how much methane leakage actually exists and how much methane leakage will be avoided through the program. The subsequent leak surveys will help reduce that uncertainty.
4. Pilot #10 (urban tree carbon offset program) would be a local initiative to develop GHG reduction offsets through tree planting
    a. Size C for this pilot represents the maximum amount of credits that CenterPoint expects to have available over the time frame.
5. Pilot #11(archetype carbon capture project for industrial or large commercial facility) would likely target deploying carbon capture technologies at 1–3 commercial/industrial customers, based on pilot size.
    a. Size A would target one facility, Size B would target two facilities, and size C would target three facilities).
    b. Similar to Pilot #8 (industrial-scale green hydrogen), but focused on carbon capture deployment within this customer class.
    c. CenterPoint would provide upfront financial support, then customers would own/operate the carbon capture system.
    d. MN lacks the geologic formations required for permanent terrestrial $CO_2$ sequestration.
        i. Likely that any industrial facility pursuing this pilot would be focused on $CO_2$ utilization and/or finding a $CO_2$ offtaker.
        ii. Analysis has been based on a concrete utilization case, with use of only 60% of the captured $CO_2$ in the concrete.
    e. NGIA legislation has a focus on life-cycle emissions assessments.
        i. This would include consideration for the $CO_2$ utilization and will vary depending on the utilization case.
6. Pilot #12 (carbon capture through methane pyrolysis at industrial facility) was included in the prior shortlist of 25 potential pilot projects, but has been moved for consideration under the R&D category for CenterPoint's innovation plan,
    a. Significant lack of data on technology performance and lifecycle emissions of carbon byproduct
    b. No strong ability to quantify given this technology's stage of development.
7. Pilot #13 (carbon capture for commercial buildings) would deploy carbon capture technology at commercial buildings via CarbinX systems.
    a. CenterPoint already has a small-scale CarbinX R&D pilot in place to provide carbon management under Conservation Improvement Program (CIP)
    b. About CarbinX:

i. CarbinX is a company that provides a commercially available small-scale carbon capture device.
ii. Captures $CO_2$ from waste streams and recovers some heat
iii. CarbinX installs the carbon capture device at projects and provides regular service of the carbon capture facility.
iv. The facility owner receives money for the carbon capture byproduct (potassium carbonate), which is used in other industries including soapmaking.

c. Additional emissions benefit from displacing need to produce potassium carbonate through other industrial means.

**Carbon capture Q&A**

1. Question: In Pilot #10 (urban tree carbon offset program), how many trees/how much land corresponds to the credit amounts?
    a. Answer: CenterPoint doesn't have detail on this right now, but the pilot profile included in the Workbook contains links to example projects that can provide information about this.
2. Question: Pilots #11 (archetype carbon capture project for industrial or large commercial facility) and #8 (green hydrogen archetype – industrial or large commercial facility electrolyzer pilot) both state that the industrial facility will "own and operate" the systems. Would it be acceptable for a third party to do the owning and operating?
    a. A: CenterPoint is not currently looking at potential pilots at this level of detail, but generally, yes that would probably be an option. The primary consideration is that CenterPoint will not own/operate the systems in these pilots.

## District Energy Pilots

| Pilot # | Project Code | Pilot Name |
|---|---|---|
| 14 | CNP14 | New Networked Geothermal Systems Pilot |
| 15 | CNP15 | Decarbonizing Existing District Energy Systems |
| 16 | CNP16 | New District Energy System |

*Note:* CNP15 and CNP16 are categorized as district energy pilots, but also contain elements related to several other innovation categories including carbon capture, strategic electrification, energy efficiency, RNG/biogas, and power-to-hydrogen.

**District energy discussion**

1. Pilot #14 (new networked geothermal systems pilot) involves new infrastructure with ground loops that would circulate water throughout the neighborhood.
    a. Would replace existing gas customers' heating with a heat pump that would pull from this central water loop.
        i. Water from this system would not be extremely hot, so homes would require a heat pump to raise the water's temperature
    b. Networked geothermal is a somewhat new concept.
        i. Being piloted in New York and Massachusetts

        ii. Allows gas utilities to leverage scale, existing right of ways , and capacity to implement infrastructure solutions in a way that reduces gas consumption while lessening their impact on the electrical grid
    c. Multi-stage infrastructure phase-in over a 5-year period
    d. Three different pilot sizes envisioned (scale based on tons of heating and cooling capacity):
        i. Size A: 200-ton system capacity
        ii. Size B: 500-ton system capacity
        iii. Size C: 1000-ton system capacity
    e. Major change to heating approach.
        i. Would require removing existing infrastructure
        ii. Significant uncertainty in savings due to site diversity (no site currently selected)
        iii. Could be benefits to implementing in low-income communities
    f. Projected costs follow those from the National Grid networked geothermal proposal (NY/MA)
2. Pilot #15 (decarbonizing existing district energy systems) would upgrade existing district energy systems.
    a. Several steam-based district energy systems in CenterPoint's service territory looking to take action to reduce GHG emission—this pilot could support this transition
    b. One existing facility already undergoing an emissions reduction analysis
3. Pilots #15 and 16 have some funding available to the study of these opportunities, as well as incentives for implementation of identified GHG reduction projects.
    a. CenterPoint would have an incentive structure based on dollar per dekatherm of savings.
        i. Similar approach to CIP, but with a higher dollar per dekatherm incentive level
4. Pilot #16 (new district energy system) would deploy new systems at various pilot scales (1, 2, or 3 systems).

**District Energy Q&A**

1. *Question:* Could you provide an estimate of how many customers/buildings might be served by the various pilot sizes for Pilot #14 (new networked geothermal systems pilot)?
    a. Answer: Sizes and cost savings not necessarily correlated with a specific customer number. Costs were based on a National Grid pilot, which was a 925 ton system targeting 180-185 customers, but it wasn't all residential customers.
2. *Comment:* Recommends reviewing the materials in the New York Department of Public Service's Proceeding to Implement the Utility Thermal Energy Network (UTEN) and Jobs Act docket for more recent cost estimates.
    a. Link to NY UTEN 1/9/2023 filing materials: https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Matterc aseno=22-M-0429

3. *Question:* Is the $1.5M incentive cap annual, or total?
    a. *Answer:* It would be an upfront cost/one-time spend. It would be based on the annual natural gas savings (not lifetime savings), consistent with the structure of CIP incentives.

## Strategic Electrification Pilots

| Pilot # | Project Code | Pilot Name |
|---|---|---|
| 17 | CNP17 | Industrial Electrification Incentive Program |
| 18 | CNP18 | Commercial hybrid heating pilot |
| 19 | CNP19 | Residential deep energy retrofit + electric ASHP pilot (with gas backup) |

*Note:* CNP19 is categorized as a strategic electrification, but also contains elements related to energy efficiency.

**Strategic electrification discussion**

1. Pilot #17 (industrial electrification inventive program) would test electric heat pumps in an industrial setting.
    a. Targeting specific sized industrial heat pumps at 3–9 industrial facilities (based on deployment size/scale).
    b. This pilot could lead to a stronger case for an industrial electrification incentive program, which could be expanded.
2. Pilot #18 (commercial hybrid heating pilot) is modeled off a ComEd program in New York featuring dual-fuel rooftop units.
    a. Each unit has an incremental cost.
        i. This pilot would partially offset those costs.
    b. Customer would pay 60% of system cost
    c. Trying to use this pilot to achieve scale—potentially up to 200 facilities.
    d. Emerging technology, but ready to hit the market.
3. Pilot #19 (residential deep energy retrofits + electric ASHP pilot with gas backup)
    a. ASHP: air-source heat pump
    b. Residential deep retrofits are an NGIA portfolio requirement.
    c. Target both single and multi-family homes
    d. Designed in phases”
        i. *Phase I: Study Scoping & Program Design.* Modeling of different combinations of building types and energy conservation strategies, including innovative/emerging weatherization measures, and finalization of different 'Tiers' of energy retrofit for the pilot testing
        ii. *Phase 2: Demonstration Projects.* Based on results of phase 1 modeling, we’d select host sites to field test selected technologies and measure performance. Pilot would cover the full cost of installation and monitoring, targeting 14 to 42 buildings.
        iii. *Phase 3: Broader Deployment of Successful Strategies from Phase 2.* Envision a shift to an on-going incentive program (e.g. not covering full installation costs), targeting 105 - 315 buildings. Final design, incentive levels, and participation targets would be informed by Phase 2 results.

e. Some homes will receive more modest retrofits/upgrades, others will receive very aggressive/extensive upgrades to start testing how commercial heat pumps operate under different conditions, etc.
f. Would target both single-and multi-family homes
    i. Each has a slightly different cost structure

**Strategic electrification Q&A**

1. *Question:* When comparing Size A and Size C deployments for Pilot #19 (residential deep energy retrofits + electric ASHP pilot with gas backup), if you divide the $6.4M cost for Size A by the 119 buildings that would be retrofitted in the Size A pilot scale, the Size A individual building cost is greater than the Size C individual building cost ($17.9M for 357 buildings). Could you explain this? (example of calculation below)

$$\textbf{\textit{Size A}} \quad \frac{\$6{,}460{,}093}{119\ buildings} = \$54{,}286/building$$

$$\textbf{\textit{Size C}} \quad \frac{\$17{,}970{,}280}{357\ buildings} = \$48{,}965/building$$

    a. *Answer:* One reason for this is the timing/scale of the three phases. Phase 1 is the same for all three sizes. In Phase 2 (Demonstration Projects), the costs are being fully covered, and involves a smaller number of participants as compared to Phase 3, where costs are only partially covered by the pilot. The full pilot cost displayed on the slides reflects a net budget.

## Energy Efficiency Pilots

| Pilot # | Project Code | Pilot Name |
|---|---|---|
| 20 | CNP20 | Small/medium business GHG audit pilot |
| 21 | CNP21 | Residential Gas Heat Pump |
| 22 | CNP22 | Gas Heat Pump for Commercial Buildings |
| 24 | CNP24 | Solar Thermal Heating for Commercial and Industrial (C&I) |
| 25 | CNP25 | Industrial and Large Commercial GHG Audit Pilot |

*Note:* There is no CNP23 project in this table because Pilot #23 (Neighborhood Weatherization Blitzes) has been removed from shortlist consideration and will instead be considered as an R&D initiative. Additionally, CNP20 and CNP25 are categorized as energy efficiency pilots, but also contain elements related to several other innovation categories. In addition to energy efficiency, CNP20 relates to carbon capture and strategic electrification, and CNP25 relates to carbon capture, strategic electrification, power-to-hydrogen, and RNG/biogas.

**Energy efficiency discussion**

1. Pilot #20 (small/medium business GHG audit pilot) would leverage CenterPoint's existing small/medium business Natural Gas Energy Analysis CIP program to fulfill the NGIA's GHG audit pilot requirement

   a. Audits would be enhanced to include additional, non-CIP recommendations to help reduce their facility's GHG emissions
   b. Would recognize participating businesses as energy leaders
   c. There are opportunities to receive incentives through this pilot related to other NGIA pilots.
      i. Example: An audit conducted through this pilot could channel businesses into other eligible pilots programs, such as Pilot #13 (carbon capture rebates for commercial buildings).
2. Pilot #21 (residential gas heat pump) would deploy thermal gas heat pumps for several residential customer to help CenterPoint better understand the technology's performance and cost savings in the Company's service territory.
   a. Several thermal gas heat pumps expected on the market in coming years
3. Pilot #22 (gas heat pump for commercial buildings) offers an opportunity to test out number of different building types and deployment configurations.
   a. Commercial gas heat pump technologies are somewhat further along than their residential counterparts, but are still new and are not yet considered cost-effective (and therefore are not CIP-eligible).
   b. Would gather more data on these units and help identify their potential value going forward.
   c. Minnesota Efficient Technology Accelerator (ETA) focus area
   d. Presents another opportunity to partner with existing efforts.
4. Pilot #23 (neighborhood weatherization blitzes) was removed from the pilot shortlist and will instead be considered under the R&D component.
   a. Uncertainty in the effectiveness of different outreach approaches
   b. Testing several outreach options via a research-based approach makes sense.
5. Pilot #24 (solar thermal heating for commercial/industrial) involves a type of technology that exists, but that has high upfront capital investment costs.
   a. Generally not cost-effective under CIP, but can be favorable when evaluating GHG reductions under NGIA.
6. Pilot #25 (industrial and large commercial GHG audit pilot) looks to build off of existing CIP energy efficiency audits for commercial/industrial facilities.
   a. Would expand customers' GHG data to help them better understand their emissions and would provide GHG reduction measures.

**Energy Efficiency Q&A**

1. *Question:* Could you please explain what a gas heat pump is?
   a. *Answer:* A gas heat pump is a technology that largely works like an electric heat pump, using a thermodynamic cycle to move heat from one area to another.
      i. In an electric heat pump, electricity is used to drive this cycle. In a gas heat pump, gas combustion is used to drive the cycle (instead of directly heating the air as in a gas furnace).Works like an AC or refrigerator in reverse—has a refrigeration cycle that extracts heat from one area and upgrades it in another.
   b. CenterPoint can provide follow-up material on this technology.

2. *Question:* What is the justification for removing Pilot #23 (neighborhood weatherization blitzes) from the shortlist and instead considering it under R&D? It seems like CenterPoint is continuing to invest in getting the word out and helping engagement in existing programs. This outreach seems to be low-hanging fruit and seems like a place where there could be a large impact if more dollars and resources are invested. There is certainly uncertainty associated with this pilot, but there is also uncertainty in many other proposed pilots.
    a. *Answer:* Part of the distinction between pilot projects and R&D initiatives is how easy it is to estimate potential impacts. Because there is so much uncertainty around exact impacts resulting from this pilot (i.e., how many additional weatherization projects would result from these different types of outreach efforts?), CenterPoint found it difficult to estimate its GHG reductions. This pilot's close relationship with CIP was also a consideration in switching it to consideration as an R&D initiative.
        i. Wanted to do some short-term R&D to better understand if this pilot fits within NGIA or should instead be included in CenterPoint's CIP portfolio.
    b. The more funding CenterPoint can dedicate to testing this, the larger its impact will be.
3. Question: Could you explain the difference between the R&D and pilot "buckets"?
    a. Answer: There is no statutory or regulatory definition for NGIA R&D. CenterPoint is using two criteria to classify projects as R&D: R&D initiatives are relatively smaller in scale than pilots and are more similar in nature to research projects than to direct implementation plans. R&D initiatives also typically have key uncertainties, such as GHG emissions reduction benefits that are difficult to quantify.
        i. The NGIA statute identifies and distinguishes these two different types of innovation plan initiatives.
4. *Question:* When you refer to R&D, are you referring to R&D under NGIA or R&D under CIP?
    a. *Answer:* NGIA

## Pilot Project Analysis: High-level Draft Results

1. The high-level draft analysis results provide a snapshot of what CenterPoint has identified so far in the analytical process, including quantitative and qualitative implications.
    a. Emphasis now is refining/improving inputs.
2. Some inputs may provide context that can help steer participants' review.
3. Relevant types of costs vary by pilot, but the three main cost components are:
    a. CenterPoint staff and vendor budgets
    b. Incentive payments
    c. Revenue requirements for capital investments made as part of certain projects
4. Natural gas commodity savings can often be the bulk of cost savings.

## Lifetime GHG Emissions Reductions

1. This metric represents the net reduction in greenhouse gas emissions over the lifetime of the measures implemented in a pilot.
    a. Measure lifetime may exceed the duration of a single innovation plan (e.g., a pilot included in a 5-year innovation plan may have a 20-year lifespan).
2. Specific types of emissions can vary by pilot, but the emissions reductions generally consist of:
    a. Net emissions reductions from project-related changes in natural gas and electricity consumption
    b. Reduced emissions from pilot-specific lifecycle emissions calculations (e.g., RNG carbon intensity, carbon capture savings, etc.)
3. Lifetime GHG reduction calculation (in tons $CO_2$-equivalent, or $tCO_2e$):

***Lifetime GHG emissions reduction = [(1) + (2) + (3)] • measure life • # of participating units***

Where…

| Component | Component definition and calculation |
|---|---|
| **(1)** | **Net impact of electricity savings and additions**<br>(1) = (annual kWh saved or added per participant) • (electric emissions factor in tons $CO_2e$ per kWh) |
| **(2)** | **Net natural gas lifecycle emissions impact**<br>(2) = (average annual dekatherms saved per participant) • (geologic gas lifecycle emissions factor in tons $CO_2e$ per dekatherm) |
| **(3)** | **Net lifecycle GHG savings**<br>(3) = other lifecycle GHG savings in annual $tCO_2e$ savings per participant |

4. Lifetime GHG emissions reductions by pilot are included in an appendix to the presentation (see Slide 38, *Lifetime GHG emission reductions by pilot*).
    a. Appendix includes lifetime GHG emissions reductions for each proposed pilot size/scale.
5. GHG reductions of large RNG projects are large but are also a function of specific funding requirements under NGIA.
    a. NGIA contains a statutory requirement that 50% or more of CenterPoint's funding go towards decarbonized gases, such as through RNG and hydrogen pilots.
6. CenterPoint calculated emissions reduction costs from multiple different NGIA perspectives (in dollars per $tCO_2e$).
    a. For each of emission reduction cost metric, CenterPoint takes a different cost metric and divides it by the same lifetime/lifecycle GHG emissions savings
    b. Emissions reduction costs calculated for Pilot Size B (mid-sized deployment)
    c. Lifetime emissions reduction perspectives included:

   i. Utility cost perspective (both lifetime and 5-year NGIA budget utility costs)— includes only costs the utility will pay and excludes costs paid by participants or others
   ii. Total (net) pilot impacts perspective—aims to capture "all the value and cost streams" that have not been quantified elsewhere in the analysis, including costs to utility, costs to participants, and the value associated with the reduction of GHGs and other pollutants.
   iii. Equipment and installation (technology) perspective—upfront costs associated with technology installation. Does not include impacts of different incentive levels and/or supplemental pilot budgets for ongoing programmatic support (e.g., program administration, marketing, customer recruitment, etc.) or the changing cost of energy. This perspective helps CenterPoint better understand potential ongoing costs of a technology at scale.
7. Anticipate needing to alter some carbon intensities for RNG projects (for example, team recently confirmed that there was a formula error in the GREET model, which we will fix)
   a. RNG pilots (Pilots #1–6) indicate that different RNG resources have different costs.
   b. Food-sourced RNG projects look most favorable
8. Pilot #7 is hydrogen blending, Pilot 8 is electrolyzer
   a. Upfront costs don't account for ongoing unit costs, which are high for Pilot #7 (green hydrogen blending into natural gas distribution system) and Pilot #8 (green hydrogen archetype – industrial or large commercial facility electrolyzer pilot)
9. Note: Industrial-side economics are sensitive to some IRA rules being finalized.
10. *Question:* How do you define the "utility perspective" in "Emission Reduction Costs (Pilot Size B)"?
   a. *Answer:* The NGIA evaluation criteria and perspectives have been established (see the table in the introduction to this document), and the utility cost perspective is a requirement. The NGIA framework does not have a societal cost that can be summarized as a single number, but CenterPoint is trying to capture some of those costs in the broader environmental categories of the framework. The utility perspective is somewhat analogous to the CIP cost analysis framework.
11. *Question:* What is holding up finalizing the rules of the IRA?
   a. *Answer:* The federal government is still determining what they will require in terms of matching renewable energy with hydrogen, and it is not yet clear whether buying from green tariffs will be eligible (NGIA recognizes green tariffs as an option, but IRA rules are forthcoming). CenterPoint is not sure if subscribing to renewables will be allowed, or if more detailed electricity procurement/tracking will be required. This has implications for the assumed cost of the industrial hydrogen pilot (Pilot #8) in particular.
12. Emissions reductions costs vary by pilot and project type (see Emissions Reduction Costs graph for Pilot Size B on Slide 37). For example…

   a. Some carbon capture pilots (Pilot #9 and Pilot #13) have negative lifetime emissions reduction costs from the total (net) pilot impacts perspective due to the useful revenue generation from the captured carbon byproduct.
   b. District energy has a range of costs
      i. The utility budget for Pilot #15 (decarbonizing existing district energy systems) is small compared to the pilot's lifetime commodity cost savings, which over time reduces the utility costs per dekatherm.
      ii. Need initial engineering/feasibility study done to better understand costs associated with Pilot #14 (new networked geothermal systems).
   c. All strategic electrification pilots look favorable in terms of emissions reductions and utility incentives.
   d. Energy efficiency emissions reduction costs result in significant savings over time
      i. High numbers for Pilot #21 (residential gas heat pumps) reflects the difference in overhead/administrative costs. This program requires lots of verification, recruitment, etc. which adds to program costs
   e. Note: Current price does not necessarily represent what costs could become if a technology is commercialized in the next 5–10 years
13. *Question:* Are the pilots evaluated over the same lifetime (e.g., 20 years) or are there different lifetimes for each pilot?
   a. *Answer:* Different lifetimes for each—pilot lifetimes are one of the inputs used in the pilot profiles (e.g., RNG pilots could have a 10 year contract, urban tree offsets can have 1 year life, etc.). The analysis looks at total savings over lifetime.

## Snapshot of Notable Pilot Projects from Different NGIA Perspectives

*NGIA utility perspective*

1. Costs from utility perspective vary based on range of factors including…
   a. If customers are contributing part of the installation costs (e.g., lower utility contribution)
   b. Projects' reductions in gas throughput, because commodity cost savings lower utility contribution costs.

*NGIA participants' perspective (including specific impacts on low- and moderate-income participants)*

1. Networked geothermal and residential deep energy retrofit pilots could be targeted towards low- and moderate-income customers/neighborhoods
2. Industrial- and commercial-focused pilots may help participants achieve their own corporate GHG reduction goals, making them more competitive with GHG-conscious consumers
3. Cost implications vary:
   a. Some pilot projects (e.g., energy efficiency), will reduce customer costs
   b. Other pilot projects (e.g., hydrogen), will increase customer costs

*NGIA nonparticipating customers perspective (including specific impacts on low- and moderate-income customers)*

1. Rate impacts to be discussed in the third round of engagement meetings
2. RNG and hydrogen blending projects will reduce the GHG intensity of gas, thus reducing the GHG emissions from all CenterPoint customers.
3. Hennepin County RNG includes an anaerobic digestion facility proposed in an Environmental Justice area of concern.
    a. Hennepin County has initiated community engagement activities to evaluate the potential for disproportionate adverse impacts and consider ways to reduce those impacts from the project.
    b. Hennepin County will continue the community engagement process as the project progresses.

*Effects on other energy systems and energy security*

1. Reliance on locally produced RNG and green hydrogen reduces dependence on out-of-state geologic gas.
    a. This may have energy security benefits for energy security.
    b. Decarbonization approach built off existing energy infrastructure.
2. Pilots that would explore decarbonization opportunities that can help mitigate growth in winter electric peak demand from space heating electrification:
    a. Hybrid heating system pilots—Pilot #18 (commercial hybrid heating pilot) and Pilot #19 (residential deep energy retrofit + electric air ASHP with gas backup)
    b. Gas heat pump pilots—Pilot #21 (residential gas heat pump) and Pilot #22 (gas heat pump for commercial buildings).

## Snapshot of Notable Pilot Projects from Environmental Perspective

*GHG emissions*

1. GHG emissions
    a. Quantitative results include both lifetime GHG savings and the social cost (value) of GHG emissions reductions
    b. RNG projects capture and recover methane and put that gas to productive use

*Other pollution*

1. Other pollution
    a. Quantitative results also include the social cost (value) of non-GHG air pollutants emissions (reductions)
    b. Anaerobic digestion of dairy manure can improve agricultural practices that harm water quality, air quality, and local odors
2. The industrial methane leak detection and repair program could also identify refrigerant leaks, to further reduce environmental and GHG impacts

*Waste reduction and reuse (including reduction of water use)*

1. Waste reduction and reuse (including reduction of water use)

    a. Hennepin County's RNG project has the potential to be a state model for organics recycling and beneficial use; this and the other 'food waste' RNG projects can help to demonstrate an effective use of anaerobic digestion in MN to process residential and commercial source-separated organics (as opposed to landfilling)
2. All RNG pilots, digestion of organic materials for energy production is effective way to decarbonize waste

*Policy (e.g., natural gas throughput, renewable energy goals)*

1. Pilots that would increase the use of renewable energy:
    a. RNG pilots (Pilots #1–6)
    b. Green hydrogen/ammonia pilots (Pilots #7–8)
    c. Pilot #14 (new networked geothermal systems)
    d. Pilot #24 (solar thermal heating for commercial and industrial)
    e. Potentially Pilot #25 (industrial and large commercial GHG audit)
2. All pilots except the carbon capture pilots would decrease geologic gas throughput.

## Snapshot of Notable Pilot Projects from Socioeconomic Perspective

*Net job creation*

1. IMPLAN modeling to quantify the net job creation from pilots is still ongoing
2. Meeting the best IRA incentive requirements often requires meeting certain labor standards

*Economic development*

1. The hydrogen pilots allow local firms and workers to gain experience in the growing hydrogen industry
2. A number of projects support improved industrial competitiveness in Minnesota by helping industry become more efficient
    a. Other pilots could entice corporate R&D teams to concentrate initial decarbonization efforts at Minnesota facilities
3. Pilots seeking higher IRA incentives would follow wage/labor IRA requirements
4. Pilot #14 (new networked geothermal systems) would represent a large-scale build out of a new type of utility infrastructure
5. CenterPoint planning to include a workforce development budget to support various projects at the portfolio level

*Public co-benefits*

1. Pilot #1 (RNG proposal – anaerobic digestion of organic materials) and Pilot #2 (RNG proposal – anaerobic digestion of East Metro food waste)
    a. Support the local municipalities driving these projects (Pilot #1 would occur in Hennepin County and Pilot #2 would occur in the East Metro area)
2. Pilot #10 (urban tree carbon offset):
    a. Direct human comfort and energy use reduction co-benefits: Trees offer shade and reduce heating/cooling costs over time

b. Environmental co-benefits: Trees sequester carbon, increase stormwater infiltration rates in urban areas, promote habitat diversity.

*Market development*

1. Many pilots may be located throughout CenterPoint's service territory
2. Projects may have a significant impact on individual customer's GHG emissions
    a. Can help customers achieve their GHG emissions goals
    b. Supports competitiveness with GHG-conscious customers

**Snapshot of notable pilot projects under NGIA innovation criteria**

*Direct innovation support*

1. Many of these projects are small-scale field testing.
    a. This allows CenterPoint to explore potential opportunities, scales, etc.
    b. Most or all costs are covered for CenterPoint customers.
    c. Goal: Better understand an emerging technology and how it could be scaled
2. RNG innovations:
    a. Pilot #1 (RNG proposal – anaerobic digestion of organic materials), proposed in Hennepin County, has the potential to be a state model for organics recycling and beneficial use.
    b. RNG pilots provide CenterPoint with experience in purchasing low-carbon fuels.
3. Innovations related to energy delivery strategies that are novel to CenterPoint:
    a. Pilot #7 (green hydrogen blending into natural gas distribution system)
    b. Pilot #14 (new networked geothermal systems)
    c. Pilot #16 (new district energy system) pilots provide experience with a different way of providing energy.
4. Innovations in reducing emissions from hard-to-electrify industrial end-uses:
    a. Carbon capture pilots (Pilots #9–13)
    b. Hydrogen pilots (Pilots #7 and 8)
5. Better understanding questions related to balancing energy efficiency retrofits with strategic electrification, while supporting testing of new retrofit technologies:
    a. Pilot #19 (residential deep energy retrofit + electric ASHP with gas backup)

*Resource scalability and role in a decarbonized system*

1. Hybrid heating targets the largest residential and commercial sector uses of natural gas.
2. The 2021 Minnesota G21 study (*Decarbonizing Minnesota's Natural Gas End Uses*) found that the "electrification with gas back up" scenario had the smallest incremental cost increase by 2050
    a. Link to G21 study: https://e21initiative.org/wp-content/uploads/2021/07/Decarbonizing-NG-End-Uses-Stakeholder-Process-Summary.pdf
3. All deep emission reductions pathways rely on a lot of decarbonized gases to reach emission reduction targets:
    a. Note: All emissions reductions pathways in the G21 study rely on decarbonized gases (scenarios all have different gas sources)

        i. All G21 study use all available biomethane resources and hydrogen blending, before tapping into more expensive decarbonized gases.
    b. G21 high electrification case:
        i. 2050 RNG demand in Minnesota would be much greater (50–100 times greater) than the annual volume of decarbonized gas production from all pilots modeled in the detailed analysis.
4. Residential and commercial hybrid heating and gas heat pumps were selected for the Minnesota Efficient Technology Accelerator's (ETA) starter portfolio.
    a. CenterPoint is taking a collaborative approach with the Center for Energy and Environment (CEE) on these pilots.
    b. Collaborative approach can amplify the effects of both NGIA and ETA.
5. Hydrogen and carbon capture are expected to be important tools in a decarbonized energy system.
    a. Federal government has heavily invested in scaling up and reducing the costs of hydrogen production and carbon capture through IRA and IIJA.

## Pilot Project Analysis Q&A and Discussion

1. *Question:* Regarding a pilot's "lifetime," an RNG project infrastructure investment is 20+ years. The gas contract may be 10 years but the facility would last longer. Is the longer life taken into account in any way (e.g., a second 10-year contract)? If so, how does this impact the analysis?
    a. *Answer:* For RNG, the main cost component is the assumption of what market price CenterPoint might be able to secure for a 10-year RNG contract. CenterPoint is not envisioning personally building out RNG projects, facilities, etc.—will host a competitive RFP process and look for developers to do that to secure the best possible facility/infrastructure development deal. CenterPoint is using an expected contract price for these developers, and would likely need to re-contract at another price (developer is taking some risk of being able to get a similar or better price in the future). CenterPoint is offering a long-term fixed price with the expectation this would reduce some of the infrastructure cost risks developers face when they rely on a shorter-term market price.
2. *Question:* I am interested in more information regarding the difficulties in calculating decarbonization potential from Pilot #23 (neighborhood weatherization blitzes). I understand that there is uncertainty in the decarbonization potential but am curious as to what those difficulties were—there are methodologies that can help calculate carbon and GHG savings from weatherization improvements.
    a. *Answer:* Weatherization measures are well-established in the Minnesota Technical Reference Manual. The calculation uncertainty for this pilot relates to unknown effectiveness of the new outreach tactics, and the fact that NGIA cannot include measures that are CIP-eligible (this particular area has strong CIP overlap).
    b. Another uncertainty is the pilot marketing component.
        i. Marketing would involve adding substantial administrative budget.
        ii. Unclear how much money spent in marketing impacts pilot adoption.

iii. Unclear how the type of marketing and/or marketing process impacts actual pilot adoption.

c. Minnesota Technical Reference Manual available here: https://mn.gov/commerce/energy/industry-government/cip/technical-reference-manual/

d. *Follow-up question:* I am struggling with seeing pilot scenarios for $40M RNG pilots but comparatively much less investment in weatherization, specifically residential weatherization.

e. *Answer:* CenterPoint would like to clarify that including an initiative in the R&D bucket does not "deemphasizing" that initiative or consider it as "lesser"—it is simply a different categorization. CenterPoint can discuss this in greater detail in the regulatory meeting, but there are also some specific statutory constraints in the budget that contribute to spending on certain pilot types.

i. Ex: NGIA has a requirement that innovation plans must dedicate at least 50% of utility costs to gaseous fuels.

f. *Comment:* Participant would like to have a conversation regarding CIP/NGIA coordination. After reaching an accommodative position over the summer where CIP is protected and NGIA builds off of CIP, it is important that subsequent interpretations of these two laws do not establish barriers. CIP eligibility is not a bar for inclusion in NGIA. With respect to NGIA spending caps and requirements, it would be helpful to ground the conversation in a representative outline of what an NGIA portfolio might look like. This would help clarify how big certain projects might be; it is important to remember how the structure of NGIA necessarily slots some resources.

i. *Response:* CenterPoint recommends that this participant refer to the last slide (Slide 41) in today's presentation, which displays the resources included in NGIA and provides some additional clarifications about those resources.

ii. Much of this will come up again in the third group of engagement meetings, which will focus on portfolio combinations. Meeting 2 is focuses on trying to reach consensus on assumptions so CenterPoint and interested parties can be in agreement about the numbers.

3. *Question:* Is there/will there be any comparative assessment between projects (e.g. comparing the relative scaling potential of different technologies)?

a. *Answer:* The individual pilot profiles in the Workbook have places dedicated to qualitative considerations. At this point in time, the plan is to highlight noteworthy benefits/drawbacks of each pilot. CenterPoint has not yet formally developed a grading scale or scoring process for pilot selection—the Workbook is intended to provide a holistic, big-picture analysis of each pilot.

b. The final evaluation criterion under "Innovation" in the approved NGIA analytical framework (Resource Scalability and Role in a Decarbonized System) is intended to take this into consideration.

4. *Comment:* Regarding trying to reach a consensus around assumptions, it seems like some of the RNG and carbon capture pilots are for hypothetical projects at currently

undefined industrial facilities. Could CenterPoint say a bit more about the models, the information sources, etc.?

a. Answer: Information sources vary between pilots, and the Workbook includes sources.
    i. Some sources were provided by RFI respondents.
    ii. Some sources are the result of ICF analysis with assumptions for different conditions, accounting for different factors, etc.
    iii. CenterPoint is always happy to receive additional data sources, in addition to model questions.
    iv. Some of the biggest implications include cost per ton of $CO_2$ and expected emissions reductions achieved, especially for industrial options. Industrial facility recruitment is a large factor, and CenterPoint is trying to identify what these facilities are most interested in pursuing.

## R&D Approach

***Note:*** *Due to time constraints, CenterPoint was unable to complete its discussion of its approach to R&D projects during the meeting. Please refer to the slides (available here at the initiative's Airtable resource library for participants) for additional information.*

1. R&D distinctions (compared to non-R&D pilots)—R&D projects are:
    a. Relatively smaller in scale research projects or studies
    b. Projects that are uncertain, difficult to quantify, or have nominal GHG benefits
2. Innovation plan will include up to 10% of total incremental investment costs in R&D
3. There are many potential R&D opportunities and ideas that could arise in the next few years that CenterPoint does not want to rule out.
    a. The R&D bucket allows funding over shorter time frames (1–2 years) to account/allow for this.
    b. CenterPoint plans on selecting/proposing additional R&D projects in its required annual innovation plan reports.
        i. Will seek PUC approval for these on a rolling annual basis.
4. Please refer to the slides for additional information on CenterPoint's approach to R&D initiatives for its NGIA innovation plan.

## Next Steps

1. CenterPoint requests that meeting attendees complete the Innovation Plan Engagement Meeting Survey (survey link available here).
    a. Please submit additional feedback via the survey.
    b. Survey responses due **Monday, March 10, 2023.**
2. Participants and other interested parties may reach out with further questions and/or feedback via the email address dedicated to this initiative: InnovationPlan@CenterPointEnergy.com.
3. Regulatory parties meeting upcoming on **Friday, March 17, 2023**.
    a. Key regulatory parties have been identified, but any additional parties are welcome to reach out if interested in attending.

4. CenterPoint still targeting mid-year for the innovation plan filing.
5. Participation stipends available for groups representing low income, environmental justice, racial equity, or other perspectives historically underrepresented in energy regulatory proceedings.
6. Participants will receive the post-meeting survey and pilot project Workbook after the meeting.
7. GPI will prepare a meeting summary which will be provided to participants.
8. CenterPoint remains open to any additional engagement.