

# **Combined Heat and Power Stakeholder Meeting #1 (of 4)**

*Convened 09/03/2014*

Meeting Summary Report Prepared For:  
**Minnesota Department of Commerce - Division of Energy Resources**

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## **Background**

In late 2013, as part of the Energy Savings Goal Study required by the state legislature, the Minnesota Department of Commerce (“Commerce”) conducted a series of stakeholder meetings on industrial energy efficiency and combined heat and power (CHP) – including two technical work group meetings focused specifically on CHP – and delivered a report on findings and recommendations to the legislature. In 2014, Commerce funded two CHP research projects that are specific to Minnesota. One study evaluates CHP regulatory issues and policies and developing an up-to-date analysis of CHP technical and economic potential; another study examines the effects of existing standby rates and net metering rules on CHP and Waste Heat to Power projects.

To continue to build on Commerce’s past and current CHP work, and to focus on more specific policy details and recommendations, Commerce was awarded a U.S. Department of Energy grant to carry out a strategic stakeholder engagement process and develop an Action Plan. As part of the project’s scope of work, Commerce is convening a series of stakeholder engagement meetings to provide information and facilitate discussion on CHP issues involving Minnesota’s regulatory framework, technical/economic potential, and education/training needs. These meetings are intended to achieve several primary objectives:

- Inform stakeholders of current efforts underway to increase CHP implementation
- Facilitate discussion regarding the opportunities and barriers to greater CHP deployment
- Solicit ideas for possible solutions to these barriers
- Provide information in the development of an Action Plan, which will act as a roadmap to facilitate greater implementation of CHP projects throughout the state

## **Meeting Overview**

The first CHP Stakeholder Meeting: "CHP Baseline, Value Proposition, and Path Forward" convened on Sept. 3, 2014, from 8:30 a.m. to 12:30 p.m., at the Wilder Center (451 Lexington Parkway North, Saint Paul, Minnesota). The meeting included 60 pre-registered and 14 walk-in attendees, for a total attendance of 74. The primary goal of the meeting was to present information regarding the current state of CHP development while exploring barriers and opportunities in Minnesota. A secondary goal was to address questions among stakeholders and facilitate discussion about the topics presented. The meeting was divided into five presentation sections, with three moderated Q&A sessions providing opportunities for feedback and questions. (*Appendix A*)

The first presentation was provided by Jessica Burdette of the Minnesota Department of Commerce, Division of Energy Resources, who outlined Minnesota’s statewide energy policy objectives and provided an overview of the state’s CHP initiatives. Next, Michael Burr of Microgrid Institute presented on the CHP Stakeholder Meeting strategy and plan, and reviewed the current baseline, value proposition, and technical potential of CHP in Minnesota. The remainder of Meeting #1 consisted of a three-part presentation by Mark Spurr of FVB Energy, reviewing key highlights from FVB Energy’s report

for Commerce, “Combined Heat & Power Policies and Potential.”<sup>1</sup> Spurr’s presentation was divided into three sections:

- CHP overview
- CHP regulatory review findings
- CHP policy analysis options

Spurr focused on both the technical and economic potential of CHP in Minnesota. His presentation addressed many points, most notably:

#### *Technical Potential & Value Drivers*

- In Minnesota, there are around 4,000 sites with the technical potential for CHP.
- The state has around 1,000 MW of CHP potential.
- CHP is up to twice as efficient as power-only plants depending of the technology used.
- Minnesota is only 43% efficient in converting fuel to useful energy, which could be improved with greater deployment of CHP technology.
- CHP can enhance local energy resiliency.
- CHP combined can provide grid support during peak periods, especially when combined with demand response.
- CHP can help utilities comply with pending regulations on greenhouse gas (GHG) emissions.

#### *Economic Potential and Issues*

- In Minnesota, lower power prices make it more difficult to rationalize the cost effectiveness of developing CHP.
- Based on efficiency per unit, electricity is a higher value energy stream than thermal output, affecting the efficiency credits that a given CHP unit may earn.

#### *CHP Policy Options*

- The FVB report offers several policy options for discussion:
  - New CHP tier in natural gas and/or electric utility Conservation Improvement Program (CIP), providing incentives to customers or third parties.
  - CIP credit for utility-owned CIPs (in addition to customer/third-party incentives).
  - Biomass-fired CHP carve-out in either existing or expanded renewable portfolio standard (RPS).
  - New alternative portfolio standard (APS) requiring electric utilities to obtain a given percentage of sales from CHP (regardless of fuel) by a given year.

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<sup>1</sup> FVB Energy, Minnesota CHP Policies and Potential Reports:

- ["Minnesota CHP Policy Brief"](#) (.pdf)
- ["Minnesota CHP Regulatory Issues and Policy Evaluation"](#) (.pdf)
- ["Minnesota CHP Technical and Economic Potential"](#) (.pdf)

- Appropriate policies and incentives for electric utilities will most substantially facilitate CHP implementation.

#### *CHP Economics and Financing*

- Given the payback periods typically preferred by private institutions, utilities have a sufficiently low weighted average cost of capital (WACC) to make many CHP projects more cost-effective and structurally better positioned to exploit the CHP potential. Without their involvement it will be much harder to reach the CHP potential outlined. With that in mind, it's also important to allow private ownership of CHP.
- CIP or APS policies for utility investment in CHP yield positive results from societal and participant cost tests.
- Capital incentives can be front-loaded to facilitate a shorter return on investment, or they can be spread out over the life of a project. Investment incentives support project costs for equipment and development, while production incentives reward efficient and reliable operation.
- Investing in CHP creates certain risks, most notably the risk of CHP hosts going out of business or otherwise no longer needing CHP thermal output. Utilities investing in CHP expose ratepayers to such risks. However, all forms of energy production carry risks, and CHP's risks should be examined in context of other risks to ratepayers embedded in existing or alternative options.

#### *Action Steps for Consideration*

1. Develop a draft "Minnesota CHP Policy Act" for consideration by the legislature in 2015.
2. Develop an interagency working group to integrate potential CHP policy with Minnesota's plan to comply with the EPA's Clean Power Plan.
3. Set goal of doubling CHP capacity from the current 962 MW by the year 2030.
4. Add new CHP tier to CIP for electric utilities.
5. Establish a ruling that utilities may own CHP facilities on customer premises.

#### **Moderated Q&A and Discussion**

During the CHP Meeting #1 Q&A and discussion sessions, stakeholders raised questions and offered comments on a wide range of issues, with most focusing on cost effectiveness and financing of CHP systems. In addition, attendees raised questions about how CHP fits into the state's CIP initiative or whether the state should adopt alternative policies such as APS or RPS.

Highlights from the Q&A sessions:

*Q: How do load profiles and demand density affect CHP economics? Specifically how large must a site's heat load be in order to make CHP cost effective?*

*A: In general, the larger a CHP deployment, the better the project's economics will be. The FVB economic potential study assessed a range of sizes, from 30 kW microturbines to a 40 MW combined-cycle facility. Technical advances have improved costs for smaller CHP units but dramatic reductions aren't expected.*

The most cost-effective commercial and institutional CHP systems provide thermal energy for district heating and cooling networks.

*Q: Does the FVB analysis set a minimum annual efficiency performance in order for a CHP system to be considered economic?*

*A: It didn't set an efficiency threshold, but not surprisingly, the more cost-effective deployments in the scenarios tended to be more efficient, and the less cost-effective were less efficient.*

*Q: Different commercial and industrial investors have different expectations for equity returns and payback time on capital investments. Don't some C&I investors have expectations that are similar to those of utilities?*

*A: Compared to regulated utilities, industrial investors generally have higher hurdle rates for CHP and other kinds of energy efficiency investments. In principle, many investors can accept equity returns and payback rates similar to those offered by typical CHP investments, but their criteria for investment make it more difficult than it would be for utilities.*

*Q: How do the proposed incentive options correlate with expectations for investment by utilities vs. third parties and customers? In other words, are you saying the incentives should focus on encouraging utility investment?*

*A: The proposed options aren't intended to suggest utilities should be the sole investors in CHP. Some customers and third parties will want to own and operate CHP plants. That opportunity is important, and the economic signals should be evenly balanced.*

*Q: During the presentation you indicated some stakeholders expressed concern about utility ownership of CHP. What are those concerns?*

*A: Over the years there's been experience with utilities getting in the way of CHP, and so there's a certain lack of trust. Also some people see it as a competitive threat because they're actively involved in developing CHP.*

*Q: Policy Option 3 includes CIP incentives for utility investment in CHP. How would that work?*

*A: The utility would be able to receive a CIP credit equivalent to the incentive it otherwise would have to provide for customer-owned CHP.*

*Q: If the utility invests in CHP, would it take the electricity output and provide the thermal output to the host?*

*A: Correct. This brings low-cost utility capital to CHP deployment, and it also brings the utility's power systems engineering and operations experience. It makes integrating CHP the utility's business. Utilities are well suited to implement CHP projects.*

*Q: Policy Option 1 and 2 describe CIP credits for electricity and natural gas utilities, respectively. Did the analysis consider combining the two in a shared program as some jurisdictions have done?*

*A: Yes a combined approach was considered, and it has potential. However, it raises methodological challenges. Gas and electric utilities both have certain requirements, and it could be complicated to handle them in a combined program.*

*Q: The CIP programs we offer all pass the societal and participant tests with strong results. The study seems to suggest CHP will just barely pass those tests. Might CHP take CIP funds away from more productive investments?*

*A: The proposed approach yields results for CHP that are comparable to other CIP investments, in terms of dollars per Btu or MWh, based on lifetime efficiency measures.*

*Q: Many of Minnesota's largest industrial facilities have opted out of CIP. Would they have to opt in to take advantage of incentives for CHP?*

*A: To the extent CHP is a utility rate-base investment, it would mitigate the need for the industrial host to opt into CIP.*

*Q: What's the reason for the proposed tiered approach to CIP credits for CHP? Why shouldn't CHP projects be given full credit for their output? If efficiency is factored into the incentives, then projects will benefit to the degree they're efficient, and a tiered system isn't necessary.*

*A: CHP generates two forms of energy, and the thermal output isn't as valuable as electric output in terms of improving overall efficiency and reducing GHG emissions. The electric sector is about 33 percent efficient, so CHP represents a dramatic improvement in primary energy efficiency. But compared to an existing onsite boiler, a new CHP system may be more efficient, but not radically so. The policy structure should be consistent with the motivating public policy goals for improving efficiency in primary energy reduction and reducing GHG emissions.*

### **Conclusion: Areas for Further Discussion**

Subsequent meetings will further examine issues affecting CHP prospects and policy options in Minnesota. Key issues raised in CHP Stakeholder Meeting #1 that merit additional consideration:

1. How do CHP investments compare to other CIP investments, in terms of performance per ratepayer dollar invested?
2. How do CHP benefits compare or contrast between various end-use applications – i.e., industrial, commercial, and institutional?
3. How do the proposed policy options compare, contrast, and complement CHP programs and policies in other U.S. states and the federal government?
4. How do standby rates and net metering policies affect CHP deployment?
5. How should incentives be balanced to ensure equitable treatment of CHP investments by utilities, customers, and third parties?

6. What barriers to utility investment in CHP can be effectively addressed with state policies or programs?
7. How should revenue streams from utility-owned CHP capacity be treated, for regulatory accounting purposes? How might that treatment affect CHP investment factors for utilities?
8. How would utilities claim CIP credits for CHP investments?
9. Given the policy drivers of improving primary energy efficiency and reducing GHG emissions, what's the most effective CIP credit structure to facilitate the most productive deployments?

Meeting #2 in the Minnesota CHP Stakeholder Engagement series is scheduled for Sept. 24, 2014, at the Wilder Center in St. Paul. The meeting is expected to focus on the context for Minnesota's CHP policy options, with presenters reviewing comparable programs in other states, and also the effects of utility standby rates and net metering policies. The results and recommendations of Energy Resources Center's report "Analysis of Standby Rates and Net Metering Policy Effects on CHP Opportunities in Minnesota," will be presented during the stakeholder meeting; the full report can be accessed at the following link: <http://mn.gov/commerce/energy/images/SRNMPE-CHP-Opportunities.pdf>



## **Appendix A**

### **Agenda**

- I.8:15 - 8:30 Registration
- II.8:30 - 8:45 Introduction (Minnesota Department of Commerce and Microgrid Institute)
- III.8:45 - 9:00 CHP baseline and value proposition (MGI)
- IV.9:00-9:45 CHP overview (FVB Energy; Slides 1-21)
- V.9:45 - 10:00 Moderated Q&A
- 10:00 - 10:15 BREAK
- VI.10:15-11:00 CHP regulatory review findings (FVB Energy; Slides 22-30)
- VII.11:00 - 11:15 Moderated Q&A
- VIII.11:15 - 11:45 CHP policy analysis options (FVB Energy; Slides 31-40)
- IX.11:45 - 12:15 Moderated discussion
- X.12:15 - 12:30 Conclusion and housekeeping