

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

Convened 11/5/2014

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

Prepared By:



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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 develops 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 convened 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 were 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 fourth CHP Stakeholder Meeting: “Discussion and Synthesis of Major Themes,” convened on Nov. 5, 2014, from 8:30 a.m. to 12:30 p.m., at the Wilder Center (451 Lexington Parkway N., St. Paul, Minnesota). The meeting was attended by approximately 60 people. The primary goals of the meeting were to facilitate discussion among participants synthesizing the results of previous meetings, submitted comments, and analysis by Commerce and its consultants. The meeting was divided into two segments, with moderated discussion of five key themes and synthesis of detailed inputs (*Appendix A*):

- 1. CHP Evaluation Criteria**
- 2. Mapping CHP Opportunities**

- 3. CHP Ownership Problems and Solutions**
- 4. Adapting CIP for Supply-Side Investments**
- 5. Education and Training Needs and Options**

The meeting began with an introduction by Jessica Burdette of the Minnesota Department of Commerce, Division of Energy Resources, who welcomed attendees, explained the objectives and context of the meeting, and introduced the discussion moderator (Michael Burr of Microgrid Institute). The moderator presented an overview of discussion topics and outcomes from CHP Stakeholder Meeting #3, which convened on Oct. 15, 2014. The presentation identified major themes discussed in submissions received by the Department of Commerce during a CHP Stakeholder Comment Period, September 24 through October 10.¹ The moderator then opened the first segment of the meeting, which focused on two major themes: CHP Evaluation Criteria and Mapping CHP Opportunities.

(Note: The paraphrased discussion and synthesis notes summarized below are drawn from remarks and discussion among numerous participants at the meeting, and therefore they do not represent direct quotes from participants or official guidance from the Minnesota Department of Commerce.)

1. CHP Evaluation Criteria

The moderator asked participants to focus on considerations and approaches for fair, accurate, and comprehensive assessment and valuation of CHP attributes. Specifically:

- *What existing methodologies or criteria provide examples to inform CHP evaluation approaches in Minnesota?*
- *What criteria should be included in evaluating CHP projects?*
- *How should CHP evaluation fit into Minnesota's other energy planning and evaluation processes?*

The moderator referred to numerous evaluation models, criteria, programs, and studies identified by Microgrid Institute (*see Appendix B*), and asked participants to suggest other models that Minnesota should consider. Three comments were noted:

- Total resource cost (TRC) tests should be considered
- Cost savings should be calculated in ways that are fair and comprehensive
- Transparency should be a hallmark of any criteria or methodologies for evaluating CHP attributes

The discussion then focused on specific criteria that should be included in evaluating CHP projects. The moderator briefly referred to the Illinois Department of Commerce

¹ Submitted comments are examined in greater detail in "CHP Stakeholder Comments: Final Summary Report," Oct. 29, 2014, available via the Minnesota Department of Commerce website: <http://mn.gov/commerce/energy/images/UpdatedFinalizedCHPStakeholderCommentsSummary.pdf>

and Economic Opportunity (DCEO) CHP pilot program and its tests and criteria, specifically:

Illinois DCEO Test Methodologies:

- *Cost-effectiveness test*
- *Energy efficiency – calculation and measurement*
- *Energy savings – calculation and attribution*

Illinois DCEO Criteria:

- CHP capacity
- Operating hours
- Recoverable heat from CHP
- Electric efficiency
- Thermal utilization
- Displaced thermal efficiency
- Parasitic loads
- Installation cost (major equipment, engineering, design, construction, permitting, interconnection, other)
- Maintenance cost (estimated fixed and variable cost; estimated downtime; planned maintenance contract terms (5-year contract required))

Stakeholder Suggested Criteria:

Participants identified numerous specific criteria to be considered:

General criteria	Efficiency/energy savings
	Fuel type
	Environmental impact
	Risk-reward analysis
	Overall societal benefits
Location-specific criteria	Location-specific value to or effect on grid and system resources
	Local fuel production capabilities
	Demand for CHP outputs
	Resilience both for host and local grid
Utility grid/system operations criteria	Peak supply capabilities
	Dispatchability
	Operating flexibility, including storage capabilities (thermal and electricity)
	Net impact on utilization of renewables (e.g., to what degree would baseload CHP lead to wind curtailment etc.)

Criteria Evaluation Considerations:

Participants offered additional comments on issues related to the criteria discussed:

- Environmental impact analysis should consider both thermal and electric output.
- Environmental impact criteria may include EPA Section 111(d) compliance benefits, but such benefits should be evaluated in comparison to other means of reducing Minnesota’s greenhouse gas footprint.
- Evaluation methodologies and systems should be both flexible and driven by goals established by the State of Minnesota.
- Evaluation methodologies may be able to address a broader range of attributes and factors if they are separated from Minnesota’s existing Conservation Improvement Program (CIP).
- Efficiency and energy savings criteria may include a minimum threshold.
- Energy savings should be calculated and allocated in a way that is fair and encourages cost-effective efficiency investments by either electric or gas utilities.
- Fuel switching issues bear further definition and analysis to ensure evaluation criteria avoid conflicts with existing regulations while also facilitating economical investments to achieve energy savings.

Minnesota Energy Planning and Evaluation Considerations:

The meeting discussion then focused on how CHP evaluation methodologies should fit into Minnesota’s other energy planning and evaluation processes. Participants offered several comments:

- Pilot projects and demonstration programs serve to advance development frameworks, clarify alternative project approaches and structures, and test their viability.
- Policy development should consider whether and how CHP may affect other resources evaluated during integrated resource planning (IRP) processes.
- Least-cost planning processes merit adaptation to allow objective consideration of non-cost factors when evaluating utility CHP investments.
- Some participants suggested IRP’s specific scope of study may not effectively serve CHP evaluation, which depends fundamentally on project-specific factors with many indeterminate variables for the IRP time horizon.
- As a counterpoint, however, it was noted that the IRP framework may provide utilities with an opportunity to think about CHP and district energy in long-term planning.
- CHP evaluation should be separated from CIP demand-side conservation project evaluation and budgets.

2. Mapping CHP Opportunities

The moderator asked participants to consider options and factors involving empirical study and granular analysis of opportunities for topping-cycle and bottoming-cycle CHP projects:

- *What primary goals and objectives would be served by additional efforts to map CHP potential in Minnesota?*
- *What kind of information should be studied? What details should be provided?*
- *How should market study efforts interact with and support long-range planning regarding integrated district heating and cooling and other local energy and economic development initiatives?*

CHP Mapping Objectives:

Participants offered numerous comments related to drivers and objectives for additional efforts to map CHP potential in the state:

- Except for limited utility studies, efforts to identify CHP opportunities tend to happen only with policy impetus.
- The role of the State of Minnesota in mapping opportunities bears clarification; existing models such as wind resource potential maps provide analogue examples in some respects.
- Some aging boilers already have been identified for upgrades or replacement to comply with federal Boiler MACT (Maximum Achievable Control Technology) regulations.
- State mapping efforts might identify thermal and electric savings opportunities that might not be considered in evaluations by utilities or customers.
- Initial efforts might naturally focus on CHP opportunities at public facilities, including district energy systems.
- Some examples (*e.g.*, Iowa and Wisconsin) illustrate state approaches to mapping and tracking biogas generation, use and disposal.
- Potential models for Minnesota include programs encouraging utilities to identify energy efficiency studies.
- Project feasibility studies, potentially with State support, would also help clarify potential for CHP development.

Potential Study Areas:

Participants suggested several topics for possible focus through a State-initiated study effort:

- Public facility CHP potential
- Critical local resilience and preparedness requirements
- Economic development needs and opportunities
- Studies of information not accessible to utilities, including customers' proprietary or confidential data
- Heat recovery additions at existing generation facilities
- Small-scale applications

Long-Range Planning Studies:

The moderator asked participants to consider how CHP market study efforts should interact with and complement long-range planning efforts in the state, including local

community resilience, integrated district energy, and economic development initiatives. Several participants referred to earlier comments regarding opportunities to consider CHP in the context of long-range community planning and State preparedness planning. Additionally participants observed that challenges affecting CHP mapping and IRP processes also factor into long-range planning considerations generally.

3. CHP Ownership Problems and Solutions

After a break, the moderator re-convened the meeting to focus on CHP ownership problems and solutions. The discussion addressed issues and options involving utility resource planning, ratepayer risks, market power, and behind-the-meter operations:

- *What regulatory or legal issues affect utilities' ability to finance, own, and operate CHP projects?*
- *What regulatory or legal issues affect the ability of third parties and customers to finance, own, and operate CHP projects?*
- *How can Minnesota best address these issues to facilitate CHP financing and deployment?*

Regulatory Issues - Utility CHP Investment:

Discussion identified several regulatory and legal issues affecting utilities' ability to finance, own, and operate CHP projects:

- Stranded asset risks
- Statutory size limitations; Minn. Stat. 216H prevents baseload plants larger than 50 MW
- Reliability, integration, and risk-mitigation costs
- Utility service obligations and restrictions
- Least-cost planning requirements and cost-calculation, apportionment, and recovery provisions
- Lack of mechanisms to attach a value to thermal output
- Potential fuel-switching regulations and considerations

Regulatory Issues - Third-Party and Customer CHP Investment:

Participants observed a few key regulatory and legal issues affecting the ability of third parties and customers to finance, own, and operate CHP projects:

- Statutory size limits (Minn. Stat. 216H and PURPA) constraining potential for economic CHP development
- Limitations and restrictions on the ability to transport power and integrate generation resources
- Limitations on power and heat sales by non-utility companies

Regulatory Roadmap for CHP Investment:

Discussion focused on several considerations and options to facilitate CHP financing and deployment:

- Potential 216H waiver process or alternative treatment for CHP facilities that achieve certain benefit thresholds – *e.g.*, high efficiency
- Incentives to reduce up-front capital costs
- Direct support for ancillary infrastructure investments
- Financing programs to reduce costs of capital
- Flexible rate treatment including on-bill repayment for utility investments in customer-side CHP
- Transparent, unbundled pricing for standby rates and avoided cost calculation

4. Adapting CIP for Supply-Side Investments

Discussion addressed considerations regarding establishing and clarifying CHP provisions in CIP:

- *How can CHP projects serve CIP goals under current policies?*
- *What CIP changes would most effectively support CHP without disadvantaging demand-side efficiency improvements?*
- *How should supply-side CIP provisions interact with the Utility Infrastructure Improvement program?*

Supporting CHP through CIP

Participants identified only the opportunity for bottoming-cycle CHP to qualify for CIP incentives, and addressed questions related to expanding or adapting CIP to encourage topping-cycle CHP and other generation and utility infrastructure investments:

- Segregating a new category of supply-side conservation opportunities with new and separate goals and incentives.
- CIP generation efficiency provisions should accommodate and support both large and small CHP projects.
- Cost-benefit analysis, metrics, goals, and evaluation methodologies could address supply-side and electric utility infrastructure investments.

5. Education and Training Needs and Options

The moderator described education and training needs as identified in earlier meetings and survey processes, and asked participants to consider priorities for addressing knowledge gaps in CHP knowledge, capabilities, and education resources:

- *What are the most important gaps in CHP knowledge, capabilities, and education resources?*
- *What kinds of education and outreach resources would most effectively fill those gaps?*
- *What examples can inform Minnesota's effort to ensure effective CHP education and training resources are available to support the State's policy goals?*

CHP Knowledge Gaps:

Participants identified several key areas with opportunities for improvement in market knowledge, capabilities, and education resources in the state:

- Laws, regulations, and policy and administration processes
- Interconnection and permitting policies and procedures
- Financing approaches and resources
- Strategic planning and option valuation
- CHP operation and related areas, such as building automation

Participants suggested knowledge gaps related to energy technology generally, and CHP in particular, among various groups including legislators and staff. Additionally, information “silos” among government agencies limit accessibility of knowledge, affecting inter-agency programs and regulatory treatment.

CHP Education and Outreach Resources:

The moderator asked participants to consider the types of education and outreach resources that would most effectively address the identified knowledge gaps.

Suggestions included:

- Programs supporting publicity, public outreach, and education regarding energy initiatives and assets
- Workshops and seminars
- Information resources, such as background materials, guides, and checklists
- Webinars and other multimedia programs

Participants identified a few examples of initiatives to ensure effective CHP education, including online resources provided by Baltimore Gas & Electric and webinars and other programs offered by the State of Illinois under the DCEO pilot program.

Conclusion: CHP Action Plan Next Steps

As part of the Department of Commerce’s process to develop a CHP Action Plan, the fall 2014 CHP stakeholder engagement process provided information and facilitated discussion on a wide range of issues affecting CHP opportunities and development in the state. Next steps in the process (*and estimated timeframes*) include:

- Post-Engagement Survey of CHP stakeholders – identifying priorities for CHP Action Plan (*December 2014*)
- Final Report on the CHP stakeholder engagement process (*January 2015*)
- CHP Education and Training Plan (*January 2015*)
- Post-Engagement Stakeholder Survey Results Report (*January 2015*)
- Draft of CHP Action Plan (*February 2015*)
- Webinar and Comment Period #2 on Draft CHP Action Plan (*February 2015*)
- Final CHP Action Plan (*April 2015*)

- Final CHP Action Plan Webinar and Continued Stakeholder Engagement (*May – December 2015*)

Summary reports and other materials related to the CHP Stakeholder Engagement process are publicly accessible at Commerce's website:

<http://mn.gov/commerce/energy/topics/clean-energy/distributed-generation/2014-workshops/chp-meetings.jsp>

Appendix A:

Agenda

Minnesota CHP Stakeholder Meeting #4 (11/5/2014)

8:30 – 8:45: Introduction and Review (Department of Commerce and Microgrid Institute)

8:45 – 10:45: **Major Themes – Part I**

1. ***CHP Evaluation Criteria***
2. ***Mapping CHP Opportunities***
3. ***CHP Ownership Problems and Solutions***

10:45 – 11:00: **Break**

11:00 – 12:15: **Major Themes – Part II**

4. ***Adapting CIP for Supply-Side Investments***
5. ***Education and Training Needs and Options***

12:15 – 12:30 Wrap-up and Next Steps (Minnesota Department of Commerce)

Appendix B:

Project Evaluation Methodologies, Criteria, and Resources

Source: *Microgrid Institute*

<http://www.microgridinstitute.org/project-evaluation-methodologies-criteria-and-resources.html>

U.S. DOE CHP and DG Deployment Resources

<http://www.energy.gov/eere/amo/technical-white-papers>

Rutgers University Costs and Benefits of Combined Heat and Power (used by NJBPU in NJ Clean Energy Program)

<http://ceeep.rutgers.edu/wp-content/uploads/2013/11/CHPCostBenefitAnalysis.pdf>

U.S. EPA CHP Partnership – CHP Project Development Handbook

http://www.energy.gov/sites/prod/files/2013/11/f4/chp_project_development_handbook.pdf

U.S. Dept. of Housing and Urban Development CHP Feasibility Screening Guide for Multifamily Housing

<http://www.energy.gov/sites/prod/files/2013/11/f4/chpguide2.pdf>

NYSERDA CHP Acceleration Program

<http://www.nyserda.ny.gov/Energy-Innovation-and-Business-Development/Research-and-Development/Onsite-Power-Applications/Combined-Heat-and-Power.aspx>

University of Illinois at Chicago CHP Resource Guide

http://www.midwestchptap.org/Archive/pdfs/Resource_Guide_10312005_Final_Rev5.pdf

Illinois Department of Commerce and Economic Opportunity (DCEO) Pilot CHP Program

<http://www.erc.uic.edu/energy-efficiency/illinois-energy-now-programs/dceo-chp-pilot-program/>

District Energy St. Paul “Energy Island” Study (including evaluation methodology and tools)

<http://www.districtenergy.com/2013/02/studies-and-reports/>

Green Banks etc.:

Connecticut Green Bank (formerly CEFIA)

<http://www.ctcleanenergy.com/>

Maryland Green Bank (in development)

<http://mdcleanenergy.org/green-bank-study>

New York Green Bank

<http://greenbank.ny.gov/>

New Jersey Resilience Bank

<http://www.njrb.com/>