Final Combined Heat and Power Action Plan (Abridged Report)

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Statement of Purpose

The Minnesota Department of Commerce, Division of Energy Resources (Commerce) has a long-standing history of developing and implementing energy efficiency and renewable energy initiatives to achieve Minnesota's statewide public policy goals.[1] The efficient use of energy in all sectors is vital to the health of Minnesota's economy and environment. Using energy more efficiently can help consumers lower their utility costs and remain competitive in global markets while also reducing greenhouse gas (GHG) emissions and other pollutants. Energy efficiency improvements also benefit ratepayers by reducing the need for new utility infrastructure, lowering energy costs, and reducing emissions.

A primary goal of Minnesota's State Energy Office, housed within the Department of Commerce, is to accelerate market acceptance of high-efficiency and renewable energy technologies and practices. The State Legislature has long recognized the fact that Minnesota has no fossil fuel resources native to the state, only renewable energy and energy conservation. As a result, priority has been placed on diversifying fuel sources that are not imported into Minnesota and consuming less energy across all sectors.[2]

> *"The legislature further finds that cost-effective energy savings should be procured systematically and aggressively in order to reduce utility costs for businesses and residents, improve the competitiveness and profitability of businesses, create more energy-related jobs, reduce the economic burden of fuel imports, and reduce pollution and emissions that cause climate change"*
> *-MN Statute 216B.2401, Energy Savings Policy Goal*

Utility Conservation Improvement Programs (CIP) are a significant source of energy efficiency activity in Minnesota and a cornerstone for achieving the statewide energy efficiency resource standard. Providing technical assistance and evaluating energy efficiency programs and technologies are key roles of Commerce's staff.[3] Commerce staff manage regulatory compliance and provide technical assistance for over 180 electric and natural gas utilities to ensure that ratepayer dollars are used cost-effectively and that energy savings are measurable and verifiable. As part of this function, staff regularly evaluate specific technologies that can help consumers be more efficient in their homes and businesses as well as help utilities sustainably achieve their respective energy savings goals.

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[1] "216C.09 Commissioner Duties - 2015 Minnesota Statutes." *The Office of the Revisor of Statutes,* 2015. <https://www.revisor.mn.gov/statutes/?id=216C.09>.
[2] "216B.2401 Energy Savings Policy Goal - 2015 Minnesota Statutes." *The Office of the Revisor of Statutes,* 2015. <https://www.revisor.mn.gov/statutes/?id=216B.2401>.
[3] "216b.241 Subd. 1d - 2015 Minnesota Statutes." *The Office of the Revisor of Statutes,* 2015. <https://www.revisor.mn.gov/statutes/?id=216B.241>.

Minnesota has several statewide energy policy goals established by law and codified in statute and rules, including:

- Energy-saving goals for electric (1.5 percent of annual retail sales) and gas (1.0 percent of annual retail sales) utilities that operate in the state of Minnesota through CIP.[4]
- A goal that twenty-five percent of the total energy used in the state be met from renewable energy resources by the year 2025.[5]
- GHG emission goals of fifteen percent by 2015, thirty percent by 2025, and eighty percent by 2050.[6]

Additionally, on August 3, 2015, the Environmental Protection Agency (EPA) released the Clean Power Plan Final Rule, setting state targets for carbon dioxide (CO_2) emissions from existing fossil fuel fired power plants.[7]

Combined heat and power systems (CHP) can potentially help support the key policy goals described above by increasing the average efficiency of Minnesota's electric and thermal generation systems, reducing aggregate greenhouse gas emissions, and improving the energy security and resilience of local energy systems.

> *"CHP can potentially help support key policy goals by increasing the average efficiency of Minnesota's electric and thermal generation systems, reducing aggregate greenhouse gas emissions, and improving the energy security and resilience of local energy systems."*

To this end, as part of the Energy Savings Goal Study required by the State Legislature in late 2013, Commerce evaluated CHP as a potential cost-effective clean energy technology within the regulatory frameworks established by the 2007 Next Generation Energy Act and as a means to, in part, achieve Minnesota's energy policy goals. Commerce conducted a series of stakeholder meetings—including two technical work group meetings focused specifically on CHP—and delivered a report on findings and recommendations to the legislature and stakeholders.[8]

Through the Conservation Applied Research and Development (CARD) program, Commerce also funded

[4] "216b.241 Energy Conservation Improvement - 2015 Minnesota Statutes." *The Office of the Revisor of Statutes,* 2015. <https://www.revisor.mn.gov/statutes/?id=216B.241>.
[5] "216B1691 Renewable Energy Objectives - 2015 Minnesota Statutes." *The Office of the Revisor of Statutes,* 2015. <https://www.revisor.mn.gov/statutes/?id=216B.1691>.
[6] "216H.02 Greenhouse Gas Emissions Control - 2015 Minnesota Statutes." *The Office of the Revisor of Statutes,* 2015. <https://www.revisor.mn.gov/statutes/?id=216H.02>.
[7] "Clean Power Plan Final Rule." U.S. *Environmental Protection Agency, Aug. 2015.* <http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule.pdf>.
[8] Burdette, Jessica and Adam Zoet. "Energy Savings Goal Study and Stakeholder Process Legislative Report." *Minnesota Department of Commerce,* Apr. 2014. <http://mn.gov/commerce/energy/images/ESG-Legislative-Report_Final.pdf>.

two CHP research studies that are specific to Minnesota's technical potential and regulatory issues related to CHP development.[9] The first study, "Analysis of Standby Rates and Net Metering Policy Effects on CHP Opportunities in Minnesota" by the Energy Resources Center, examines the effects of existing standby rates and net metering rules on CHP and waste heat-to-power projects.[10] The second study, "Minnesota CHP Policies and Potential" by FVB Energy, evaluates CHP regulatory issues and policies and develops an up-to-date analysis of CHP technical and economic potential.[11]

To continue to build on Commerce's CHP analysis and findings and focus on more specific policy details and recommendations, Commerce sought to leverage existing federal funding and was awarded a U.S. Department of Energy (DOE) grant to carry out a strategic stakeholder engagement process and develop an Action Plan for CHP deployment in Minnesota. The goal of this project was to explore current barriers and potential solutions to CHP implementation in the state informed by the stakeholder work and analyses conducted previously. Commerce held a series of stakeholder meetings between September and November 2014 to provide information and facilitate discussion on CHP issues involving Minnesota's regulatory framework, technical and economic potential, and education and training needs. The objective of these public meetings was to:

1. *Inform Stakeholders* about current activity underway to evaluate CHP technologies and potential implementation.
2. *Facilitate discussion* regarding barriers and opportunities for deployment of CHP technologies.
3. *Solicit ideas* for solutions to the challenges presented during discussion of CHP implementation.
4. *Provide information* of the necessary steps to increase CHP activity in Minnesota.

Outcomes

The studies, reports, and presentations examined during the CHP stakeholder engagement process provided a comprehensive examination of the issues affecting CHP deployment. Over

[9] "CARD Grant Program." *Minnesota Department of Commerce*, 2015. <http://mn.gov/commerce/energy/utilities/conservation/Applied-Research-Development/>.
[10] Miller, Graeme, Cliff Haefke, and John Cuttica. "Analysis of Standby Rates and Net Metering Policy Effects on CHP Opportunities in Minnesota." *Energy Resources Center*, Apr. 2014. <http://mn.gov/commerce/energy/images/SRNMPE-CHP-Opportunities.pdf>.
[11] Spurr, Mark and Anne Hampson. "Assessment of the Technical and Economic Potential for CHP in Minnesota." *FVB Energy and ICF International,* Jul. 2014. <http://mn.gov/commerce/energy/images/CHPTechnicalandEconomicPotential.pdf>.
Spurr, Mark. "Minnesota Combined Heat and Power Policies and Potential." *FVB Energy,* Jul. 2014. <http://mn.gov/commerce/energy/images/CHPRegulatoryIssuesandPolicyEvaluation.pdf>.

the course of the project, Commerce engaged a diverse list of around 250 stakeholders with representatives from utilities, advocacy groups, trade associations, think tanks, consulting firms, legal firms, government agencies, commercial/institutional/industrial users, and independent power producers. Results of this stakeholder engagement include:

- Four in-person stakeholder meetings with an average attendance of seventy participants per meeting.
- Two stakeholder surveys with ninety-one valid completed responses.
- Two public comment periods with twenty-five written submissions, comprising more than one hundred pages of comments plus attachments.
- Thirty-eight reports and presentations produced and disseminated.
- Two webinars to share project results.[12]

As a result of this work product, Commerce and stakeholders have a more robust and nuanced understanding of the opportunities and barriers to CHP in Minnesota. Specifically, discussions with stakeholders during the DOE CHP stakeholder engagement process suggest six priority areas that would effectively help advance CHP in Minnesota if addressed:

I. **CHP Evaluation Methodology and Criteria:** Establishing an approach for fair, accurate, and comprehensive assessment and valuation of CHP projects.

II. **Mapping CHP Opportunities:** Conducting an empirical study and granular analysis of opportunities for topping-cycle and bottoming-cycle CHP projects.

III. **Education and Training Needs and Options:** Addressing knowledge gaps and defining options for CHP education and training.

IV. **CHP Ownership Problems and Solutions:** Addressing issues and options involving utility resource planning, ratepayer risks, market power, and behind-the-meter operations.

V. **CIP CHP Supply-Side Investments:** Exploring CHP as an eligible Electric Utility Infrastructure (EUI) efficiency improvement under CIP.

VI. **Standby Rates:** Introducing transparent, unbundled pricing for standby rates.

Commerce convened a public comment period from March 31 through May 15, 2015, during which stakeholders were invited to submit written comments on the Department's Draft CHP

[12] "Combined Heat and Power Stakeholder Meetings Webpage." *Minnesota Department of Commerce*, 2015. <http://mn.gov/commerce/energy/businesses/clean-energy/distributed-generation/2014-workshops/chp-meetings.jsp>.

Action Plan.[13] Commerce greatly appreciates the time and effort stakeholders contributed throughout the CHP stakeholder engagement process. Commerce closely reviewed the written comments provided by stakeholders on the priority areas and action items presented in the Draft CHP Action Plan.

Based on a thorough review and synthesis of the priority areas identified through discussions with stakeholders, analysis from Commerce's CHP studies, and consideration of stakeholder comments submitted on the Draft Action Plan, this section presents Commerce's Final CHP Action Plan recommendations to help increase CHP activity in Minnesota.

Final Action Plan Summary Recommendations

Number ID	Priority Areas	Action Items	Timing
I	CHP Evaluation Methodology and Criteria	Establish CHP Energy Savings Attribution Model and Project Evaluation Criteria	Near-Term (2015-2016)
II	Mapping CHP Opportunities	Map CHP Opportunities at Wastewater Treatment Facilities and Public Facilities	Intermediate-Term (2016-2017)
III	Education and Training Needs and Options	Expand Education and Training Resources on Commerce's Website	Near-Term (2015-2016)
IV	CHP Ownership Problems and Solutions	Leverage Existing Financing Programs Applicable to CHP	Near-Term (2015-2016)
V	CIP CHP Supply-Side Investments	Examine Electric Utility Infrastructure Policy	Long-Term (2015-Onward)
VI	Standby Rates	Continue Discussion Through PUC's Generic Proceeding	Long-Term (2015-Onward)

I. Priority Area: CHP Evaluation Methodology and Criteria

Discussions with stakeholders suggest a need to provide regulatory certainty regarding how CHP projects could be evaluated within CIP. Thirty-nine percent of respondents who participated in the post-engagement CHP stakeholder survey indicated that establishing CHP project evaluation methodologies and criteria would be an effective initiative to facilitate CHP deployment in Minnesota.

[13] Zoet, Adam, and Jessica Burdette. "Draft Combined Heat and Power Action Plan." *Minnesota Department of Commerce, 31 Mar. 2015*. <http://mn.gov/commerce/energy/images/draft-chp-action-plan-2015.pdf>.

I. Action Item: Establish CHP Energy Savings Attribution Model and Project Evaluation Criteria

Objective: Establish a CHP attribution model and project evaluation criteria to clarify how CHP projects would be evaluated and determined as eligible as part of CIP.

Timing: Near-term (2015-2016). While establishing a CHP attribution model and project criteria will likely take a considerable amount of time to finalize, working to develop them during 2015 and 2016 can still help inform utilities' 2017-2019 CIP Triennial Plan filings or provide information for stand-alone project proposals evaluated and approved by the Department. As one stakeholder pointed out in comments submitted on the Draft CHP Action Plan, "Even if a final model is not available in time for utilities to develop CHP-specific CIP offerings for inclusion in their 2017-2019 plan filings, having the model available could allow them to support CHP projects through custom rebate offerings, as well as the development of additional programs through the CIP modification process."[14]

Plan: Commerce will establish a CHP attribution model and project evaluation criteria in collaboration with two CHP subcommittees composed of experts recommended by the Technical Reference Manual Advisory Committee (TRMAC).[15] Below is a summary plan that outlines how Commerce intends to achieve the goals of this effort (a more detailed version of this plan can be found within the Unabridged Final CHP Action Plan[16]):

- **Activity #1: Scoping:** The objective of this activity is to work strategically with the TRMAC to finalize a "work plan" that establishes timelines and expectations and defines an ongoing communications plan in order to achieve the goals set out in the subsequent phases of this effort.

- **Activity #2: CHP Subcommittee Meetings:** The goal of this activity is for Commerce to convene a series of CHP subcommittee meetings to discuss and define establishing a CHP attribution model and project evaluation criteria.

- **Activity #3: CHP Attribution Model and Project Evaluation Criteria Drafting:** The goal of this activity is to propose and finalize a CHP attribution model and project evaluation criteria.

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[14] "7690.1430 New Project Proposals; Ending Existing Projects - Minnesota Administrative Rules." *The Office of the Revisor of Statutes,* 19 Jan. 2005. <https://www.revisor.mn.gov/rules/?id=7690.1430>.
"7690.1400 Proposed Project Changes; Supplemental Procedures - Minnesota Administrative Rules." *The Office of the Revisor of Statutes,* 19 Jan. 2005. <https://www.revisor.mn.gov/rules/?id=7690.1400>.

[15] The Minnesota Technical Reference Manual consists of a set of standard methodologies and inputs for calculating the savings impacts and cost-effectiveness of utility CIPs in Minnesota. Commerce established the TRMAC in 2013, and it acts as a forum for Minnesota electric and natural gas utilities and other stakeholders to provide ongoing feedback and recommendations to Commerce regarding the content of the Minnesota TRM for energy conservation improvement programs.

[16] Zoet, Adam, and Jessica Burdette. "Unabridged Final Combined Heat and Power Action Plan." *Minnesota Department of* Commerce, Oct. 2015.<http://mn.gov/commerce/energy/images/final-unabridged-chp-action-plan-2015.pdf>.

- **Activity #4: CHP Attribution Model and Project Evaluation Criteria Regulatory Process**: The goal of this activity is to formalize these efforts through Commissioner's Order pursuant to Minnesota Rules Chapter 7690.

II. Priority Area: Mapping CHP Opportunities

FVB Energy's "CHP Technical and Economic Potential" report illustrates that there is significant economic potential for CHP in the state, but a more granular analysis is needed to identify specific project opportunities for implementation. Feedback from the CHP stakeholder meetings indicate that except for limited utility studies, efforts to identify CHP opportunities tend to happen only with a policy impetus, and pilot projects and demonstration programs can serve to advance development frameworks, clarify alternative project approaches and structures, and test their viability. Stakeholders also suggested that project feasibility studies, potentially with State support, could help clarify potential for CHP development in the state.

Stakeholders specifically indicated that examining CHP potential at public facilities would be the most useful mapping initiative to help facilitate CHP deployment in the state. Public facilities are good candidates for implementation of CHP systems in Minnesota as many have significant and concurrent electric and thermal demands and public entities are better able to accept longer paybacks and have access to financing.

There is also a great opportunity to utilize CHP and other distributed generation technologies at wastewater treatment facilities to capture energy savings. One approach to reduce electricity consumption at wastewater facilities is to use anaerobic digestion to produce digester gas and then use the digester gas as a fuel for the combined production and beneficial use of heat and electrical power.

II. Action Item: Map CHP Opportunities at Wastewater Treatment Facilities and Public Facilities

Objective: Map CHP project opportunities at wastewater treatment facilities and at public facilities to identify most viable project opportunities for potential implementation.

CHP Mapping at Wastewater Treatment Facilities

Commerce was awarded, in partnership with the University of Minnesota Technical Assistance Partnership (MNTAP) and the Minnesota Pollution Control Agency (MPCA), a DOE grant to decrease energy use at Minnesota municipal wastewater facilities and scope opportunities for renewable energy generation. Commerce will assess opportunities for CHP implementation at wastewater facilities as part of this project's scope.[17] These facilities could serve as demonstration projects for CHP in the wastewater treatment sector and help guide the development and implementation of similar projects in the state. Through this project, Commerce and its core project partners will:

[17] "Wastewater Treatment Plant Project Webpage." *Minnesota Technical Assistance Program*, 2015. <http://www.mntap.umn.edu/POTW/wwtp.html>.

1. *Develop partnerships* with municipalities operating wastewater treatment facilities with technical assistance providers, technology providers, and state/regional resources to assess operations for improved energy efficiency opportunities.

2. *Conduct EE opportunity assessments* at sites with sufficient energy efficiency opportunity potential and that are positioned to implement resulting opportunities.

3. *Facilitate site investment* in identified proposed project concepts to decrease site energy consumption.

4. *Assess renewable generation opportunities* (e.g. facilities with CHP potential).

CHP Mapping for Public Facilities

Commerce intends to build on the analysis completed by FVB Energy and assess CHP opportunities at public facilities in Minnesota provided external funding can be procured to support such an effort.[18] The primary goal of this effort would be to map and identify the most viable CHP opportunities at public facilities in Minnesota. This project could help spur implementation of favorable CHP projects identified at public facilities and increase the current 961.5 MW of CHP capacity in Minnesota by around 100 MW in the near-term. Through this project, Commerce in partnership with the Energy Resources Center (ERC) would map and identify the most viable CHP opportunities at public facilities in Minnesota by:

1. Expanding upon Commerce and the ERC's body of CHP work in Minnesota by identifying and mapping existing sources of CHP potential for possible development.

2. Conducting an initial market characterization of CHP opportunities at public facilities in Minnesota relying on existing public data and utilizing a specialized CHP screening tool developed by the project team.

3. Carrying out detailed CHP feasibility studies (based on a quantitative and qualitative approach) at 8-15 of the most favorable sites identified through the initial screening of CHP public facilities.

4. Reviewing the opportunity potential and next steps with site management and key stakeholders to facilitate impact and project implementation.

5. Developing an Implementation Model that focuses on the CHP public facility screening tool developed and validated during the project, which other public facilities can utilize to identify and implement CHP opportunities. This Implementation Model would lay the groundwork for a dedicated Lead By Example initiative in Minnesota, that could be leveraged by other states, dedicated to the implementation of CHP in the public sector.

[18] To fund this project, Commerce and its project partner Energy Resources Center submitted a grant application to the DOE as part of the State Energy Program 2015 Competitive Awards. Unfortunately, Commerce was not awarded the grant. The Department will need to search for other funding sources to support this effort.

Timing:

- CHP Mapping at Wastewater Treatment Facilities: intermediate-term (2016-2017)
- CHP Mapping for Public Facilities: TBD based on procurement of external funding to support project

Below is a high-level outline of the timelines for the two CHP mapping efforts. More detail about each of the individual tasks is provided in the following "Plan" section.

CHP Mapping at Wastewater Treatment Facilities Project Timeline

Task 1: Strategic Planning (Months 1-3)

Task 2: Develop Partnerships (Months 1-12)

Task 3: Conduct EE Assessments (Months 5-30)

Task 5: Identify RE Opportunities (Months 9-36)

Task 6: Implementation Model (Months 24-36)

Task 7: Dissemination of Results (Months 33-36)

CHP Mapping for Public Facilities Project Timeline

Task 1: Strategic Planning (Months 1-3)

Task 2: Initial Public Facility CHP Market Characterization (Months 4-9)

Task 3: Competitive RFP for CHP Feasibility Assessments Evaluator (Months 9-11)

Task 4: CHP Feasibility Assessments (Months 12-23)

Task 5: Implementation Model (Months 24-32)

Task 6: Dissemination of Results (Months 33-36)

Plan: At a high-level, the goals of this action item can be achieved by implementing the following strategy and plan outlined below (a more detailed version of the project plans can be found within the Unabridged Final CHP Action Plan[19]):

Mapping CHP Opportunities at Minnesota Wastewater Treatment Facilities

- *Task 1: Strategic Planning –* Work strategically with DOE and project partners to finalize the scope of work, establish timelines and expectations, and to define an ongoing communications and management plan.

- *Task 2: Develop Partnerships –* Engage municipal wastewater treatment facility managers and operators and inform them of the program opportunity and align regional utilities and assistance providers, technology providers, and state/regional resources to assess operations for improved energy efficiency and finance opportunities.

[19] Zoet, Adam, and Jessica Burdette. "Unabridged Final Combined Heat and Power Action Plan." *Minnesota Department of* Commerce, Oct. 2015.<http://mn.gov/commerce/energy/images/final-unabridged-chp-action-plan-2015.pdf>.

- *Task 3: Conduct Energy Efficiency Assessments* – Conduct energy efficiency opportunity assessments at sites with sufficient energy efficiency opportunity potential and that are positioned to implement resulting opportunities. Provide site specific detailed report summary of energy efficiency recommendations. Review the opportunity potential with site management and key stakeholder to promote impact. Share training resources with site and regional staff to improve awareness and self-directed assessment of energy efficiency opportunities.

- *Task 4: Facilitate site investment* – Identify barriers to implementation of facility energy efficiency recommendations and to develop strategies to overcome technical and financial barriers to implementation.

- *Task 5. Identify Renewable Energy Opportunities* – Identify and advance opportunities for renewable energy generation at wastewater facilities.

- *Task 6: Action Plan/Implementation Model* – Develop an Action Plan/Implementation Model that would present a detailed step-by-step process that other wastewater treatment facilities can follow to identify and implement onsite energy efficiency and renewable energy opportunities.

- *Task 7: Dissemination of Results* – Promote the resources that were developed under this project to key stakeholders.

Mapping CHP Opportunities at Public Facilities

- *Task 1: Strategic Planning* – Work strategically with DOE and project partners to finalize the scope of work, establish timelines and expectations, and to define an ongoing communications and management plan in order to achieve the goals set out in the subsequent phases of this project.

- *Task 2: Initial Public Facility CHP Market Characterization* – Conduct an initial market characterization of CHP opportunities at public facilities in Minnesota relying on existing data and utilizing a specialized CHP screening tool developed by the project team.

- *Task 3: Competitive RFP for CHP Feasibility Assessments Evaluator* - The project team will develop and issue a request for proposal to hire a CHP evaluator to carry out the CHP feasibility assessments at public facilities as part of Task 4's scope.

- *Task 4: CHP Feasibility Assessments* - Based on findings of the initial public facility CHP screenings and the CHP market characterization report, the project team will conduct CHP feasibility studies (based on a quantitative and qualitative approach) at 8-15 of the most favorable sites identified in Task 2.

- *Task 5: Implementation Model* – Develop an Implementation Model that focuses on a specialized CHP public facility screening tool developed and validated during the project, which other public facilities can utilize to identify and implement CHP opportunities once it is made publicly available.

- *Task 6: Dissemination of Results* - Promote and deploy the resources that were developed under this project to key stakeholders and that can be utilized by public facilities in Minnesota and in other states.

III. Priority Area: Education and Training Needs and Options

Commerce contracted Microgrid Institute to develop a CHP Training and Education Plan by identifying gaps in knowledge and skills, considering training and education options, and producing a set of recommendations to support CHP deployment in the state.[20] Microgrid Institute gathered input and led discussion on training and education topics during the CHP stakeholder engagement process. An analysis of survey responses and meeting discussion content show that stakeholders perceive three primary gaps in market knowledge and workforce resources:

1. *CHP options and opportunities:* Some key stakeholder groups – most notably including prospective end-use customers – lack knowledge and understanding about CHP systems and their potential.

2. *Regulatory, finance, and development issues:* CHP development processes and factors are perceived as complex and uncertain, which tends to discourage decision makers from exploring and pursuing CHP development.

3. *Onsite energy staffing:* Workforce and training resources may be inadequate to support needs among prospective users of CHP and other onsite energy systems, including energy management and efficiency solutions.

III. Action Item: Expand Education and Training Resources on Commerce's Website

Objective: Commerce will continue to disseminate information about CHP opportunities primarily through updates to the Department's webpage.

Timing: Near-term (2015-2016).

Plan: Commerce will continue to disseminate information about CHP opportunities primarily through updates to the Department's CHP Stakeholder Engagement Webpage.[21] Updated resources will include:

- *Webinars and workshops:* Training to enable stakeholders to adopt and apply Minnesota's CHP project evaluation methodologies and criteria.
    - Commerce will address this goal by posting resources on the Department's website developed under Action Item I as they relate to establishing CHP attribution model and project evaluation criteria.

[20] Burr, Michael and Peter Douglass. "Combined Heat and Power: Training and Education Plan." *Microgrid Insitute*, Feb. 2015. <http://mn.gov/commerce/energy/images/mg-chp-training-education-plan.pdf>.
[21] "Combined Heat and Power Stakeholder Meetings Webpage." *Minnesota Department of Commerce*, 2015. <http://mn.gov/commerce/energy/businesses/clean-energy/distributed-generation/2014-workshops/chp-meetings.jsp>.

- *Project feasibility support:* Training, guidance, and ongoing assistance for stakeholder efforts to study the feasibility of CHP projects.
    - Commerce will address this by posting information resources on the Department's website related to its CHP mapping initiative outlined in Action Item II.
- *CHP evaluation resources:* Technical resources for stakeholder efforts to evaluate CHP development opportunities.
    - Commerce will address this goal by posting resources on the Department's website related to its CHP mapping initiative outlined in Action Item II.
- *Financing resource guides:* Guidance and reference information to assist stakeholders in efforts to plan and obtain financing for CHP projects.
    - Commerce will address this issue by providing links to financing programs on the Department's website that stakeholders can access for potential CHP projects.
- *Existing resources:* Commerce believes that there is already a wealth of existing CHP resources available from organizations such as the DOE CHP Technical Assistance Partnership,[22] EPA CHP Partnership,[23] SEE Action,[24] ACEEE,[25] and ICF International[26] that address the other education and training gaps that stakeholders identified, including:
    - *CHP information tools and programs:* Multimedia resources, case studies, and other information materials supporting stakeholder efforts to research and evaluate CHP generally.
    - *Legal and regulatory information*: Practical explanation and expert guidance relating to CHP laws, policies, and procedures affecting development.

IV. Priority Area: CHP Ownership Problems and Solutions

Discussions with stakeholders and results from the FVB Energy's "CHP Technical and Economic Potential" study illustrate that the economics of CHP projects are very site-specific, the upfront cost of CHP systems is often a significant barrier, and there is not a "one-size-fits-all" financial program or mechanism that meets the needs of every CHP project.

Stakeholder discussions suggest possible ways to overcome these barriers include incentives to reduce up-front capital costs, direct support for ancillary infrastructure investments, leveraging financing programs to reduce costs of capital, and flexible rate treatment including on-bill repayment for utility investments in customer-side CHP.

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[22] "CHP Technical Assistance Partnership (CHP TAPs) Webpage." *U.S. Department of Energy*. <http://energy.gov/eere/amo/chp-technical-assistance-partnerships-chp-taps>.
[23] "Combined Heat and Power Partnership Webpage." *U.S. Environmental Protection Agency*. <http://www.epa.gov/chp/>.
[24] "Combined Heat and Power Webpage." *State & Local Energy Efficiency Action Network*. <http://www4.eere.energy.gov/seeaction/topic-category/combined-heat-and-power>.
[25] "Combined Heat and Power Webpage." *American Council for an Energy Efficient Economy*. <http://aceee.org/topics/combined-heat-and-power-chp>.
[26] "U.S. DOE Combined Heat and Power Installation Database Webpage." *U.S. Department of Energy*, 5 Aug. 2015. <https://doe.icfwebservices.com/chpdb/>.

IV. Action Item: Leverage Existing Financing Programs Applicable to CHP

Objective: Explore, communicate, and improve awareness of financing programs that could be better leveraged to meet the individual needs of customers for CHP projects.

Timing: Near-term (2015-2016).

Plan: Commerce will continue to explore ways to improve its own financing program offerings that could be utilized for CHP projects (such as the ones summarized in the Table below). However, there is a need for an organization(s) outside of Commerce to champion a wider effort to explore CHP financing and ownership issues, synthesize and summarize existing resources that could be leveraged, and provide recommendations for ways to address gaps and barriers.

	Guaranteed Energy Savings Program	**Local Energy Efficiency Program**	**Energy Savings Partnership**	**Trillion Btu Program**	**Commercial - Property Assessed Clean Energy Program**	**Rev It Up Program**
Eligibility (recipient)	State Agencies, Higher Ed, Local Governmental Units, K-12	Local Governmental Units, K-12	LEEP Program participants	Commercial and Industrial Businesses, 501 (c)(3) organizations	Commercial and Industrial Businesses, 501 (c)(3) organizations	Local Governmental Units, Commercial and Industrial Businesses, Small Businesses (< 50 employees), Health Care Facilities, MHFA
Type	State Administered Energy Savings Performance Contracting (ESPC) Program	State Administered Design-Bid-Build (DBB) Program for local governmental entities	Lease Purchase Agreement	Revolving Loan Fund	Special Assessment (against property)	Revenue Bonds – tax-exempt or taxable (project dependent)
Project Size	Min. $350k Max. none	Min $50k Max. $350k	Min. $50k Max. none	Min. 10k Max. $1M	Max. 20% of Assessed Property Value	Min. $1M Max. $20M
Term (years)	Up to 25	Up to 15	Up to 15	Up to 5	Up to 20	Up to 25
Interest Rate			3 – 6%	4.5 – 6%	4 - 6%	Dependent upon issuance (4 – 6%)
Administrator	Commerce	Commerce	St. Paul Port Authority	St. Paul Port Authority	St. Paul Port Authority; SWRDC	Commerce
Resources	http://mn.gov/commerce/energy/topics/financial/Energy-Savings-Program/	http://mn.gov/commerce/energy/topics/financial/Energy-Savings-Program/	http://sppa.com	http://sppa.com	sppa.com http://www.swrdc.org/economic-development/grant-opportunities/	http://mn.gov/commerce/energy/businesses/financial/funding-opportunities.jsp

V. Priority Area: CIP CHP Supply-Side Investments

As discussed during the CHP stakeholder meetings, CHP systems do not fit neatly into the standard definition of supply-side or demand-side efficiency resources as CHP systems address system efficiency improvements. Consequently, CHP does not clearly fit into utility CIPs, which focus on demand-side efficiency to meet the 1.5% energy savings goal.

Stakeholders explored issues related to expanding or adapting CIP to encourage CHP through a new category of supply-side conservation opportunities with new and separate goals and incentives. Thirty-eight percent of respondents who participated in the post-engagement CHP stakeholder survey indicated that including CHP as an eligible supply-side resource under electric utility infrastructure (EUI) investments in CIP would be an effective policy initiative to explore and facilitate CHP deployment in Minnesota.[27]

V. Action Item: Examine Electric Utility Infrastructure Policy

Objective: Commerce will explore and clarify whether and how CHP could qualify as an eligible supply-side resource as defined under EUI statutory language.

Timing: Long-term (2015-Onward). Examining and clarifying EUI policy will likely take a considerable amount of time to finalize, but beginning to explore this issue in the near-term can still help inform CIP Triennial Plan filings, and programmatic changes can be incorporated into utility plans in the longer-term through the CIP modification process.

Plan: Commerce issued an RFP in April 2015 to hire a consultant to identify and develop a set of EUI measures that could be included in Minnesota's Technical Reference Manual (TRM) as well as the Energy Savings Platform Smart Measure Library.[28] GDS Associates was selected as the successful responder.

The new EUI measures for the TRM produced via this project will be used as the basis for developing measures for CIP plans and calculating claimed savings over 2017-2019 by Minnesota investor-owned, municipal, and cooperative electric utilities. The new TRM will be finalized and released by year-end 2015. The EUI measures will be added after the release in the review period. More details about the individual tasks related to this project can be found within the Unabridged Final CHP Action Plan.[29]

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[27] Minnesota Statute 216B.241 subd. 1c (d) allows a utility or association to include in its energy conservation plan energy savings from EUI improvements projects approved by the Minnesota Public Utilities Commission under 216B.1636 on top of a minimum energy saving goal of at least one percent from end-use efficiency measures, provided that the EUI projects result in greater energy efficiency than would have occurred through normal maintenance activity. EUI cost recovery is addressed for investor-owned utilities in 216B.1636.

[28] The Minnesota Technical Reference Manual consists of a set of standard methodologies and inputs for calculating the savings impacts and cost-effectiveness of utility CIPs in Minnesota.

[29] Zoet, Adam, and Jessica Burdette. "Unabridged Final Combined Heat and Power Action Plan." *Minnesota Department of* Commerce, Oct. 2015.<http://mn.gov/commerce/energy/images/final-unabridged-chp-action-plan-2015.pdf>.

This project will act as a starting point to also explore policy questions regarding whether and how CHP could qualify as an eligible EUI resource. Commerce will collaborate with Minnesota utilities through the TRMAC to examine whether CIP EUI provisions could facilitate supply-side efficiency improvements, including CHP, and explore the implications for existing demand-side CIP programs.

V. Alternative to CIP EUI Approach

There were myriad CHP regulatory and policy barriers raised during the CHP stakeholder engagement process. FVB Energy's "Minnesota CHP Policies and Potential" study provides a thorough assessment of potential changes to Minnesota policies and programs to increase the implementation of CHP.[30] Among FVB Energy's key conclusions is that improved policies could lead to significantly greater implementation of CHP in Minnesota. Specifically, the creation of a new Alternative Portfolio Standard (APS), which would require electric utilities to obtain a specified percentage of sales from CHP (regardless of fuel) by a given year, could increase Minnesota's CHP deployment by as much as 1,000 MW of new CHP by 2030 - approximately a doubling of current CHP.

While an APS would require legislation and creation of an entirely new program and implementation mechanisms, it could prove to be a viable alternative approach to help spur CHP implementation in the state. Therefore, if CIP EUI provisions are deemed inappropriate or ineffective to support CHP investments, Commerce recommends continued discussion with stakeholders regarding alternate policy solutions such as a new APS that could increase CHP deployment, where appropriate, in Minnesota and explore the addition of other thermal renewable fuel sources.

VI. Priority Area: Standby Rates

Forty-three percent of respondents who participated in the post-engagement CHP stakeholder survey indicated that introducing transparent, unbundled pricing for standby rates would be an effective policy initiative to facilitate CHP deployment in Minnesota. Overall, the standby rate discussion that occurred as part of CHP stakeholder engagement process and ERC's study on the effects of standby rates on CHP deployment suggest that improvements to existing standby frameworks could lead to greater implementation of CHP and other distributed generation resources. If the economic barrier that standby rates currently impose on CHP projects were completely eliminated, the ERC's analysis indicates that the potential for new CHP capacity with a less than a ten-year payback would increase from 779 MW to 1,116 MW within Minnesota's IOU service territories.

[30] Spurr, Mark. "Minnesota Combined Heat and Power Policies and Potential." *FVB Energy,* Jul. 2014. <http://mn.gov/commerce/energy/images/CHPRegulatoryIssuesandPolicyEvaluation.pdf>.

VI. Action Item: Continue Discussion Through PUC's Generic Proceeding

Establishing a generic proceeding on standby rates would help address a priority issue that was identified through the extensive analysis completed by Commerce and its partners. Commerce hopes that the PUC will take up such a proceeding in the near future so that stakeholders can collaborate to examine possible improvements to standby service. Commerce intends to participate in this regulatory proceeding.

Further detail regarding each of these summary recommendations can be found within the Unabridged Final CHP Action Plan.[31]

[31] Zoet, Adam, and Jessica Burdette. "Unabridged Final Combined Heat and Power Action Plan." *Minnesota Department of* Commerce, Oct. 2015.<http://mn.gov/commerce/energy/images/final-unabridged-chp-action-plan-2015.pdf>.