

2014 Minnesota CHP Stakeholder Survey:

Pre-Engagement Results Report

Prepared For:

Minnesota Department of Commerce - Division of Energy Resources

Prepared By:



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Background and Methodology

The 2014 Minnesota Combined Heat and Power (CHP) Stakeholder Perspectives Survey seeks to gauge opinions and knowledge among a sample of people interested in onsite energy options in Minnesota and related regulatory policies and market factors. The Minnesota Department of Commerce, Division of Energy Resources (DER), commissioned the survey as the result of a grant from the U.S. Department of Energy to support stakeholder engagement in the development of a CHP action plan. This longitudinal survey assesses perspectives before and after a series of CHP Stakeholder Engagement Meetings hosted by DER during September, October, and November 2014 in St. Paul.

Initial (pre-engagement) survey questions focused on factors affecting deployment of CHP systems in Minnesota. Survey questions were divided into four categories:

- Demographics and CHP Experience
- CHP Policy
- CHP Resources and Technology
- CHP Market Potential
- CHP Finance

Microgrid Institute developed and administered this survey under the direction and review of DER and its CHP Working Group. To develop survey questions, Microgrid Institute reviewed DER-commissioned reports and other industry literature, and interviewed subject matter experts on CHP markets, policy and legal issues, and finance and economics. Except for demographic questions, the initial (pre-engagement) survey primarily used bounded-continuous answer formats to gauge a range of opinions and perspectives among respondents. Typical questions asked respondents to indicate a range of agreement or disagreement with a series of statements, or asked respondents to rank a series of factors in terms of perceived importance. Microgrid Institute selected these question formats as best-practice methods for gauging changes in perspective over time.

The pre-engagement survey opened on Monday, Aug. 4, with initial notifications distributed via email to 143 recipients. Most recipients completed the survey online, with a few completing the survey by phone. By the survey's close at 5:00 p.m. on Friday, Aug. 15, 45 participants completed valid responses.

Survey Sample

The sample for the CHP Stakeholder pre-engagement survey was comprised of individuals and organizational representatives that DER, the CHP Working Group, and Microgrid Institute expected would be interested in issues addressed during the CHP Stakeholder Engagement Meetings.

Representatives of utilities and government institutions comprised approximately two-thirds of the sample. The remaining one-third was comprised primarily of representatives from end-use companies, CHP technology vendors, consultants, and environmental organizations.

Survey respondents were self-selected—*i.e.*, they opted in to respond to the survey, and Microgrid Institute had limited control over demographic distribution of responses from among the stakeholder sample. Additionally, the survey required respondents to provide valid contact information to determine that A) they were among the sample group and B) whether they would participate in separate interviews on the survey subject. The survey assured respondents that their answers would be treated confidentially by Microgrid Institute and DER, and that survey results would be reported only in aggregate form.

To mitigate limitations with sample size and therefore demographic distribution, survey methodologies prioritized increasing responses among a range of different stakeholder groups. Microgrid Institute and DER conducted reminder email and telephone notifications to increase survey response rates generally, and especially from underrepresented groups (primarily end-use customers), and also to address technical issues affecting survey completion by some participants.

Findings and Analysis

Pre-engagement survey responses reflect a range of knowledge, experience, and opinions related to CHP operations, markets, policies, and economics in Minnesota.

CHP Experience, Technology and Operations: Among respondents with direct or indirect experience owning and operating CHP, most report those experiences have been favorable. Among the 30 percent of respondents reporting direct experience with CHP, 87 percent said their experience was mostly to all favorable, and 53 percent indicated their CHP operations and maintenance (O&M) requirements have been mostly or all easy to manage. (A further 40 percent indicated O&M was partly easy and partly difficult to manage, and 7 percent said it was mostly difficult to manage.) Among the 45 percent of respondents reporting indirect experience with CHP, about 65 percent said their experience was mostly to all favorable, and 35 percent said they were partly or mostly not favorable.

About 32 percent of respondents reported that they currently are considering or working to install a CHP system, with 46 percent of those projects in either engineering and development or construction phases.

Respondents generally indicate positive views toward CHP technologies, with substantial majorities agreeing that CHP technologies today:

- are effective and reliable (84 percent agree or strongly agree);

- produce substantial efficiency improvements (64 percent);
- can use a wide range of fuels (63 percent); and
- can serve a wide range of customer requirements (79 percent).

CHP Policy: Responses regarding CHP policies indicate a mix of perspectives, with generally more responses indicating that current energy policies and regulatory frameworks tend to impede CHP deployment in Minnesota.

A plurality (49 percent) of respondents disagreed or strongly disagreed with a statement that standby power tariffs are fair and non-discriminatory toward CHP systems owned by customers and third parties in Minnesota. By comparison, 19 percent of respondents agreed or strongly agreed with the same statement, and 32 percent neither agreed nor disagreed.

Most respondents ranked utility business interests and strategic conflicts (presumably related to regulatory frameworks) as the most important hindrances to CHP deployment in Minnesota—both by utilities (53 percent ranked as #1 or #2) as well as customers and third parties (63 percent ranked #1 or #2). Inadequate policy incentives were identified as the second most important hindrance to CHP deployment by customers and third parties, while uncertainties about applying CHP toward CIP goals were identified as the second-most important hindrance to CHP deployment by utilities.

Market Potential: Three-fourths (76 percent) of respondents agreed or strongly agreed that many viable sites exist for CHP deployment today. Respondents recognized a range of market factors affecting CHP potential in Minnesota. Among the factors suggested in the survey, the most respondents agreed or strongly agreed that potential for CHP deployment substantially increases with:

- rising electricity prices (84 percent);
- low natural gas prices (79 percent);
- greater knowledge and understanding of CHP (73 percent); and
- greenhouse gas regulation (65 percent).

CHP Economics: Respondents indicated significant doubt about the economics of CHP under current market and policy conditions. For example, a majority of respondents (60 percent) disagreed or strongly disagreed that either efficiency incentives or environmental and renewable incentives adequately support commercial financing for CHP systems.

The survey results suggested ambivalence among stakeholders about whether CHP payback periods are too long. About 46 percent of respondents disagreed or strongly disagreed that commercial financing allows CHP system payback periods sufficient to support economic deployment. However, payback

period and return on investment ranked on average as the #1 most supportive factor affecting CHP economics, with access to affordable capital ranking a close second.

Among respondents who indicated the question applied to them, about half reported that their organizations require a payback periods no longer than either 2 years or 5 years for CHP or similar investments, while the other half can accept payback periods as long as 8 years, 10 years, or more.

Education and Training Needs: Respondents indicated some ambivalence about various talent, education, and training issues. For example, about 47 percent neither agreed nor disagreed that Minnesota's workforce includes ample talent qualified for CHP O&M, with 37 percent agreeing or strongly agreeing with the statement and 10 percent disagreeing or strongly disagreeing. Among areas of education and training, respondents ranked finance, investment, and development, and policy and legal issues as most important. Likewise, strategic understanding ranked #1 among technology and operational hindrances to CHP deployment in Minnesota.

Conclusion and Next Steps

To the degree the State of Minnesota determines that CHP represents a potential solution to achieve the state's energy goals, Minnesota policies should, at a minimum, treat CHP in a fair and nondiscriminatory manner, and regulatory frameworks should avoid discouraging or preventing CHP deployment—either by utilities or customers and third parties.

Accordingly, the results of the CHP Stakeholder pre-engagement survey suggest that efforts to develop a CHP action plan for Minnesota should evaluate the fairness and equity of current policies and regulatory frameworks—especially standby power tariffs, net metering policies, and utility cost-recovery models that discourage CHP deployment by either utilities or customers and third parties. Additionally, efforts should consider uncertainties regarding how CHP can be applied toward meeting Minnesota's energy policy goals, including conservation, renewable energy, and greenhouse gas reduction goals.

Moreover, survey responses suggest that efforts to develop a CHP education and training plan for Minnesota should focus on strategic understanding of CHP as well as related business and legal issues—as opposed to tactical understanding of CHP engineering and O&M, which respondents suggest are less instrumental for future CHP deployment.

Next steps in the Minnesota CHP Stakeholder Engagement Survey involve continued engagement with participants in DER's CHP Stakeholder Meetings, followed by a post-engagement survey. Microgrid Institute anticipates producing a final report presenting the results of the forthcoming post-engagement survey and comparing those results with pre-engagement survey results, to gauge changes in

perspective resulting from engagement and outreach processes, and to further support Minnesota's efforts to develop a CHP action plan.

Questions about either the pre-engagement or post-engagement survey and related reports should be directed to Microgrid Institute:

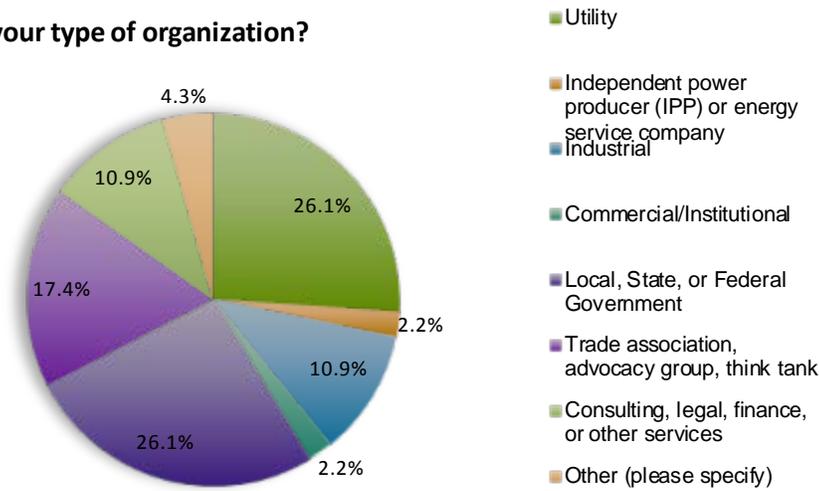
- Peter Douglass (pdouglass@microgridinstitute.org / 320-493-1923)
- Michael Burr (mtburr@microgridinstitute.org / 320-632-5342)

2014 Minnesota CHP Stakeholder Survey: Pre-Engagement Results

Section 1: Demographic Information and CHP Experience

Question 1:

What is your type of organization?



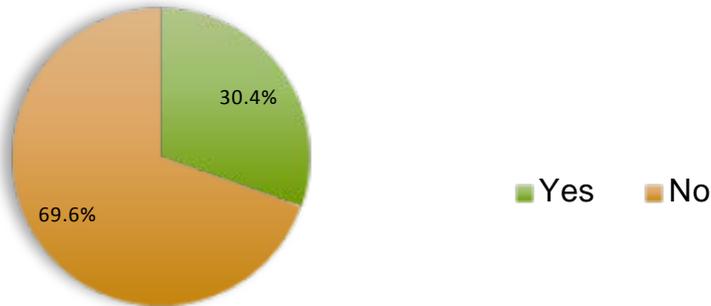
Question 2:

What is your role at your organization?



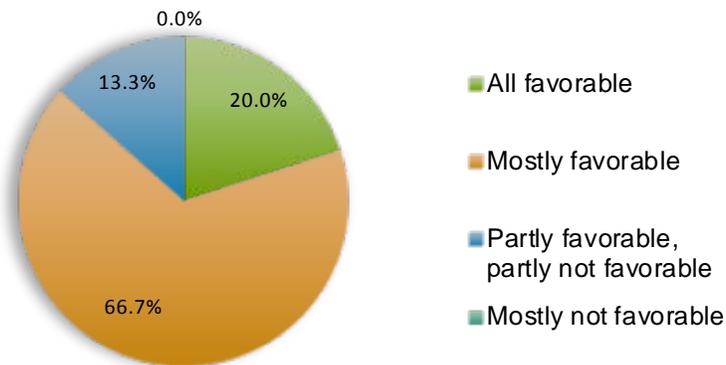
Question 3:

Do you or your organization have direct experience owning and operating CHP systems?



Question 4:

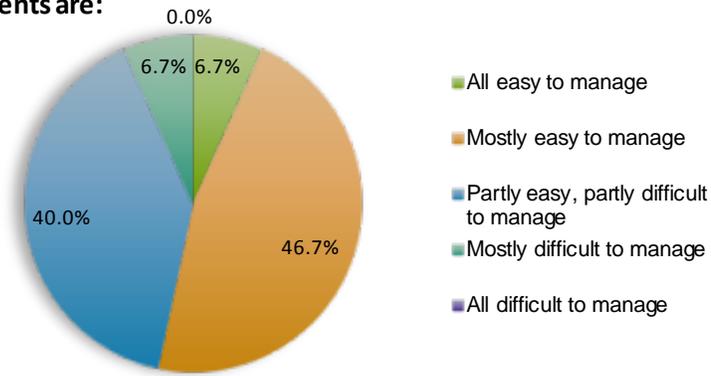
My organization's direct experience with CHP has been:



- 30% of respondents indicated they have direct experience owning and operating CHP systems, of which 87% said their experience was mostly to all favorable.

Question 5:

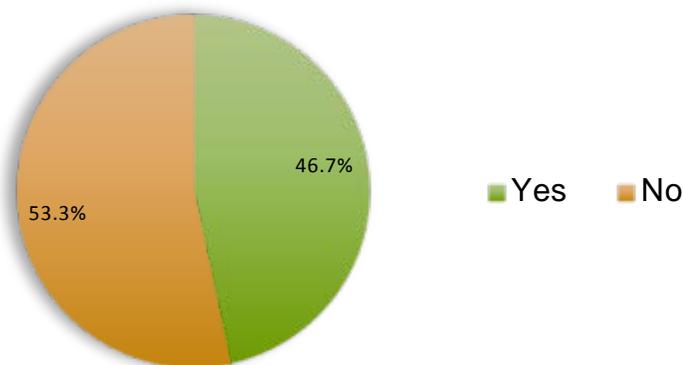
For my organization today, CHP operations and maintenance (O&M) requirements are:



- 53% of respondents stated that their CHP O&M was mostly easy or all easy to manage. The remaining 47% reported O&M was either partly or mostly difficult to manage.

Question 6:

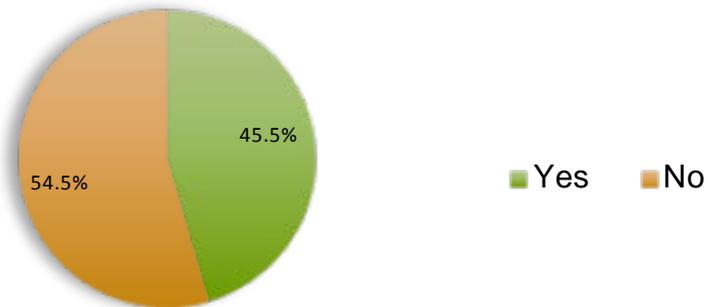
Does your organization sell excess electricity offsite or into the utility grid?



- 47% of respondents with CHP systems sell excess electricity offsite or to the utility grid.

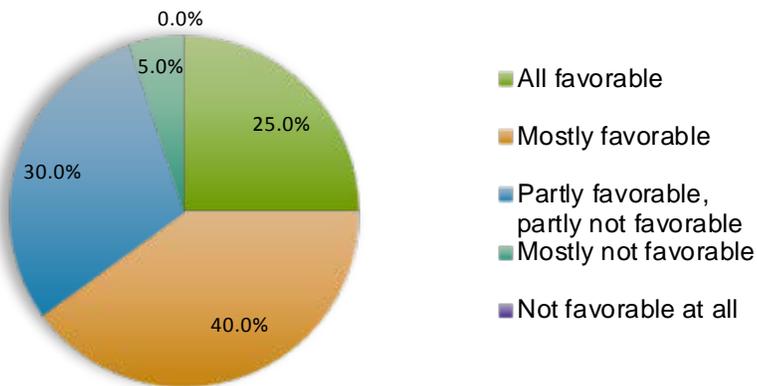
Question 7:

Do you or your organization have indirect experience with CHP systems



Question 8:

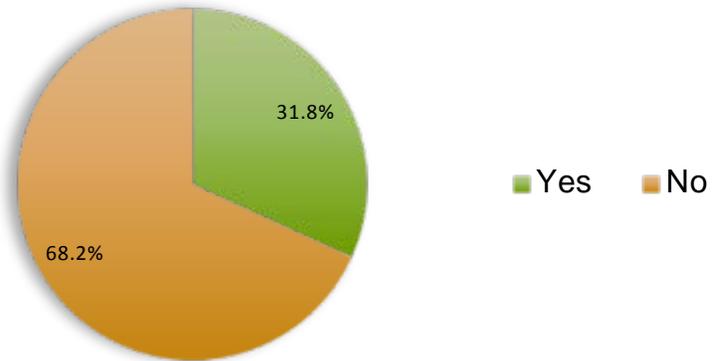
My organization's indirect experience with CHP owned by others has been:



- 46% of respondents indicated they have indirect experience with CHP systems owned and operated by other organizations, of which 65% said their experience was mostly to all favorable.

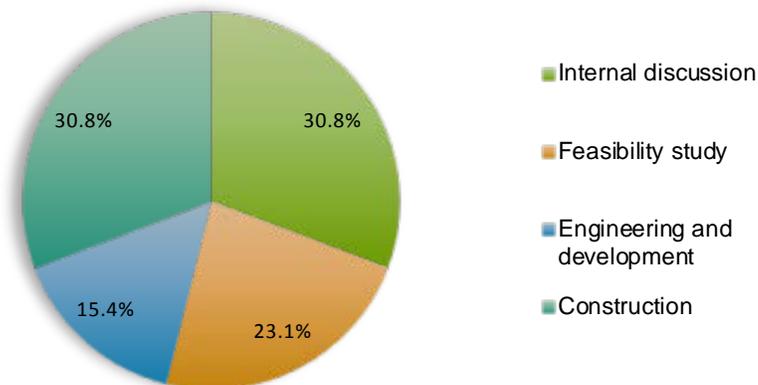
Question 9:

Are you currently considering or working to install a CHP system?



Question 10:

At what stage is your new CHP project?

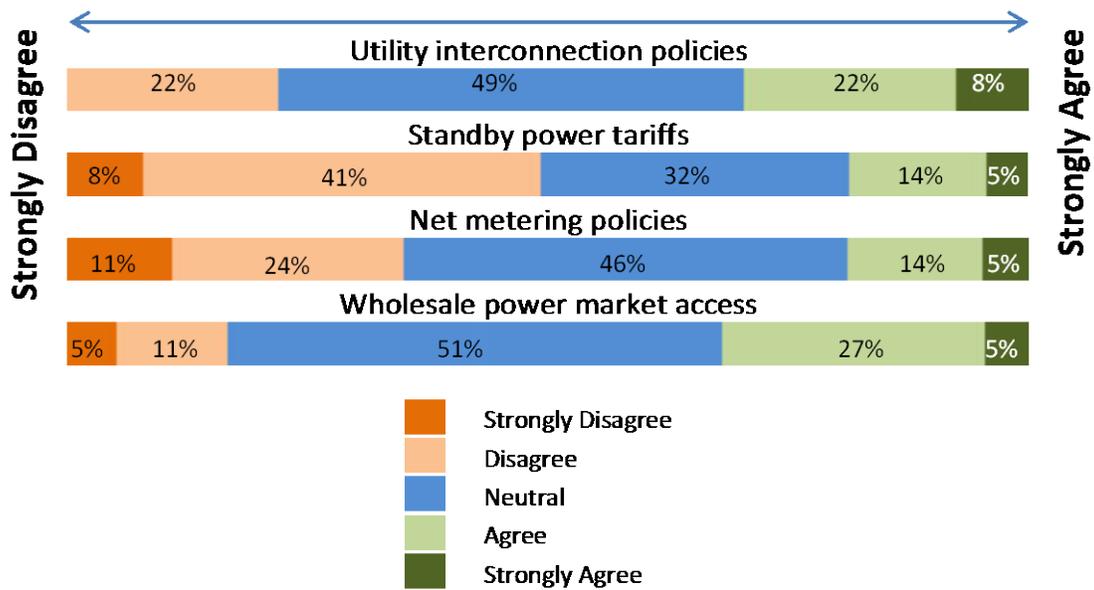


- 32% of respondents indicated they are currently considering or working to install a CHP system. Of those, 46% reported that their planned CHP systems are in engineering and development or construction phases.

Section 2: CHP Policy

Question 11:

Please indicate the degree to which you agree or disagree that each of the following policies is fair and nondiscriminatory towards customer- and/or third-party-owned CHP systems in Minnesota.

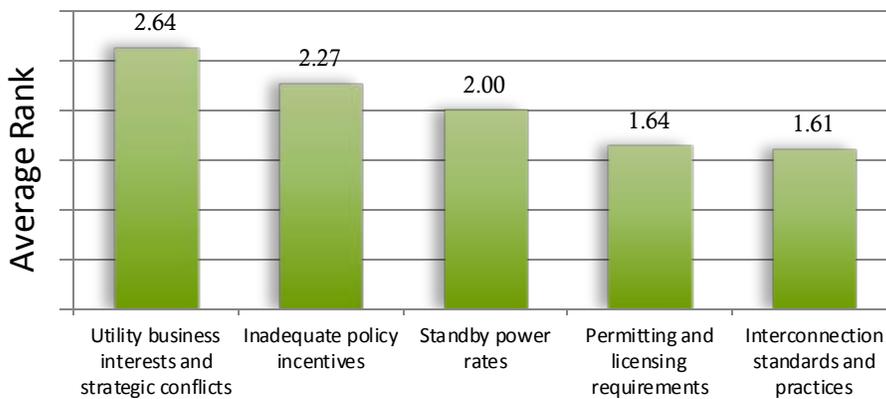


- 49% of respondents disagree or strongly disagree that standby power tariffs are fair and non-discriminatory, while 35% disagree or strongly disagree that net metering policies are fair and non-discriminatory.
- 30% of respondents Agree or Strongly Agree that utility interconnection policies are fair and nondiscriminatory towards customer- and/or third-party-owned CHP systems in Minnesota and 32% Agree or Strongly Agree that access to a wholesale power market is fair and non-discriminatory.

Question 12:

RANK the following policy issues in terms of how substantially you believe they hinder CHP deployment *by customers and third parties* in Minnesota.

Figure 1: Average Rank out of 5



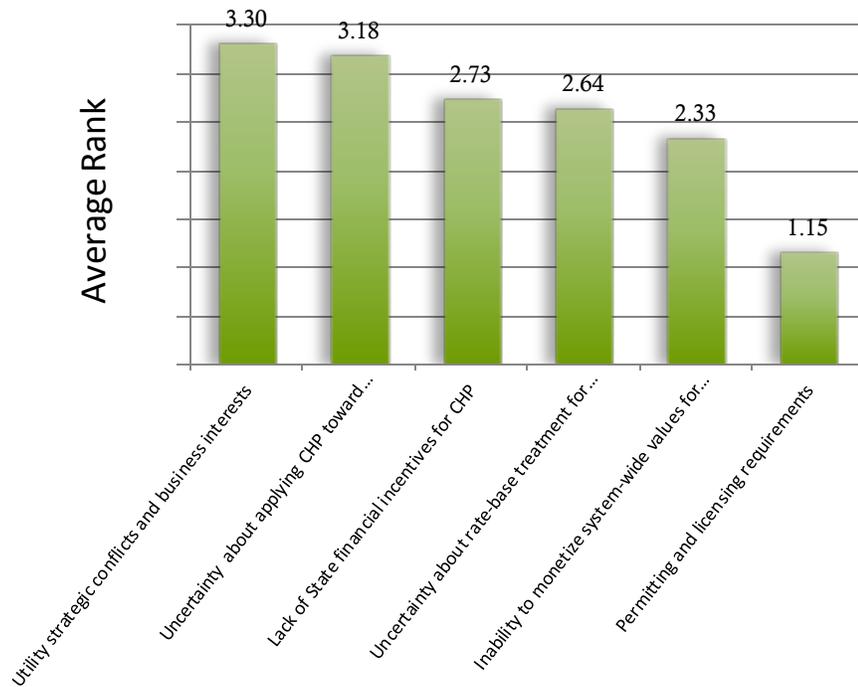
NOTE: Weighted average ranking. (See Appendix A: *Weighted Average Rank Formula*)

- Utility business interests and strategic conflicts along with inadequate policy incentives were ranked as the largest hindrances to CHP deployment by customers and third parties in Minnesota. Standby power rates, permitting and licensing requirements and interconnection standards and practices were ranked 3, 4 and 5 respectively.

Question 13:

RANK the following policy issues in terms of how substantially you believe they hinder CHP deployment *by utilities* in Minnesota.

Figure 2: Average Rank out of 6

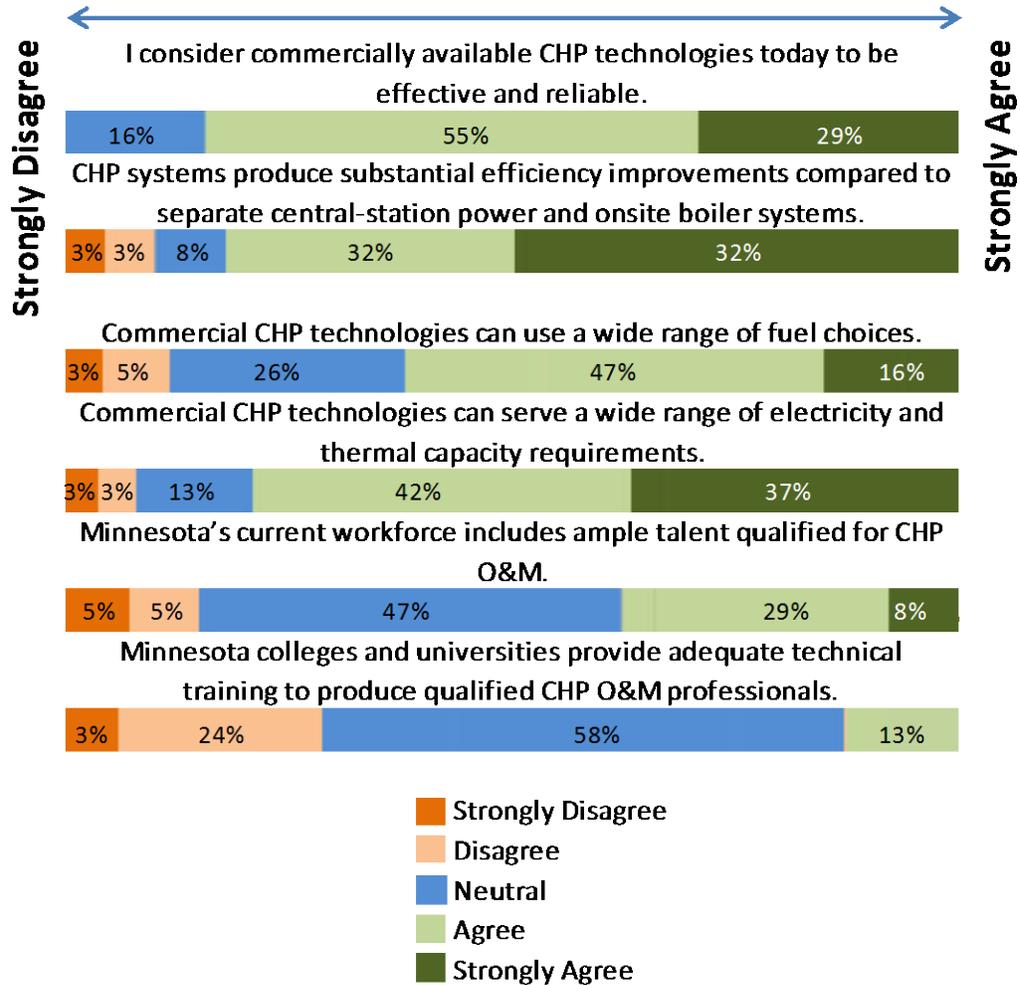


- Utility strategic conflicts and business interests, as well as uncertainty about how to apply CHP toward meeting utilities' CIP goals were ranked as the biggest hindrances to CHP deployment by utilities in Minnesota.

Section 3: CHP Resources and Technology

Question 14:

Please indicate the degree to which you agree or disagree with the following statements.

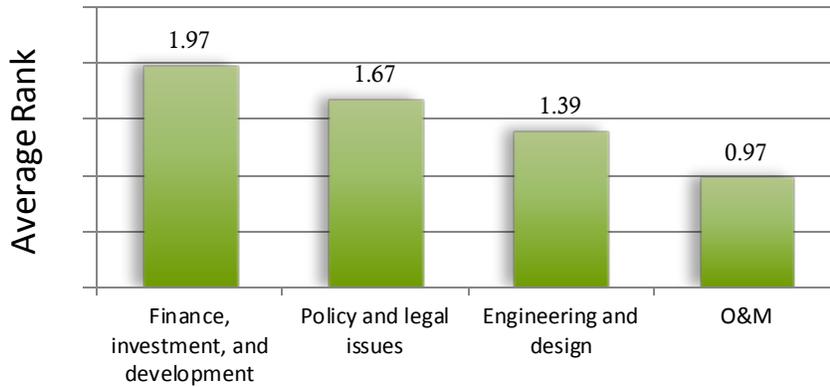


- 64% of respondents agree or strongly agree that CHP systems produce substantial efficiency improvements compared to separate central-station power and onsite boiler systems.
- 84% consider commercially available CHP technologies today to be effective and reliable.
- 79% agree or strongly agree that commercial CHP technologies can serve a wide range of electricity and thermal capacity requirements.
- 63% agree or strongly agree commercial CHP technologies can use a wide range of fuel choices.

Question 15:

RANK the following areas of Education and Training that are most urgently needed to support CHP deployment in Minnesota

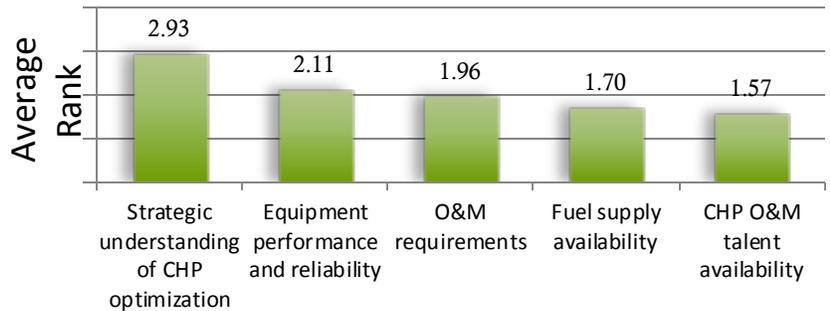
Figure 3: Average Rank out of 4



Question 16:

RANK the following technology and operational issues in terms of how substantially they hinder CHP deployment

Figure 4: Average Rank out of 5

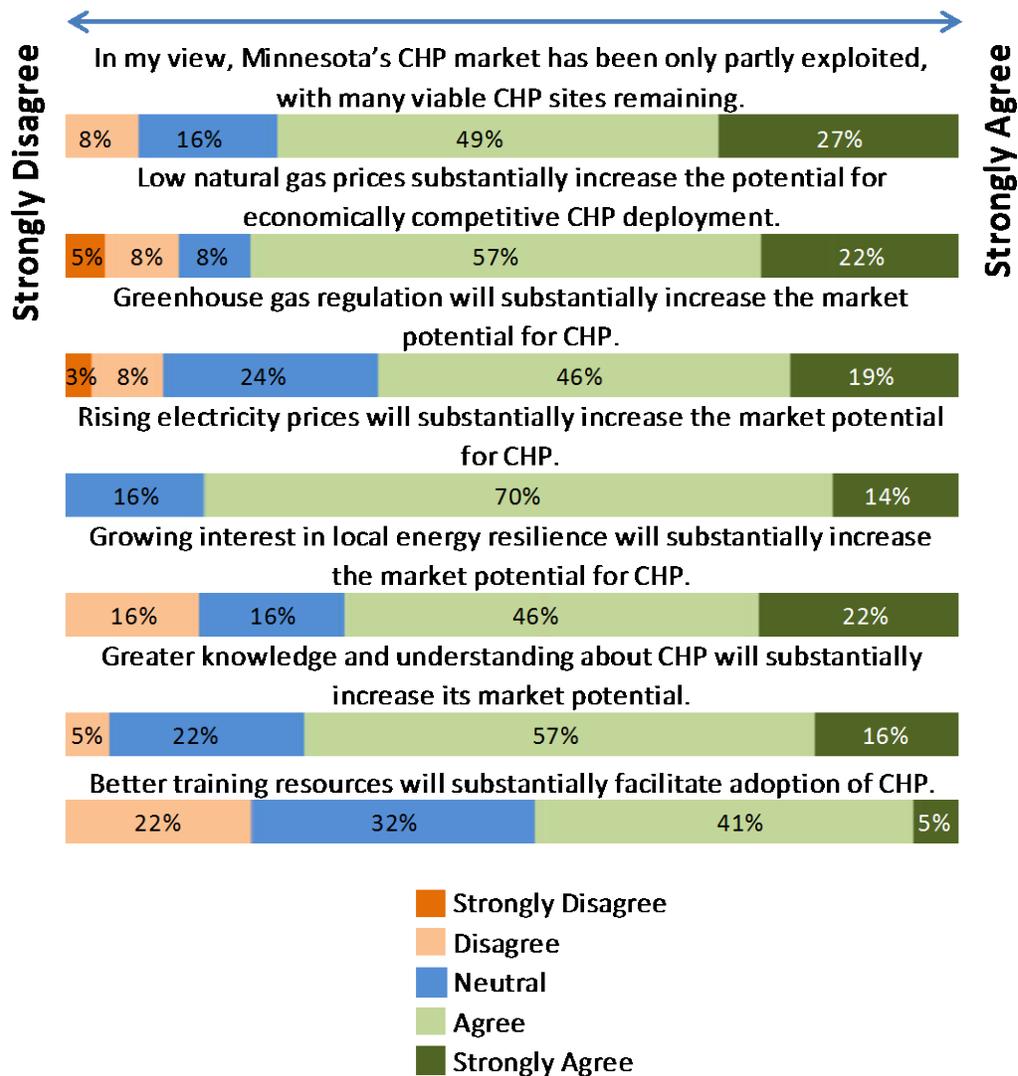


- Strategic understanding of CHP optimization as well as equipment performance and reliability were ranked as the most sizable technology and operational hindrances to CHP deployment in Minnesota.

Section 4: CHP Market Potential

Question 17:

Please indicate the degree to which you agree with the following statements as they apply to CHP in Minnesota today. (Strongly Disagree=1; Disagree=2; Neutral=3; Agree=4; Strongly Agree=5):

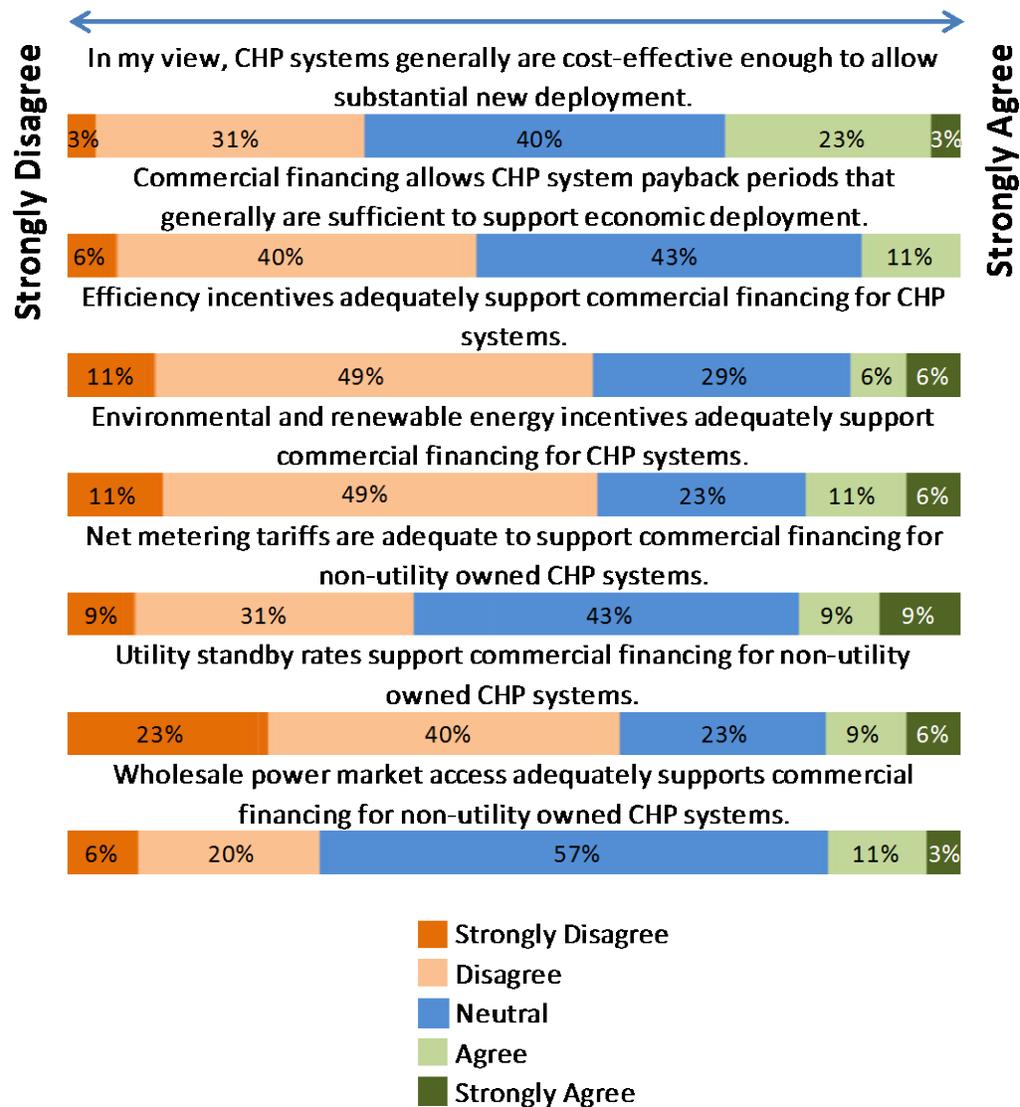


84% of respondent believe that rising electricity prices will substantially increase the market potential for CHP and 76% believe Minnesota's CHP market has been only partly exploited, with many viable CHP sites remaining.

Section 5: CHP Finance

Question 18:

Please indicate the degree to which you agree with the following statements as they apply to CHP in Minnesota today.

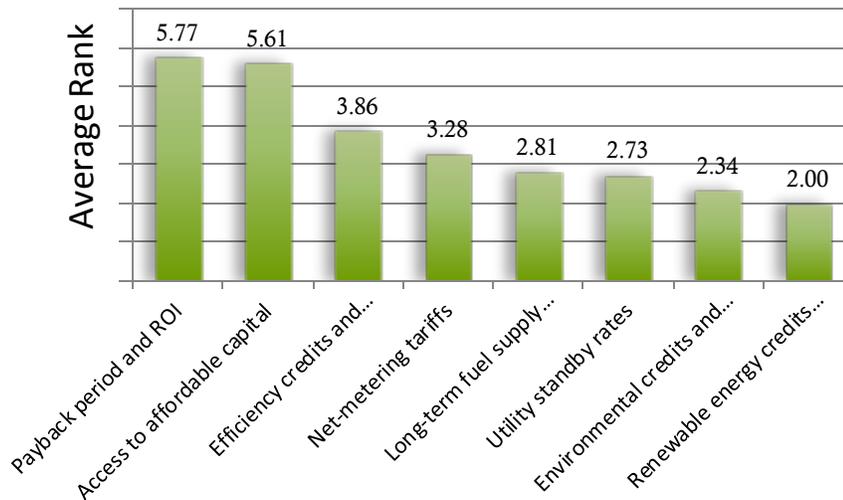


- 63% of respondents disagree that utility standby rates support commercial financing for non-utility owned CHP systems.
- 60% of respondents disagree that efficiency incentives as well as environmental and renewable energy incentives adequately support commercial financing for CHP systems.

Question 19:

RANK the following financing issues in terms of how effectively they support CHP deployment in Minnesota.

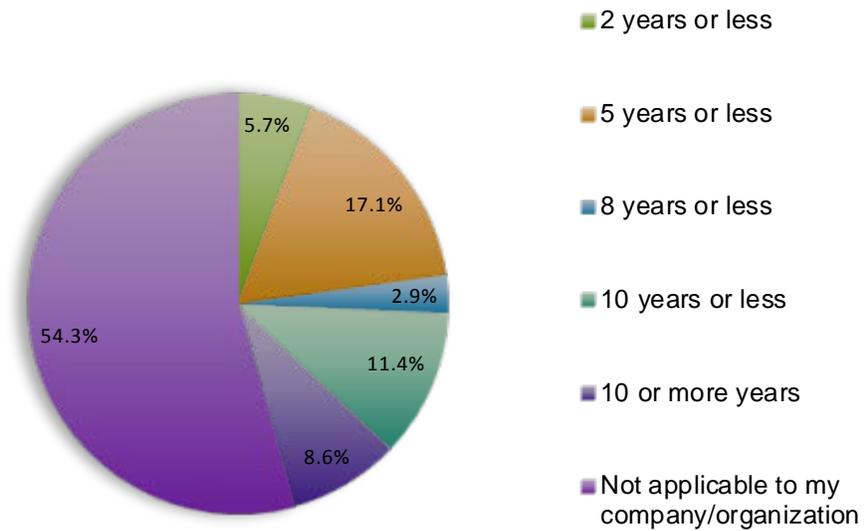
Figure 5: Average Rank out of 8



- Two thirds of respondents ranked payback period/return on investment in addition to access to affordable capital as the most important financing issues that can support CHP deployment in Minnesota.

Question 20:

For CHP or similar investments, my company/organization typically requires a simple payback period of:



- 23% of respondents require a simple payback period of 5 years or less for CHP systems.

- END OF SURVEY REPORT -

Appendix A: Weighted Average Rank Formula

Ranking questions calculate the average ranking for each answer choice to determine which answer choice was the highest ranked overall. The largest average ranking number indicates the top answer choice. When presented on a bar graph, for example, the longest bar will logically correspond with the highest ranked answer choice. The weighted ranking results are produced by the source application and cannot be adjusted by the survey administrator.

The ranking average is calculated as follows, where:

w = weight of ranked position

x = response count for answer choice

$$\frac{X_1W_1 + X_2W_2 + X_3W_3 \dots X_nW_n}{\text{Total}}$$

(Source: SurveyMonkey)