

# MI Power Grid New Technologies and Business Models Workgroup: Combined Heat & Power

Identified Barriers	Possible Solutions
1. High standby rates	•
2. Complex and confusing electric rates <sup>i</sup>	• Create tools to allow interested entities to easily identify the rate impacts for the specific CHP or WHP application. This also supports clearer estimation of project's economic benefits.
3. Interconnection with utility can be lengthy, unclear, and frustrating. <sup>ii,iii</sup>	•
4. Not all electric companies willing to allow net metering of natural gas and propane systems, <sup>iv</sup> even if they reduce emissions compared to the energy mix at the time.	• Allow net metering even for fossil fuel generated electricity <sup>v</sup> that provides greenhouse gas reductions.
5. Integrated resource plans do not adequately consider CHP and WHP systems.	•
6. Lack of regulatory path and incentives for utilities to use CHP and WHP to make money. <sup>vi</sup>	<ul style="list-style-type: none"> <li>• Create incentives and regulatory path that supports utility implementation of CHP and WHP.</li> <li>• Create incentives for electric utility to invest in CHP and WHP.<sup>vii</sup></li> </ul>
7. No regulatory support for growing natural gas and propane technologies <sup>viii</sup>	• Regulations supporting easier installation of natural gas and propane technologies. <sup>ix</sup>
8. Legislative barriers regarding fuel switching	<ul style="list-style-type: none"> <li>• Change legislation to remove fuel switching barriers.</li> <li>• Clarify that CHP is not fuel switching.<sup>x</sup></li> </ul>
9. MI Renewable Energy Credits for renewable resources and EWR credits for energy conservation. No incentive for CO <sub>2</sub> emissions reductions from CHP or WHP generation. <sup>xi</sup> There is also a lack of utility incentives for these technologies. <sup>xii</sup>	<ul style="list-style-type: none"> <li>• Create legislative changes to provide incentives for CO<sub>2</sub> emissions reductions from CHP and WHP systems</li> <li>• Recognize that WHP is emissions free, as it uses waste heat that will be wasted if not captured.<sup>xiii</sup> It currently receives the same level of investment tax credit as wind and solar energy at the federal level.<sup>xiv</sup></li> <li>• Monetize CO<sub>2</sub> reductions and clarify the value to decarbonization.<sup>xv</sup></li> </ul>
10. MI energy policies tilting economics of clean energy in favor of renewables, regardless of CO <sub>2</sub> emissions reductions <sup>xvi</sup>	<ul style="list-style-type: none"> <li>• Revise MI energy policies to incentivize CHP and WHP alongside renewables<sup>xvii</sup></li> <li>• Create technology neutral incentives based on actual carbon reductions.<sup>xviii</sup></li> <li>• Alternatively:<sup>xviii</sup> <ul style="list-style-type: none"> <li>○ Add WHP to MI RPS</li> <li>○ Include CHP in Advanced Clean Energy Portfolio Standard</li> </ul> </li> <li>• Provide robust incentives for other industrial energy efficiency projects</li> </ul>
11. High capital costs <sup>xix</sup>	<ul style="list-style-type: none"> <li>• Incentive programs to reduce initial cost and reduce return on investment period.<sup>xix</sup></li> <li>• Public education. CHP and WHP are cheaper than storage in microgrids.<sup>xx</sup></li> </ul>

	<ul style="list-style-type: none"> <li>• Be clear about the assumptions used to calculate project payback, such as variable utility rates. Build in flexibility.<sup>xxi</sup></li> <li>• Areas most suitable for CHP, such as hospitals, universities, industrial facilities, and cannabis growers,<sup>xxii</sup> can be identified and supported through incentives.</li> <li>• Capitalize on utility investment, public private partnerships, and private capital<sup>xxiii</sup> to reduce costs.</li> </ul>
12. Perceived risk of natural gas future price risk. <sup>xxiv</sup>	•
13. Negative view of its environmental impact due to use of natural gas in net zero carbon goal environment.	<ul style="list-style-type: none"> <li>• Provide education regarding the significant emissions reduction available from CHP and WHP systems, even in comparison to intermittent carbon free sources of electricity.<sup>xxv</sup></li> <li>• Support fueling systems with renewable and lower-carbon fuels such as biogas, renewable natural gas or biomethane, and hydrogen.<sup>xxvi</sup></li> <li>• Renewable natural gas has high technical resource potential that may help offset natural gas demand equivalent to residential consumption and yield 95% reduction in residential GHG emission from natural gas<sup>xxvii</sup></li> </ul>
14. Lack of standardization in the site versus source calculation for greenhouse gas reductions.	<ul style="list-style-type: none"> <li>• Develop a standardized procedures for calculating site versus source greenhouse gas reductions.</li> <li>• Allow net metering for all technologies (agnostic of fuel source) that provide an overall reduction in greenhouse gases,<sup>xxviii</sup> according to standardized procedures.</li> </ul>
15. Lack of method to value resiliency <sup>xxix</sup>	<ul style="list-style-type: none"> <li>• Find way to account for the resiliency benefits derived from CHP and WHP systems through development of metrics.</li> </ul>
16. Decision maker hesitancy (Not in the business of running power plants)	<ul style="list-style-type: none"> <li>• District scale solutions allows a third party to run the CHP and WHP systems so the entities can focus on core business<sup>xxx</sup></li> </ul>
17. Lack of knowledge of CHP and WHP systems	<ul style="list-style-type: none"> <li>• Educate public on CHP and WHP systems and their benefits.<sup>xxxi</sup></li> <li>• Contractor trainings.<sup>xxxii</sup></li> </ul>
18. Workforce knowledge barriers	•

Note: CHP = Combined Heat and Power. WHP = Waste Heat to Power.

## Applicable and Emerging Business Models

- District solutions (Rob Thornton)
  - Community-scale energy solutions, p. 3
  - Resilient City, p. 4
  - Paradigm shift – local generation of heat and power, p. 10
  - Climate disaster mitigation, p. 11

- Residential CHP (Tom Miller)

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- <sup>i</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>ii</sup> Miller, T. 04/07/2021 workgroup PPT. p. 12.
  - <sup>iii</sup> Panel: Speaking from Experience – CHP Motivations, Barriers, and Realities. 04/07/2021 workgroup meeting.
  - <sup>iv</sup> Miller, T. 04/07/2021 workgroup PPT. p. 22.
  - <sup>v</sup> Miller, T. 04/07/2021 workgroup PPT, p. 22.
  - <sup>vi</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>vii</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>viii</sup> Miller, T. 04/07/2021 workgroup PPT, p. 22.
  - <sup>ix</sup> Miller, T. 04/07/2021 workgroup PPT, p. 22.
  - <sup>x</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>xi</sup> Sharkey. 04/07/2021 workgroup PPT, slide 24., p. 128 PDF.
  - <sup>xii</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>xiii</sup> Sharkey. 04/07/2021 workgroup PPT, slide 7.
  - <sup>xiv</sup> Sharkey. 04/07/2021 workgroup PPT, slide 16.
  - <sup>xv</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>xvi</sup> Sharkey. 04/07/2021 workgroup PPT, slide 25., p. 127 PDF.
  - <sup>xvii</sup> Sharkey. 04/07/2021 workgroup PPT, slide 26., p. 128 PDF.
  - <sup>xviii</sup> Panel: Speaking from Experience – CHP Motivations, Barriers, and Realities. 04/07/2021 workgroup meeting.
  - <sup>xix</sup> Miller, T. 04/07/2021 workgroup PPT, p. 22.
  - <sup>xx</sup> Kirshbaum. 04/07/2021 workgroup PPT, slide 14.
  - <sup>xxi</sup> Panel: Speaking from Experience – CHP Motivations, Barriers, and Realities. 04/07/2021 workgroup meeting.
  - <sup>xxii</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>xxiii</sup> Thornton. 04/07/2021 workgroup PPT, slide 39-40.
  - <sup>xxiv</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>xxv</sup> Miller, G. 04/07/2021 workgroup PPT, p. 25-26.
  - <sup>xxvi</sup> Kirshbaum. 04/07/2021 workgroup PPT, slide 5.
  - <sup>xxvii</sup> Miller, G. 04/07/2021 workgroup PPT, p. 29.
  - <sup>xxviii</sup> Miller, T. 04/07/2021 workgroup PPT, p. 22.
  - <sup>xxix</sup> Panel: The Power of CHP-Roadblocks to Harnessing its Opportunity. 04/07/2021 workgroup meeting.
  - <sup>xxx</sup> Thornton. 04/07/2021 workgroup PPT. and Swinson. 04/21/2021 workgroup PPT.
  - <sup>xxxi</sup> Miller, T. 04/07/2021 workgroup PPT, p. 22.
  - <sup>xxxii</sup> Miller, T. 04/07/2021 workgroup PPT, p. 22.