



# CHP Roadmap for Michigan

## Program Description

A project team completed an intensive two-year study to develop a roadmap for Michigan to ramp up its deployment of combined heat and power (CHP). The Michigan Energy Office (MEO) led the team, which also included the Energy Resources Center, 5 Lakes Energy LLC, NextEnergy, and Sustainable Partners LLC (“SPART”). With 3,000 MW of Michigan’s coal-fired generating units scheduled to come offline before 2030, MEO identified an opportunity for CHP to play a more significant role in the state’s energy mix. The [CHP Roadmap for Michigan](#) project differed from previous projects; it applied an integrated resource modeling tool to determine least-cost deployment of CHP resources under various reliability and environmental constraints based on projections of demand, fuel prices, technology price and performance, taxes, and other factors. Depending on natural gas prices and the availability of renewable energy resources, optimal levels of additional CHP deployment in Michigan ranged from 722 MW to 2,360 MW between 2018 and 2030. Parallel to this modeling effort, the project team completed an analysis of Michigan’s CHP-related supply and value chains, providing insight to support state-level policy analyses and recommendations.

## Program Development

**REASON FOR PROJECT:** CHP is a proven technology with environmental, economic and grid benefits, but Michigan has seen few new installations in recent years. MEO sought to identify why and how to overcome CHP barriers.



**In 2016, Oakland University added a 4.7 MW CHP gas turbine unit to its central heating plant, providing 60 MMBtu/hour of thermal output (high-temperature water). In addition, the university’s Engineering Center houses two microturbines that each generate 200 kW of electricity and sufficient hot water to supplement the campus-wide water system and melt snow on the building’s perimeter.**

**The CHP Roadmap for Michigan identified between 722 MW and 2,360 MW of least-cost additional CHP development among key categories of end users, including colleges and universities. These CHP installations at Oakland University provide examples of typical CHP installations in Michigan.**

**TIMELINE:** January 2016–February 2018

**BUDGET:** \$310,000

**SOURCE OF FUNDING:** U.S. Department of Energy and MEO (State Energy Office)

**KEY FINDINGS:** Michigan is home to 88 CHP systems with an installed capacity of 3,500 MW. The CHP Roadmap for Michigan identifies an ideal level of additional CHP of between 722 MW and 2,360 MW by 2030. Projects are considered viable if the payback period is 10 years or less for public and institutional sectors and less than four years for the private sector.

## Stakeholders and Partners

MEO informs energy policy and program development by facilitating partnerships, administering grant funds, and providing statewide education, outreach opportunities, and stakeholder collaboratives. For this project, MEO engaged with over 300 individuals, including 21 detailed interviews with representatives active in the various sectors of Michigan’s CHP supply and value chains. Project partners also received detailed survey results from over 100 individuals working at firms throughout these sectors.

## Summary of Policy Results and Outcomes

To achieve optimal levels of CHP deployment in Michigan, the CHP Roadmap for Michigan recommends the following action items:

- Consider best practices in utility standby rates and Public Utility Regulatory Policies Act (PURPA) avoided cost/buyback rates
- Fully value CHP when considering costs and benefits of distributed energy resources
- Incorporate CHP as a resource in Michigan utility energy waste reduction plans
- Require utility integrated resource plans to consider CHP as both a supply-side and demand-side resource
- Update interconnection standards to better align with new technologies and best practices.
- Offer financial incentives for CHP adoption
- Promote Property Assessed Clean Energy (PACE) financing and on-bill financing for CHP, which would allow customers to pay for projects as part of their utility bills
- Collaborate closely with leading CHP organizations, including the Midwest CHP Technical Assistance Partnership (CHP TAP)

## Lessons to Share

The methodology employed throughout the roadmap project was developed with the objective of replicability in other states. To achieve this objective, the project team relied on:

- U.S. Department of Energy state-by-state CHP technical potential projections
- U.S. Department of Energy CHP Installation Database
- U.S. Environmental Protection Agency data on CHP economics and performance across a range of technologies and generating capacities
- U.S. Energy Information Administration data for Michigan's existing power plant portfolio

### Resources:

- ["CHP Technology Roadmapping and Modeling Presentation, Integrated Resource Planning \(IRP\) Workshop, Michigan Public Service Commission," April 12, 2017](#)
- ["Michigan Energy Office Issues Combined Heat and Power Report," August 1, 2018](#)

Mapping of the Michigan CHP supply and value chains relied on methodology previously developed to support creation of the [Michigan Clean Energy Roadmap](#). Boundaries for supply and value chain mapping were determined through market research and market analysis based on likely economic impacts to the state of Michigan arising from deployment of CHP projects. Market segments where Michigan companies are currently participating in the CHP supply or value chain were given principal consideration for surveys and interviews.

## For More Information

**U.S. DOE MIDWEST CHP TECHNICAL ASSISTANCE PARTNERSHIP (CHP TAP)**  
[www.mwchptap.org](http://www.mwchptap.org)

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