



*Customer-Sited Renewable Potential Study*  
*Kick off Meeting Discussion*

**Presented by:**

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**Presented to:**

*Michigan DSM Collaborative*

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## **Customer Sited Renewable Generation– What we want to address**

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- **Key Study Components**
- **Work Approach**
- **Potential Resources**
- **Next Steps**

## **Customer-Sited Renewable Generation– Key Study Components**

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- 1) Determine Potential for Customer-sited renewable generation for select resources**
  
- 2) Quantify potential savings and reduced GHG emissions from estimated customer-sited renewable potential**
  
- 3) Propose funding levels for different levels of customer-sited renewable generation**
  
- 4) Recommend program designs to achieve potential**

## **Customer Sited Renewable Generation– Key Resources**

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**Focus on most likely resources in terms of availability option to Michigan consumers, customer interest and future potential**

- **Solar PV – up to 2MW**
- **Wind – up to 1.5 MW**
- **Farm Methane**
- **CHP with biomass**

## **Work Approach: 1) Determine Customer-Sited Renewable Resource Potential**

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- **Estimate 10-year annual energy and demand potential**
- **Technical Potential.** The technical potential is the total renewable resources, located within the state, with the potential for electric energy conversion.
- **Practical Potential.** This is the amount of capacity that we believe can be developed based on practical considerations. It is the potential that might reasonably be expected to be implemented based on currently available technologies and other screens specific to each resource, potential funding incentives and development constraints.

## Work Approach: 1) Determine Customer-Sited Renewable Resource Potential (Continued)

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- Review stakeholder sources of potential
- Literature review of public sources
- Review relevant load data

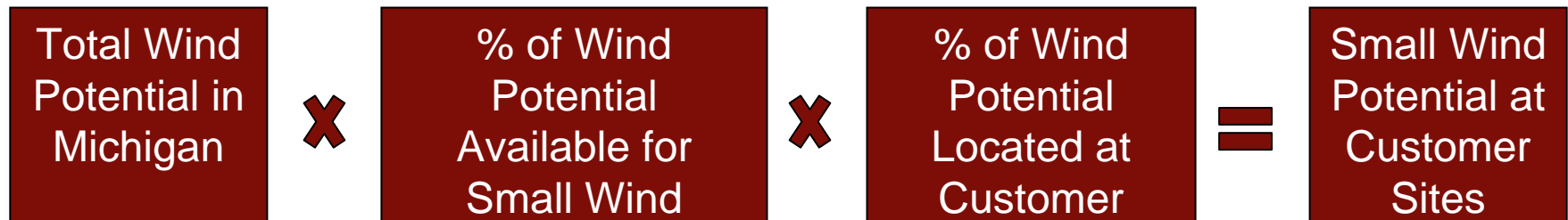
Resource	Potential		Potential Funding and Incentives	Development Constraints
	Technical	Practical		
Wind				
Solar				
etc.				

## Work Approach: 1) Determine Customer-Sited Renewable Resource Potential (Continued)

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### Small Wind Example

- We will start with NREL Wind Potential
  - Eliminate resource not suitable for small wind turbines
  - Identify available land that could support wind turbines at residences/businesses and eliminate potential not on customer sites
  - Account for intermittency



## **Work Approach: 2) Quantify Savings and Greenhouse Gas Emissions Reductions**

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- **Quantify potential savings**
  - **Quantify reduction in peak demand and energy**
  - **Determine reduction in avoided costs of electricity**
  
- **GHG Reductions**
  - **Determine marginal emissions rate**
  - **Calculate emission reductions from fuel displacement by renewables**
  - **Review in context of State goals**

## **Work Approach: 3) Propose Funding Levels**

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- **Develop supply curve of funding level vs. customer sited generation**
- **Work with Michigan's Department of Technology Management and Budget Purchasing Operations to establish scenarios of:**
  - **Incentive Levels**
  - **Avoided Costs**
  - **Customer Responsiveness**
- **Determine revised potential based on scenarios**
  - **BAU case**
  - **Aggressive Incentive case**

## **Work Approach: 4) Program Designs to meet Achievable Potential**

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- **Evaluate design options**
  - **Review current Michigan Programs**
  - **Assess best practices of programs in other states**
- **Assess Market Barriers**
  - **Regulatory**
  - **Economic**
  - **Political**
  - **Technical**
- **Identify ways to Mitigate Market Barriers**

## Potential Resources: General

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Author	Title
Land Policy Institute	Potential Application of Renewable Energy on Brownfield Sites: A Case Study of Michigan
Environment Michigan Research & Policy Center	Energizing Michigan's Economy: Creating Jobs and Reducing Pollution with Energy Efficiency and Renewable Electric Power
National Renewable Energy Laboratory	Net Metering Policy Development in Minnesota: Overview of Trends in Nationwide Policy Development and Implications of Increasing the Eligible System Size Cap
National Renewable Energy Laboratory	State Clean Energy Practices: Renewable Energy Rebates
National Renewable Energy Laboratory	State of the States 2009: Renewable Energy Development and the Role of Policy

## Potential Resources: Wind

Author	Title
American Wind Energy Association	Small Wind Turbine Global Market Study
American Wind Energy Association	How and Why to Permit for Small Wind Systems: A Guide for State and Local Governments
American Wind Energy Association	Policies to Promote Small Wind Turbines: A Menu for State and Local Governments
Lawrence Berkeley National Laboratory	Building a Market for Small Wind: The Break-Even Turnkey Cost of Residential Wind Systems in the United States
US Department of Energy	Economic Benefits, Carbon Dioxide (CO <sub>2</sub> ) Emissions Reductions, and Water Conservation Benefits from 1,000 Megawatts (MW) of New Wind Power in Michigan
US Department of Energy	2009 Wind Technologies Market Report
US Department of Energy	Small Wind Electric Systems: A Michigan Consumers' Guide

## Potential Resources: Solar

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Author	Title
Lawrence Berkeley National Laboratory	The Impact of Rate Design and Net Metering on the Bill Savings from Distributed PV for Residential Customers in California
Lawrence Berkeley National Laboratory	Customer-Sited PV: A Survey of Clean Energy Fund Support
Lawrence Berkeley National Laboratory	Supporting Solar Power in Renewable Portfolio Standards: Experience from the United States
National Renewable Energy Laboratory	Rooftop Photovoltaics Market Penetration Scenarios
National Renewable Energy Laboratory	Supply Curves for Rooftop Solar PV-Generated Electricity for the United States

## Next Steps

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- **Compile and review useful data sources**
- **Develop baseline profile for potential**
- **Develop funding estimates for renewable energy potential alternatives**