



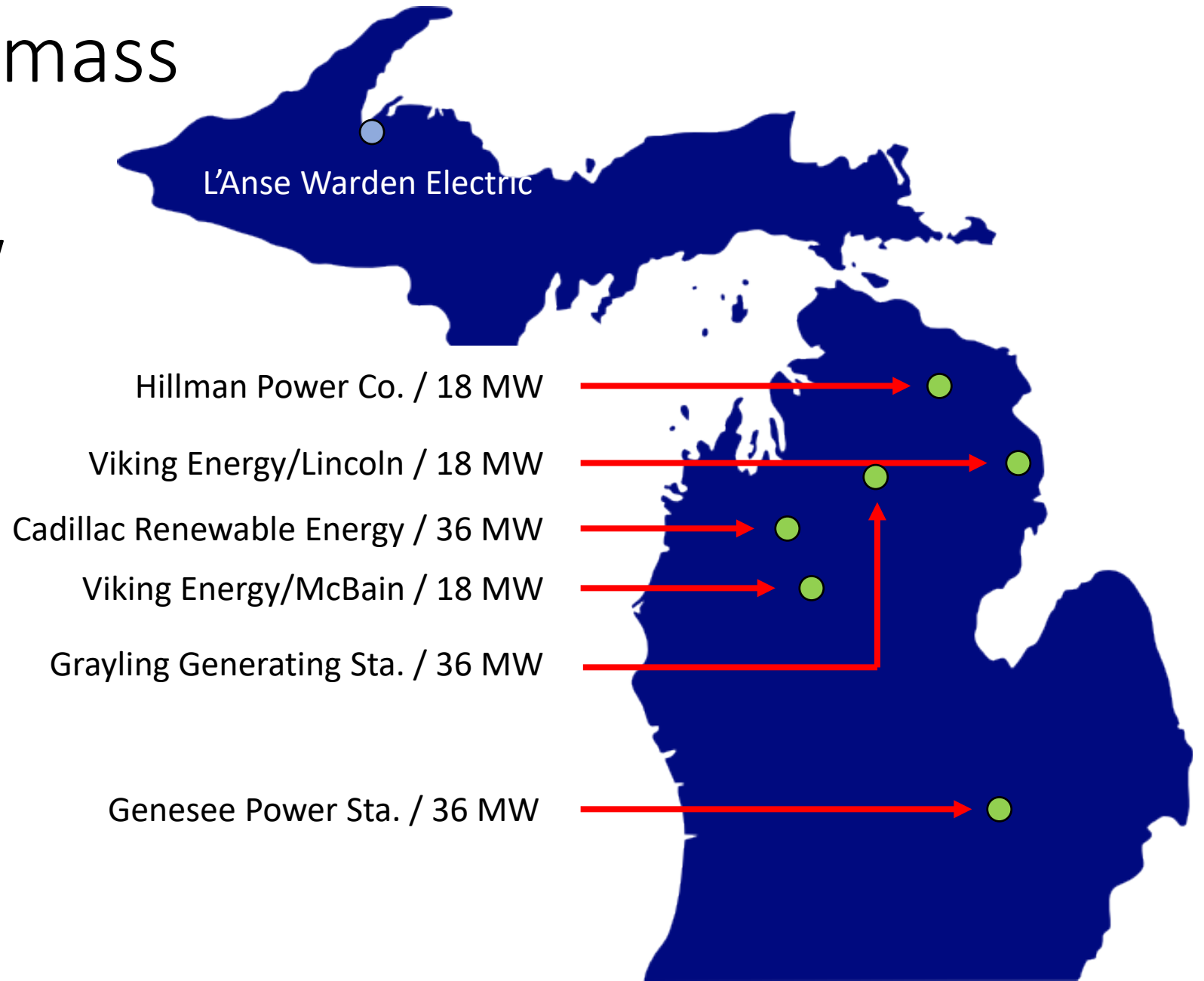
# Biomass Power in the Bioeconomy

*The Second Michigan Forest Bioeconomy Conference*

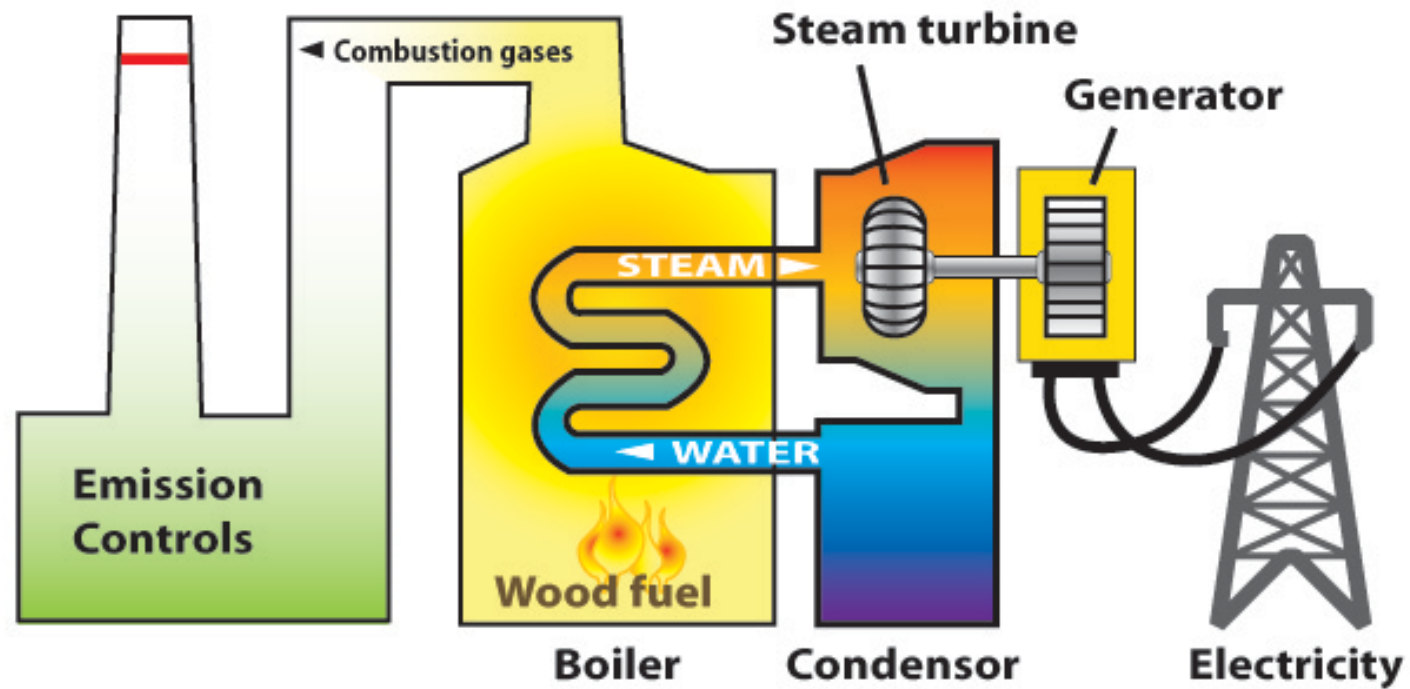
February 12-13, 2019

# Michigan Biomass

180 MW




# Biomass power generation



# Environmental regulation

## Federal

- Clean Air Act
- Clean Water Act
- NHSM rules
- RFS e-RIN
- Carbon neutral 

## Michigan

- Dept. Env. Gr. Lakes & Energy (DEGLE)
- Public Service Commission

NOV 19 2014

OFFICE OF  
AIR AND RADIATION

### MEMORANDUM

**SUBJECT:** Addressing Biogenic Carbon Dioxide Emissions from Stationary Sources

**FROM:** Janet G. McCabe, <sup>JGM</sup> Acting Assistant Administrator  
Office of Air and Radiation

**TO:** Air Division Directors, Regions 1-10

The President's Climate Action Plan (2013) highlights the critical role that America's forests play in addressing carbon pollution in the United States by removing nearly 12 percent of total U.S. greenhouse gas (GHG) emissions each year from the atmosphere. Conservation and sustainable management can help to ensure our forests and other lands continue to remove carbon from the atmosphere while also improving soil and water quality, reducing wildfire risk, and otherwise managing forests to be more resilient in the face of climate change. In many cases, the generation of sustainably sourced bioenergy products can be an integral part of regimes that promote conservation and sustainable forest management. The Environmental Protection Agency's (EPA) work on assessing biogenic carbon dioxide (CO<sub>2</sub>) emissions from stationary

# Renewable energy resource

Eligible under Michigan's Renewable Portfolio Standards *(15% by 2021)*

- Sec. 3(f) PA 295 of 2008
  - (iv) Trees and wood ... from sustainably managed forests or procurement systems
  - (vii) Wood wastes and residues from ... wood products or paper.

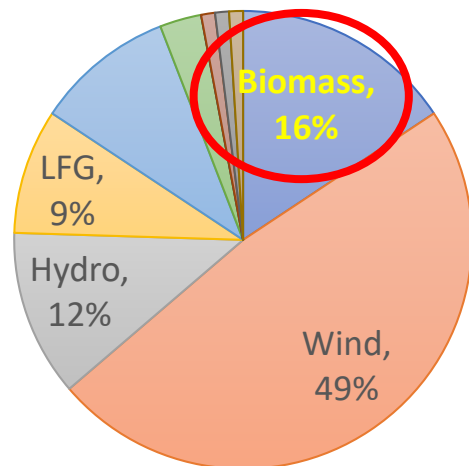


Fig. 1: 2016 Compliance RECs

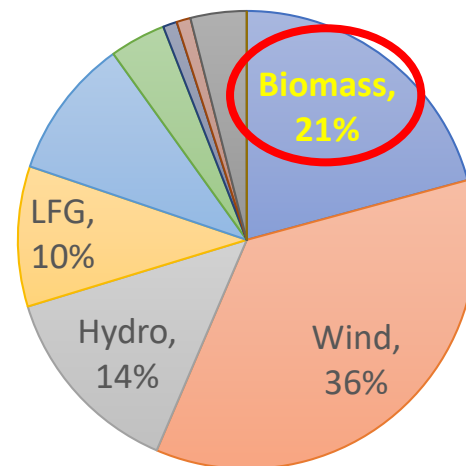


Fig. 2: 2009-17 Total REC Inventory

# The energy market

## Electric power customers

- Regulated utilities
- Municipal utilities *Pre-2000*
- Electric co-ops

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- Alternative suppliers *Post 2000*
- Corporate purchasing *Post 2000*
- Voluntary green energy programs

## Thermal customers

- Food production, processing
- Institutional heating/cooling
- Industrial processes

## Co-generation applications

# Ancillary benefits

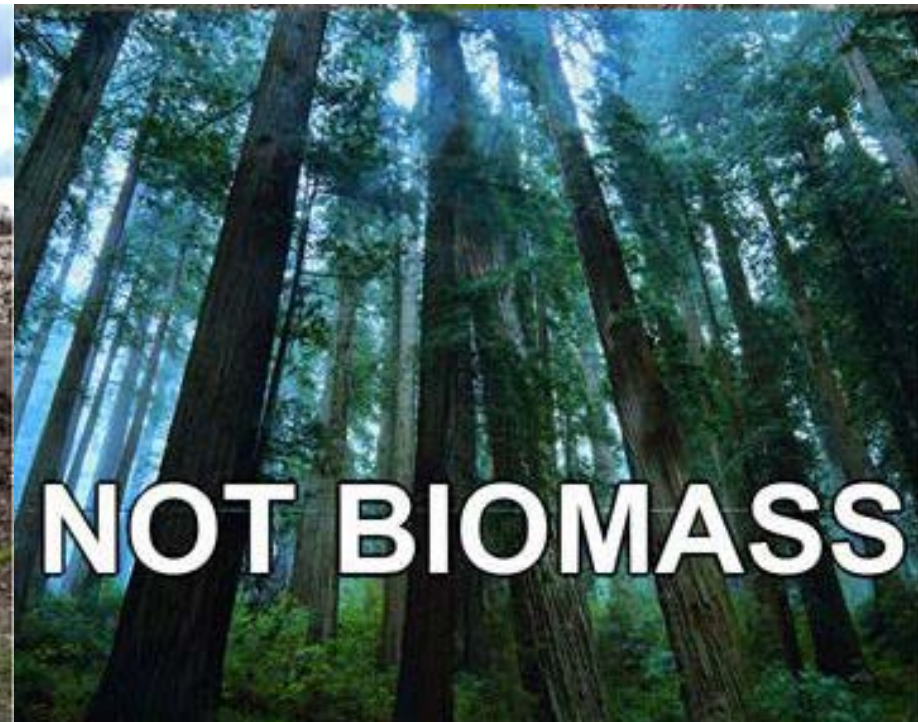
- Materials management / beneficial reuse
- Baseload renewable power
- Thermal energy
- \$200 million total economic activity
  - \$32 M fuel
  - \$34 M labor
  - 700 jobs

“Not the energy we make...  
but how we make that energy”



# Fuel resources

**We do not cut trees specifically for biomass power!**



# Fuel resources

- Cradle to grave utilization
- Forest stewardship
- Habitat maint./dev.
- Commercial thinning

2 million green tons



**Football field x 1 mile**

# Fuel resources

- Cradle to grave utilization
- Forest stewardship
- Habitat maint./dev.
- Commercial thinning

2 million green tons



86,000 semi loads

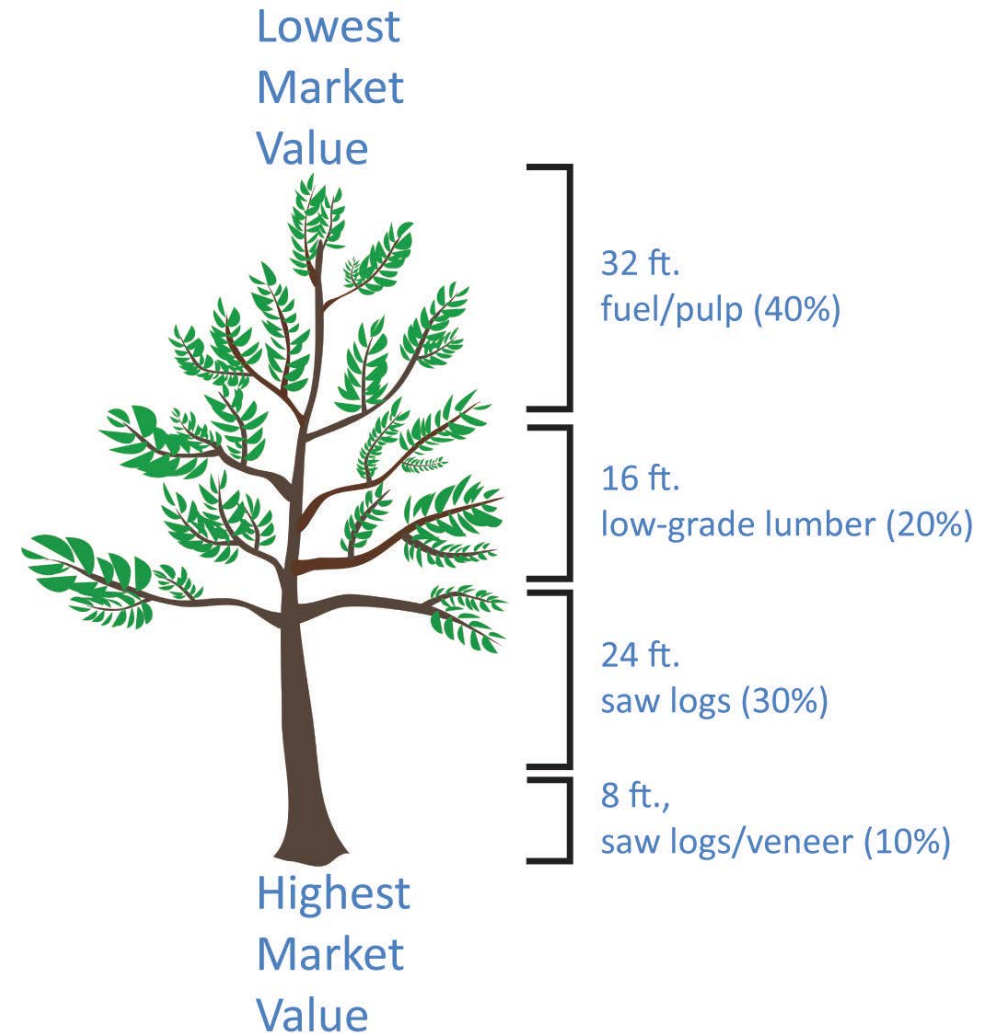
# Fuel resources

## Wood fiber value chain

- 50% forest based
  - Sustainable forest management
    - FSC, SFI, Tree Farm
  - Timber harvest
    - Higher value markets
- Secondary materials
  - Mills, manufacturing
- Landfill diversions

## Alternative fuels

- Railroad ties, scrap tires



# Technical benefits

- Grid support
  - 24/7/355
  - Distributed resource
  - Increased reliability
- Energy diversity
  - Domestic
- Renewable thermal
  - Fuel oil substitute
  - Cogeneration

# Electricity markets

## MI: Partial deregulation

- Regulated providers *(90%)*
- Alternative energy supplies *(10%)*
- Renewable Portfolio Standards
- Corporate purchasers
- Voluntary green pricing programs

# Future

- Low demand, ample resources
- Competition – Natural gas, wind, solar
- Uncertain tax policy
- Uncertain regulatory policy

## Needs to succeed

- Equitable rates w/ancillary benefit value
- Innovative energy policy
- Access to new markets
- Reasonable regulatory frameworks



# Potential markets

- Institutional heating / district heating
- Co-generation
- Export pellets
  - Europe: saturated
  - Asia: emerging
  - MI: High transportation costs
    - Limited access – deep water ports
      - High lock fees, limited rail
  - Changing energy policies





# Summary

1. Not what but how
2. “Beneficial use” fuels from existing materials
3. High value wood fiber markets
4. Sustainable forest resources / materials management
5. Diversifies energy portfolio
6. Electric & thermal
7. Baseload, dispatchable renewable energy
8. Grid support / reliability / security
9. Need accommodating energy / regulatory / tax policy
10. Support rural economies

# Questions?

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Michigan   
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