

MICHIGAN'S ENERGY FUTURE

A presentation by



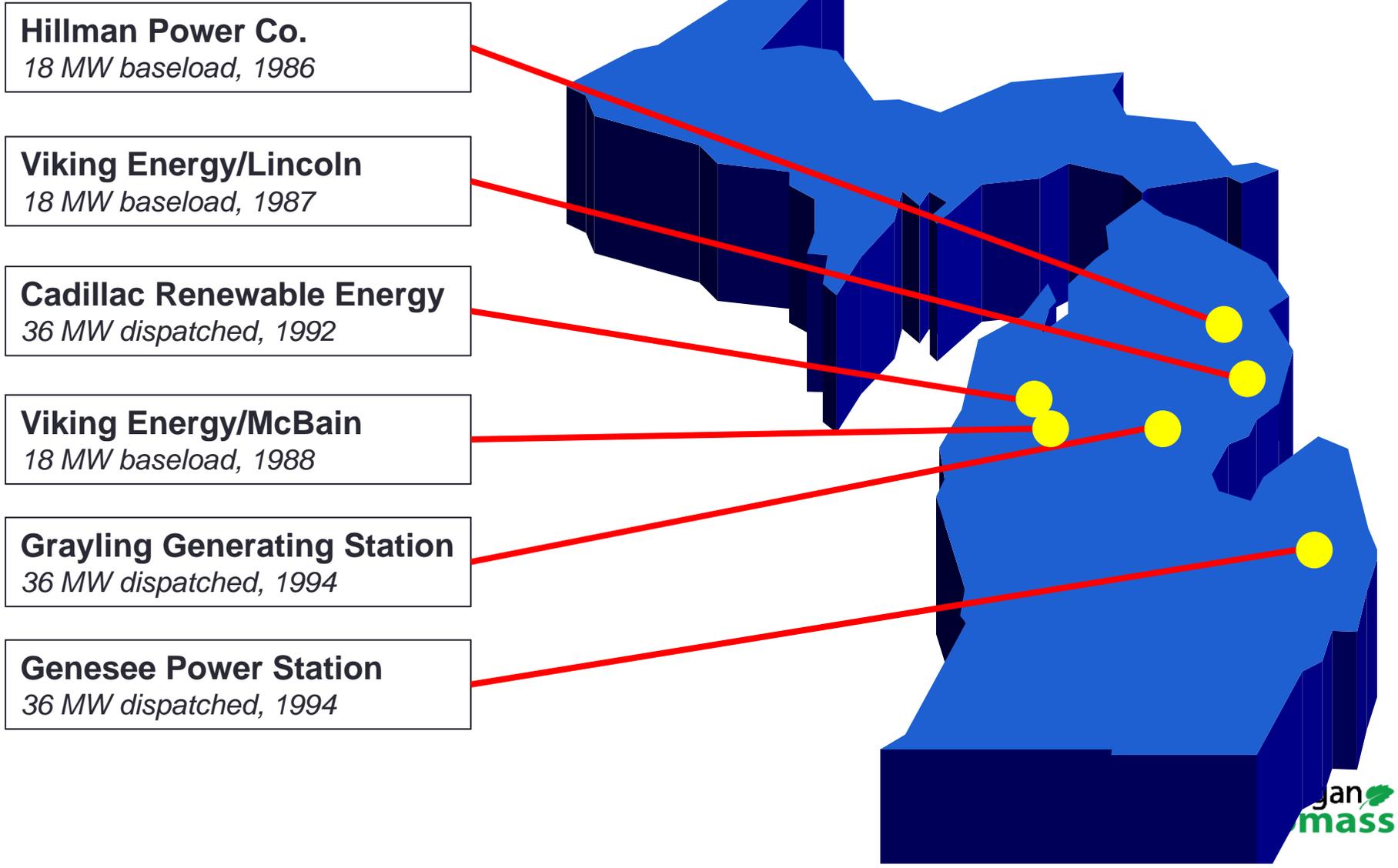
Presentation topic

- 1. What information do energy policy makers need to consider in order to make good energy decisions?*
- 2. What is Michigan's long-term potential for more wind, solar, hydro, biomass, landfill gas, and other renewables sources?*

Michigan Biomass

- Coalition of wood-fired power plants
 - Pre-RPS
 - Since 1986
 - PURPA contracts, CECo.
 - 162 MW installed capacity
 - About half of all biomass power in Michigan
 - Vs. industrial/commercial uses

Michigan Biomass facilities



Other biomass facility

L'Anse Warden Electric
18 MW / Detroit Edison PPA

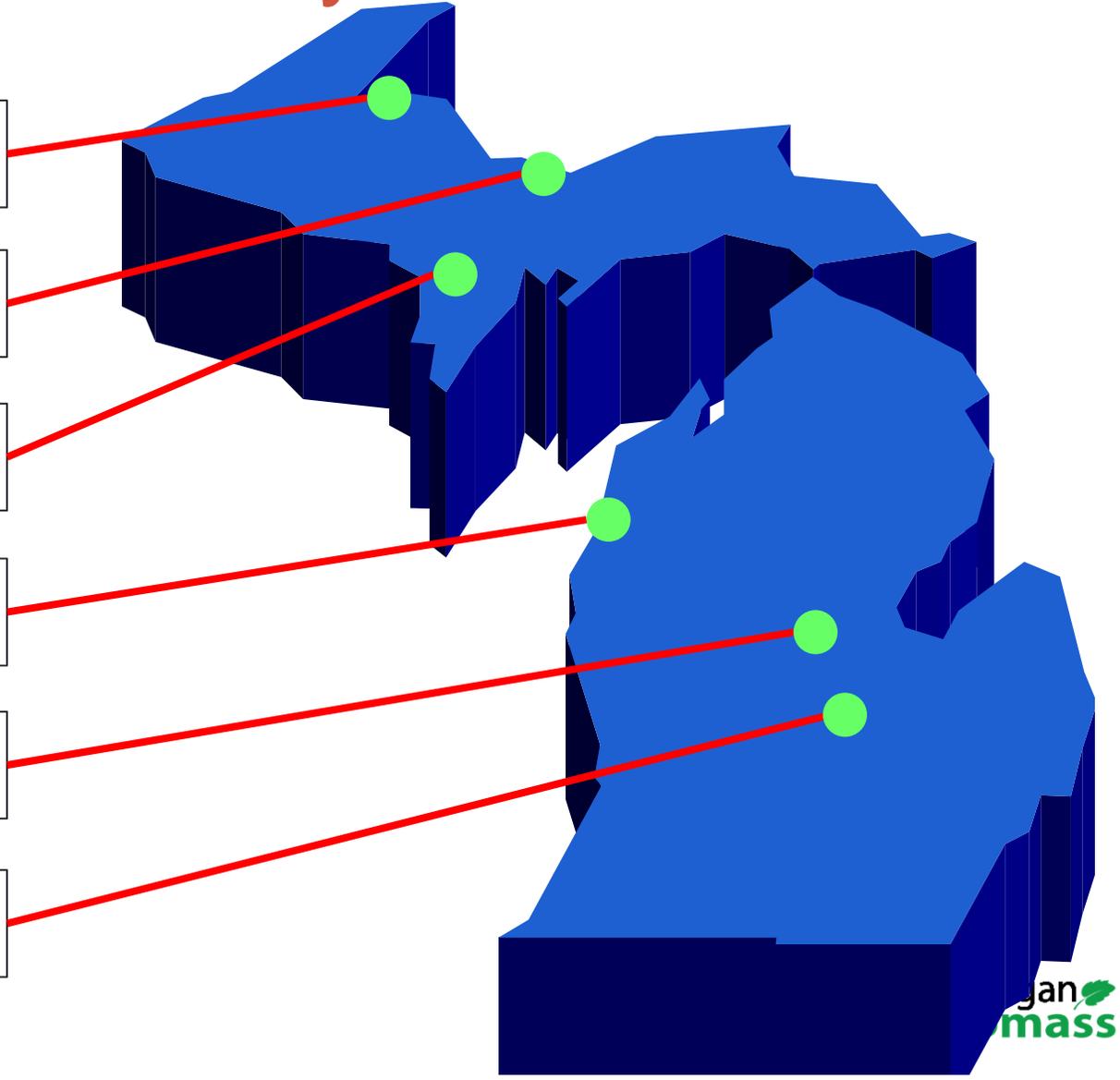
Northern Michigan Univ.
10 MW eq. CHP

Verso Paper
25 MW eq.

TES Filer City
Co-fire, 10 MW eq. / CEC Co. PPA

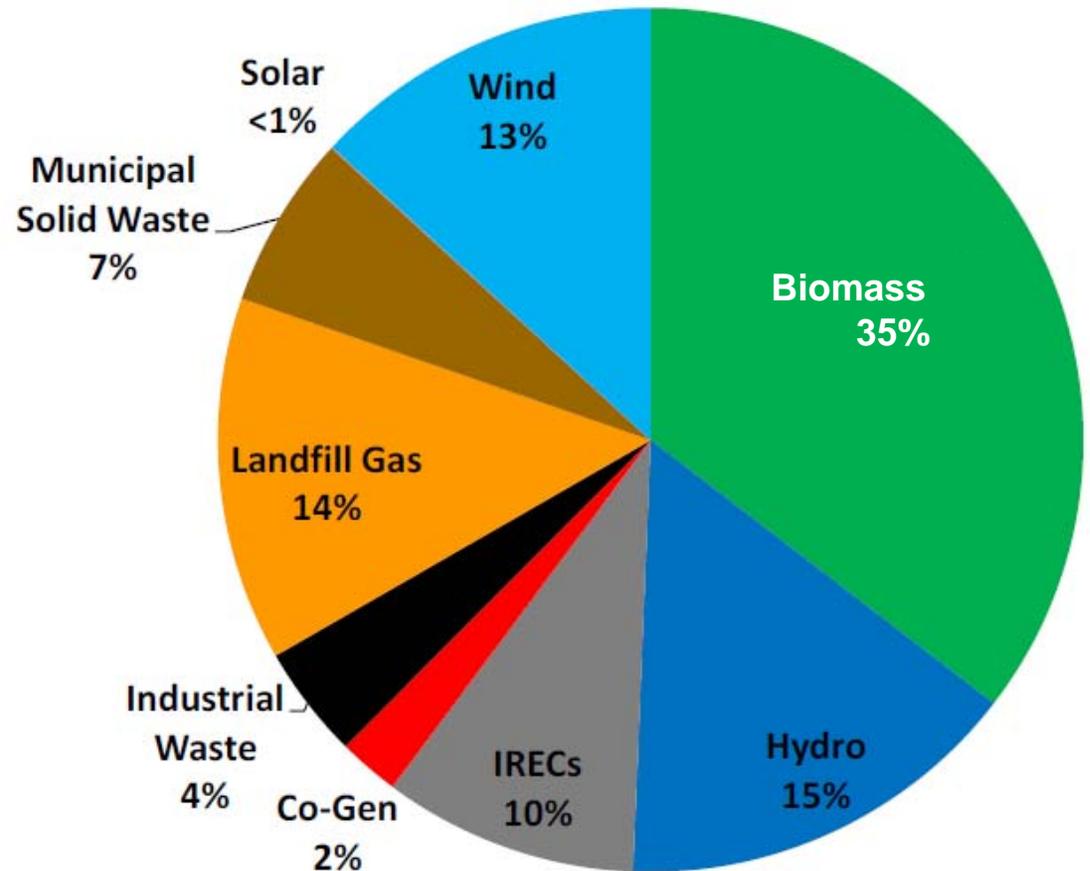
Central Michigan University
3 MW eq., CHP (offline)

Michigan State University
Co-fire, MW eq. n/a



Production

- Biomass a significant¹ source of RECs
- Wood IPPs = 1% of grid power²



¹MPSC 2012 RPS report

²U.S. Energy Information Administration, 2012

Fuel sources

- Timber harvest residues
- Mill byproducts
- Clean “recycled” wood
 - Crates, pallets
 - Construction materials
- Urban “green wood”
 - Storm cleanup
 - Landscape debris
 - Right-of-way maintenance

Non-renewable fuels

- Scrap tires (tire-derived fuel)
 - MDEQ Scrap Tire Management Program
 - Biomass TDF use = 54% of total volume
 - 8 million tires
- Treated wood
 - Railroad ties

Biomass economics

- Local resources...
 - \$30 million in fuel
 - Markets for low-, no-value fiber
- Local jobs...
 - 400 direct fuel-related jobs
 - 130 power plant jobs
- Local communities
 - Property taxes
 - \$11 million annual payroll
 - Local goods & services



Source: Michigan Biomass member facilities

Biomass benefits

- Grid support
 - Stabilization in rural areas
 - Dispatchable
 - Volt-ampere reactive (VAR) power
 - Required by heavy industry
 - Not provided by wind & solar
- Forest health & stewardship
 - Fire risk mitigation
 - Thinning, habitat
 - Certification and sustainability requirements
- Beneficial use vs. landfill, decay
 - Aids forest products manufacturers

Fuel, fuel, fuel

- 80% of total operating costs
- Driven by...
 - Timber, forest products industries
 - Housing, construction, consumer buying habits
 - Diesel prices (transportation, processing)
 - Supply chain infrastructure capability
 - Power purchase agreements
 - Avoided cost = “proxy” cap on wood fuel prices
- Critical to project financing

Biomass competitiveness

- Compete for fuel supply
 - New & expanded energy demand ... RPS incentives
 - Higher-value competitors
 - Composite board manufacturing
 - Landscape mulch
 - Animal bedding
- Minimal growth under RPS
 - Fuel cost, availability, reliability, sustainability
 - Long project lead time

Proposed biomass projects

Project	MW Cap	MWh	Green tons eq.	2013 status
CMU	17	134,028	227,848	Terminated
DTE	400	3,153,600	5,361,120	Terminated
Escanaba	25	197,100	335,070	In development
Gwinn	20	157,680	268,056	Pending
LBW&L	300	2,365,200	4,020,840	Terminated
Mancelona	36	283,824	482,501	Terminated
Dow Corning	40	315,360	536,112	Terminated
Novi (Newberry)	24	189,216	321,667	Terminated
NMU	10	78,840	134,028	Under construction
TCL&P	20	157,680	268,056	Terminated
Verso	25	197,100	335,070	Complete
White Pine	50	394,200	670,140	Pending
Wolverine	120	946,080	1,608,336	Tabled
Totals	1,087	8,569,908	14,568,844	

Biomass tomorrow

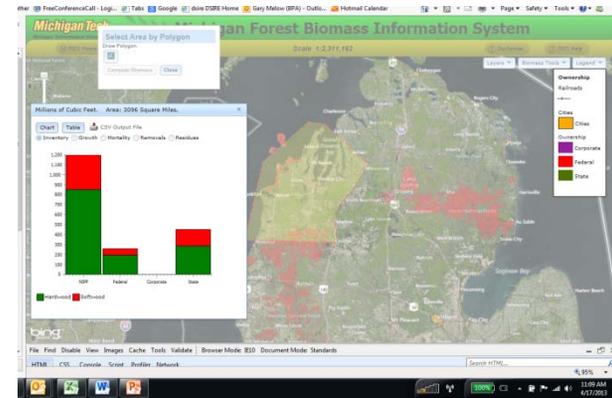
- Projects nearing contract expiration
 - 27% current total biomass capacity could go off line
 - CECo. REP: no plans to renew

	<u>MW cap</u>	<u>Jobs</u>	<u>Year</u>
Hillman Power LLC	18	72	2015
Viking/Lincoln	18	72	2018
<u>Viking/McBain</u>	<u>18</u>	<u>72</u>	<u>2018</u>
TOTAL	52	216	

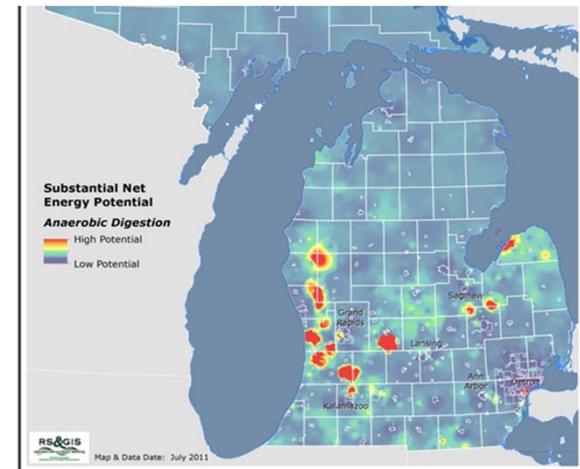
- Dispatched plants at 47% capacity in 2012

Biomass potential

- Identify & assess fuel resources
 - Feedstock data systems
 - Forest Biomass Inventory System /MTU
 - Michigan Biomass Inventory System / MSU
 - Funding struggles for both
 - Public investment warranted
 - Dedicated fuel production research
 - MSUE Forest Biomass Innovation Center



MTU
Forest Biomass Inventory System



MSU
Michigan Biomass Inventory System

Biomass potential

- Other considerations
 - Accommodating PPAs
 - Rates
 - Recognition of intrinsic values
 - Baseload capacity, dispatchable, grid support, local economics, etc.
 - Sensible incentives
 - Capital vs. O&M costs

'No regrets' biomass

- Ensure viability of existing biomass capacity
 - Local resources, local jobs, local communities
 - Wise resource utilization
 - “Technical” support
 - Grid stabilization
 - VARs
 - Cost effective
- Revitalize forest products industry
- Incorporate benefits of biomass
- Assess biomass resources
 - Develop, support needed data systems
 - Quantify feedstock, energy opportunities



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