

# Michigan's Energy Future?

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Green Energy Jobs Michigan

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# Michigan Today

- Importer
- 100% coal
- 97% oil
- 80% natural gas
- \$26 billion leaves MI each year



# Michigan Tomorrow

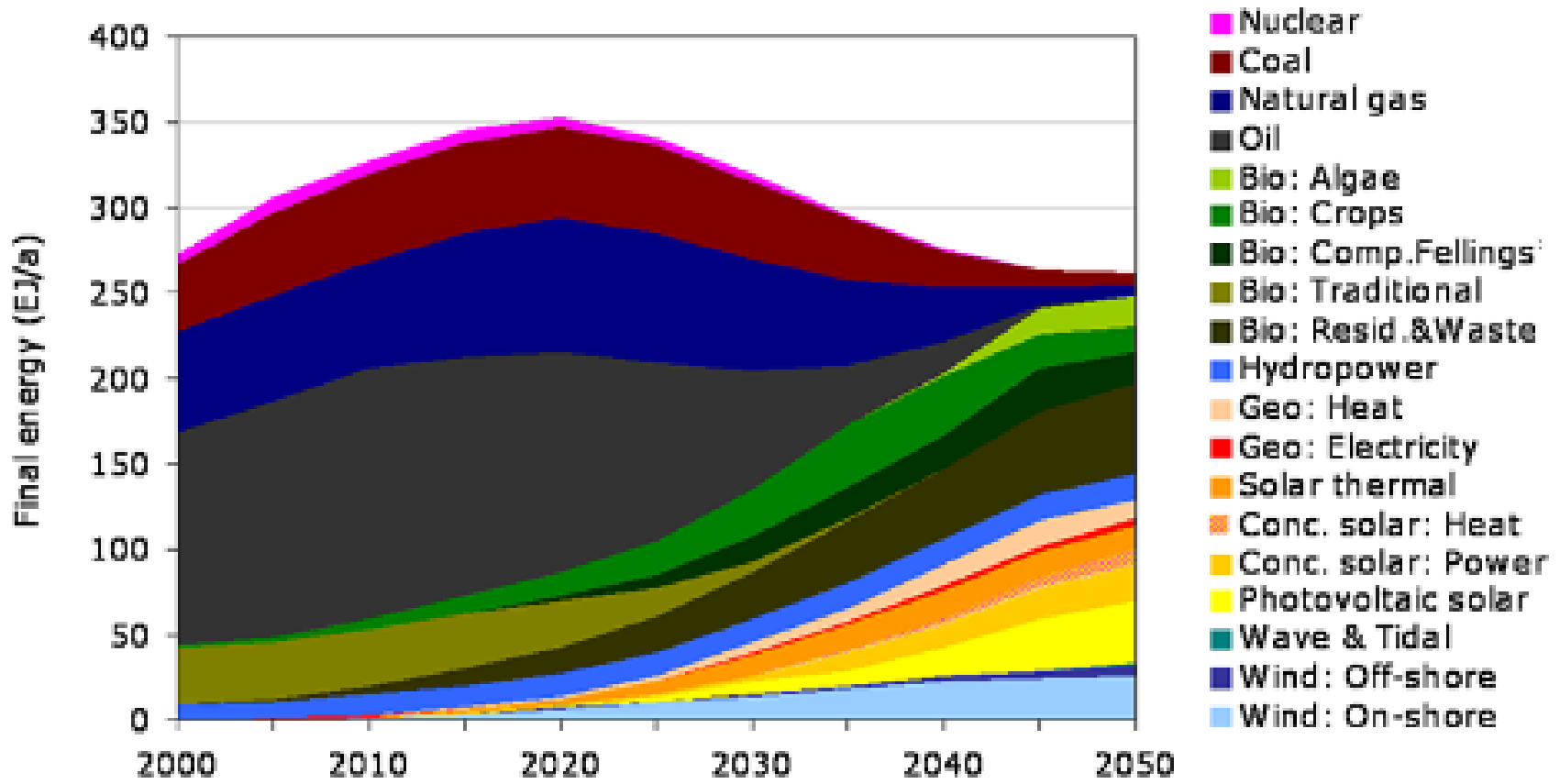


# Why Renewables & Efficiency?

- Peak Oil
- Cleaner Air
- Climate Change
- Reduce Imports
- Predictable Energy Prices
- Jobs!



# WWF/Ecofys Energy Report

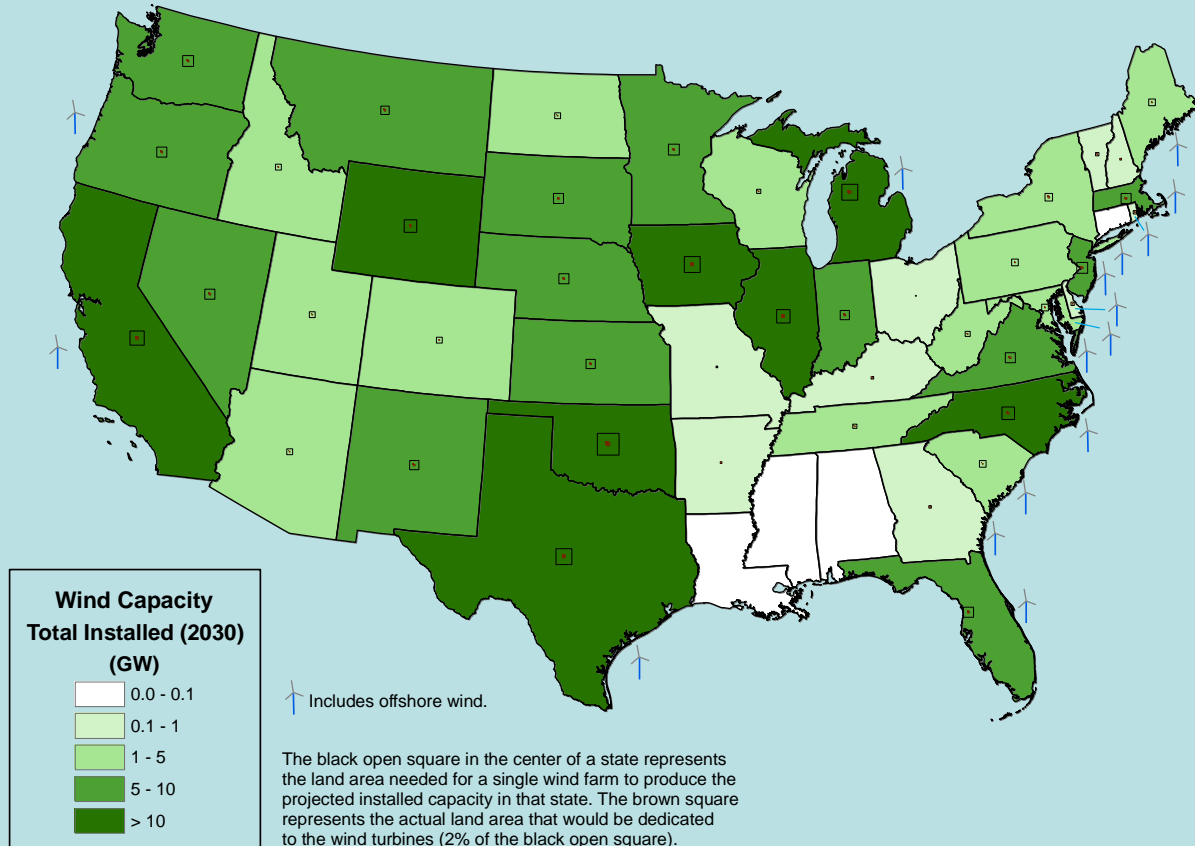


# WWF/Ecofys Energy Report

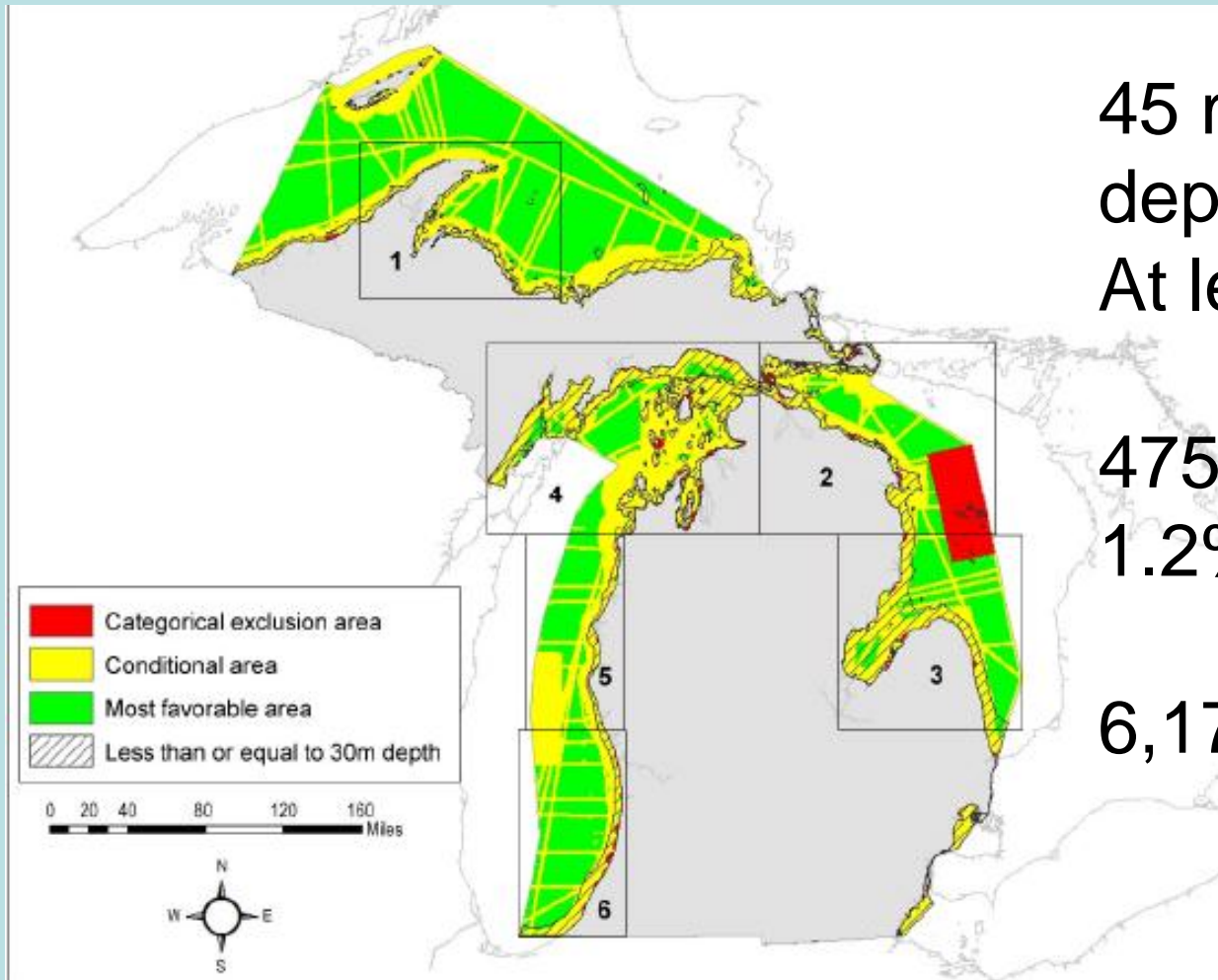
- Electricity – 50% Solar, 25% Wind, 13% Biomass, 12% Hydro
- Transportation – Electric & some Biofuels
- Buildings – Net Zero, Super Insulated, Solar, Geothermal
- Smart Grid – Manage Variability

# Wind Energy Potential

- Installed  
500 MW
- RPS  
1,600 MW
- 20% Vision  
>10,000 MW



# Offshore Potential 483,000 MW





# Global Market in Billion \$

	<b>2005</b>	<b>2010</b>	<b>2020</b>
<b>PV</b>	11.2	71.2	113.6
<b>Wind</b>	11.8	60.5	122.9
<b>Biofuels</b>	15.7	56.4	112.8

Source: Clean Energy Trends 2011

# “Sizing the Clean Economy”

## Brookings 2011 Study

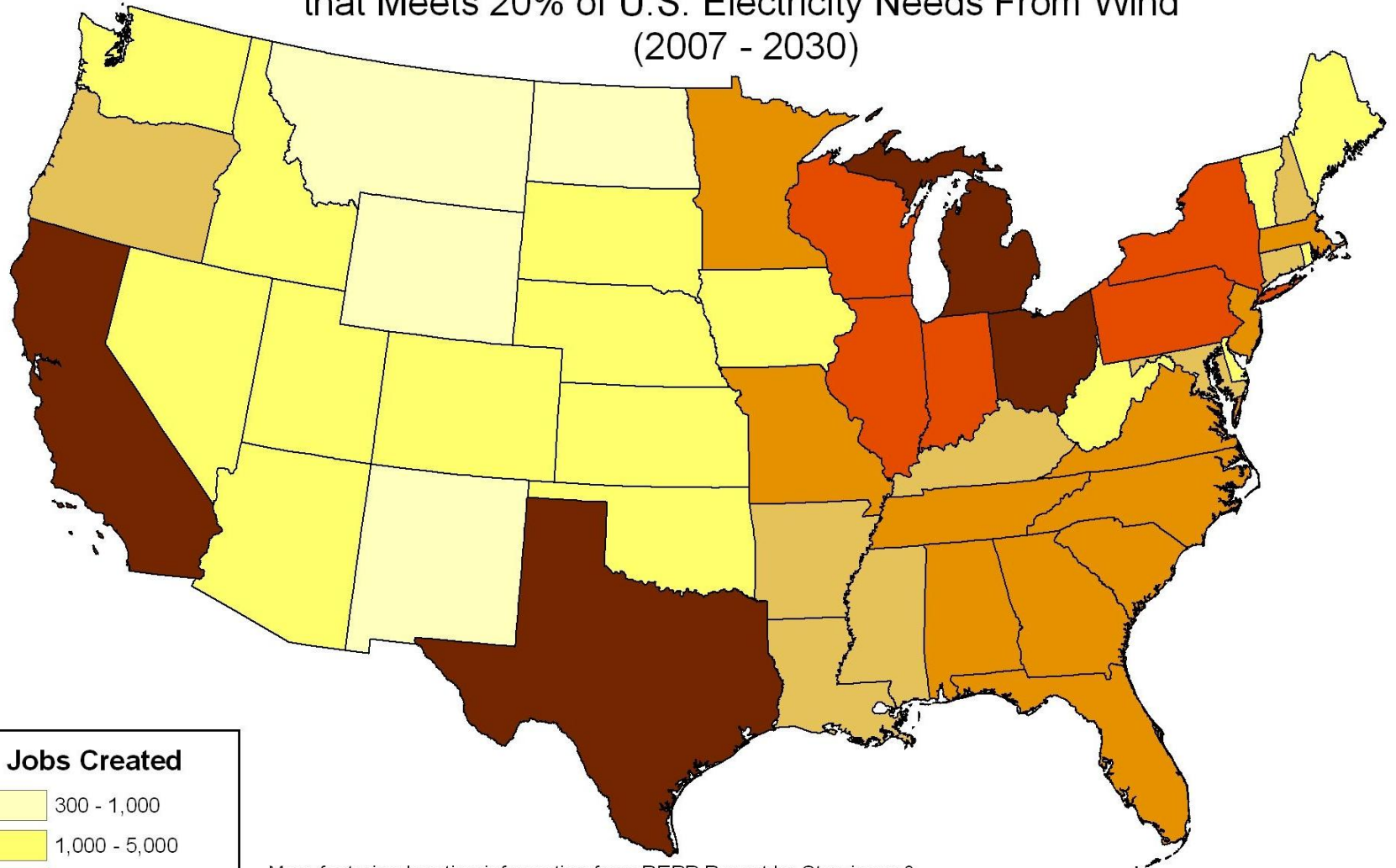
- 2.7 million workers in clean economy
- More than fossil fuel industry
- But less than IT
- Manufacturing & export intensive
- Opportunities for low & mid skilled
- Renewables segment growing fastest

# Jobs Growth 2003-2010

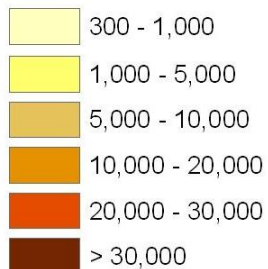
Segment	Absolute Change in Jobs	Annual Average % Change
1. Wave/Ocean Power	273	20.9
2. Solar Thermal	3,732	18.4
3. Wind	15,110	14.9
4. Carbon Storage	228	13.3
5. Solar PV	12,286	10.7
6. Fuel Cells	3,499	10.3
7. Biofuels/Biomass	9,296	8.9
8. Smart Grid	7,001	8.6
10. Energy Services	18,702	6.9
12. Geothermal	998	6.7
13. Green Architecture	19,678	6.4
15. Electric Vehicles	5,447	6.3

Source: Brookings-Battelle Clean Economy Database

# Total Cumulative Manufacturing Jobs Created by Scenario that Meets 20% of U.S. Electricity Needs From Wind (2007 - 2030)



## Jobs Created



Manufacturing location information from REPP Report by Sterzinger & Svrcek (2004)

Major component assumptions: 50% of blades are manufactured in U.S. in 2004 increasing to 80% in 2030, 26% of towers are from the U.S. in 2004 increasing to 50% in 2030 and 20% of turbines are made in the U.S. increasing to 42% by 2030.

# Big Issues

- More Efficiency?
- Drill & Dig or Green?
- Big or Small?
- What Mix?

# Have To Start Now!

- Training & Education
- Right Rules
- Right Incentives
- Right Investments

# “Sizing the Clean Economy” Brookings

“And so a broad strategy for all parties must be to place regional growth strategies specifically near the center of efforts to advance the clean economy”