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Global perspective on Wind Energy: How can Michigan be in The Game?

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Object of Presentation

- Understand the basics of the global wind energy market
- Understand implications for Michigan
Michigan
- Identify opportunities and strategy for
for Michigan

Stefan Schmitz background

- Qualified in Germany and England & Wales
Wales
- Specializes in energy and project finance
- In renewable energy since 2000
- Advises project developers, banks, investors, investors, utilities, turbine manufacturers
- Experience in wind, solar, geothermal projects projects
- Current work includes: wind projects in US, France, Czech Republic; solar projects in France, Italy, Spain

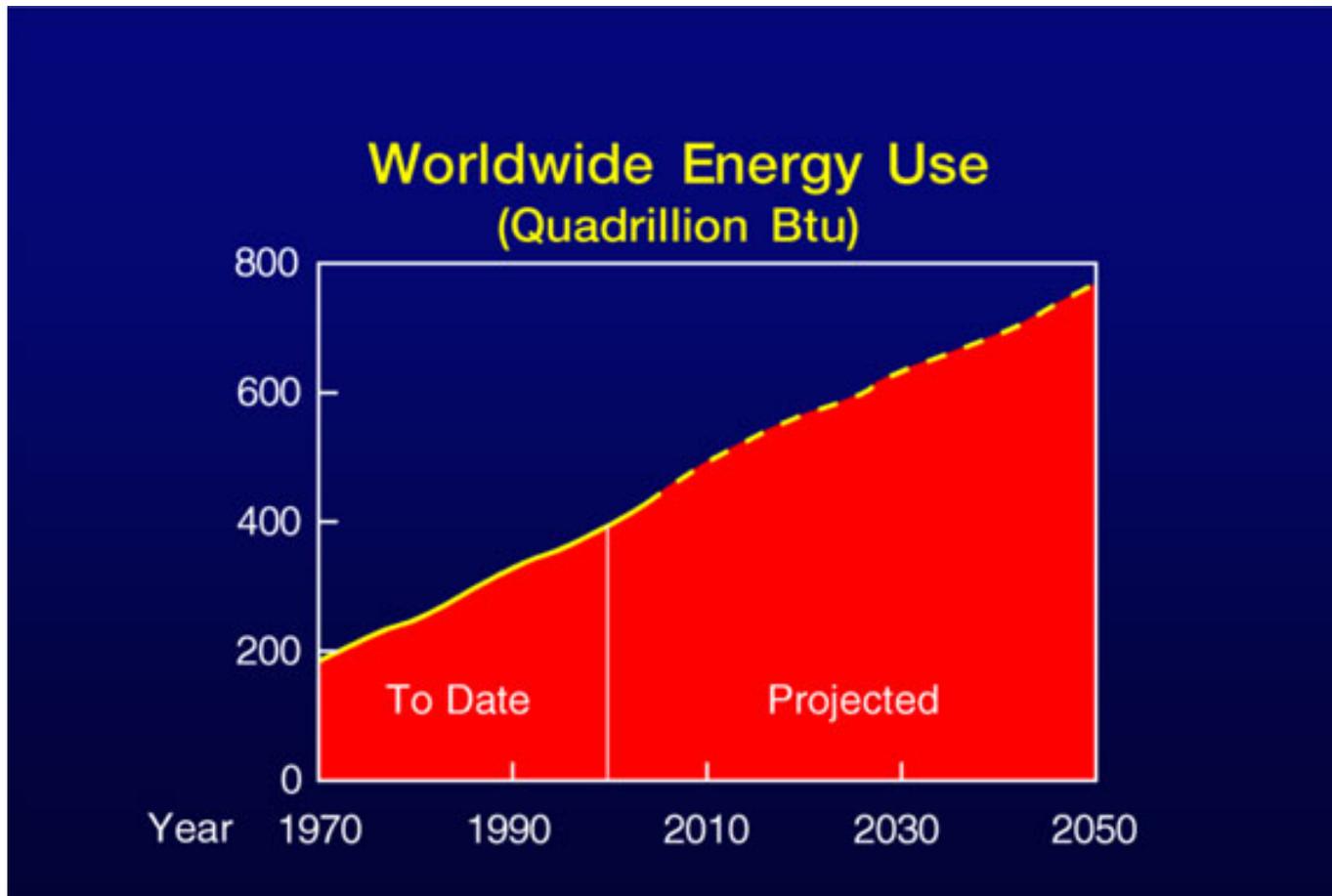
Introduction

- Energy is indispensable in a modern society
- Energy consumption is increasing increasing
- Emerging markets demand their their share of economic growth/energy
- More energy is needed !

Introduction

- Traditional sources of energy are finite (Oil has already peaked)
- Other sources become more expensive
- Renewables can soon be generated at competitive costs
- Fossil fuels increase global warming
- Fossil fuels depend on imports from unstable areas of the world

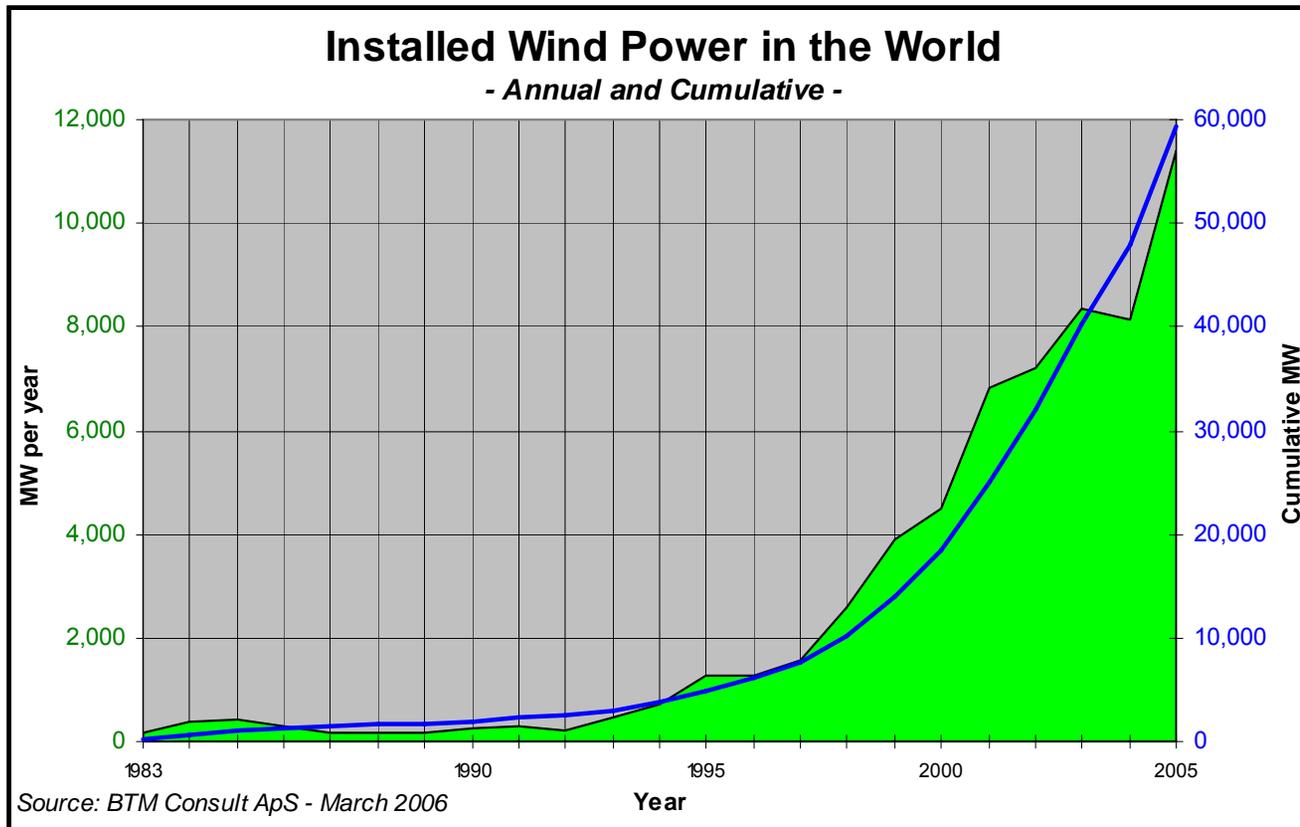
Opportunities



Introduction

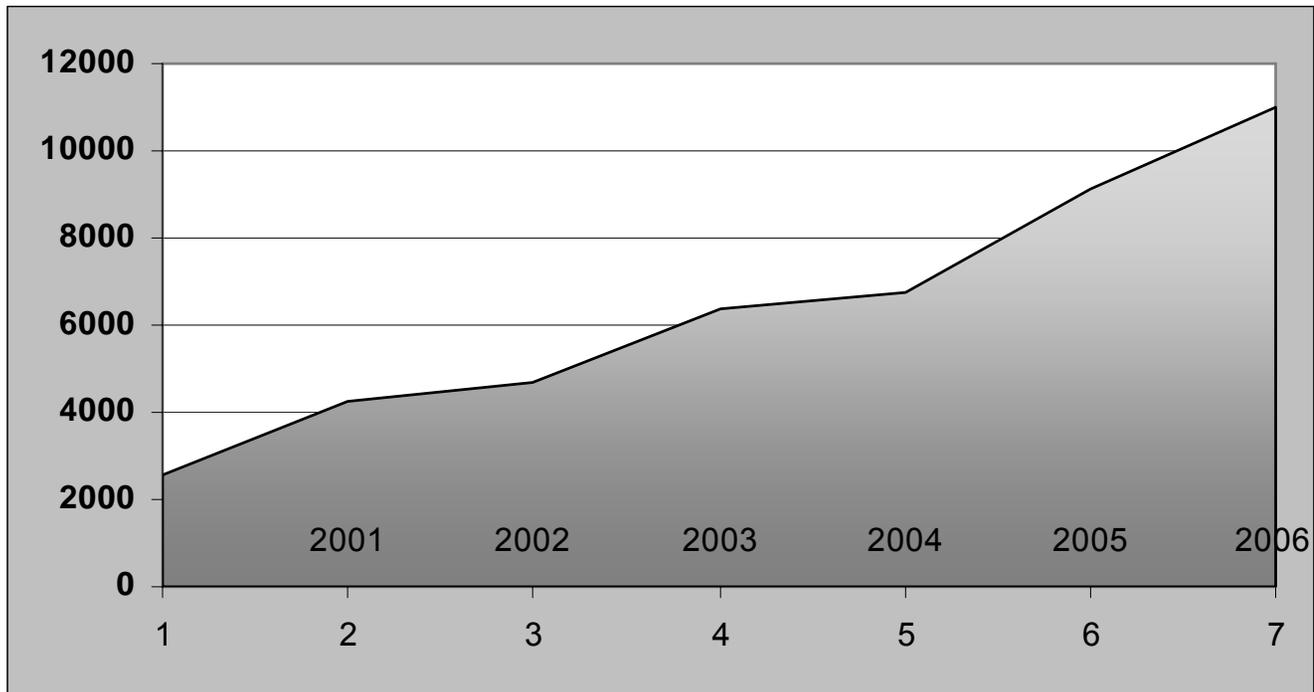
- Total investment in renewable energy is expected to grow to \$100bn within a decade, a sustained compounded annual growth rate of 15-20%.

Growth of Wind Energy



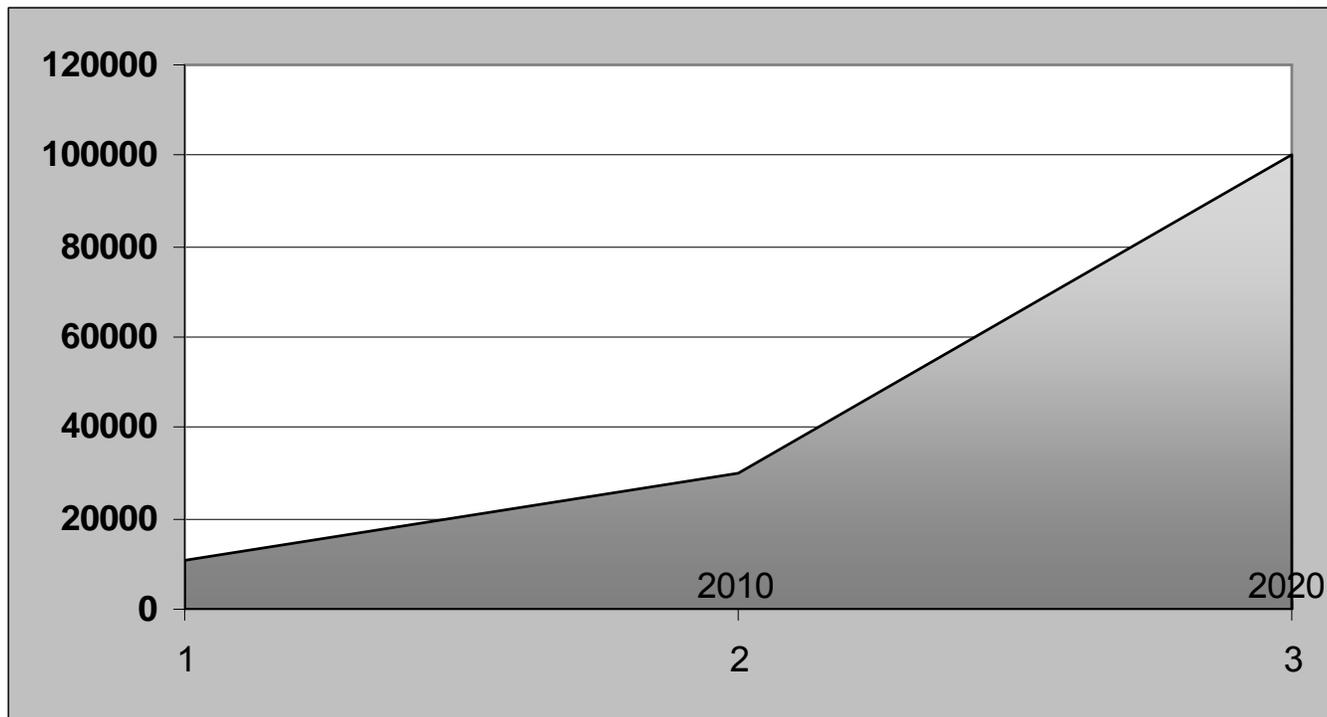
Growth in the US

Installed MW



Expected Growth US until 2020

Installed MW



The Global Wind Market

- US first mover in the 1980s
- Europe took over 15 years ago
- Most know-how today in Europe
- Manufacturing dominated by European based based companies
- Developers on both sides of Atlantic, larger ones ones in US, small and very small in Europe
- Financing (debt and equity) largely from Europe Europe

Money

- Market is afloat with money for equity equity investment
- Supply of equity far exceeds projects projects
- Debt might be more difficult because because of the current credit crunch crunch
- Banks will apply rigorous conditions conditions on loans

Equipment

- Greatest obstacle for growth
- Wind turbines in very short supply
- US requires different technology
- Very few large companies, limited output
- Even less for off-shore projects
- Waiting periods of up to two years
- Costs have almost doubled in the last 5 years years

→ growth potential is limited !

Know - How

- Few people with know-how worldwide worldwide
- All sectors:
 - Development
 - Engineering
 - Construction
 - Financing
 - Legal
 - Insurance

Global Competition

- Competition for know-how, turbines, debt, and jobs
- Key competition: projects, manufacturers manufacturers
- Competition globally: Market players will go where they can make most profits profits at least risk

Decisive Factors for Success

- Political Stability
- Good wind speeds
- High, long term and secure tariff
- Good planning laws and regulations regulations
- Government support
- Trained work force
- Accessibility

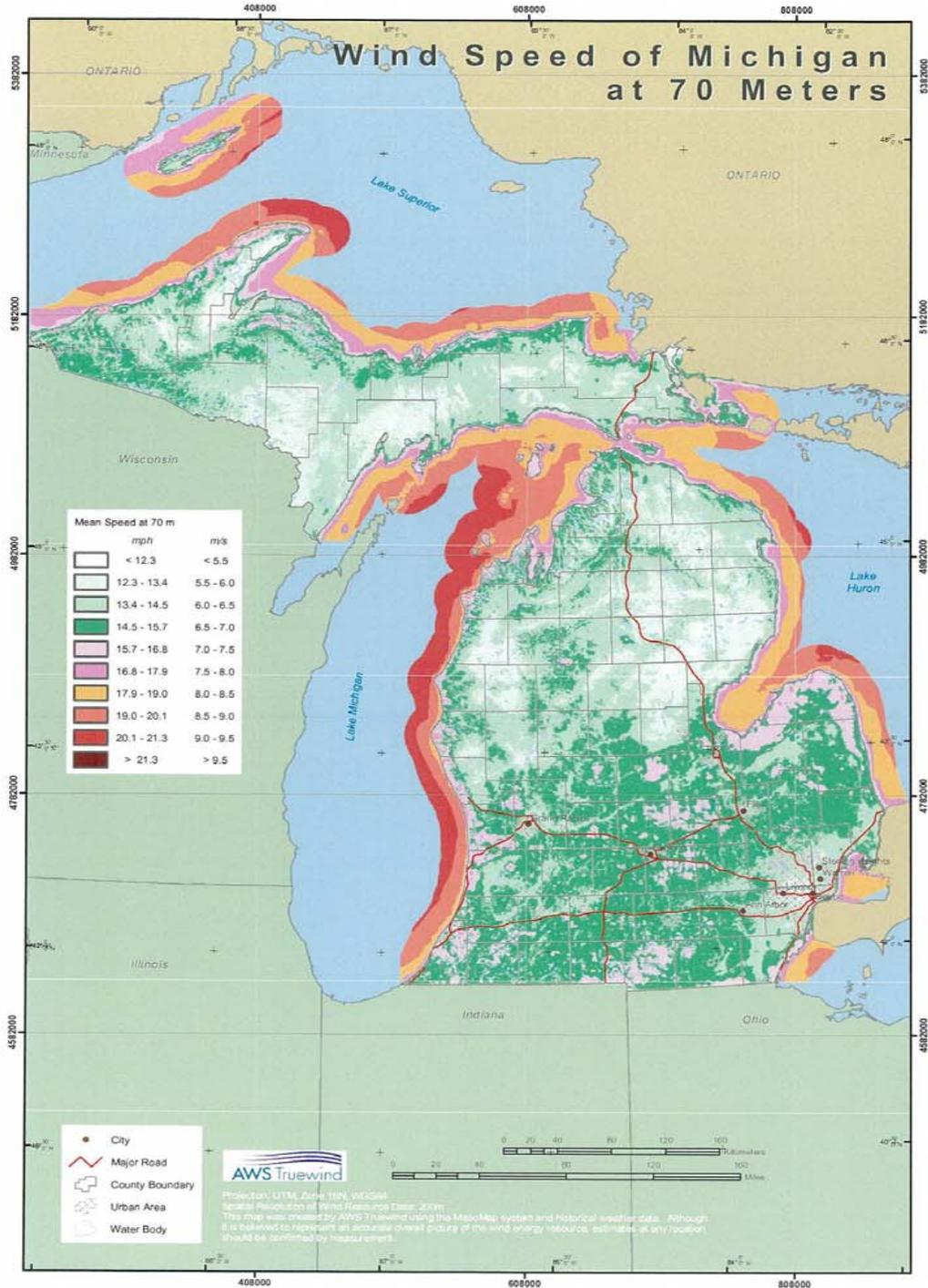
Additional Factors for Manufacturers

- Will they be able to sell their equipment (are potential customers nearby, will projects be built in the vicinity) ?
- Access to the sea, harbour, roads roads
- State incentives

Michigan

SO

- Is wind energy a good opportunity for Michigan ?
- How can Michigan benefit ?
- What does Michigan have to do ?



Michigan

- Tariff: without RPS the chances for Michigan are low
- Tough competition from other states in US
- Even with RPS success not guaranteed
- Feed-in-Tariff ?
- Additional aspects needed

Planning, zoning

- Opportunities can be increased increased by creating a favourable set of rules for planning and zoning

Off-Shore

- Michigan has very good potential potential for off-shore wind projects projects
- No projects yet in the Great Lakes Lakes or sweet water
- Market only gearing up
- No turbines available at the moment

Roadmap(s) for Success in Michigan

I THINK...

- Government
- Projects
- Manufacturing

Roadmap(s) for Success in Michigan

I THINK...

- Regulatory framework (RPS, feed in tariff; planning and zoning)
- Attract project developers who will build projects in Michigan
- Manufacturers will follow if they see enough customers (plus incentives)

Roadmap(s) for Success in Michigan

- Cold calling manufacturers to invest in Michigan is a difficult enterprise
- Many other states are doing this, lots of competition
- Setting up a framework which takes account of the business' interests and needs can be more successful

Roadmap(s) for Success in Michigan

SO...

This is an international market..

Understand it and the players..

Talk to the European developers..

Questions ?

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