

Growth Opportunities for Chicago Area Manufacturers in the Renewable Energy Industry

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Market Opportunity Analysis

- The key to success for most companies is strategic planning and the key to strategic planning rests on the matching of market needs to corporate capabilities - "strategic fit."*
- Is there a strategic fit for the region as a whole?
- What can government and community stakeholders do to leverage regional assets towards the goal of economic growth?

Wind, Wind, and more Wind*

- In 2008 wind energy accounted for 42% of new capacity added, second only to natural gas.
- Wind energy also increased its contribution towards non-hydro renewable generation from 33% to 42%.
- The US Department of Energy report *20% Wind Energy by 2030* projects 16,000 MW of annual installed capacity by 2018.

Market Size and Growth

- 2008 US wind turbine market \$12.4 billion
- As of year-end 2007 the US is the largest market followed by China, Spain, and Germany.
- The US is expected to remain the largest market through 2012 followed by China.*
- The market is expected to at least double in size.

Global Wind Turbine Manufacturers

- Of the top ten global manufacturers of wind turbines only GE Energy is a US company.
- One is Indian; two are Chinese, and the other six are European.
- They are all pursuing a globalization strategy.
- New capacity has been established in China, India, and South Korea by experienced European manufacturers through local subsidiaries and regional manufacturers.

Global Sourcing Strategy

- Preference is for existing suppliers of specialized components.
 - Blades
 - Control Systems
 - Gearboxes
 - Generators
 - Power Converters
- Preference is for suppliers located near the point of assembly for components manufactured to specification.
 - Towers
 - Cast Irons
 - Forging Services
 - Nacelle Cover and Spinner

Constraints on Market Growth

- Cast Irons and Forging Services are the most significant constraint on the market.
 - Surplus capacity in China and South Korea
 - Capacity shortage in US
- The shortage of high quality forged rings may also be a constraint on the supply of bearings and gearboxes.

Cost of Importing Castings and Forgings

- Transportation and logistics
- Carbon emissions
- Net Energy Gain
- Potential quality issues
- Balancing regional distribution will require investing in US capacity both in terms of quality and size.

Competitive Analysis

- You are trying to uncover segments that are not currently being served or segments that are not being served well by competition.*
- Established suppliers to the wind turbine industry should pursue a market penetration or product development strategy.
- For commodity items or components manufactured to specification, new entrants should pursue a market development strategy.
 - Product positioning
- For specialized components, the only option for new entrants is diversification.

Market Diversification Strategy

- Acquire managers or companies with product and market knowledge.
- Form a joint venture with an established supplier.
- Focus on second tier and supply subcomponents to established first tier suppliers.
- Focus on suppliers of smaller wind turbines.

Marketing and Attraction Strategy

- It is unlikely that an assembly plant will be located in Illinois.
- The focus should be on attracting first tier suppliers of specialized components.
 - Firms that outsource subcomponents should be targeted to support the customer base of regional suppliers.
- In addition to incentives, introductions to potential suppliers, service providers, and enthusiastic local officials should be facilitated.

Small Wind is Beautiful

- Simple supply chain
 - Fewer components
 - Mostly commodity items
- Opportunities for innovation
 - Variable speed electronics
 - Blade design
- US Dominated Market
- Lower barriers to entry
- Much smaller market; \$42 million in 2007
- Attractive market for both contract manufacturers and design engineers

What is solar power?

- Solar power is a combination of several competing technologies with a wide variety of applications.
 - Photovoltaics
 - Solar thermal energy
 - Concentrating solar power
 - Sterling engine
- Market driven by innovation
- Still a relatively small market

Geothermal Power

- Geothermal electricity generation is unlikely in the Midwest.
- Geothermal heating systems on the other hand are viable, especially on a commercial or industrial scale.
- May present opportunities for cogeneration or combined heat and power (CHP)

Biomass

- Production of biofuels will be near the source of its feedstock; most likely in rural areas.
- Biomass power plants may be viable, but again it is unlikely that these will be centrally located.
- Commercial biomass heating systems are probably the most viable alternative for metropolitan areas.
 - Pellet fuel burners
- May also present opportunities for cogeneration or combined heat and power (CHP)

Cluster Analysis*

Industry	Illinois	Metro Chicago	Cook County
NAICS 333612 Speed changer, drive, and gear manufacturing	2.91	3.37	3.14
NAICS 333911 Pump and pumping equipment manufacturing	2.55	3.17	4.75
NAICS 335313 Switchgear and switchboard apparatus mfg.	2.41	2.91	4.15
NAICS 331210 Iron, steel pipe and tube from purchase steel	2.5	2.77	4.11
NAICS 335931 Current-carrying wiring device manufacturing	1.86	2.18	ND
NAICS 326199 All other plastics product manufacturing	1.74	2.14	1.12
NAICS 333995 Fluid power cylinder and actuator mfg.	1.58	1.71	0.55
NAICS 336510 Railroad rolling stock manufacturing	1.13	1.58	0.23
NAICS 333613 Mechanical power transmission equipment mfg.	1.8	1.53	0.59
NAICS 333411 Air purification equipment manufacturing	1.81	1.46	ND
NAICS 333922 Conveyor and conveying equipment mfg.	1.41	1.42	1.01
NAICS 332991 Ball and roller bearing manufacturing	1.33	1.42	ND
NAICS 335312 Motor and generator manufacturing	1.08	1.37	1.75
NAICS 333412 Industrial and commercial fan and blower mfg.	1.31	1.34	ND
NAICS 334418 Printed circuit assembly manufacturing	1.21	1.27	0.66

*Location quotients for supplier industries over 1.25; industries in yellow confirmed by survey.

Innovation and Mass Production

- Job creation in the Chicago metropolitan area due to renewable energy development will be in multiple industries and occupations.
- Manufacturing jobs will probably be of two types.
 - Manufacture of component parts
 - Design and engineering of systems
- Effectively supporting both forms of job creation will require multiple strategies.

Cluster Initiative

- Supporting the regional supplier network will require the development of a renewable energy cluster initiative.
 - Forum for information sharing
 - Marketing of industrial capacity
 - Attraction of new firms
- Public-private partnership led by industry
 - Established suppliers
 - New entrants

Net Metering and Feed-in Tariffs

- Illinois utilities are now required to offer net metering, but it is in such small quantities both in number and size that a business plan based on it is not feasible.
- For incentives to have an economic impact they need to be long-term and effectively funded.
- Attracting innovative renewable energy firms to Chicago will require at the very least lifting the caps on net metering.
- A feed-in tariff would be far more effective.
 - Rewards electricity generation as opposed to system installation
 - Leads to commercial scale development

Commercial and Industrial Development

- A feed-in tariff in conjunction with a technical assistance program for the installation of commercial renewable energy systems targeted at large electricity consumers would be an effective way of driving growth in small wind and solar.
- An alternative incentive program would be needed to promote geothermal and biomass heating systems.
- The focus should be on large consumers and efficient systems with short payback periods.

Summary

- A renewable energy cluster initiative would support both the regional supplier network and innovative design and engineering firms.
- Lifting the caps on net metering and introducing a feed-in tariff would drive growth in distributed generation systems.
- Building the capacity of suppliers will require access to capital and consulting services.

Thank You

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