



Federal & State Perspectives on the
Prospects for Renewable Energy:

The Market Approach of the State Clean Energy Funds

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Points of Discussion

- Introductory Thoughts – Disruptive Technology
- Overview of the Clean Energy Markets Today
- Three Aspects of Technology Deployment
- The Clean Energy Funds
- Conclusion



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Clayton Christensen, *The Innovator's Dilemma*

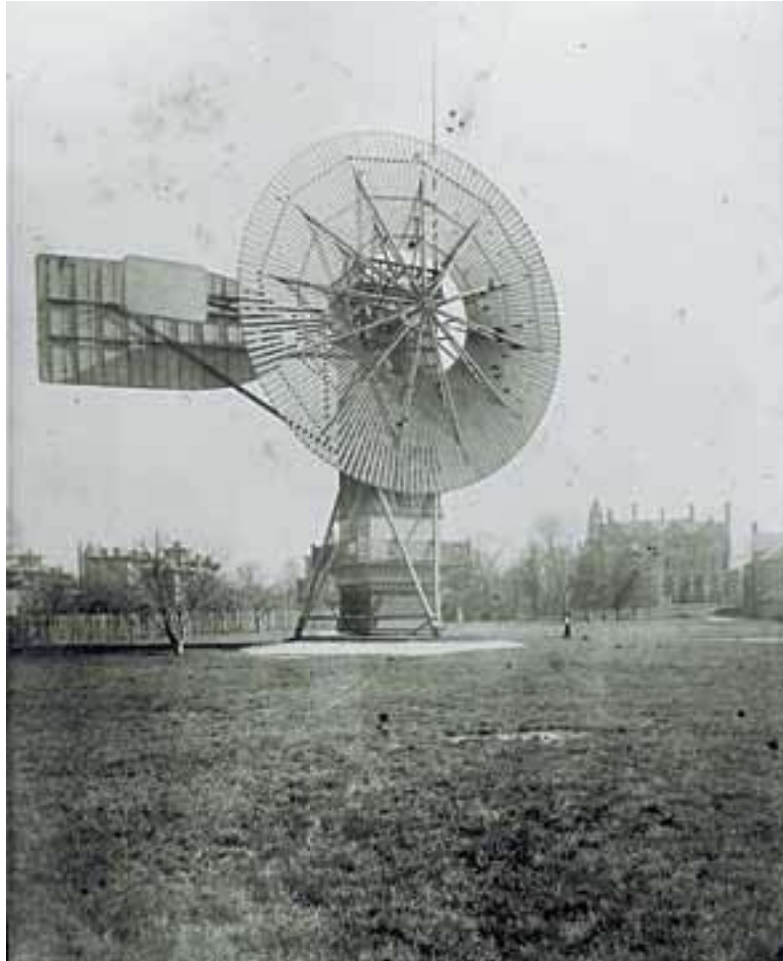
“Disruptive technologies bring to a market a very different value proposition than had been available before...Because failure is intrinsic to the search for initial market applications for disruptive technologies ... action must be taken before careful plans are made... [People confronting disruptive technologies must] ... directly create knowledge about new customers and new applications through discovery-driven expeditions into the market place.”



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Disruptive Technology



Charles F. Brush
Cleveland, Ohio

Built in the winter of 1887-88

50 foot diameter rotor
144 wooden blades

Generated 12 kW
Charged DC batteries for house

Operated for 20 years

Photo © the Charles F. Brush Special Collection, Case Western Reserve University, Cleveland, Ohio.



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Disruptive Technologies in the Past

“The horse is here to stay, but the automobile is only a novelty – a fad”

Advice of Henry Ford's lawyer, 1922

“What could be more palpably absurd than the prospect of locomotives traveling twice as fast as stagecoaches”

The Quarterly Review, March 1825

“I think there is a market for about five computers”

*Thomas J. Watson,
Chairman of the Board IBM, 1943*



Clean Energy: Growing but still not at scale

- In 2003, the U.S. added:
 - ❑ 1,400 MW of wind
 - ❑ 75 MW of fuel cells
 - ❑ 60 MW of solar PV
- But total generating capacity of U.S. is about 850,000 MW
- Clean energy will provide about 3.6% of U.S. electricity consumption in 2003



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Clean Energy Market: Negative Trends

- Energy security means pro-domestic fossil fuel
- Climate change not a U.S. market driver
- Financial insecurity of energy companies
- Uncertainty about future economic growth in the U.S.
- Philanthropy facing a period of financial constraint
- Capital going to transfers of existing energy assets
- Energy re-positioned as an “adequacy of supply” issue



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Clean Energy Market Barriers

The Big Five Business-As-Usual Barriers:

- High Cost
- Technical Constraints
- Information Gaps
- Immature Market Infrastructure
- Uncertain Regulatory Framework



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Clean Energy Market: Positive Trends

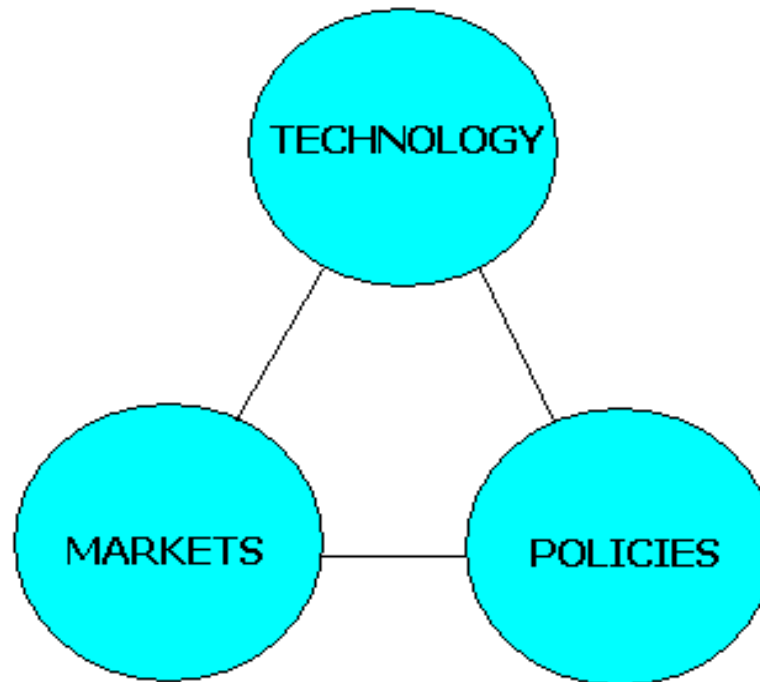
- State clean energy funds
- Niche market applications of some technologies nearing critical commercial mass
- Energy independence of home grown clean energy an organizing principle
- Increasing interest in cooperation by US states and European states
- Advocacy is being reinserted into market experimentation about technology



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Three Aspects of Technology Deployment



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Clean Energy Technology Issues

- Components vs. Systems
- Plug-n-Play interconnection
- Component/System costs
- Component/System life
- Component/System reliability
- Component/System availability



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Clean Energy Market Issues

- Educated consumers
- Installation and maintenance infrastructure
- Public investment / subsidies / grants
- Financing and leasing options
- Green power market / Renewable Energy Credits
- Power purchase agreements
- Government procurement
- Bulk buying groups



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Clean Energy Policy/Regulatory Issues

- Net Metering tariffs
- Interconnection standards
- Zoning, codes and standards
- Tax policies -
 sales, income, property
- Insurance
- Recognition of distribution
 system benefits
- Real time pricing
- Renewable Portfolio Standard
- Renewable Energy Credits
- Environmental regulation -
 Clean Air Act, climate change
- Monetization of externalities
- Smart meters
- Environmental Disclosure



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Clean Energy Fund Annual Budgets

	Annual \$ for Renewables (in million \$)	Annual \$ for Efficiency (in million \$)	Type of Administrative Structure
CA	\$135.0	\$228.0	state agency
CT	\$14.0 - \$28.0	\$100.0	tech development agency
DE	\$0.3 - \$1.0	\$1.5	state agency
IL (2 funds)	\$11.3	\$7.6	indep. nonprofit / state agency
MA	\$25.0 – \$40.0	\$120.0	tech development agency
MN	\$8.0 – \$9.0	--	utility
MT	\$1.8	\$8.9	Utility
NJ	\$31.0	\$93.0	utility / state agency
NY (2 funds)	\$21.5	\$107.5	state agency / utility
OH	1.0	9.0	state agency
OR	\$8.0 - \$9.5	\$31.5	independent nonprofit
PA (4 funds)	\$9.6	\$5.2	independent nonprofits
RI	\$2.0 - \$2.5	\$14.0	state agency
WI	\$3.8	\$38.7	state agency

Clean Energy States Alliance

- Developing professional relationships amongst fund staff
- Sharing info about successes and failures
- Working together on joint projects
- Joint investments (in the future)

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Clean Energy States Alliance Projects

- Public Education
- Monitoring and Evaluation
- Solar PV collaborative
- Homeland Security and Distributed Generation
- Financial tools
- MBA network
- Offshore energy
- Foundation investments in clean energy Solar PV
- Public Fuel Cell Alliance
- Small wind program design



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Conclusion

This is a multi-generational challenge worthy of U.S. innovation and industry. To accelerate, we need to work harder at the state and regional level on the following:

- Coordinated investments
- Economic development approaches
- Policy support
- Innovation networks
- Market infrastructure strategies
- Industry collaborations



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