



# Small Wind Systems A U.S. Perspective and Lessons Learned

Dennis Lin



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## Small Wind Discussion Topics

- US DOE Small Wind Program
- US DOE Perspectives and Lessons Learned
  - Technology
  - Market
  - Policy
- Summary

## US DOE Small Wind Activities

- Organization Structure
  - Office of Energy Efficiency & Renewable Energy
  - National Labs, National Wind Technology Center (NWTC)
- Small Wind R&D
  - DOE/Industry Partnership Projects
  - Technical Support
- Small Wind Independent Testing & Certification
  - American Standard for Small Wind Turbines
  - Testing at NWTC and Regional Centers
  - Small Wind Certification Starts in 2010

[www.smallwindcertification.org/](http://www.smallwindcertification.org/)
- Outreach & Education



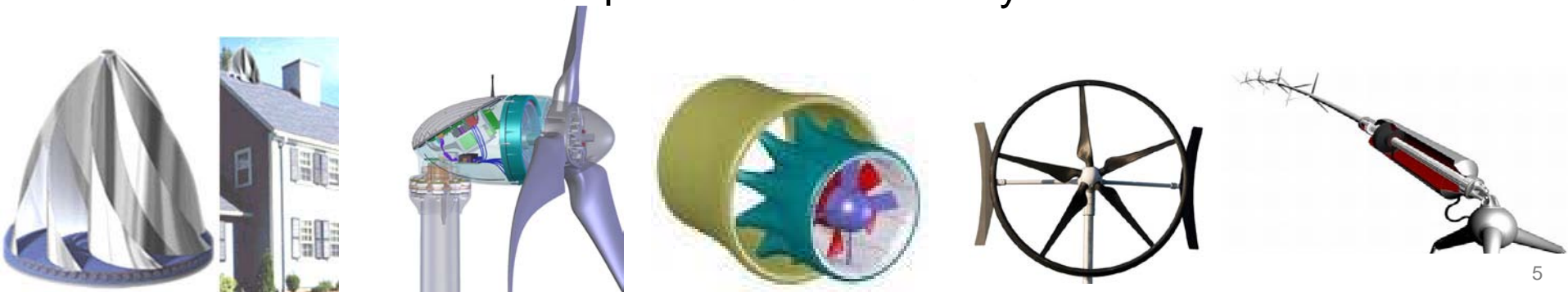


# Outreach & Education – Wind for Schools



# Technology

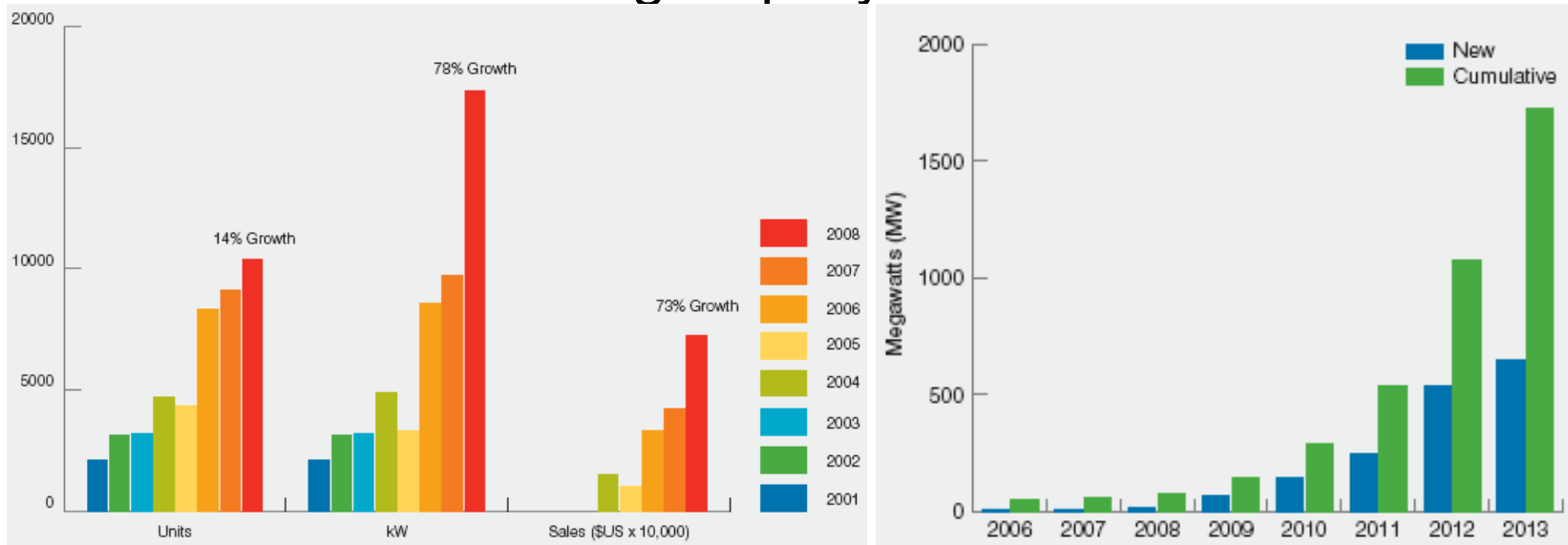
- Small Wind Turbines
  - Horizontal vs Vertical Axis Designs
  - Grid-Connected and Net-Metering
  - Off-Grid (with Battery) Applications
  - Hybrid Systems
- Lessons Learned
  - Low-Volume Production Contributes to High System Cost
  - More Performance Data is Needed for Building-Integrated Designs
  - Private Venture Capital is a Great Catalyst for Innovation





# Market

## ■ US Market is Growing Rapidly



Source: AWEA

## ■ Lessons Learned

- Consumers Demand Easily Understood Information
- Consumer Acceptance is Critical
- Financial Payback is not the Only Motivation for Consumers
- Grid-Connection Accelerates Small Wind Adoption



# Rural Residential Market Critical Mass in Southern California

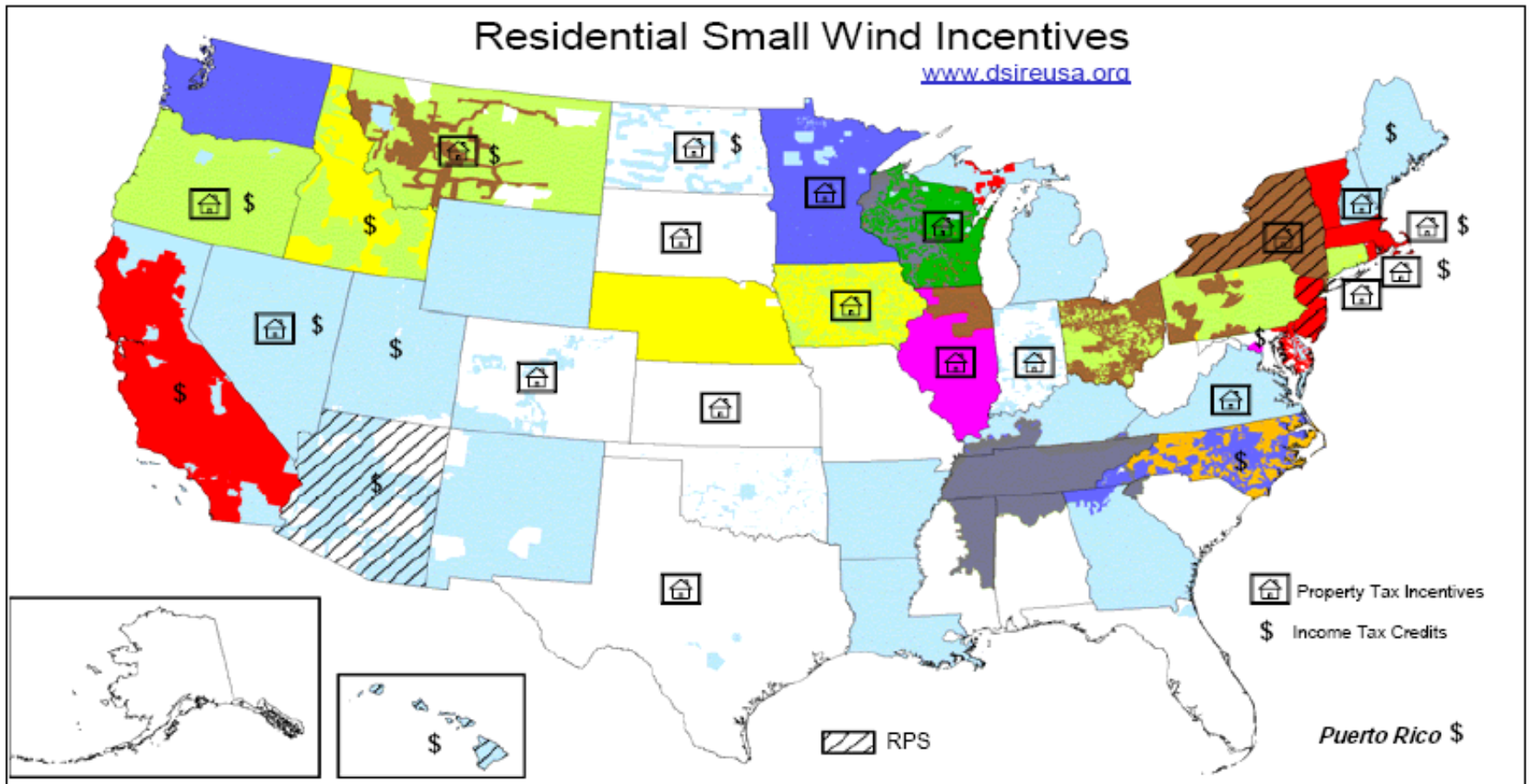


# Policy

- Government Financial Incentives
  - 30% Federal Investment Tax Credit
  - State and Other Incentive Programs
- Lessons Learned
  - Favorable Government Policy Requires Coordinated Advocacy
  - The Impact of Small Wind is Beyond Energy Generation
  - Environmental Factors and Utility Interconnection Can Be Challenging

# Residential Small Wind Incentives

[www.dsireusa.org](http://www.dsireusa.org)



**BUYDOWNS/GRANTS**

	Buydown/Grants
	Buydown/Grants & Net Metering
	Buydown/Grants, Net Metering, & Loans

**PRODUCTIVITY INCENTIVES**

	Productivity Incentives & Loans		Productivity Incentives
	Net Metering, Loans & Prod. Incentives		Net Metering & Prod. Incentives

**MINOR INCENTIVES**

	Loans
	Net Metering & Loans
	Net Metering

Yearly grants through the USDA farm bill are available for Illinois, Pennsylvania, Florida, Iowa, Wisconsin and Ohio.

## Summary

- US Market is Very Different from Those of Developing Asian Countries
- Technology Innovation and Consumer Acceptance Will Accelerate Deployment
- High-Volume Manufacturing Will Significantly Reduce Cost of Energy
- Standard/Certification Will Help Market to Mature
- Government and Private Sector Support is Essential



Dennis Lin

Phone: (202) 586-7285

Email: [dennis.lin@ee.doe.gov](mailto:dennis.lin@ee.doe.gov)

US Department of Energy  
Office of Energy Efficiency & Renewable Energy  
1000 Independence Ave SW  
Washington DC 20585