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Wind & Hydropower Technologies Program

The Realities of Consumer-Owned Wind Power For Rural Electric Co-operatives

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The Market for Small Wind Turbines is in Rural America

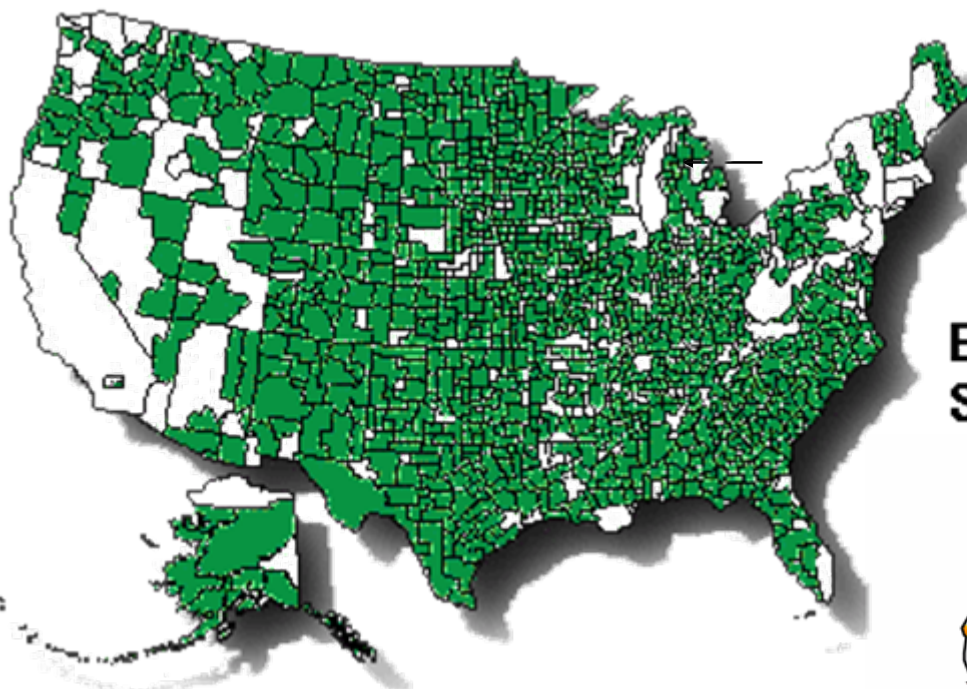
- Better access to good wind resources
- Zoning is less often a barrier
- Larger parcels provide adequate space for wind turbine installations
- Most of rural America receives electric service from rural electric cooperatives
 - 864 distribution co-ops serve 39 million people in 47 states



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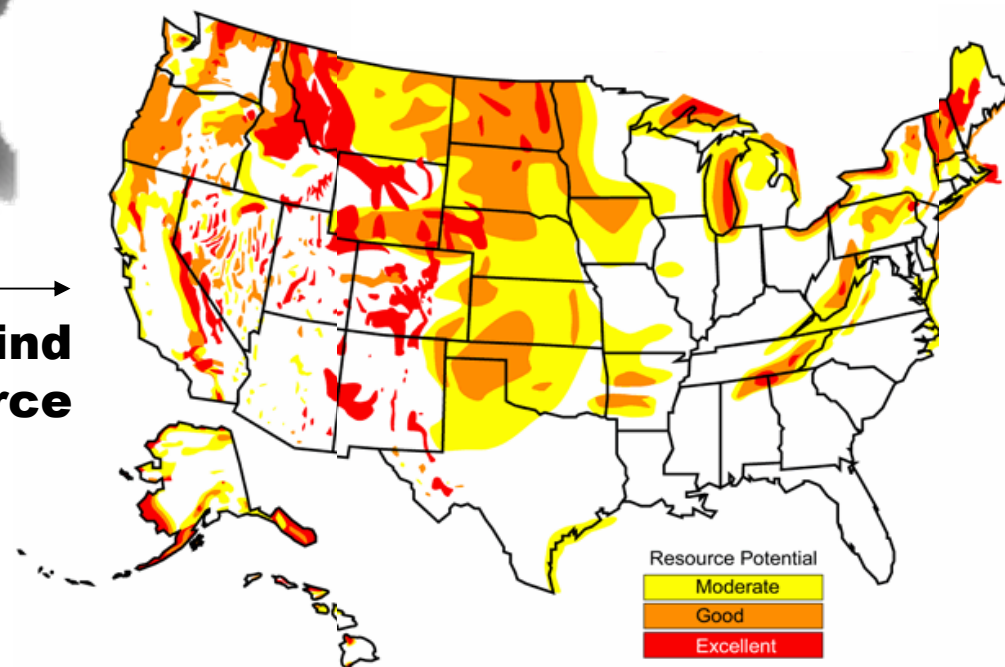
Wind in Co-op Territory



Source: NRECA

**Electric Co-op
Service Areas**

**Wind
Resource**



Resource Potential

Moderate
Good
Excellent



Consumer-Owned Wind Power

*The relationship between
wind turbine owners and their cooperatives
is crucial for the future of
small wind power!*

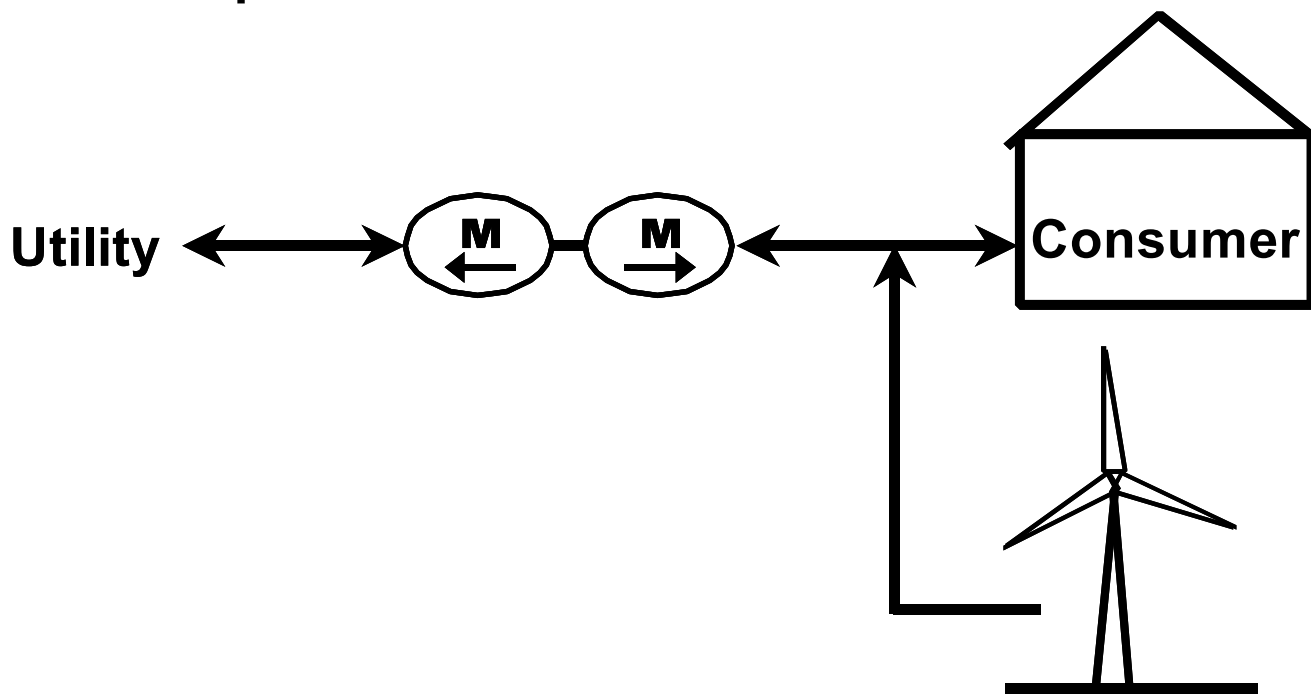
Our Focus → consumer-owned wind power

- Wind turbine(s) connected on the consumer's side of the electric meter
- Reduces consumption of utility electricity
- Excess energy may be exported and sold
- Consumers with energy-based tariffs
- Single-phase electric service, typically < 25 kW



Meter Configuration For Net Billing

Net energy is recorded instantaneously as either a purchase or a sale.

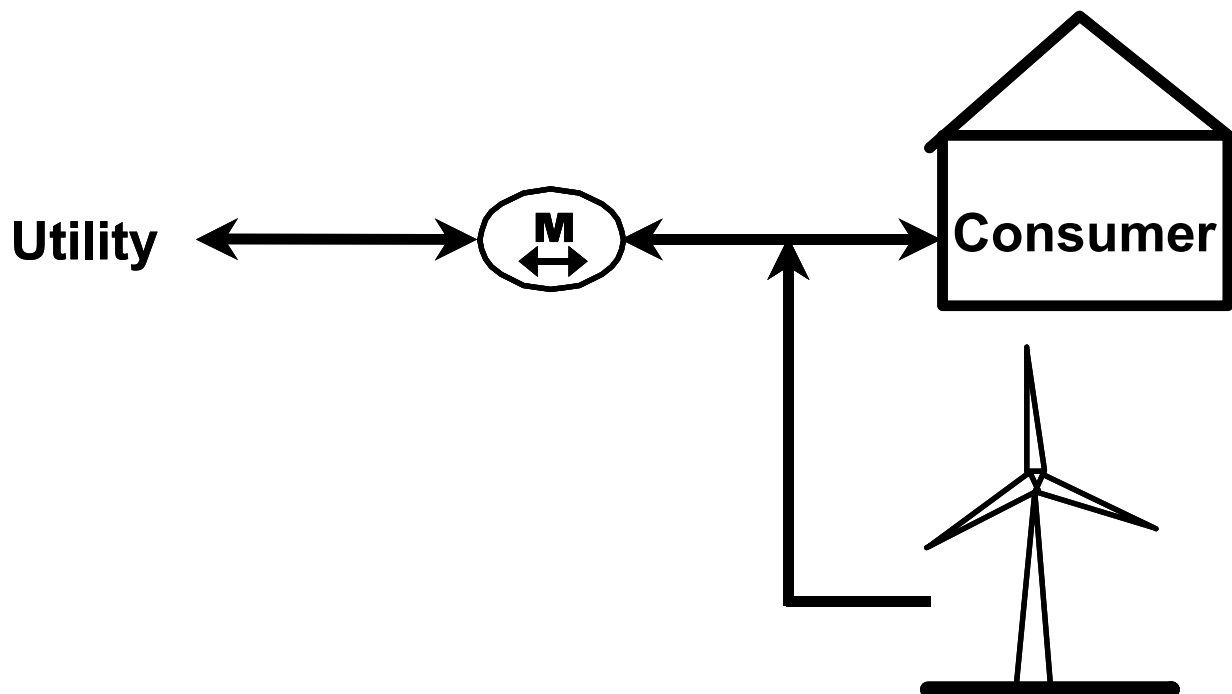




Meter Configuration For Net Metering

Cumulative net energy is recorded.

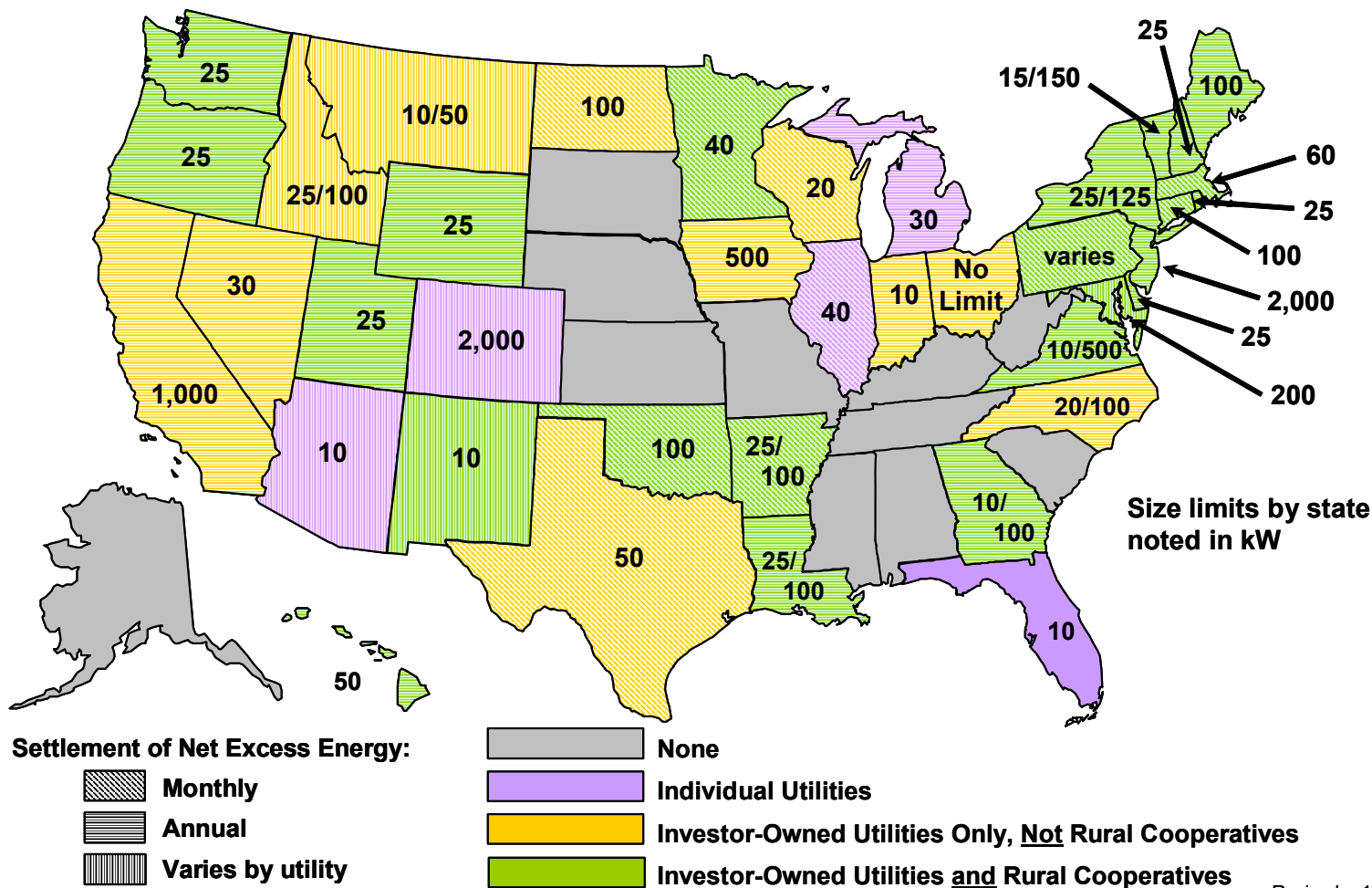
The account is settled either monthly or annually.





Net Metering for Wind

Only 22 states have net metering for all rural customers





Wind Interconnection Dispute in Iowa

- Sweckers and Midland Electric Cooperative
 - 8 years of litigation
 - Interconnection fees? Determination of avoided cost? Avoided cost or net metering?
 - Iowa Public Utility Board
 - Federal Energy Regulatory Commission (FERC)
 - Iowa Supreme Court
- FERC ruling in February 2006 backed away from the net metering enforcement action of June 2005
 - Provisions of EPAct 2005 are changing the scene, outcome is uncertain for net metering

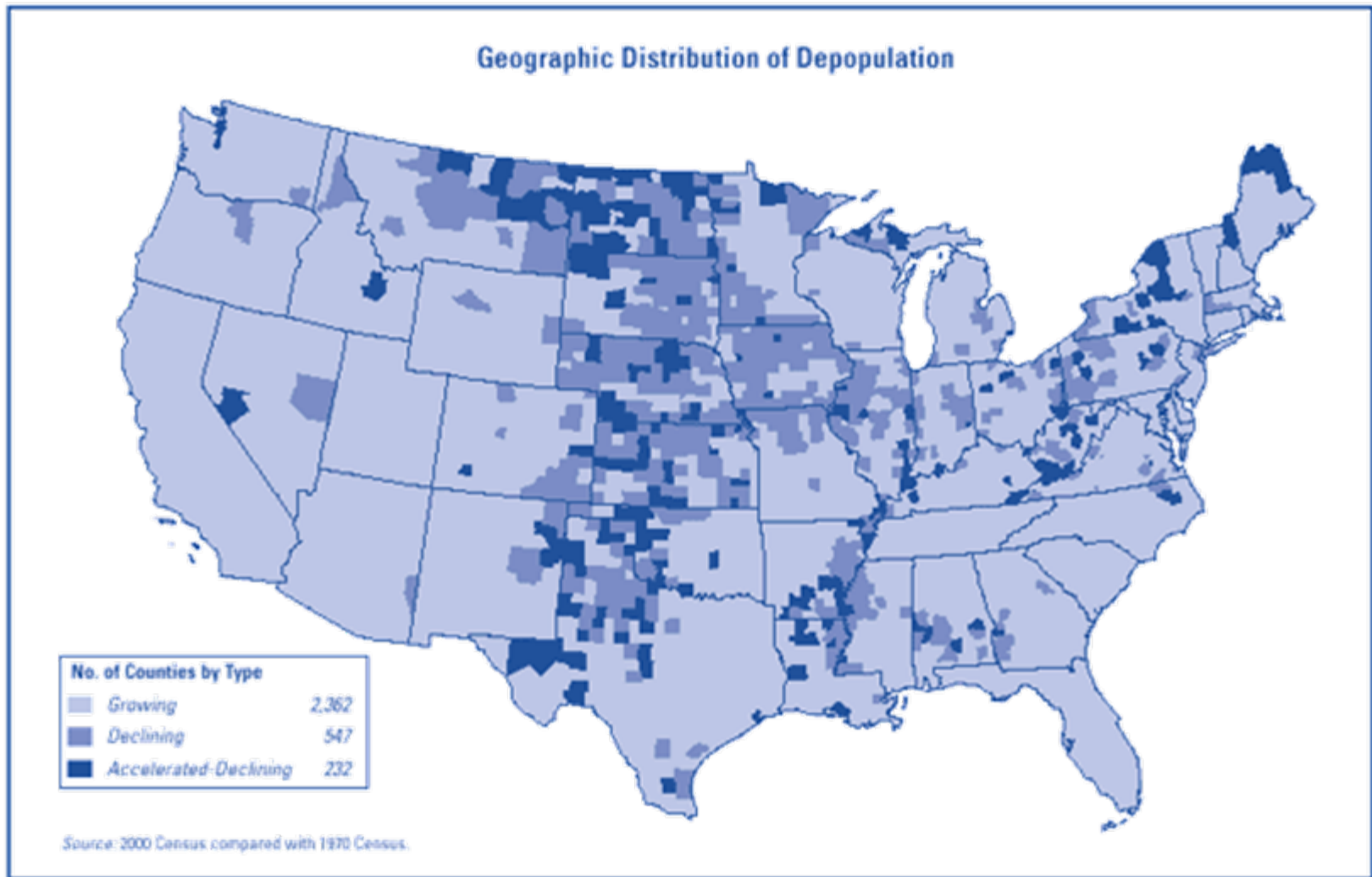


Understanding the Co-ops

- Pinched Finances
 - Smaller rural population means declining loads
 - Reduced ability to pay for facility fixed costs
- Price Signals Are Confusing
 - Tariffs for consumers are kWh-based
 - ➔ perception that electricity is a variable cost
 - Coop operating costs may be 50% fixed costs
- Load Match (~ 20% capacity credit)
- Culture of Fairness
 - “member economic participation”
- Net Metering - It's about the money!



Declining Rural Populations





Typical Utility Infrastructure Investment Per Customer

• Electric power distribution	\$3,000
• Telephone	\$1,600
• Natural gas distribution	\$1,100
• Cable television	\$ 750

Data from South Dakota (S. Wegman)

- Utility customers per mile of distribution line:
 - Investor-Owned: 35
 - Publicly Owned: 47
 - Cooperatives: 7



Times Are Changing

- Member preferences turning to renewable energy
- Price of electricity is going up
- Opportunity for rural economic development
 - Wind is an untapped resource
- Wind power is a hedge for an uncertain future:
 - Price of coal? Price of natural gas?
Carbon taxes? Other?



Co-ops and Consumer-Owned Wind Power

- Options
 1. Avoided cost interconnections
 2. Net metering interconnections
 3. Green power generation
 - Co-ops aggregate and sell the green power?
 4. Co-op support services for wind power
 - Sales, leasing, financing, installation, maintenance
 5. Place value on environmental and/or risk-reduction attributes
 6. Consumer-owned wind power to drive local economic development



Conclusions

- The market for consumer-owned wind power is in rural America where...
- Net metering is not widely available
- There is a disconnect between co-op and consumer perceptions
- Co-ops have significant fixed costs & are resistant to reduced revenues from consumers
- Benefits of consumer-owned wind power are not being given monetary value



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