



# Wind for Schools



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The New Center

(Sustainable Economic & Energy Development)

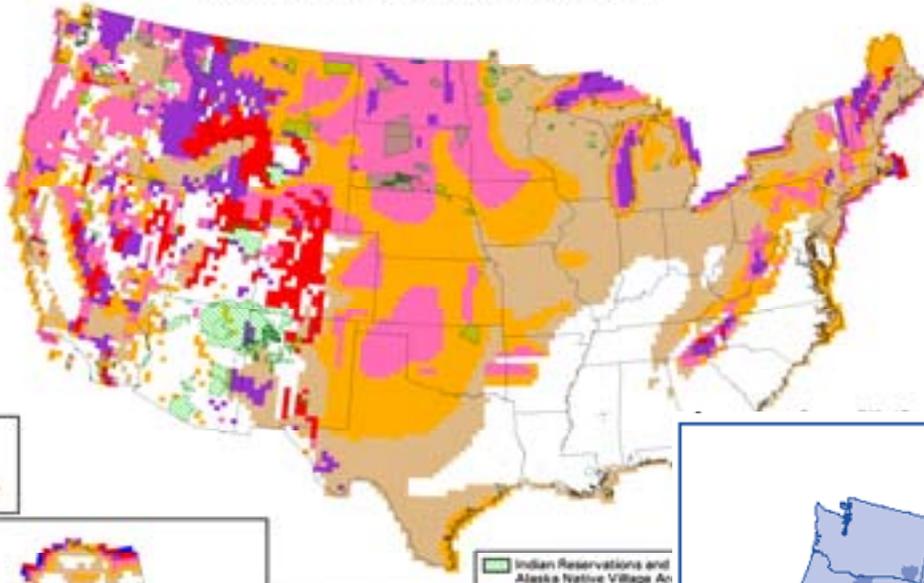
Wind Powering America – State Summit

June 8, 2006

Pittsburgh

# Good Match between Economic Need & Wind Resource

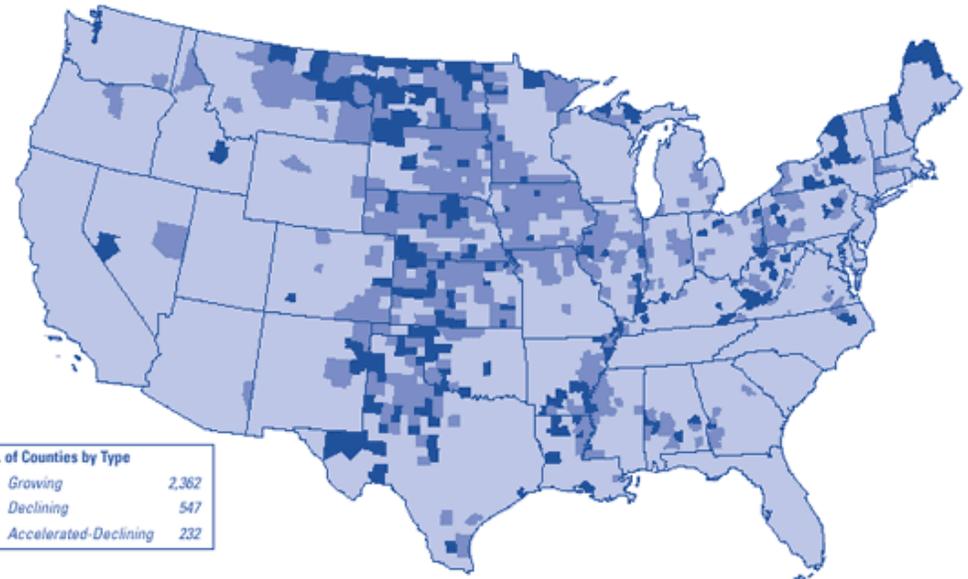
United States - Wind Resource Map



Wind Power Class	Resource Potential	Wind Power Density at 50 m, W/m <sup>2</sup>	Wind Speed <sup>a</sup> at 50 m, m/s	Wind Spd at 50 m, mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15
4	Good	400 - 500	7.0 - 7.9	15.7 - 18
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19
7	Superb	800 - 1800	8.8 - 11.1	19.7 - 24

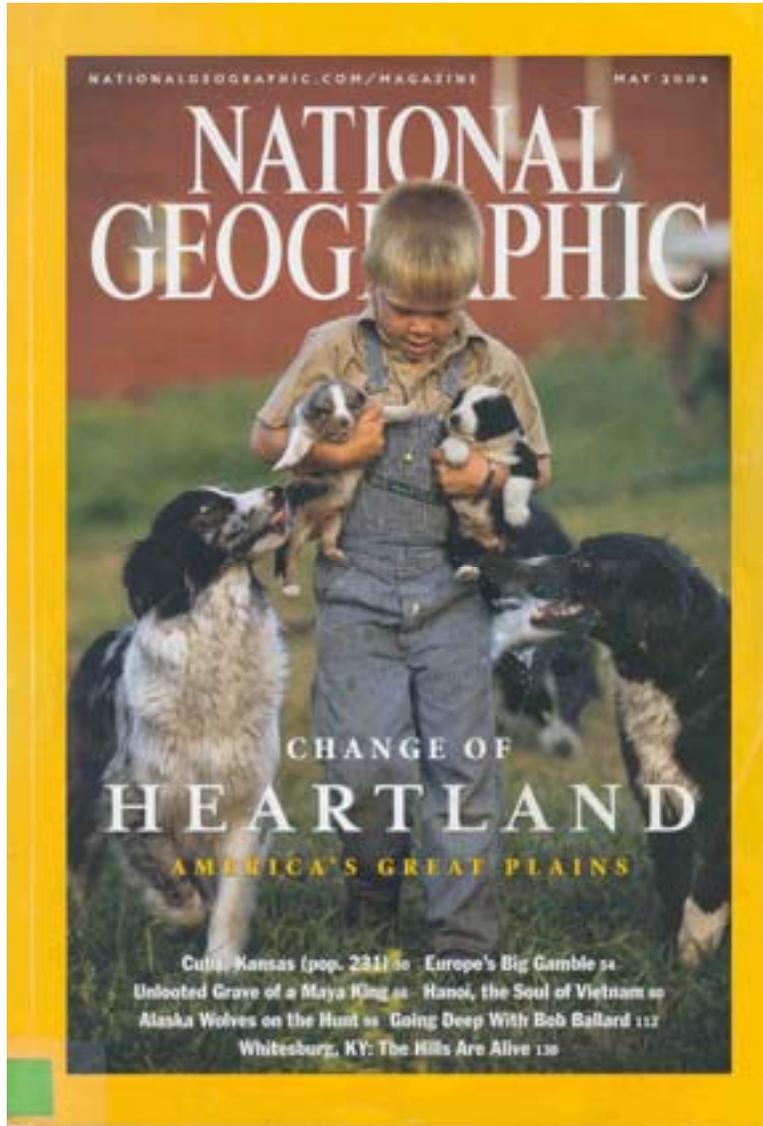
<sup>a</sup> Wind speeds are based on a Weibull k value of 2.0

Geographic Distribution of Depopulation



Source: 2000 Census compared with 1970 Census.

# The Drying Up of Rural America



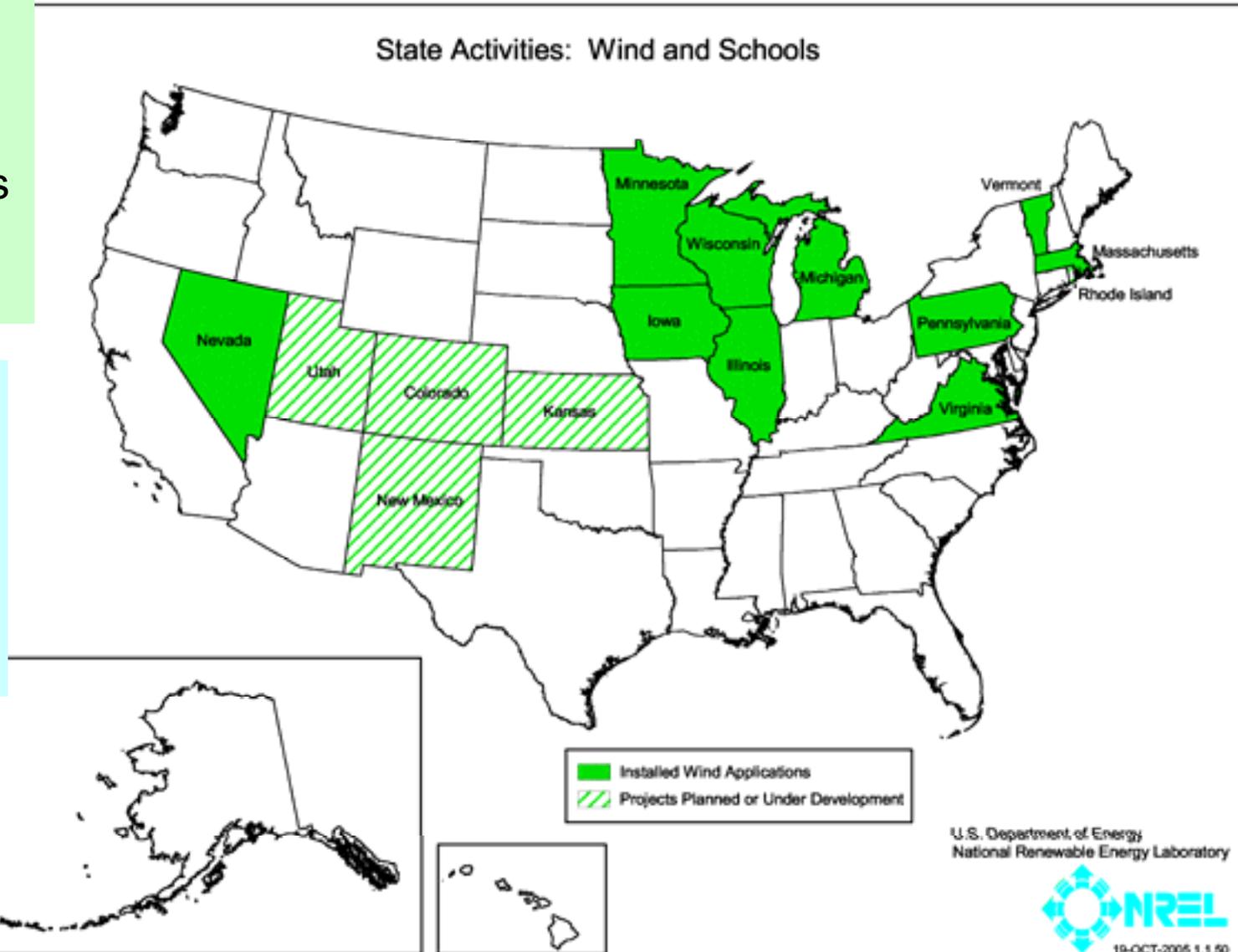
***“When you lose the school,”  
said a retired teacher,  
“you’ve lost the town.”***



# Wind for Rural Schools

About 30% of the nation's 94,000 K-12 public schools are rural.

They serve 27% of the 47M K-12 public school students



# Harnessing the Rural Drivers for School Wind

Fear of losing the next cohort: few jobs or career options to encourage people to stay or return

- Transfer focus from finances to curriculum and learning about energy transitions

Inherent community interest in wind power

- Engage curiosity of farmers, ranchers, business-people

Healthy “Show Me” skepticism

- Help get “iron in the ground”

Town leaders look for a visionary projects

- Position school wind project as a low-cost way to make leadership group visible

Rural utilities look for energy options that co-op owners can embrace

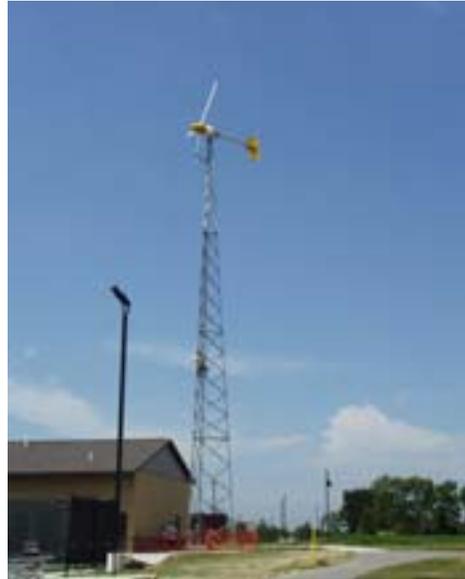
- Provide low-risk chance to participate and learn with a small collaborative project



# School Wind Projects across the U.S.



Spirit Lake, IA



Holland, MI



Beverly, MA



Eldora, IA

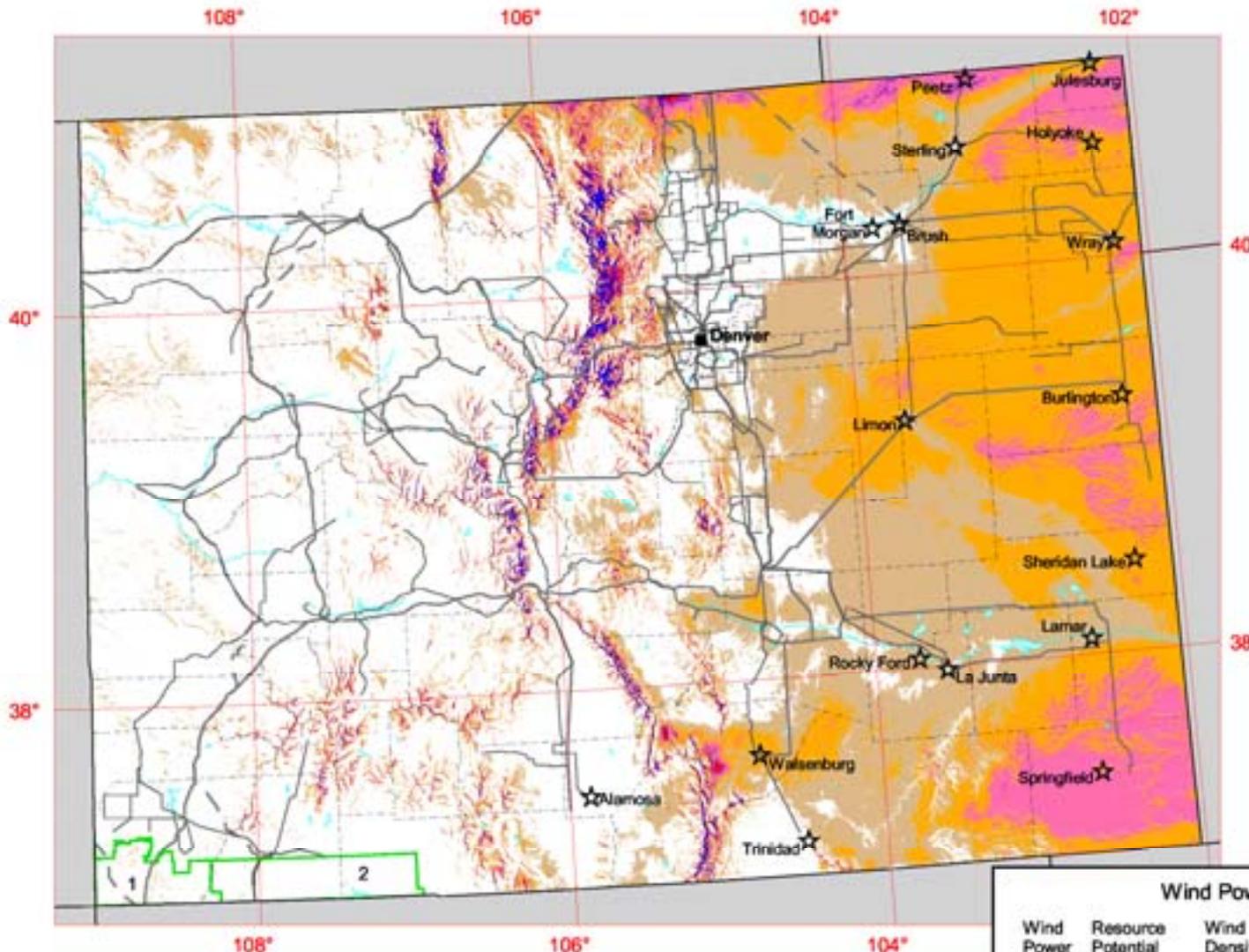
# Wind for Schools Pilot Project

- Contacted 17 schools on Colorado's eastern plains
- Reviewed utility bills & sketched financial analysis
- Presented results to local wind interest groups, plus
  - School board
  - City government
  - Local utility
  - Economic development interests
  - Other interested parties (e.g., ESCOs, farmers, Ag Extension agents)



# Colorado

## Wind and Schools



**Transmission Line\***  
Voltage (kV)

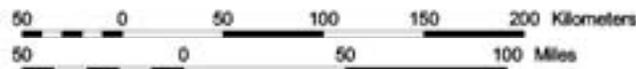
- 115 - 161
- 230
- - 345

\* Source: POWERmap, ©2003  
Platts, a Division of the  
McGraw-Hill Companies

The annual wind power estimates for this map were produced by TrueWind Solutions using their Mesomap system and historical weather data. It has been validated with available surface data by NREL and wind energy meteorological consultants.

Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m $W/m^2$	Wind Speed <sup>a</sup> at 50 m m/s	Wind Speed <sup>a</sup> at 50 m mph
1	Poor	0 - 200	0.0 - 5.9	0.0 - 13.2
2	Marginal	200 - 300	5.9 - 6.7	13.2 - 15.0
3	Fair	300 - 400	6.7 - 7.4	15.0 - 16.6
4	Good	400 - 500	7.4 - 7.9	16.6 - 17.7
5	Excellent	500 - 600	7.9 - 8.4	17.7 - 18.8
6	Outstanding	600 - 800	8.4 - 9.3	18.8 - 20.8
7	Superb	> 800	> 9.3	> 20.8

<sup>a</sup> Wind speeds are based on a Weibull k of 2.0 at 1500 m elevation.



**Indian Reservation**

- 1 Ute Mountain
- 2 Southern Ute



U.S. Department of Energy  
National Renewable Energy Laboratory

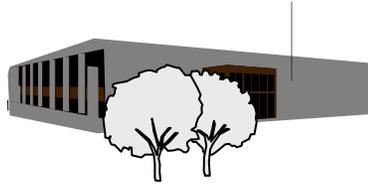
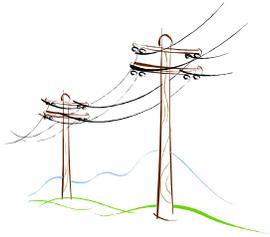
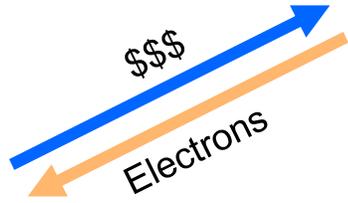


# Keys to Success

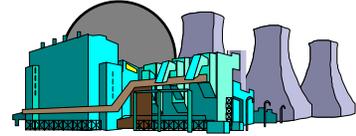
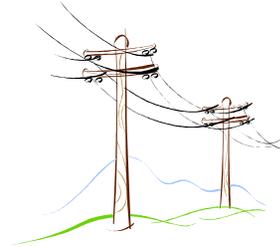




Rural School



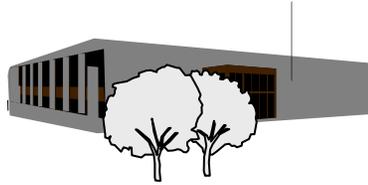
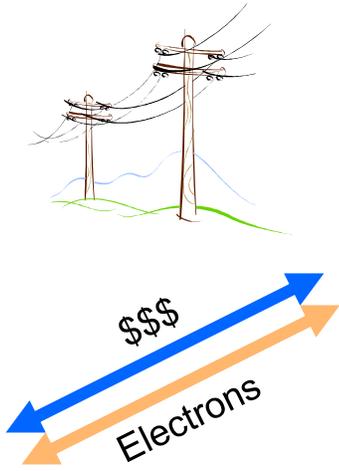
Local Muni or RE Co-op



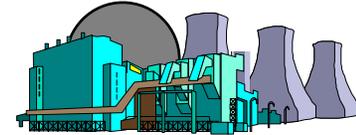
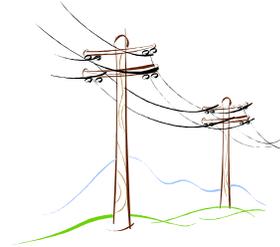
G&T Co-op or IOU



Rural School



Local Muni or RE Co-op



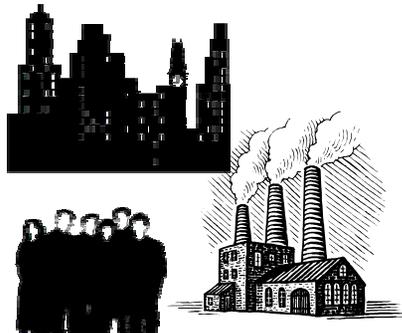
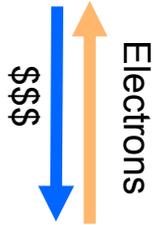
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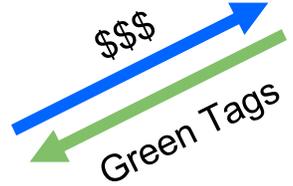
Community



Green Tag Marketer



Cities, Industries, Individuals



Marketing Campaign



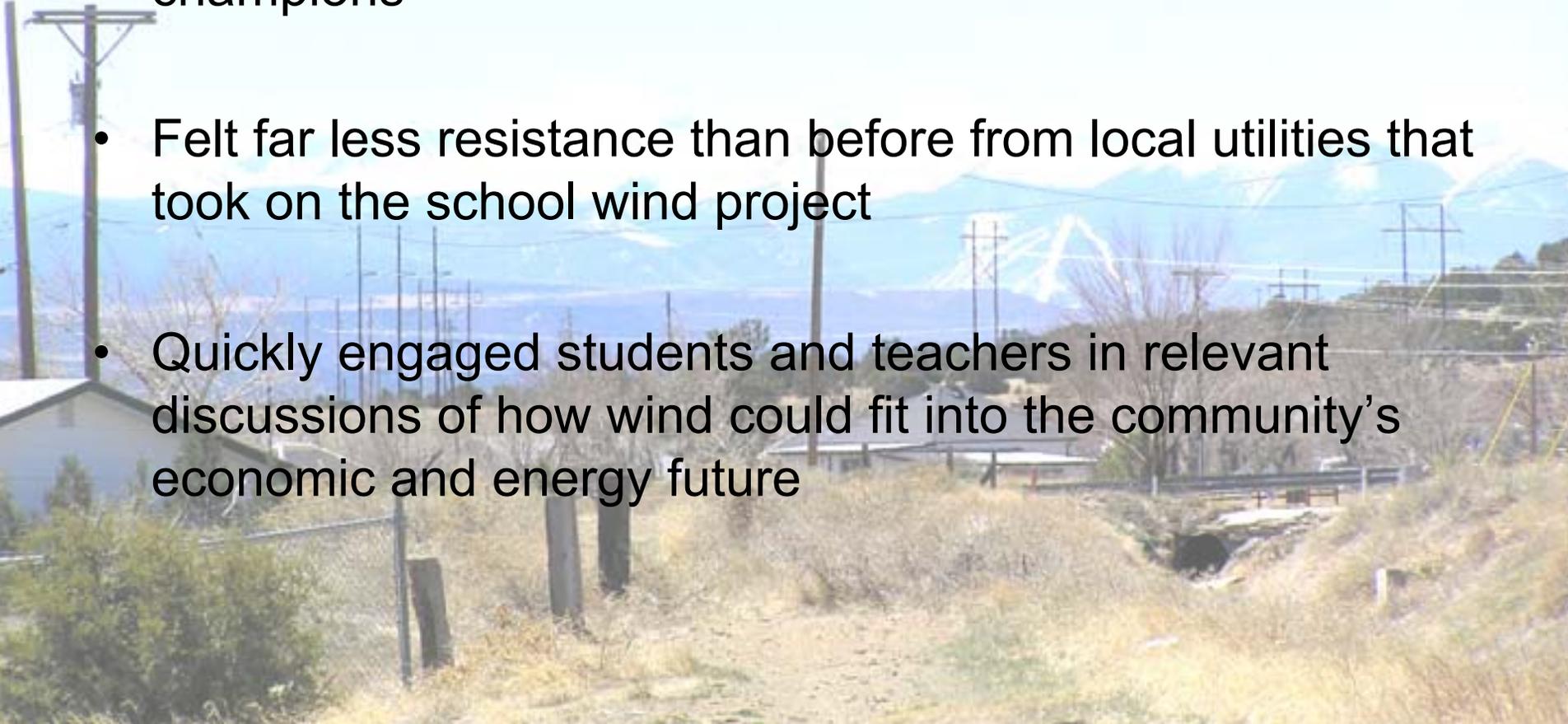
Community Wind

# Some Lessons Learned

- Pace of acceptance has been in every case remarkably slow
  - Typically months, not weeks
- Misunderstandings arise from distant and some-time communication
  - Need continual and clear, transparent communication with at least the project champion
- Poor finances will kill a project if you let them
  - Size your facility with the best economics in mind
  - Still, avoid allowing finances alone to rule the decision-making

# Some Notable Successes

- Experienced rapid uptake of concept (and prospectively grueling sales and installation jobs) by community champions
- Felt far less resistance than before from local utilities that took on the school wind project
- Quickly engaged students and teachers in relevant discussions of how wind could fit into the community's economic and energy future





*Carpe Ventem*

[www.windpoweringamerica.gov](http://www.windpoweringamerica.gov)