

Wind for Schools Program Overview



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School Wind Projects: Most Common Models

- Purchase green tags
- Buy a portion of the output of a utility-scale wind project
- Small turbine on the school grounds (behind the meter) offsets electricity costs
- Larger turbine powers a school, with excess electricity sold to local utility
- School lands leased to wind farm developers
- Payments by developers to school funds in lieu of taxes
- **Install small wind or wind/solar system primarily for educational purposes**



Spirit Lake, IA



Mount Holly, VT



U. Of Colorado



Project Objectives

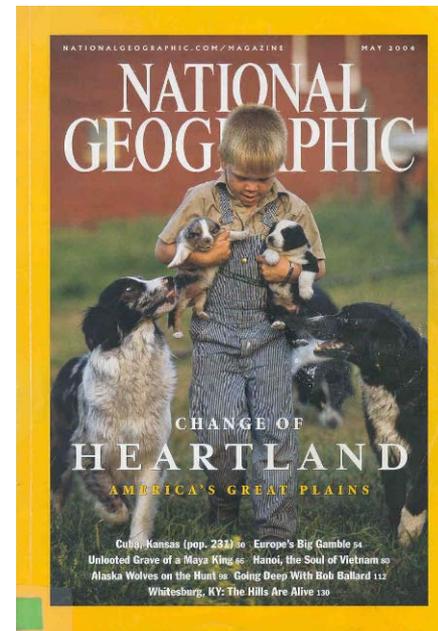
Engage rural America in the concept that wind offers an alternative energy and economic future for rural America

Engage rural school teachers and students in energy education, specifically wind

Equip college juniors and seniors in wind energy applications and education to provide the growing U.S. wind industry with interested and equipped engineers

We hope to meet these objectives by installing small wind turbines at K-12 schools in rural communities with the help of local institutions of higher education

Long-term economic development in rural areas is tightly linked to schools



20% energy from wind will require on the order of 2,750,000 FTE job years over a 20 year project life

- We need to start training the people who will make this happen

Project Approach

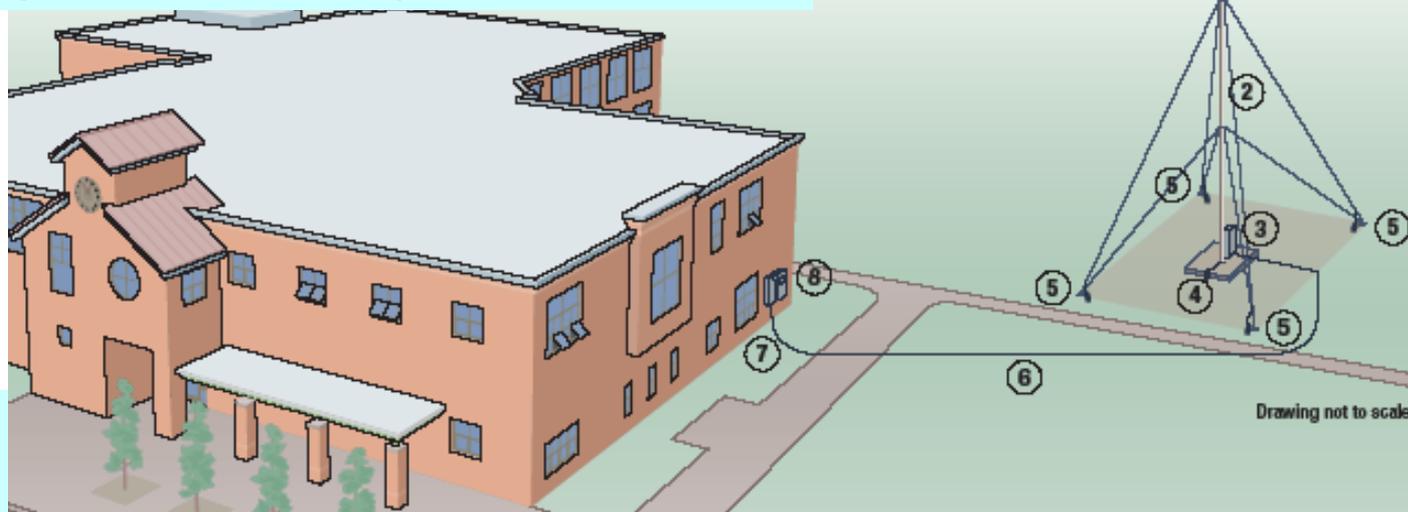
- Low-cost replicable system
- Assist community and local utility to implement a sustainable school wind project
- Work with AWEA/NEED on K-12 curriculum
- Build in-state capacity to provide technical assistance for community-scale projects
- Work with State Universities on college-level program and curricula
- Work collaboratively with all community organizations to implement successful projects



Walsenburg, CO

Power System

Initially envision using a standard system package, but could branch out and provides a process for the use of larger or different systems.



Components of Standard System

- 1) SkyStream 3.7, 1.8-kW wind turbine
- 2) 70-ft guyed tower
- 3) Tower/turbine base fused disconnect and junction box
- 4) Turbine foundation including tower base electrical grounding
- 5) Tower guy wire foundations and electrical grounding
- 6) School electrical connection
- 7) School disconnect and junction box
- 8) School's electrical power meter or interconnection point

SKYSTREAM 3.7™

www.skystreamenergy.com

Southwest Windpower

Renewable Energy Made Simple

State Facilitators

In-state person with knowledge of local issues and organizations to engage with the variety of stakeholders needed for successful school projects

- Engage with the variety of stakeholders needed for successful school projects: community, school, science teachers, local co-op/utility, WAC, NREL
- Help assemble financial package that will work
- Goal: Install 3 to 5 systems per year at rural schools
- Assist in the development of the Wind Applications Center

Colorado: **Tom Potter**, All American Energy

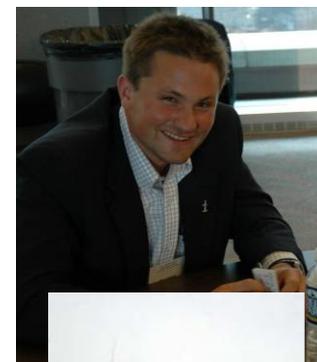
Idaho: **Brian Jackson**, Renaissance Engineering

Kansas: **Dan Nagengast**, Kansas Rural Center

Montana: **Mike Costanti**, Matney-Frantz Engineering

Nebraska: **Dan McGuire**, American Corn Growers Foundation

South Dakota: **Steve Wegman**, SD Public Utilities Commission



Wind Application Centers

Establish a training and implementation center to educate engineers in wind applications and analysis:

- Modeled after the DOE Industrial Application Center
- Develop a long-term program on wind energy applications; NREL/DOE will help for first 3 years but additional funding will be need
- Provide data analysis, technical assistance, implementation support for Wind for Schools Program
- Become the “go-to place” for technical assistance for school and community wind
- Train engineers to enter the wind marketplace/industry

Colorado State University

Boise State University

Kansas State University

Montana State University

University of Nebraska, Lincoln

South Dakota State University



South Dakota State University

You can GO ANYWHERE from here.®

NREL / DOE

Supply organization, oversight, financial assistance, and training to state organizations implementing Wind for Schools projects

- Provide initial/seed funding for the Wind Application Center (3 years)
- Provide funding for the State Facilitation (3 years)
- Host a yearly week long training program at NREL on wind applications
- Assist in the identification of candidate schools and final school assessment (resource analysis, siting and interconnection, installation guidance etc)
- Support the development of wind specific energy curricula
- Development of project documentation, legal information, and other logistical support

Education Curricula:

- Work with partners (e.g. NEED, KidWind) to develop K-12 Curricula incorporating data from the wind turbine for projects
- Development of college curriculum with WACs



Project Finances

Sample financial arrangement

- Reduced system cost ~\$10,000
- \$1,500 from the school
- \$2,000 from selling lifetime green tags through a broker – Community Energy
- \$2,500 from a buy-down fund or other grant source
- \$4,000 provided in-kind by the community and utility

Payback - The real payback is in the education

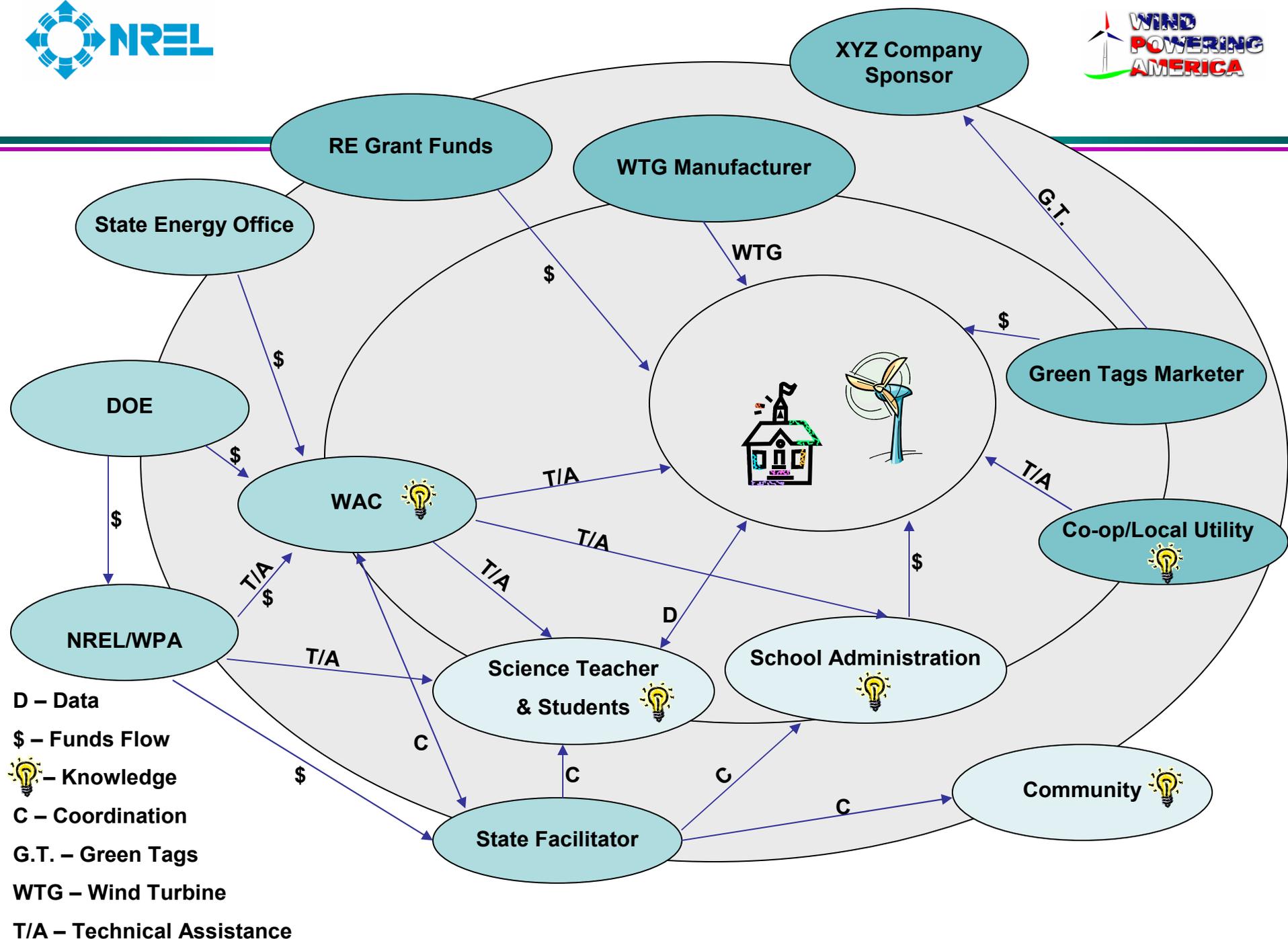
- Skystream @70ft in a class 3 wind resource will produce about 6000 kWh/year
- At a retail rate of \$0.05 / kWh this amounts to ~\$300 per year in reduced energy costs
- Simple payback to school ~5 years



Skyline High School,
Idaho



Milford High
School, Utah



D – Data
 \$ – Funds Flow
 – Knowledge
 C – Coordination
 G.T. – Green Tags
 WTG – Wind Turbine
 T/A – Technical Assistance

Program Expansion Plans

2007 Pilot Rollout

- Initial Pilot underway in Colorado
- Putting in place contracts for the first five pilot expansion states
- Plan to have the first Wind for Schools applications training in August
- Expect to have the first potential school systems being analyzed this fall
- Power systems being implemented in late 2007 and through spring 2008

2008 Phased Rollout

- Funding looking constrained in FY2008 - Congress still needs to act
- With appropriate funding – expect to roll out to 5 additional states in the spring of 2008
- Process of determining where rollout will take pace is unclear - priority states, regional focus, competitive competition...
- Hope to expand to approximately 5 new states each year

There are many other State based programs to develop educational opportunities in schools – feel free to use our support services, but don't feel you have to wait for our program

John Mall High School
Walsenburg, Colorado

Project partners:

- National Renewable Energy Laboratory
- Tom Potter
- Southwest Windpower
- Community Energy
- Western Resource Advocates
- John Mall High School / Administration
- Community of Walsenburg

San Isabel Electric Association provided trenching, cabling, manpower

Community Energy donated equipment based on sales of Colorado Rural Green Tags to large businesses on the Front Range (urban-rural partnership)

NREL/Tom Potter provided technical assistance and organizational support



San Isabel Electric Association helping raise turbine



Deals for more than one large local wind farm in progress

WIND POWER CAN FUND SCHOOLS

winds of opportunity for utah



www.wind.utah.gov

Carpe Ventem

<http://windpoweringamerica.gov>

Click on Schools under Program Areas