

DRI's Green Power Program and Renewable Energy Center (REC)

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DRI's Green Power Program

■ Purpose:

- The mission of the Green Power program is to support and promote the use and development of green sources of energy in Nevada, with an emphasis on educating Nevada's K-12 population.

■ History:

- Initiated by requests from Nevada Power (NP) and Sierra Pacific Power Co. (SPPC) to partner in renewable energy outreach efforts
 - First installation in 1999 -- Daystar system installed at DRI's Las Vegas campus
 - First school installation in September, 2002
- GreenPower constitutes an education/outreach component of the broader DRI Renewable Energy Center (REC)

DRI's Green Power Program

■ Funding sources:

- Currently, about 400 ratepayers throughout NV participate by means of NP/SPPC bill payment program
- Sierra Pacific Resources (SPR) contributes in various ways
- Other funding sources (corporations, foundations, individuals) are being sought

■ DRI's role:

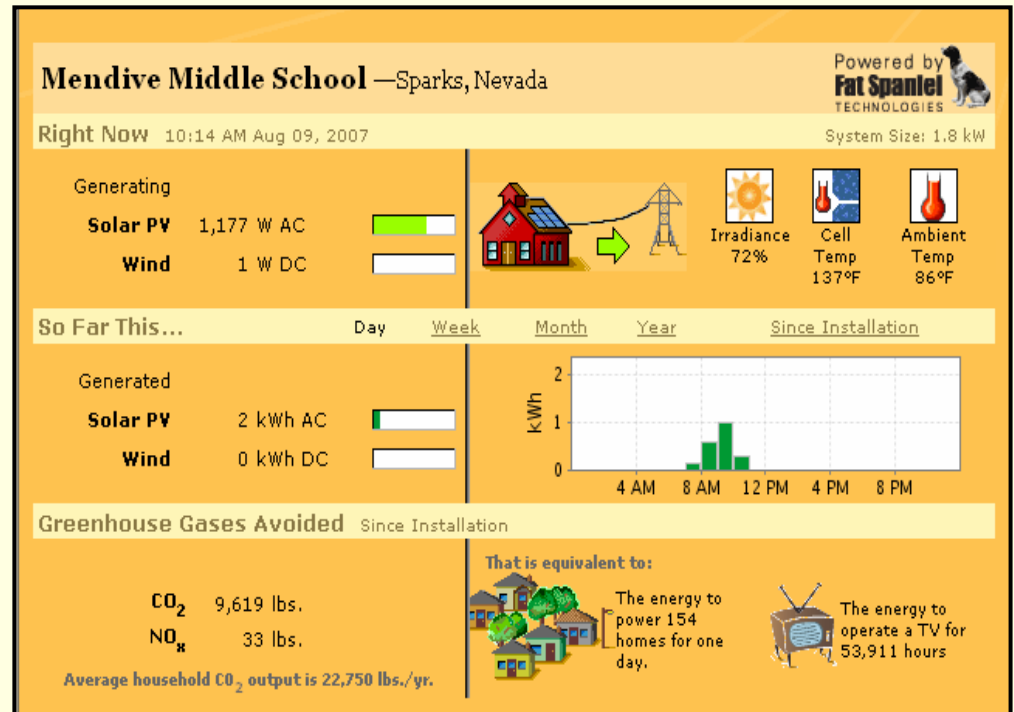
- Identify candidate schools for new installations
- Collect necessary funds
- Work out logistics with school
- Assist in curriculum development

15 Participating Green Power Schools



Monitoring Performance of Green Power Systems

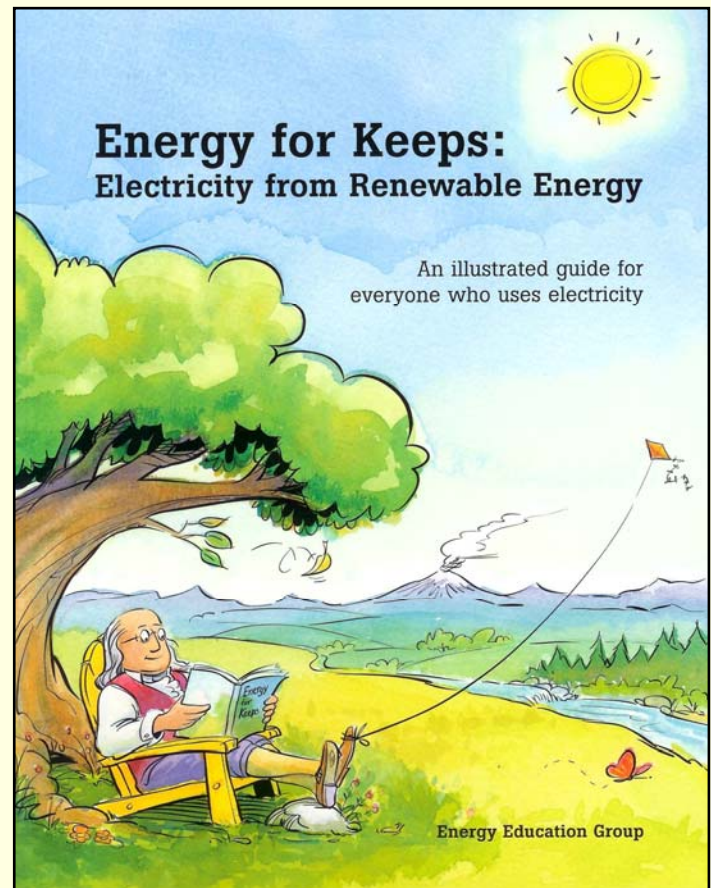
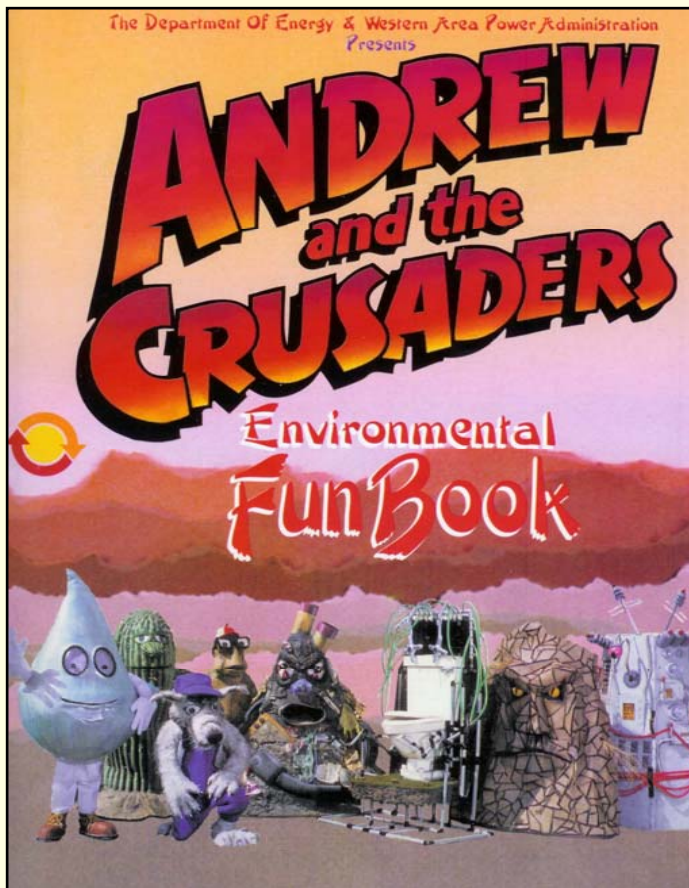
- Web-based “Fat Spaniel” software is used
- Provides real-time display of solar and wind energy
- Also shows longer-term trends in renewable energy produced
- Provides summary of greenhouse gas benefits



<http://www.solargenerations.com/realtime.html>

Educational Value of Green Power Program

Age-appropriate science educational materials are provided



Future Plans for Green Power Program

- 1-more conventional school installation is planned
- Considering possible ways to reach more students
 - Bus students to a central location
 - Create traveling exhibit to bring to schools
- Enhanced teacher training
 - SPR has provided funding for DRI to hire ½ time person

DRI's REC

- Originated as part of the Nevada Southwest Energy Partnership (NSWEP)
- NSWEP Partners include:
 - 3 Nevada research institutions: DRI, UNR, UNLV
 - 3 Governmental organizations: DOE, NREL, NSOE
- NSWEP Purposes:
 - Promote RDD&D of Nevada's renewable energy
 - Partner with private sector
 - Provide education and outreach regarding renewable energy

DRI's REC – primary focal areas

Wind energy resource assessment

- Measurement and modeling to assess wind potential throughout the State
- Wind conditions at relevant locations and heights
- Detailed spatial and temporal scales
- Infrastructural considerations:
 - Accessibility
 - Proximity to power lines
 - Land use restrictions



DRI's REC – primary focal areas

Hydrogen in Off-Grid Applications

- Produce H₂ by electrolysis as way of storing excess solar and/or wind energy
- When needed, use H₂ as fuel in gen-set to produce electrical power



DRI's REC – primary focal areas

Hydrogen in Transportation Applications

- Working with Washoe County RTC to convert para transit buses from CNG to HCNG
- Explore codes, requirements, and practical aspects of H₂ production, storage, and re-fueling in transportation applications.
- Assess vehicle performance and emissions effects of conversions.



DRI's REC – other focal areas

- Biomass-to-energy applications
 - Biomass resource assessment for Nevada
 - Evaluation of thermochemical conversion processes
 - Biodiesel fuel from Nevada feedstocks
 - Life-cycle analyses

- Development of energy usage monitoring system
 - Provide appliance-specific energy usage data
 - Improve energy efficiency in residential applications

DRI's REC – other focal areas

■ Education/Outreach Activities

■ Green Power Program

■ Workforce Training

- Dept. of Labor funded collaboration between DRI and TMCC
- Objective is to develop a system for training a workforce in renewable energy
- Involves TMCC faculty externships with companies and also course development or modification
- Explore other successful programs and local ventures
- Identify industry needs for trained personnel

DRI's Future Energy Activities

- Grow existing partnerships – academic, government, and private industry
- Establish new partnerships
- Continued growth of DRI-REC
 - Expand existing capabilities/strengths
 - Environmental measurements and evaluations
 - Impact assessments
 - Climatological information
 - Renewable energy resource mapping
 - Information acquisition, transmission, analysis, and display
 - Develop new capabilities
 - Biomass-to-energy applications
 - Life-cycle assessments
 - Energy efficiency evaluations