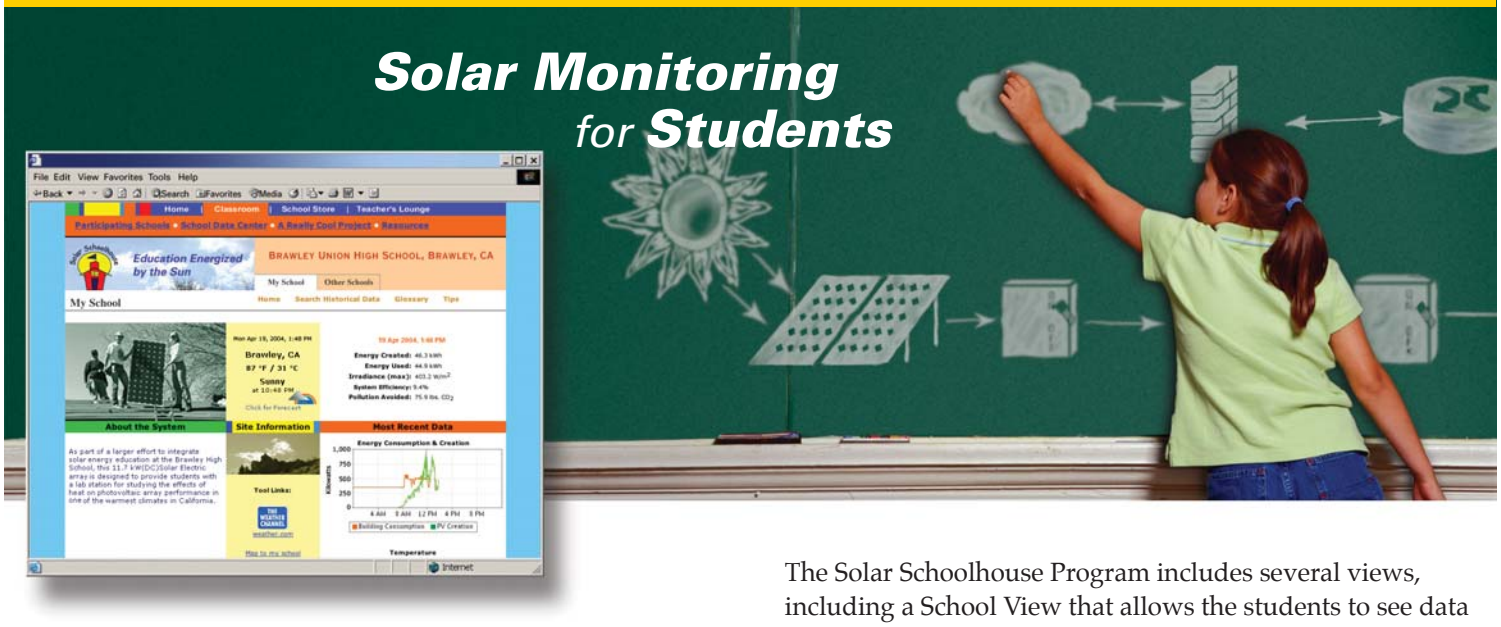
Fat Spaniel TECHNOLOGIES

Educational Solar Monitoring Solutions

Solar Monitoring for Students



Solar Education for Students

Fat Spaniel Technologies and the non-profit Rahus Institute bring science lessons to life through the Solar Schoolhouse Program. The Fat Spaniel Technologies Monitoring Solution, PV2Web™ allows students to view their school's live energy data via the Internet. PV2Web provides students with easy to understand views of their Solar Electric system, with the ability to interact with data from their school and other schools across the country. Solar Schoolhouse provides an interactive, hands-on science curriculum which focuses on solar energy and environmentalism. Students will learn about solar electricity, energy usage and conservation.

Solar Schoolhouse Program

The Solar Schoolhouse Program was developed by the non-profit Rahus Institute to provide environmental science curriculum for public schools with live solar installations. Each school that installs a solar electric system will have live data published to the Solar Schoolhouse website using Fat Spaniel Technologies Monitoring. Students and teachers can see how much energy is produced from the sun by their school's system and how much of the energy generated is returned to the energy grid.

PV2Web Monitoring Features

Utilizing easy to understand and visually engaging website views, students can see how much solar energy their school is generating on a daily, weekly, monthly and yearly basis. Students can compare their energy generation and consumption based on seasonal and environmental changes, and with other monitored schools in the Solar Schoolhouse Program.

The Solar Schoolhouse Program includes several views, including a School View that allows the students to see data on how much energy their school is generating and using, and the environmental benefits, such as greenhouse gases avoided. Other views include an Environmental Data View which allows students to see data regarding cell temperature, irradiance and ambient temperature, a "How It Works" view that provides an overall description of how solar energy and solar monitoring work. An Administrative View is also included for the facilities manager and the installer to monitor the performance of the solar energy system.

Benefits to the Students

- **Interactive, hands-on science curriculum**
- **Educational opportunity to learn about solar energy and solar conservation**
- **Students become a part of the solar community**

Benefits to the School

- **Turnkey, low-maintenance operation**
- **Utilize science curriculum and materials developed for the Solar Schoolhouse Program**
- **Increase awareness of electricity use and encourage more energy efficient behavior**

Visualize Renewable Energy℠

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Dynamic data searches can be performed with results returned in graphic or table views.

Standard System Includes

- All required hardware, including sensors, loggers and communication equipment
- 5 years monitoring service
- 5 years of feature upgrades
- Executive View and Installer Administrative View
- 24x7 information accessibility via any internet enabled device

Hardware Components

- Enclosure: All PV2Web components are delivered assembled inside 1 or more enclosures
    - Steel or plastic
    - Outdoor rated, NEMA 3R
- Communication Gateway
    - Internet connectivity: TCP/IP
    - UL and CE listed
- Power adaptors and power cords
- Connectors and short run cabling

Additional Hardware Components if needed

- Data logger
    - For building load and environmental monitoring
- Current transducers
    - Available Sizes: 3 ¼", 2", 1 ¼"
- Environmental sensors
- Pyranometer or light level sensors
- Thermister
- Anemometer

System Compatibility

- PV2Web is compatible with any inverter including models from:

SMA: Sunny Boy Series, Sunny central
Xantrex: Trace Series, SunTie, PV Series
Outback: FX, VFX, GTFX, GVFX
PV Powered: Star Inverter PVP1100, Star Inverter PVP1800, Star Inverter PVP2800
Fronius: IG, Sunrise, Solarix
Sharp: Sun Vista
Ballard: Ecostar

Note: Some systems require power meter

No Computer Required

- No onsite computer necessary
- Monitoring software resides on the Fat Spaniel Technologies' servers

Internet Connectivity

- Internet connectivity is required for data collection at PV site
- Internet connectivity options include DSL, Cable, modem*, wireless*

Power/Electrical

US: Standard 110 AC
EU/UK: 220

Standard Data Collected

- AC voltage (Volts)
- AC current (Amps)
- AC power (Watts)
- AC total energy since start of operation (kWh)

Optional Data Collected

- DC current, voltage, power and cumulative energy
- Building voltage, power and cumulative energy
- Irradiance (W/M^2)
- Ambient Temperature and Cell Temperature (Degrees Celsius, Degrees Fahrenheit)
- Wind speed (mph, or m/s)
- Wind direction (Degrees)
- Battery input/out current, voltage, power and cumulative energy

Data Acquisition

- System stores data locally for up to 24 hours in the event of a network outage
- Data upload automatically occurs via Internet connection
- 2 years worth of live data available on the Fat Spaniel Technologies servers

Documentation

- Quick Reference Installation Guide
- Wiring Diagrams

Certifications

- California Energy Commission approved performance meter

* Requires separate accessory kit

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