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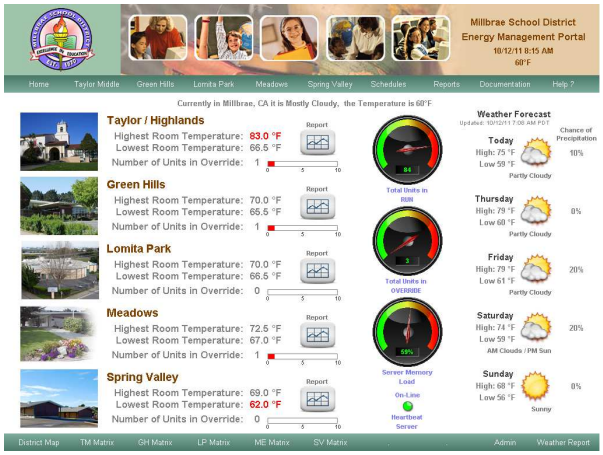
Case Study

A Low Cost, Enterprise Level, Energy Management System for the Millbrae School District



The Millbrae (California) School District, which is comprised of four elementary and one middle school, underwent a modernization project during the summer of 2011. In addition to the heating, ventilation, air conditioning (HVAC) controls upgrades, the project included improvements to the IT infrastructure and a new Wi-Fi network for each school. With rising energy costs colliding with statewide budget cuts, The District was looking for a way to manage their HVAC units to lower costs and, at the same time, improve classroom conditions for the students. The existing energy management systems (EMS) had proven to be too complicated and were in various states of disrepair. A less complicated, cost effective solution was desired.

Energy ETC proposed leveraging the newly installed Wi-Fi infrastructure to create a District wide EMS which could be monitored and controlled from the Internet. Using software technology from Building Clouds, hardware and cloud services from cloudbeam, and programmable thermostats from Radio Thermostat of America, a fully integrated EMS was created for all five schools.

Authorized users are now able to adjust set points and operational hours for each connected thermostat from an internet-connected web browser from anywhere in the world. An easy-to-navigate graphical user interface allows remote on/off control, 7-day programming of operating schedules and set points, set point adjustment, alarm annunciation for out of range or fault conditions, graphing of historical data, tracking of operational hours for maintenance purposes (filter changes for example), email and text message alerts for alarms and maintenance.

System Components

Enterprise EMS Software, Opendiem by **Building Clouds**
Control Systems Integration, EMS Hosting Services, and Helpdesk by **Energy ETC**
Cloud Based Services, and Wi-Fi enabled hardware by **Cloudbeam**
Programmable thermostats by **Radio Thermostat of America**

System Details & Savings

Field technicians replaced the existing thermostats with Wi-Fi enabled units and simultaneously provisioned them onto the Cloudbeam remote server over the Wi-Fi network. Energy ETC used the Opendiem software suite of products by Building Clouds to integrate the data from the cloud into a cohesive EMS presentation over the web. As devices were provisioned, the District was able to begin using their new EMS immediately.

A monthly subscription fee allows the District worry free, 24x7 access to the EMS Portal via Software as a Service. The cloud server running the portal is located in a secure data center and receives regularly scheduled data backups and maintenance including operating system updates and patches. Helpdesk support is provided Monday through Friday from 8:00am until 5:00pm.

Programmable thermostats are able to save up to 20% of the energy used by the devices they control. A conservative estimate using 5% energy savings for the District's five schools could save them $7,500.00 per year. If 20% energy savings are achieved, the savings could be up to $30,000.00 per year. **
Annual savings from even the most conservative savings estimate will more than pay for the monthly subscription fees.

Savings from reduced service calls may prove to be even greater than the energy savings. The facilities team for the District no longer has to make multiple classroom visits per week to address hot and cold complaints from the teachers, these changes can now be made remotely and often before the teacher knows there is a problem. Classroom service visits for temperature issues have been reduced by more than 50% since the new system has been in place.

Energy Management System Portal Features

- Monitor and control all connected thermostats from a web browser (Internet Explorer for example) or smart phone apps.
- Set occupancy schedules individually, or create custom groups of classrooms, schools, etc.
- Set holiday schedules up to two years in advance
- See all out of specification, alarm conditions from a single screen
- Run usage reports, and temperature performance graphs
- Alert maintenance staff of faults or temperature issues via email or text message
- Easily add lighting, irrigation, hot water systems and more to the Wi-Fi EMS ecosystem and portal.
- All devices attached to the Wi-Fi EMS ecosystem are automated demand response (ADR) ready and can accept a signal from a utility demand response server (DRAS) and automatically reduce energy usage during high cost periods

*** Based upon data from Energy Star at http://www.energystar.gov for K-12 schools HVAC only, 20% cooling, 80% heating loads*