

Beaverton School District's Energy Management Program

August 9, 2010

Sheri D. Stanley

Energy & Resource Conservation
Program Manager



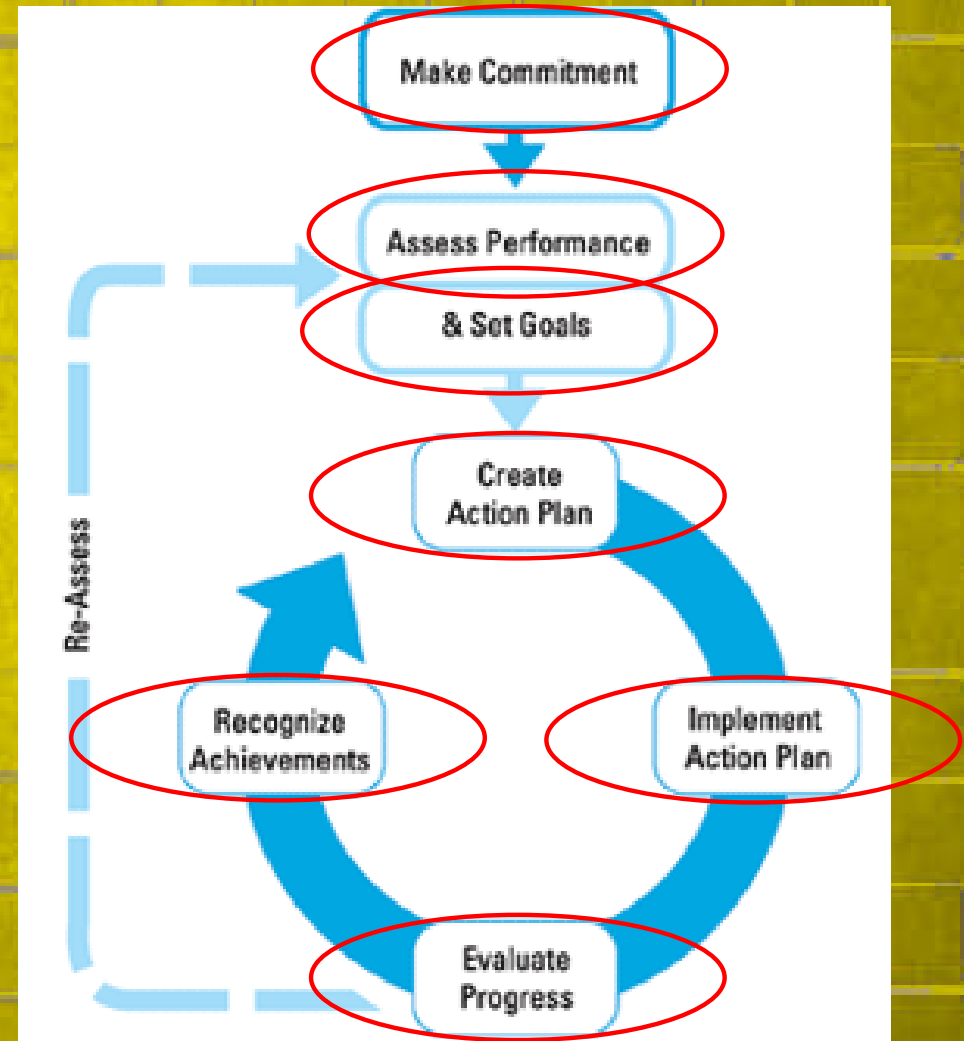


- 51 schools
- Over 5 million square feet
- ~\$5 M utility (electricity and natural gas) budget
- 38,000 students; 4,200 teachers and staff



BSD's plan through the lens of EPA's Guidelines for Energy Management

1. Make Commitment
2. Assess Performance
3. Set Goals
4. Create Action Plan
5. Implement Action Plan
6. Evaluate Progress
7. Recognize Achievements



1. Make Commitment



- 1993 - BSD Energy Policy adopted
- 1993 - Energy Conservation Administrative Regulations adopted
- 2000, 2006, 2009 - Administrative Regulations strengthened
- 2008/9 - Schools invited to “take the energy pledge”
- 2009 - Superintendent signs Energy Star Partner commitment
- 2009/10 - Schools again invited to pledge



Energy Pledge Program

Page 3

February 2009

STAFFTalk

**Energy
Conservation
Web Page**



To see how the District is doing on conserving energy and resources, click on the green "Energy Conservation" icon on the home page of the District's website at www.beaverton.k12.or.us.

This page is continually growing, so check back often to see the latest information on District sustainability and conservation efforts as well as valuable resources and tools!

District-wide conservation efforts continue

*Submitted by Sheri Stanley
Energy & Resource Conservation Program Manager*

Congratulations Greenway Elementary!!!

In December, 36 of our schools entered PGE's Save More, Matter More campaign by making the pledge below. Participants were then entered into a drawing for one of five \$3,000 lighting retrofits, and Greenway won!

Our Continuing District-Wide Pledge...

PGE's campaign has been a great starting point for our District-wide energy pledge campaign, which is focused on increasing energy conservation awareness. A total of 46 schools have pledged their commitment. Be on the look-out for evidence of energy conservation in your school/work site! Good luck on completing your monthly pledge goals.

For more information, contact
angela_fojtik@beaverton.k12.or.us
or sheri_stanley@beaverton.k12.or.us
503-591-4492.



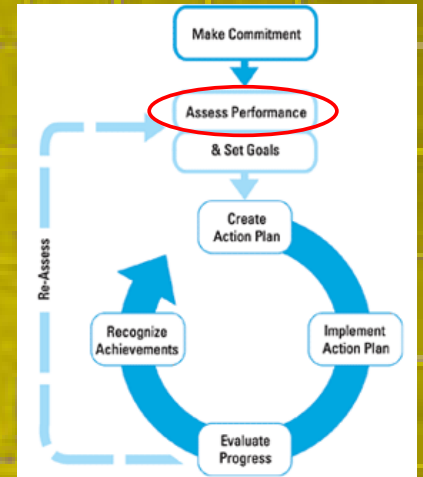
The Energy Conservation Pledge

We pledge to increase our energy conservation efforts by:

- 1. Turning out the lights when we leave a room for 5 minutes or more.**
- 2. Shutting down computers at the end of the school day.**
- 3. Increasing awareness and visibility of energy conservation efforts.**

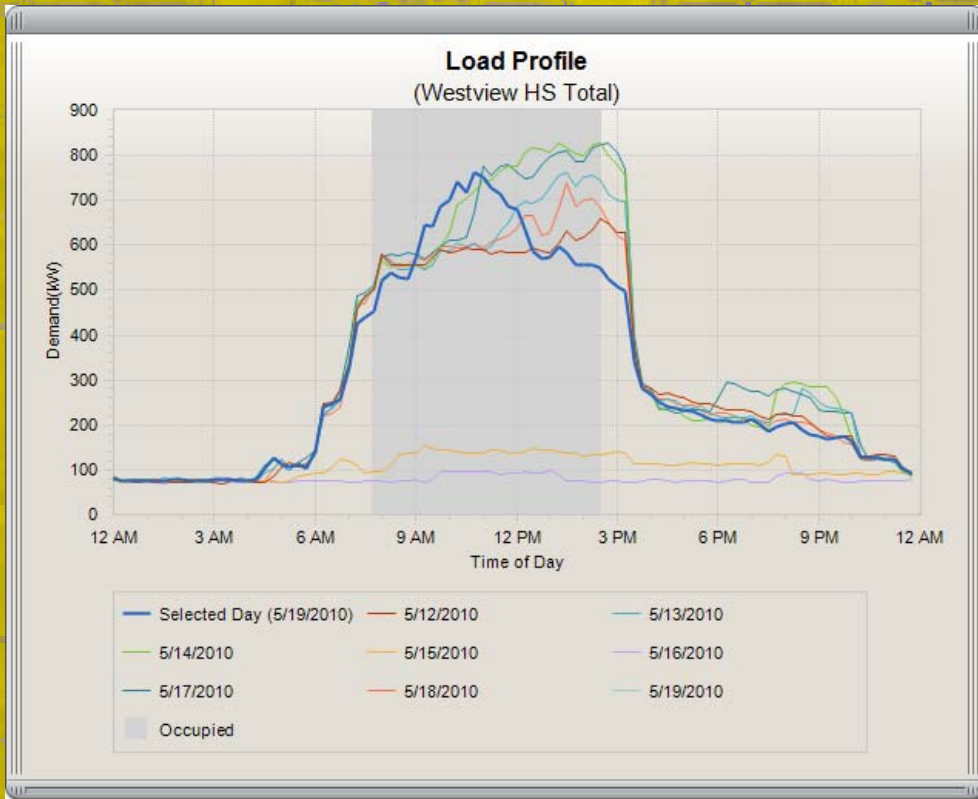
2. Assess Performance

- **Utility Manager Pro**
Utility bill accounting software to track monthly electricity, natural gas, and water consumption/cost
- **Energy Star Portfolio Manager**
For normalization of data and benchmarking with other schools across the nation
- **Energy Expert**
PGE's interval data metering tool for monitoring electricity consumption at each school in 15-minute intervals within 24 hours of consumption

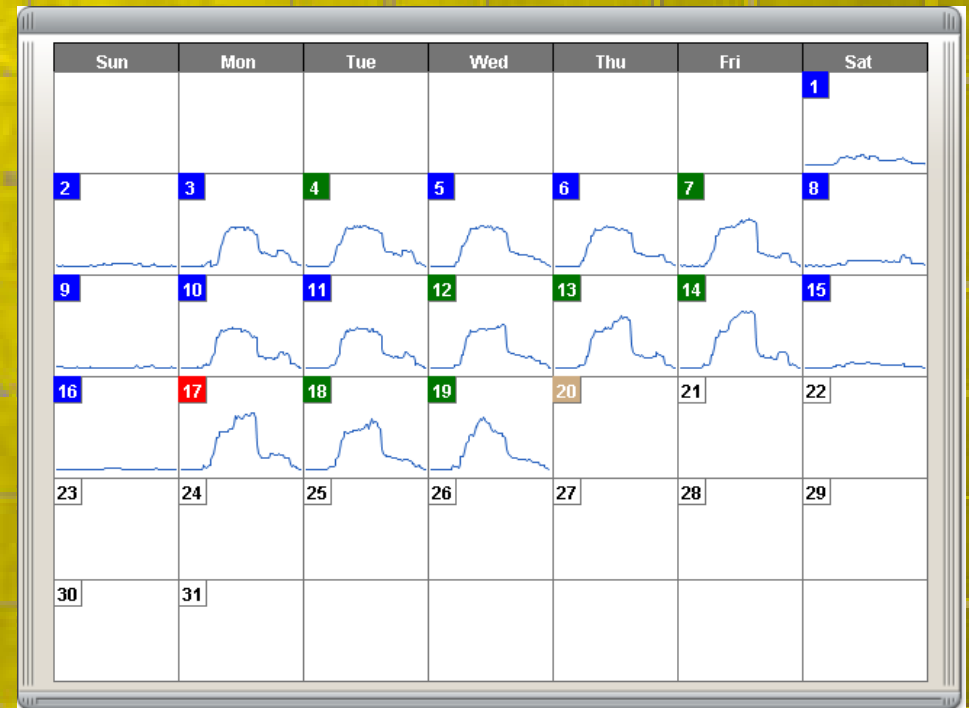


Energy Expert

Web-based Interval Metering



Energy Expert is available for every school in our District, and utilized by our energy management department. But also...



We're training principals, custodians, staff, and student groups to utilize this tool as well.

An example: Energy Expert at work, saving energy and dollars

IT Practice:

All 14,000 computers come on from 3:00 am to 5:00 am for updates.

All 14,000 experience auto start-up as scheduled:

High Schools: 5:30 am to 8:00 pm

Middle Schools: 7:00 am to 7:00 pm

Elementary: 6:30 am to 6:30 pm

Good goal: eliminate 3:00 – 5:00 am update protocol

Ideal goal: eliminate auto start-up altogether!

- Home
- Enterprise Navigator
- Curtailment
- Alarm Manager
- Data Analyst
 - Single Point Trend
 - Multi-Point Trend
 - 3D Surface Chart
 - 24 Hour Line Chart
 - Scatter Plot
 - Statistical Summary
 - Histogram
 - Single Point Digital
 - Multi-Point Digital
 - Data View and Export
- Energy Analyst
- My Favorite Reports
- My Links
- System Manager
- Point group editor
- User preferences
- Help
- About
- Logout

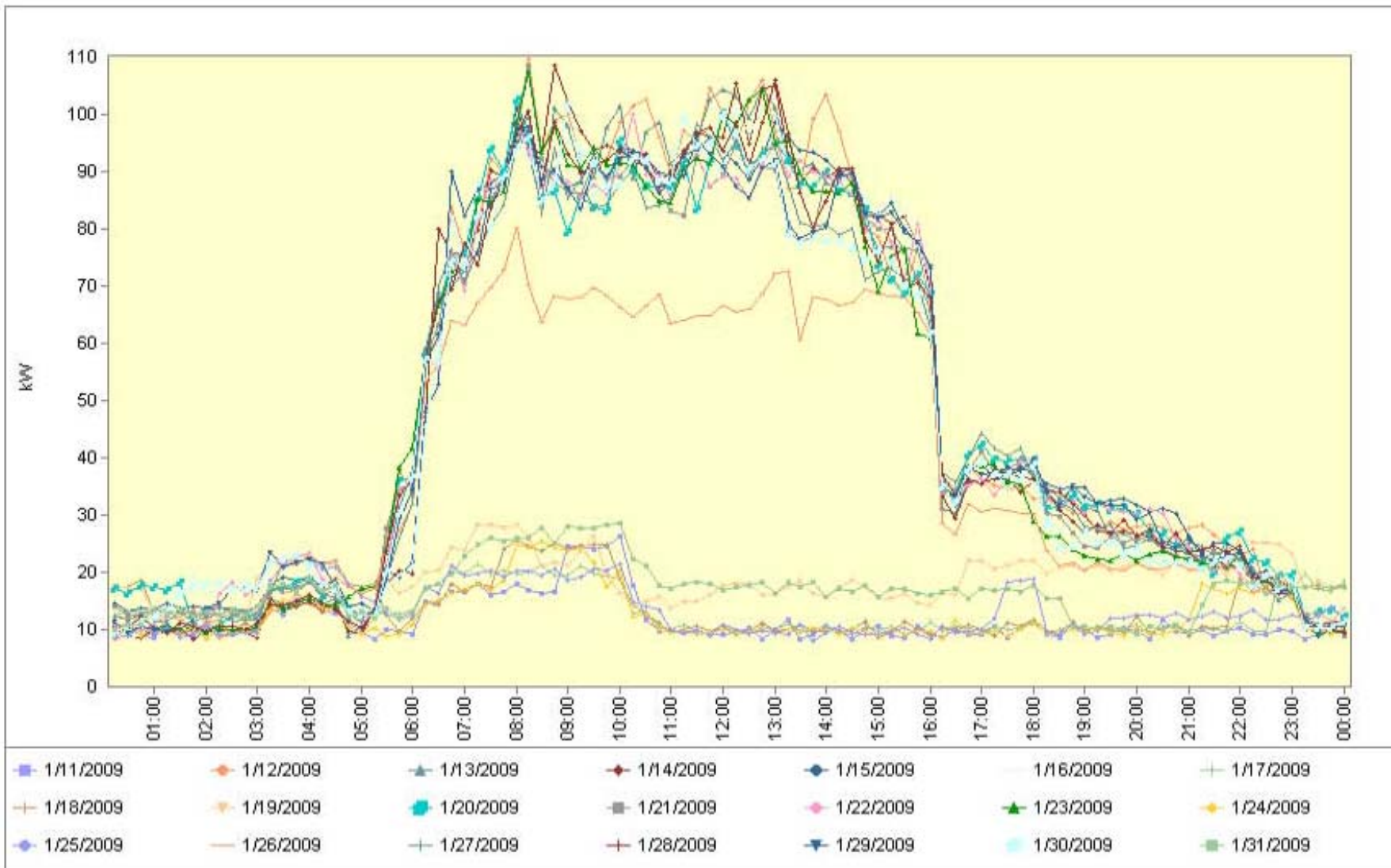
Errol Hassell 3am-5am comp updates

Day of All
week: days

Report date: 6/29/2009 11:55:00 AM

Report span: 1/11/2009 - 1/31/2009

Total days: 21



Elimination of 3:00 am to 5:00 am updates

14,000 computers x 150 W x 2 hrs/day x 365 days/yr = 1,533,000 kWh
1000 W/kWh

@ 10¢/kWh

(District average rate)

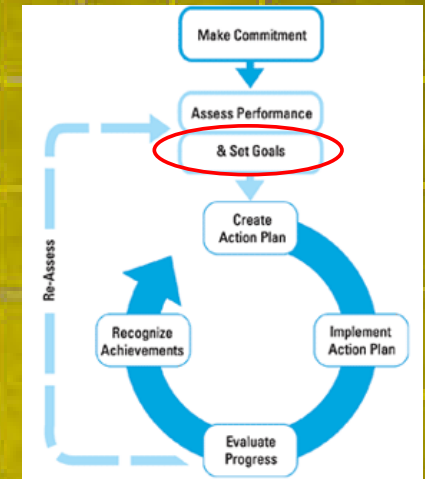
\$153,300/yr saved

...and eventually, with increased District-wide awareness and my IT champions, we eliminated the auto start-up!
We anticipate these savings to be *substantial*.

3. Set Goals

In 2008/9, purely budget driven:

- Calculate EUIs for all buildings for several years
- In an iterative process, determine each school's energy budget and level of reduction required, based on District utility budget (less \$750,000), historical use, and ODOE guidelines:



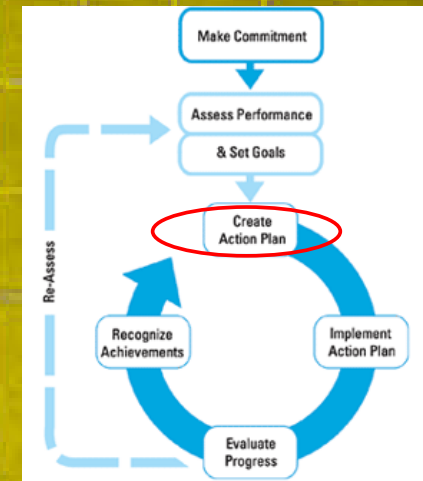
EUI Method of Ranking Reduction Requirements					
	Typical EUI				
	ODoE Range	5% reduction	10% reduction	15% reduction	20% reduction
	kBTU/sqft/yr	required	required	required	required
Elementary	37.8 - 43.2	<43.2	43.2 - 52	52 - 58	>58
Middle School	39.9 - 45.6	<45.6	45.6 - 54	54 - 60	>60
High School	44.8 - 51.2	<51.2	51.2 - 61	61 - 65	>65

- Create monthly goals by distributing each school's budget among the months, based on average seasonal consumption

In 2009/10, goals targeted on reaching ODOE EUI levels

4. Create Action Plan

- Behavior Modification and Technological Solutions
- Technical examples
 - Tighten HVAC schedules, refine scheduling process/alarm response
 - Conduct day and night time energy walk-throughs and place Maintenance work orders for investigation and repair
 - Energy Star qualify schools
 - Ramp up SB1149 Program Activity (energy efficiency upgrade resource)
 - Stay informed of other sources (\$440,000 in stimulus funds and multiple ETO incentives awarded this year)



4. Create Action Plan (continued)

- **Behavioral examples**
 - **Gain support from high level individuals...and publish support**
 - **Utilize AmeriCorps Program for outreach to schools**
 - **Conduct Energy Pledge Program**
 - **Find passionate individuals to form energy conservation teams at sites**
 - **Conduct night and daytime energy walk-throughs (without policing!) and report observations to occupants and Facilities and Maintenance Administrators**

Summer 2008 and 2009 Major SB1149 Projects

Boilers

Scholls Hts Elementary	3,761 therms
Intl School of Beaverton	5,096 therms
Kinnaman Elementary	4,557 therms
Raleigh Hills K-8	4,832 therms
Raleigh Park Elementary	3,944 therms
McKinley Elementary	2,815 therms

Projected Savings

Lighting Retrofits

Hazeldale Elementary	616 kWh
Greenway Elementary	3,260 kWh
Kinnaman Elementary	9,280 kWh

Lighting Controls

Cedar Mill Elementary	1,334 kWh
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HVAC Controls

Westview High School	12,591 kWh
Barnes Elementary	2,660 kWh and 565 therms
Chehalem Elementary	5,915 kWh and 735 therms
Raleigh Park Elementary	14,203 kWh and 996 therms
McKinley Elementary	17,374 kWh and 1,883 therms

Summer 2010 SB 1149 Projects

Boilers

Arts & Comm High School

4,581 therms

Rock Creek Elementary

3,043 therms

Westview High School

17,848 therms

McKay Elementary

3,932 therms

Whitford Middle School

9,460 therms

Lighting Retrofits

District-wide portables

22,933 kWh

Barnes Elementary

10,438 kWh

Whitford Middle School

46,411 kWh

Lighting Controls

Southridge High School

36,620 kWh

McKay Elementary

7,601 kWh

Whitford Middle School

37,455 kWh

Rock Creek Elementary

12,869 kWh

HVAC Controls

Greenway Elementary

1,077 therms

McKay Elementary

41,023 kWh and 1,874 therms

Whitford Middle School

12,018 kWh and 9,630 therms

Rock Creek Elementary

20,714 kWh and 2,580 therms

SB1149 Installation Examples



Stimulus Funds: Replacement of Metal Halides in all Middle and High School Gyms

Before



After

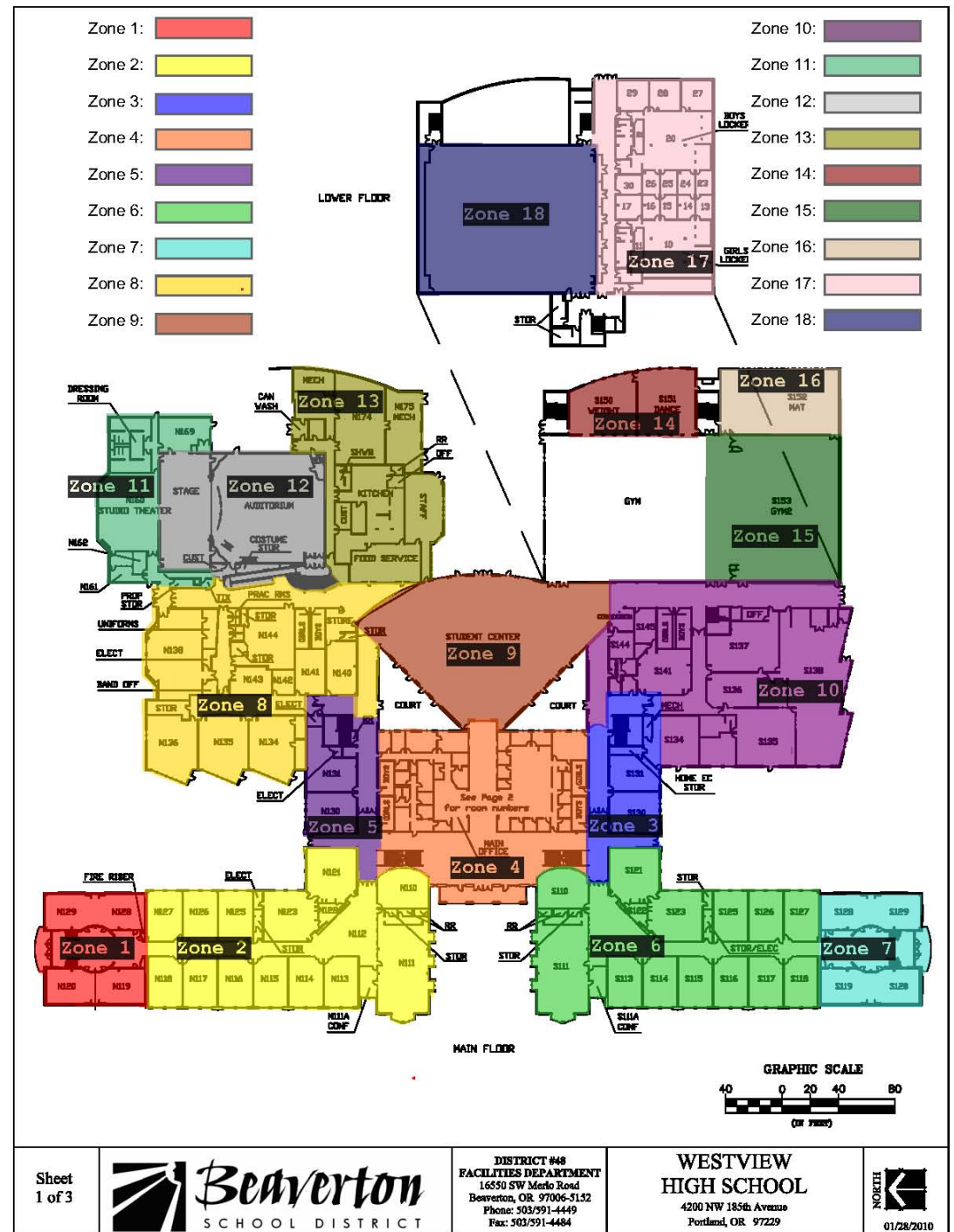


HVAC Scheduling Project

Create HVAC zone maps to assist Administrators in selecting energy efficient use of buildings for events/summer activities

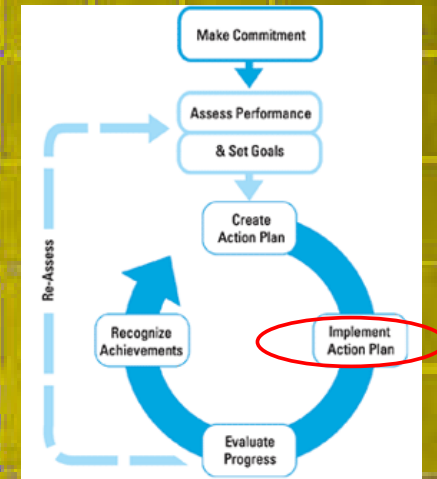
Create new process for scheduling which increases accuracy and yields ability to search “end dates” to execute building shut down

Confirm with interval data metering tool



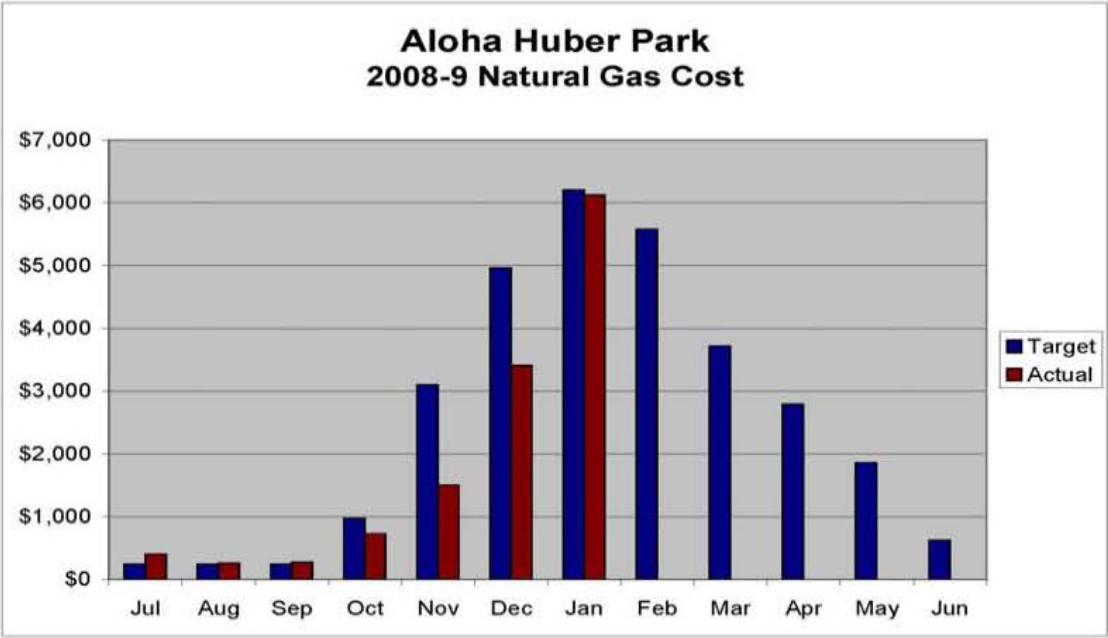
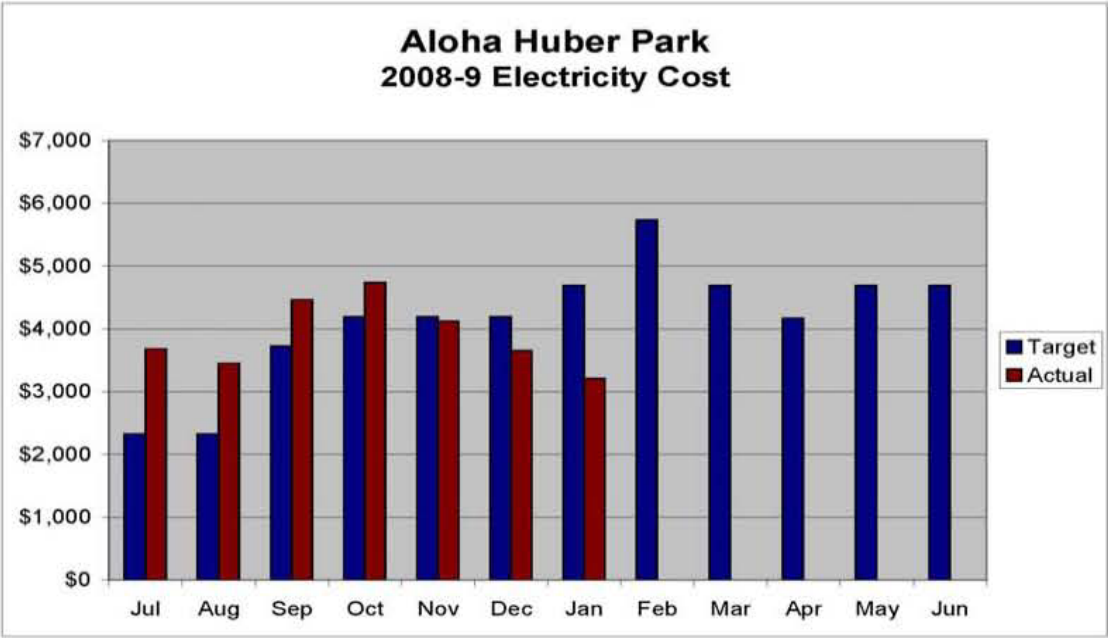
5. Implement Action Plan

- **SB1149 Projects**
- **Communication**
 - Remind occupants of Administrative Regulations regarding energy use
 - Report to schools monthly on their energy goals and progress
 - Report to Superintendent's Council, School Board, etc., on District progress
- **Raise Awareness**
 - Website presence
 - AmeriCorps outreach including newsletters, e-mails



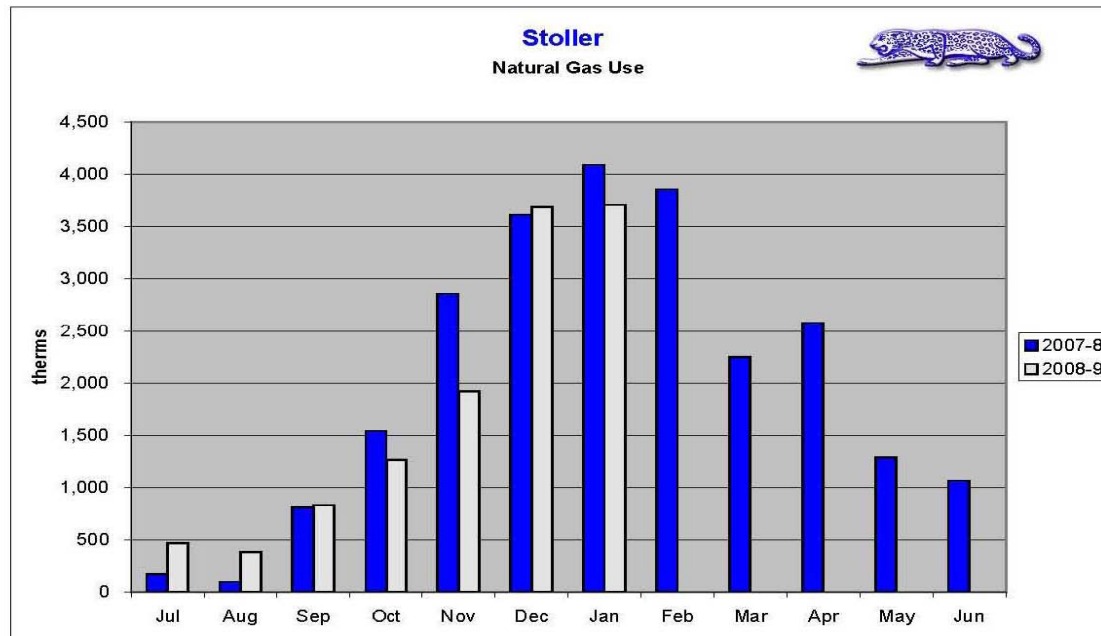
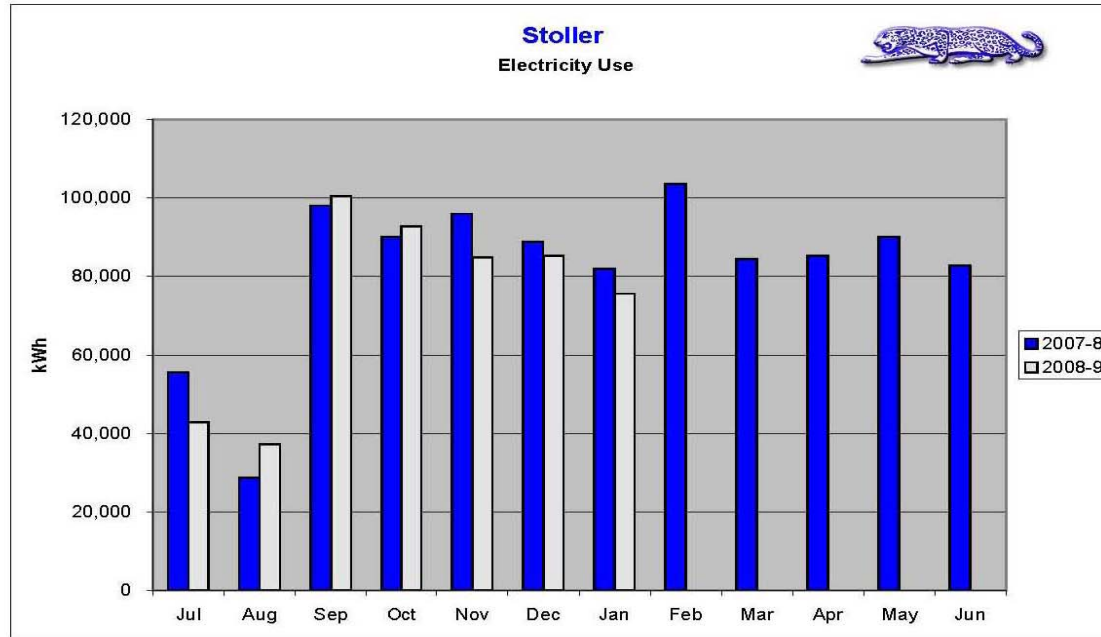
Energy Cost

Comparing Actual Cost to Target Cost



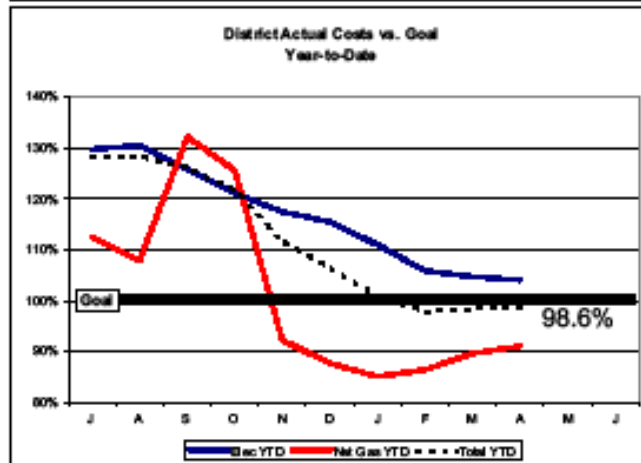
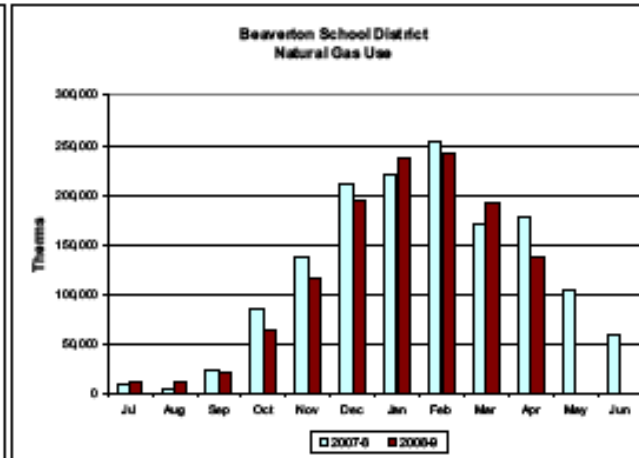
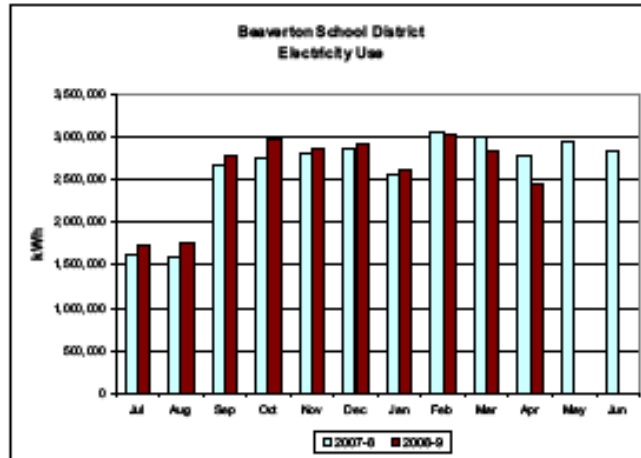
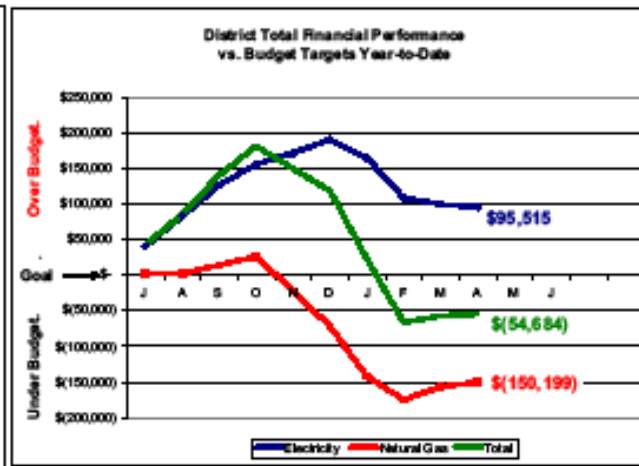
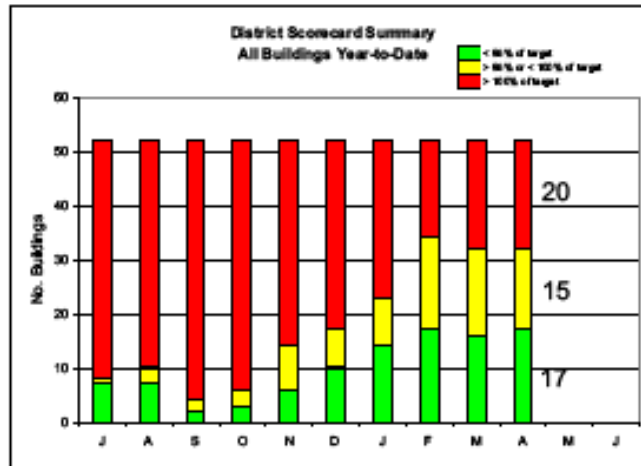
Energy Consumption

Comparing This Year to Last Year



Beaverton School District
 Energy Budget Performance Scorecard FY 08-09
 Performance Report Through April 2009

5/19/2009



Key Observations

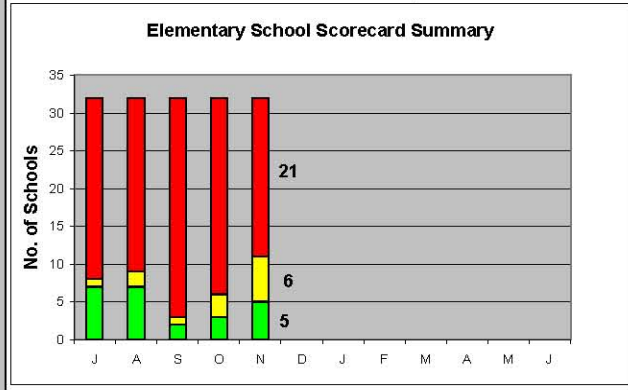
Year-to-Date:

1. Year-to-date results indicate 32 buildings better than target, the same number as March.
2. Year-to-date costs below target for 3rd month in a row.
3. Overall results relatively consistent for past 3 months.

Elementary Schools Scorecard

Through November
(Page 1)

Elementary Schools Overall Performance



4

Elementary Schools (Page 1)

Color Key	Performance Definitions
	< 95% of budget target
	> 95% but < 100% of budget target
	> 100% of budget target

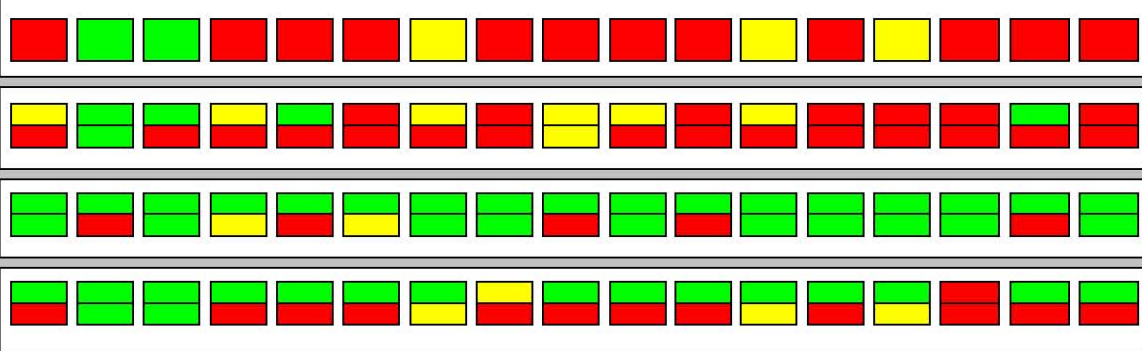
Aloha Huber Park	Barnes	Beaver Acres	Bethany	Bonny Slope	Cedar Mill	Chehalis	Cooper Mountain	Elmonica	Errol Hassell	Findley	Fir Grove	Greenway	Hazel Dale	Hiteon	Jacob Wismer	Kinnaman
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Strategic Objectives	Performance Measures
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Objective A Meet Electricity Budget Goal	1	Current Month Actual vs. Target
	2	FY-to-Date Actual vs. Target

Objective B Meet Natural Gas Budget Goal	3	Current Month Actual vs. Target
	4	FY-to-Date Actual vs. Target

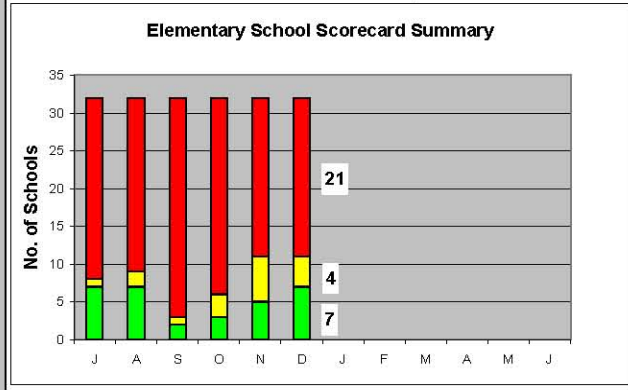
Objective C Meet Energy Budget Goal	5	Current Month Actual vs. Target
	6	FY-to-Date Actual vs. Target



Elementary Schools Scorecard

Through December
(Page 1)

Elementary Schools Overall Performance



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Elementary Schools (Page 1)

Color Key	Performance Definitions
	< 95% of budget target
	> 95% but < 100% of budget target
	> 100% of budget target

* facility is currently under construction

School	Alpha Huber Park	Barnes	Beaver Acres	Bethany	Bonny Slope	Cedar Mill	Chehalam	Cooper Mountain	Elmonica	Errol Hassell	Findley	Fir Grove	Greenway	Hazel Dale	Hiteon*	Jacob Wismer	Kinnaman*
Performance Measures	Yellow	Green	Green	Red	Red	Red	Green	Red	Red	Green	Red	Yellow	Red	Green	Red	Red	Red
Objective A	Green	Green	Yellow	Yellow	Green	Green	Red	Red	Red	Green	Yellow	Red	Green	Red	Red	Green	Red
Objective B	Green	Red	Green	Red	Red	Red	Green	Green	Green	Green	Yellow	Green	Green	Green	Red	Yellow	Green
Objective C	Green	Green	Green	Red	Red	Green	Green	Yellow	Red	Green	Yellow	Green	Green	Green	Red	Yellow	Green

Strategic Objectives	Performance Measures
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Objective A Meet Electricity Budget Goal	1	Current Month Actual vs. Target
	2	FY-to-Date Actual vs. Target

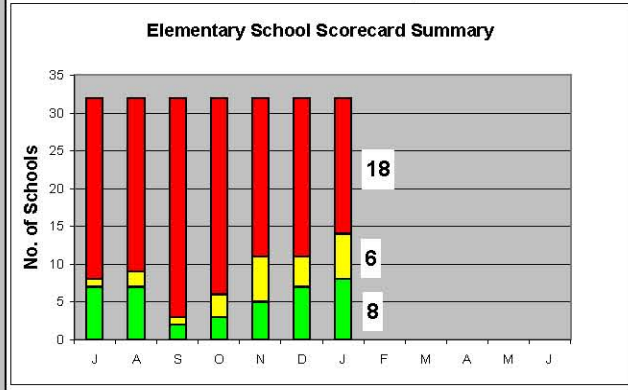
Objective B Meet Natural Gas Budget Goal	3	Current Month Actual vs. Target
	4	FY-to-Date Actual vs. Target

Objective C Meet Energy Budget Goal	5	Current Month Actual vs. Target
	6	FY-to-Date Actual vs. Target

Elementary Schools Scorecard

Through January
(Page 1)

Elementary Schools Overall Performance



Strategic Objectives	Performance Measures
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Objective A Meet Electricity Budget Goal	1	Current Month Actual vs. Target
	2	FY-to-Date Actual vs. Target

Objective B Meet Natural Gas Budget Goal	3	Current Month Actual vs. Target
	4	FY-to-Date Actual vs. Target

Objective C Meet Energy Budget Goal	5	Current Month Actual vs. Target
	6	FY-to-Date Actual vs. Target

6

Elementary Schools

(Page 1)

Color Key	Performance Definitions
	< 95% of budget target
	> 95% but < 100% of budget target
	> 100% of budget target

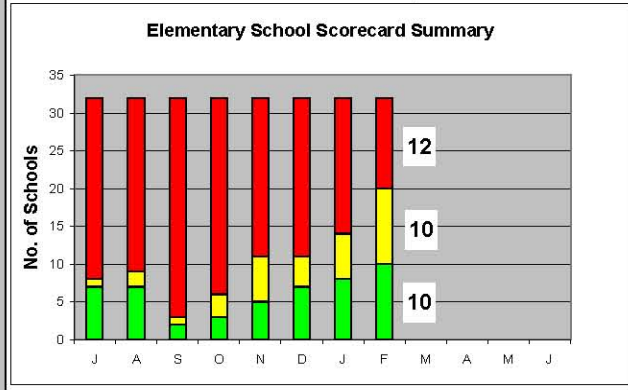
* facility is currently under construction

Aloha Huber Park	Barnes	Beaver Acres	Bethany	Bonny Slope	Cedar Mill	Chehalis	Cooper Mountain	Elmonica	Errol Hassell	Findley	Fir Grove	Greenway	Hazel Dale	Hiteon*	Jacob Wismer	Kinnaman*
Yellow	Green	Green	Red	Red	Yellow	Yellow	Red	Red	Green	Red	Green	Yellow	Yellow	Red	Red	Red
Green/Red	Green	Green	Green/Red	Green/Red	Red/Red	Green/Red	Red/Red	Red/Red	Green/Red	Yellow/Red	Green/Red	Green/Red	Yellow/Red	Red/Red	Green/Red	Yellow/Red
Green/Red	Red	Green	Yellow	Red	Green	Green	Red	Red	Green	Green	Yellow	Green	Green	Red	Green	Yellow
Green/Red	Green	Green	Green/Red	Green/Red	Green/Red	Red	Red	Yellow	Green	Yellow	Green	Green	Yellow	Red	Red	Green/Red

Elementary Schools Scorecard

Through February
(Page 1)

Elementary Schools Overall Performance



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Elementary Schools (Page 1)

Color Key	Performance Definitions
	< 95% of budget target
	> 95% but < 100% of budget target
	> 100% of budget target

* facility is currently under construction

School	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Aloha Huber Park	Green	Green	Green	Yellow	Red	Green	Yellow	Red	Yellow	Green	Yellow	Green	Yellow	Green	Yellow	Green	Yellow	Green	Yellow
Barnes	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Beaver Acres	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Bethany	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Bonny Slope	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Cedar Mill	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Chehalis	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Cooper Mountain	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Elmonica	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Errol Hassell	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Findley	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Fir Grove	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Greenway	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Hazel Dale	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Hiteon*	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Jacob Wismer	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Kinnaman*	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

Strategic Objectives	Performance Measures				
Objective A Meet Electricity Budget Goal	<table border="1"> <tr><td>1</td><td>Current Month Actual vs. Target</td></tr> <tr><td>2</td><td>FY-to-Date Actual vs. Target</td></tr> </table>	1	Current Month Actual vs. Target	2	FY-to-Date Actual vs. Target
1	Current Month Actual vs. Target				
2	FY-to-Date Actual vs. Target				
Objective B Meet Natural Gas Budget Goal	<table border="1"> <tr><td>3</td><td>Current Month Actual vs. Target</td></tr> <tr><td>4</td><td>FY-to-Date Actual vs. Target</td></tr> </table>	3	Current Month Actual vs. Target	4	FY-to-Date Actual vs. Target
3	Current Month Actual vs. Target				
4	FY-to-Date Actual vs. Target				
Objective C Meet Energy Budget Goal	<table border="1"> <tr><td>5</td><td>Current Month Actual vs. Target</td></tr> <tr><td>6</td><td>FY-to-Date Actual vs. Target</td></tr> </table>	5	Current Month Actual vs. Target	6	FY-to-Date Actual vs. Target
5	Current Month Actual vs. Target				
6	FY-to-Date Actual vs. Target				



- Tools & Resources**
- ▶ Annual Budget
 - ▶ Bond Measure
 - ▶ Curriculum
 - ▶ Data and Research
 - ▶ Facility Use
 - ▶ Handbooks and Forms
 - ▶ Library Resources
 - ▶ Other Resources
 - ▶ Proficiency
 - ▶ School Boundaries
 - ▶ School Meals

Nike School Innovation Grant Funds Leap Start Summer Program In Beaverton School District

Nearly 260 students are jumping at the chance this summer to attend the Beaverton School District's five week Leap Start Summer Program, funded by the Nike School Innovation Fund (NSIF).

Media Showcase

The Coffee Cup (4:57)
Delaney demonstrates how to construct mache coffee cup.

[Archive]

Superintendent's Message

District Goal (2010-2015): All students will show continuous progress toward their personal learning goals, developed in collaboration with teachers and parents, and will be prepared for post-secondary education and career success.



- District News** **In The News**
- Free Summer Food Service Program June 21 August 20
 - Service To Beaverton Award Winners
 - A Year In Review
 - 21 Beaverton Schools Energy Star Qualified
 - Change To Ethnicity And Race Reporting
- [more]

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Beaverton
SCHOOL DISTRICT
creating pathways to the future for all students

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HOME District Departments Schools For Students For Staff For Parents For Community

Boundary Information | Handbooks and Forms | Policies and Regulations | Research and Reports | Resources | School Board

Home » Departments » Facilities » Energy & Resource Conservation » Energy Conservation

Energy Conservation

In the Beaverton School District, ENERGY is a hot topic. We always need energy to heat and cool our schools, run appliances and electronics, and keep the lights on. Beaverton students are learning about energy, where it comes from, how it's made, why it's important, and how we can conserve it. Education is the first step to spreading awareness about this key resource! Not only can we save resources and create less pollution, but we can save dollars on our already tight budget.

The Energy and Resource Conservation Department sends out Energy Use Performance Scorecards **PDF** on a monthly basis. In combination with other tools available to principals, schools use this information to monitor and manage their energy consumption.

Were you recently upgraded to a smart meter at home? All of our schools were too. And with this new technology, we are now able to monitor our real time energy use data through software called **Expert 1234**. Since we can "see" our electricity use in 15-minute intervals, we can tell if our schools are, for example, shutting down at night and over the weekends. The Beaverton School District is invited to review their school's interval metering data. Contact Shem Stanley for account access.

Electricity and natural gas bills help us track the cost of energy **PDF** and compare that cost with other years. Energy costs are often difficult to compare, because the cost of energy frequently changes.

Energy can be best compared among years by simply looking at consumption **PDF**. We can keep track of schools that are using more energy due to construction and are able to tell when energy use has decreased in the District.

Did you know that school buildings can get an Energy Star rating just like your refrigerator? When buildings use energy efficiently, they are nationally recognized and awarded with an Energy Star rating. Twenty-one of our schools have earned this rating! Aloha-Huber K-8, Elmonica, Bonny Slope, Jacob Wismer, Stoller, Sexton Mountain, Enol Hassell, Bethany, William Walker, Greerway, Oak Ridges, Schalls Heights, Findley, Terra Linda, Montclair, Vose, Cedar Mill, West TV, Cedar Park, and ISB currently have this distinction, and more are on the road to qualifying. And as of summer 2007, Beaverton School District is an Energy Star Partner. Contact 503-591-4402 for more info.

powered by

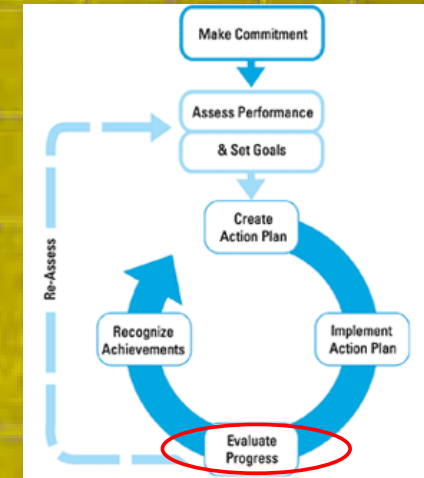
Departments

- Business Services
- Community Involvement
- English Language Learners
- Facilities
 - Construction Design Standards
 - Energy & Resource Conservation
 - Facility Use
 - Maintenance Services
 - Sustainability
- Human Resources
- Information & Technology
- Instruction
- Nutrition Services
- Public Safety and Security
- Transportation

6. Evaluate Progress

2008/9 results:

- Total kBtu/sq ft reduced by more than 10%
- 2.4 million kWh of electricity saved
- *Every* school reduced electricity consumption, some by >20%
- \$393,000 in energy efficiency measures implemented and reimbursed
- Nearly \$450,000 cost-avoided

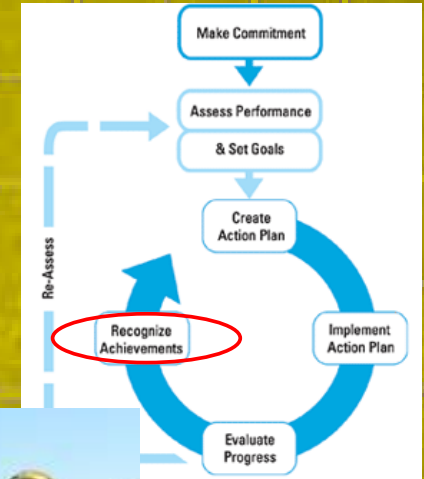


6. Evaluate Progress (continued)

2009/10 results:

- **All data is not yet in, but so far, energy consumption is down another 12%**
- **\$2M in energy efficiency measures being implemented and reimbursed**
- **\$440,000 in stimulus funding awarded and projects completed**
- **We are currently \$1.2 M under budget, but must remember it was a mild winter and rates did not increase as projected**
- **Leading Oregon with 21 schools awarded the Energy Star (Thanks goes to Tom Hudson, Green Building Services for donation of PE assistance.)**

7. Recognize Achievements



STAFFTalk June 2010

Flicks by the Fountain

Flicks by the Fountain, a free event for the community, is an outdoor movie series that is held in Beaverton City Park during the month of August. This year, Beaverton School District student media will be showcased as part of the pre-movie entertainment. Below are the selected films that will be shown during Flick by the Fountain and the Mid-week Movie:



BSD awarded 2010 PGE Energy Leader Award



Laura Schaeffer, BSD Energy Conservation Outreach Coordinator, Sheri Stanley, Energy & Resource Conservation Program Manager and Tiffany Ritchey, PGE Key Customer Representative

BSD was recently awarded the 2010 PGE Energy Leader Award. The award states: **"For demonstrating your wise use of energy, leading so that others may follow"**

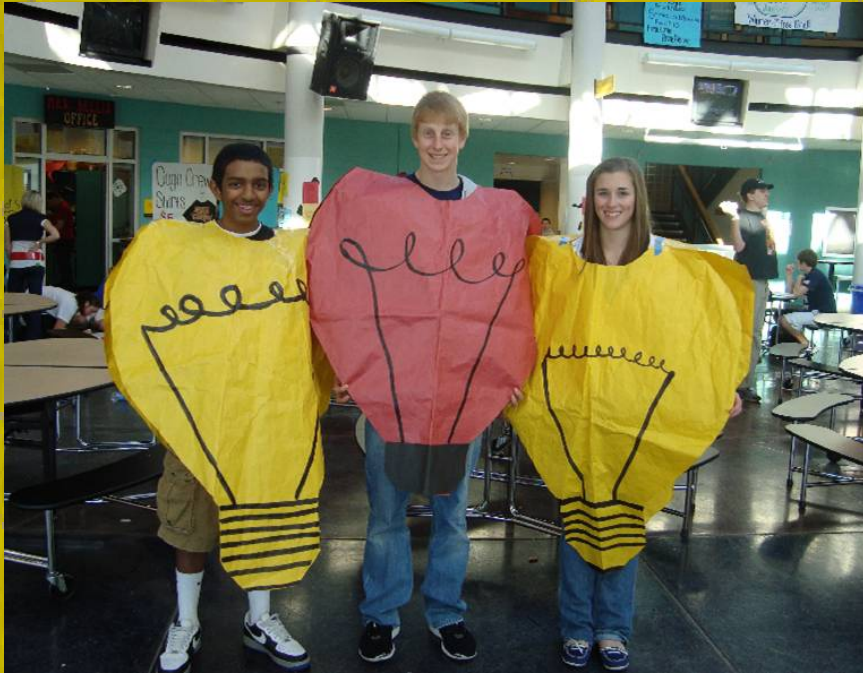
PGE gave special recognition to two organizations in the Metro area that have done a great job of leading the way so that others might follow. In addition to making high-efficiency upgrades to building systems, as an Energy Leader, BSD is also active in changing the culture of the organization so that wise and efficient use of energy is a natural part of doing business.

Collaboratively, many District departments contributed to this award; the Maintenance Department made significant improvements to HVAC operating systems; Facilities accomplished many large energy conservation projects (new boilers, water heaters HVAC controls and lighting retrofits); and the District obtained \$400K in federal grant dollars to retrofit lighting in high school and middle school gyms and Transportation buildings.

For more information, contact Sheri Stanley, 503-591-4492.



Closing Thoughts



- **For BSD this is truly a group effort.**
Staff, teachers, students, Facilities, Maintenance, HVAC, IT, Nutrition Services, AmeriCorps
- **Support from the top is key.**
This cannot be overstated.
- **Communicate, report on progress, don't police occupants.**
- **Know what you're spending on energy...and what you should be spending—track bills, calculate energy use intensities.**
- **Be informed of free/low-cost training, incentives, and resources.**

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