

FACILITIES - ENERGY AND RESOURCE CONSERVATION

Summary

BSD continues to be a leader in energy management locally and nationally. The District currently has 31 EPA-recognized Energy Star schools and 14 certified Oregon Green Schools. BSD's Energy Star® score across our school building portfolio continues to impress with 90 out of 100 possible points, placing the BSD portfolio in the 90th percentile of similar school buildings across the country. Additionally, all but 4 of our schools are currently within the Oregon Department of Energy (ODOE) recommended Energy Use Index (EUI) range of 47-61 kBtu/SF/year. The District currently maintains an EUI average of 45 kBtu/SF/year.

Analysis

Table 1: 2017-18 BSD Total Utility Consumption Comparison and Goals

UTILITY	2015-16	2016-17	2017-18*	Comparison to Prior Year**	2018-19 Goals ***
Electricity (kWh x 1,000)	30,492	30,949	33,416	Usage (+7.6%) Cost (+5.8%)	33,082
Natural Gas (Therms x 1,000)	1,047	1,379	1,396	Usage (-8.8%) Cost (-5.6%)	1,274
Water (CCF x 100)	117	109	159	Usage (+27%) Cost (+39%)	128
Solar PV Production (1000 x kWh)	310	272	420	Production (+35%)	950

*Includes Timberland MS, Sato ES, Vose ES and Mountainside to the BSD portfolio representing an 8.0% square footage gain.

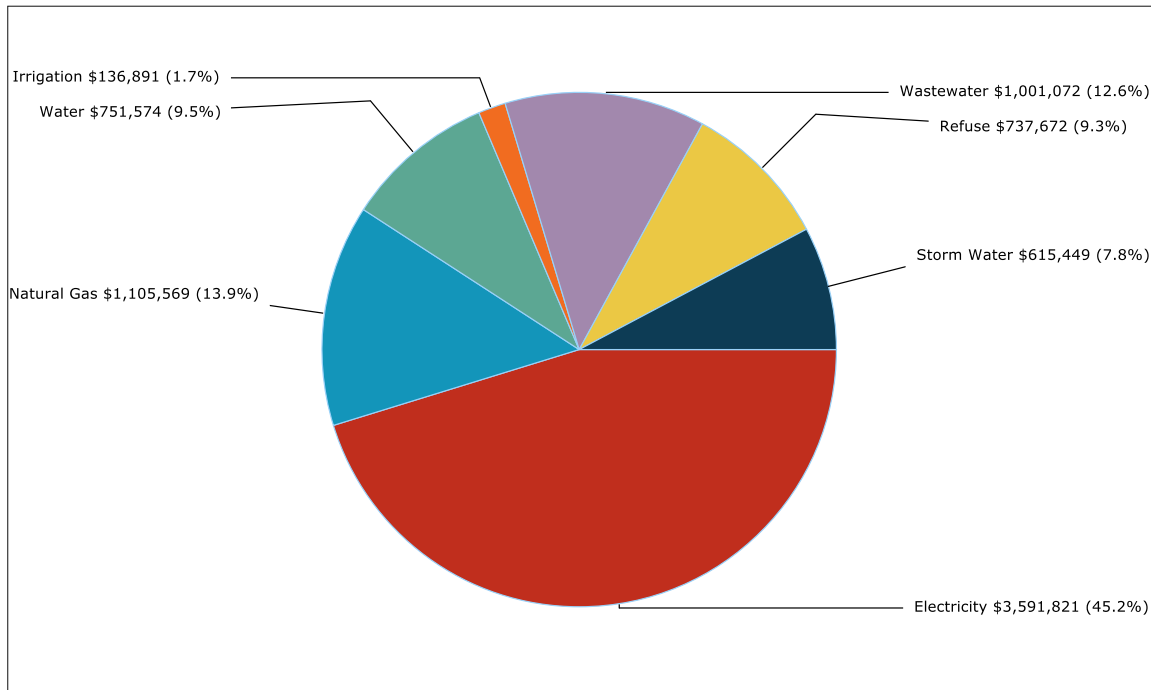
**Electricity and solar generation compares 17/18 to 16/17. Natural gas and water compare to a 3-yr rolling average.

*** Goals include 1% decrease in electricity usage from 17/18. Natural gas and water goals are to better our 3-yr average rolling average.

- Electricity usage largely follows occupied school hours per year which have been increasing during the year with after school programs and expanded summer school.
- Natural gas consumption follows the weather; warmer temperatures generally equate to lower Therm usage.
- Water use varies year to year in direct relation to irrigation, which makes up approximately 90% of BSD's total annual water volume. Water usage (CCF) is up 27% and the water usage cost portion of our water bill is up 39% compared to our 3-yr rolling average.

- Photovoltaic (PV) solar electricity production reached 414,000 kWh of electricity last year. Production in 2018-19 is expected to reach 950,000 kwh (nearly 1 megawatt!).

Graph 1: 2017-18 BSD Total Utility Cost



- The total water bill for 2017-18 was \$2,504,985 up 24.1% compared to our 3-yr average and currently makes up 31.6% of our annual utility expenses.

Accomplishments

1. Energy and Resource Conservation (E&RC) continues to work closely with Facilities Development and the Maintenance Departments investing \$2.9 million SB1149 funds into energy-efficient capital projects. The addition of roof insulation, advanced HVAC and lighting systems and controls are expected to save 2.4 million kWh and 60,000 Therms per year for a total cost savings of \$225,000. The cost savings does not include the added net benefit to operation and maintenance (O&M).
2. BSD solar systems to date have generated 2.1 Gigawatts (million kWh) of electricity - enough to power nearly 200 average-sized homes for a year.
3. The back-of-the-house organics collection effort was embraced by 16 additional schools. Total participation now stands at 27 with an estimated 5,500 pounds of food waste being diverted from landfilling each month.

Areas of Concern and Program Risk

1. Increases in water usage and cost are now rising at double digit percentages per year. Fixed fees from new schools, increased irrigation, and historically high water rate increases are contributors. Reducing water usage, specifically irrigation, district-wide will alleviate this risk.
2. Rates for electricity are projected to continually rise at an annual rate of 2-5%. Natural gas rates over the last several years has declined or remained flat, however, rate increases of 1-3% are projected within the next 3 years.

Short Term Goals

1. Meet E&RC's energy consumption targets for 2018-19. Our district-wide electricity usage target will be set at 1.0% below 17-18 year kWh usage. Natural gas and water target are set to better our 3-year rolling average.
2. Continue to deliver cost-effective energy projects that align with the bond renovation effort and maintenance needs. E&RC will conduct additional energy audits, offer cost-effective SB1149 program measures, pursue Energy Trust of Oregon (ETO) incentives, and collaborate to ensure continued success of all capital projects.
3. Expand BSDs Energy Star Certification Portfolio where possible. Recent system enhancements in our schools not only save energy but provide better thermal comfort, ventilation, and enhanced lighting environments that provide opportunity to pursue further certification.
4. Work to establish a formal District-wide water conservation policy and a long-term plan for investment in water-saving technology.
5. Introduce back-of-the-house organics collection to remaining 25 BSD schools.

Long-term Goals

1. Work closely with commissioning agents to ensure our new school buildings meet Energy Star certification and ODOE EUI target ranges as designed.
2. Pursue Energy Management Information System (EMIS) software enhancements coupled with energy submeters that will tie together with HVAC Building Management System, fault detection, and building analytics to further improve energy and building performance while driving operations and maintenance to a more predictive model.
3. Invest and execute water conserving measures that meet our return-on-investment criteria established by a new water conservation policy.
4. Promote energy and resource conservation practices and larger sustainability themes into our STEM curriculum.