

# 2013 Performance Measures Report



BED lineworkers keep the power on in Burlington at all times of day and in all types of weather.



The crew of the Spirit of Ethan Allen celebrates a 75 percent reduction in the electricity bill after some efficiency work that was done through BED.

*Our future is in renewable energy,  
and BED is on the verge of contracting or owning  
100 percent renewable power sources*

## **BURLINGTON ELECTRIC DEPARTMENT**

Successfully transitioning  
to a post-carbon economy with reliability,  
stable rates and a clean power supply



PHOTOS: CATHY CHAMBERLAIN

**Burlington Electric Commission**  
**585 Pine Street**  
**Burlington, Vermont 05401**

Spencer Newman, Chair  
Scott Moody, Vice Chair  
Robert Herendeen  
Jean O'Sullivan  
Mark Stephenson

To: All BED ratepayers and citizens of Burlington  
From: Spencer Newman  
Date: March 2014  
**Re: Performance Measures Report**

We are pleased to present Burlington Electric Department's Performance Measures Report for 2013. We have been preparing these reports since 1998 for the benefit of the Burlington City Council and our ratepayers. Each year, BED conducts a comprehensive self-examination and presents the findings in this report. Performance measurement helps us achieve several important goals for the organization, involving accountability, service, costs, strategic planning and management.

Our big focus this past year was the continued implementation of the Smart Grid into our operating system. We have begun to realize the benefits of this project with better outage management, far fewer truck rolls for various services, and easier integration of small scale local renewable projects into the BED distribution system.

BED is very close to achieving its goal of contracting for or owning enough renewable generation in our power portfolio to serve 100% of the city's energy needs (before accounting for Renewable Energy Certificates). BED recently contracted for an additional 13MW of wind energy and is in the process of purchasing the Winooski One Hydro facility, a 7.4 MW hydroelectric facility that would feed directly into our distribution system. With the purchase of Winooski One we will meet our 100 percent renewable goal after nearly a decade of concerted effort. With many utilities talking about 20 percent by 2020, this is quite the accomplishment.

At BED, we are proud of our 109-year history as a publicly owned utility. We are proud to have led with energy efficiency and renewable energy, and we are very proud to have been awarded the ARRA grant that has allowed us to move forward with Smart Grid.

## **INTRODUCTION**

Burlington Electric Department is a department of City government and an essential part of Burlington's infrastructure. As a public utility, BED is an expression of the community's commitment to **not-for-profit rates, local control, and sustainability**.

BED offers customers the right to participate directly in the most important decisions about the future of the utility. This illustrates the importance of community-based decisions about our energy future because they reflect local values such as **renewable energy**. Residents have supported many bond items over the years that put us on the path to 100 percent renewable generation, that supported strong energy efficiency measures and that improved system reliability. These were forward-thinking votes that allowed BED to provide clean, green and stably priced power to its residents and businesses.

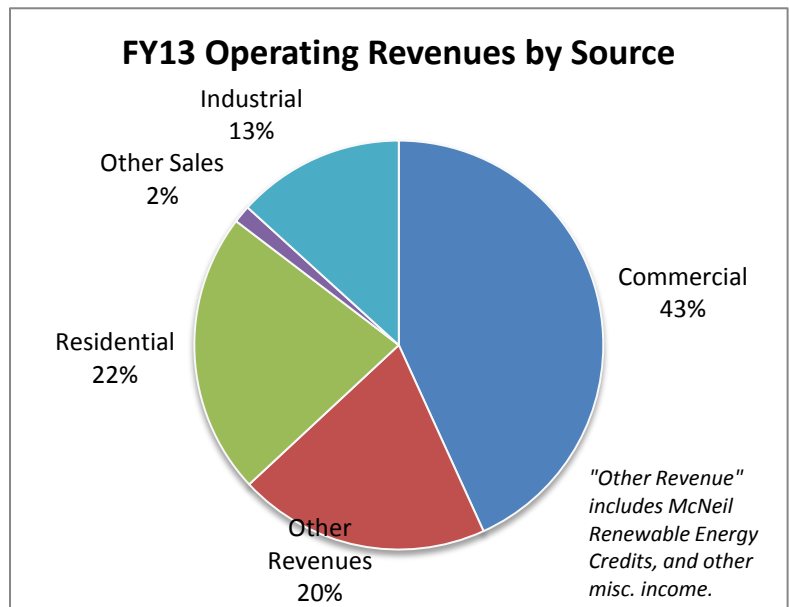
We're proud to serve Burlington and will continue to be responsive to the community. This report is intended to help explain what we do and to help us measure our progress over time. We invite your comments and suggestions.

## MARKET & REVENUES

**BED provides electric service to 16,600 residential customers and 3,755 commercial and industrial customers.** For a variety of reasons, including a very large number of students, BED's turnover in residential accounts is more than 6,000 per year. This is a remarkable amount of account management for a utility of this size and contributes to somewhat higher than average customer service costs.

On the other hand, BED has two large customers that represent 29% of total sales. Not surprisingly, commercial and industrial customers use much more electricity than residential customers and account for 56% of revenues.

All BED customers expect certain fundamental services — reliable and safe electricity, professional and courteous service, and affordable bills. Each customer group has unique needs, however. That's why we have tailored our programs and services to meet the needs of each group.



## SERVICE QUALITY & CUSTOMER SATISFACTION

Like all Vermont utilities, BED is required to submit a quarterly **Service Quality and Reliability Plan (SQRP)** to the Department of Public Service. The SQRP establishes standards for a variety of performance criteria (see a selection of measures below).

Each utility is expected to meet these minimum performance standards. BED performed far better in most categories than required. In only two areas did BED exceed the state standard (Check info):

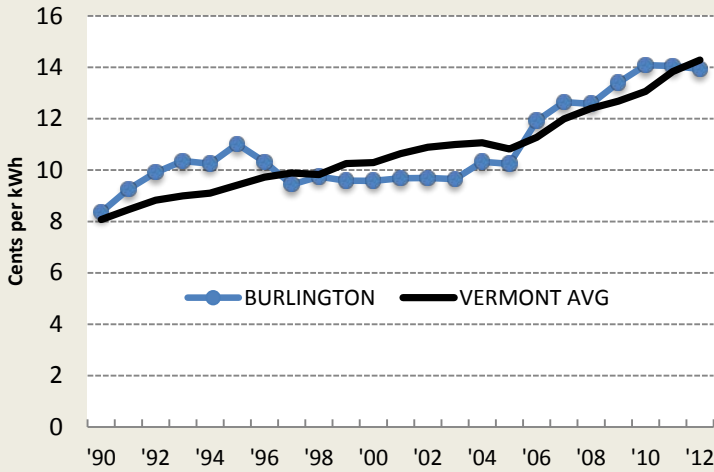
(Lost time categories: The lost time severity (total work days missed due to injury) number was higher than standard due to one employee sustaining an injury that resulted in a significant amount of missed work days.)

BED will continue to work hard on service quality and reliability. We know our customers expect no less.

Performance Area	Standard	BED
% Bills found inaccurate	0.1%	0.1%
% Bills estimated	5%	0.2%
% Customer requested work completed by promised delivery date	95%	100%
Average # of customer interruptions per year	2.1	1.1
Average duration of customer interruption (hours)	1.2	.7
Lost time incidents / year (injury leading to lost work time)	< = 3.5	5.29
Lost time severity (total work days missed due to injury)	< = 71	159.6

# RATES AND BILLS

**BED's overall rates were 2.5% lower than the statewide average in 2012**

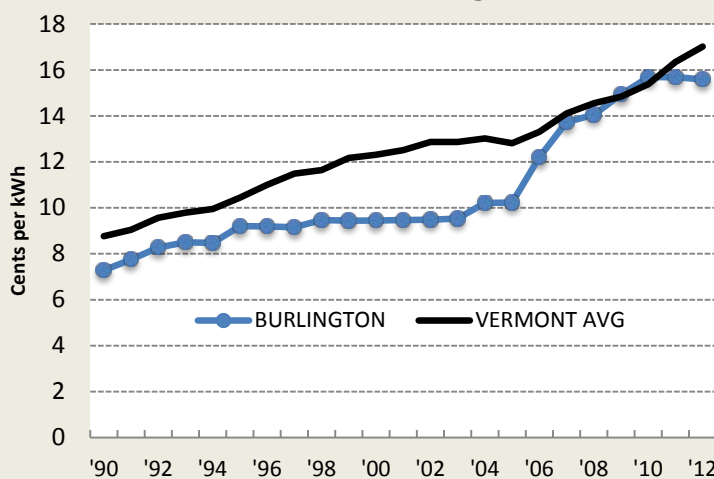


Utilities have different rate designs that make comparisons difficult. The easiest way to measure performance is to compare *average revenues per kilowatt-hour* - total revenue divided by kWh sales. This is called "average rates" and is a standard measure for the price of electricity to the consumer.

BED had a rate increase in 2009, but has not had one since and does not expect an increase in FY 2014 or FY 2015.

Although rates are an important indicator, they tell only part of the story. A customer's bill reflects the rate times the amount of electricity used. Thus, customers who are more efficient and use less power have lower bills.

**BED's residential rates were 8.5% lower than the statewide average in 2012**



## RESIDENTIAL CUSTOMERS

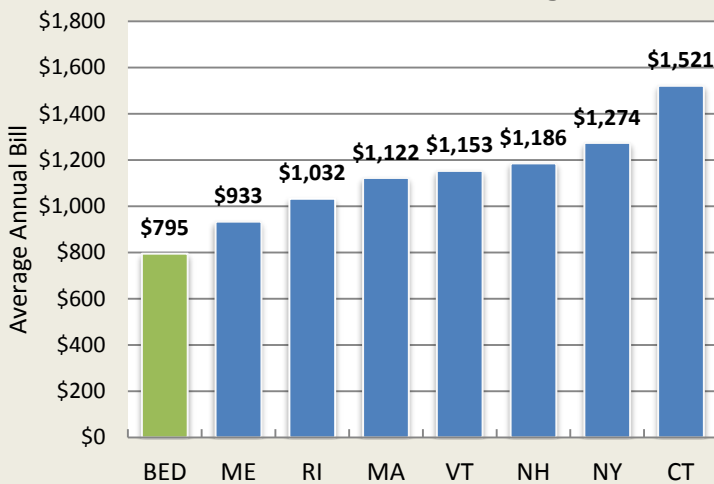
**BED's residential rates were 8.5% lower than the statewide average in 2012.**

In addition to competitive rates, Burlington residents have managed their electric use through energy efficiency (see p.5). The combination has produced relatively stable bills for Burlington residents.

**Burlington's average residential bills were 31% less than the statewide average in 2012.**

	Avg. Res. Rate / kWh	Avg. Res. Annual Bill
<b>Burlington</b>	<b>15.58¢</b>	<b>\$795</b>
<b>Vermont</b>	<b>17.02¢</b>	<b>\$1,153</b>

**Burlington's avg. annual residential bill was 31% lower than the statewide average in 2012**



**In 2012, an average Burlington residential customer paid \$358 less per year than the statewide average** (and lower than the average for every state in the region). Overall, this represented aggregate savings of \$5.9 million in 2012 – money that could be saved or spent in the local economy. These savings also help lower housing costs, which is important in Burlington's tight housing market.

(Note: Some of the difference in usage and bills reflects the number of small rental units in Burlington.)

# RATES AND BILLS

The 2012 inflation-adjusted average annual residential bill was still lower than in 1990. This is especially noteworthy in contrast to the rising costs of other energy sources. For example, according to the U.S. Department of Energy, the inflation-adjusted price of natural gas for residential customers in 2012 was 64% higher than in 1990.

## COMMERCIAL & INDUSTRIAL CUSTOMERS

Average commercial and industrial rates have increased 8.0% since 2007. Although BED's rates remain slightly higher than the statewide average, the gap has closed in recent years.

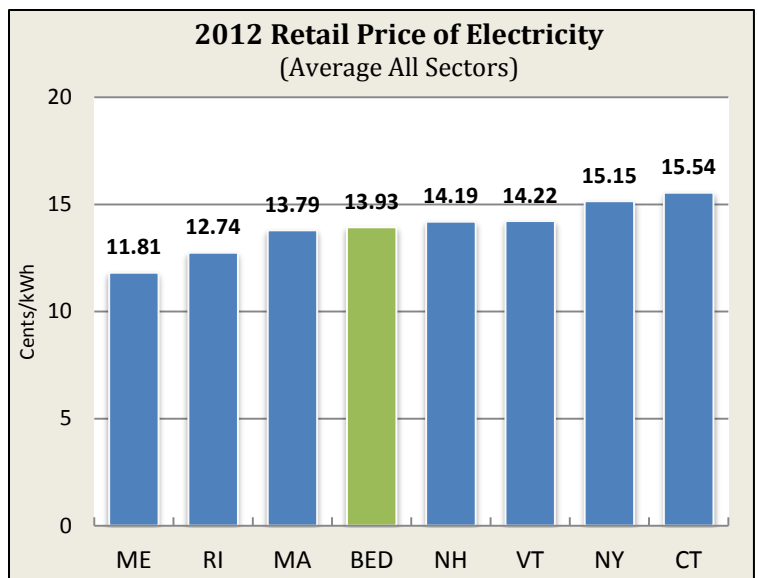
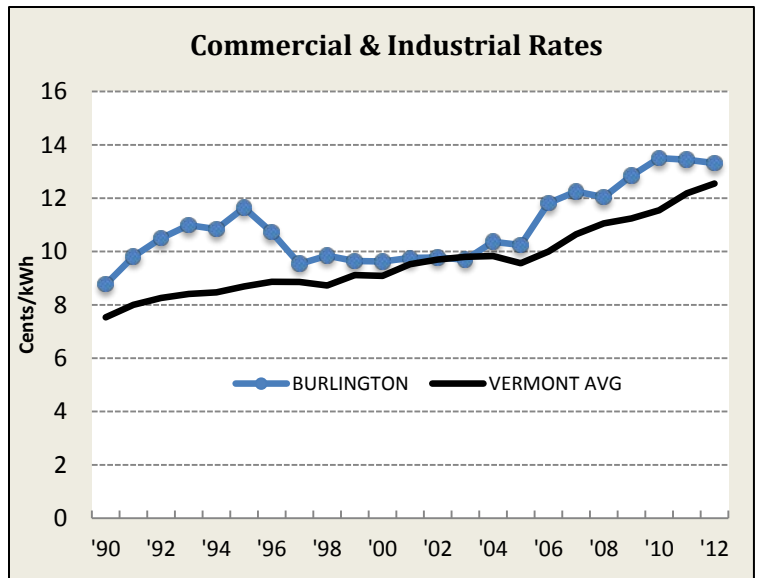
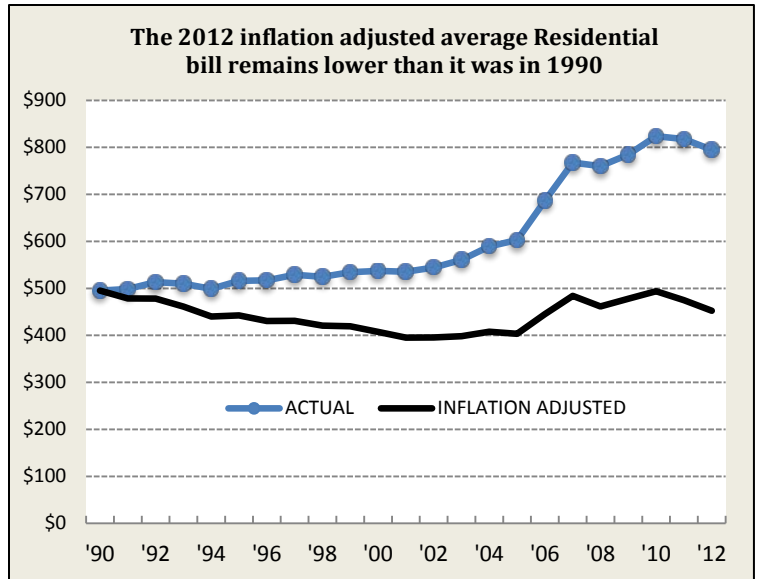
As the long term contracts entered by BED in recent years have started to deliver energy, and BED has needed to depend less on the New England spot markets, BED's average rates have stabilized.

Other Vermont utilities have not yet absorbed as much of the new market prices, and will need to do so as they replace expiring contracts. At that point, their rates (and the statewide average) will very likely catch up with BED's.

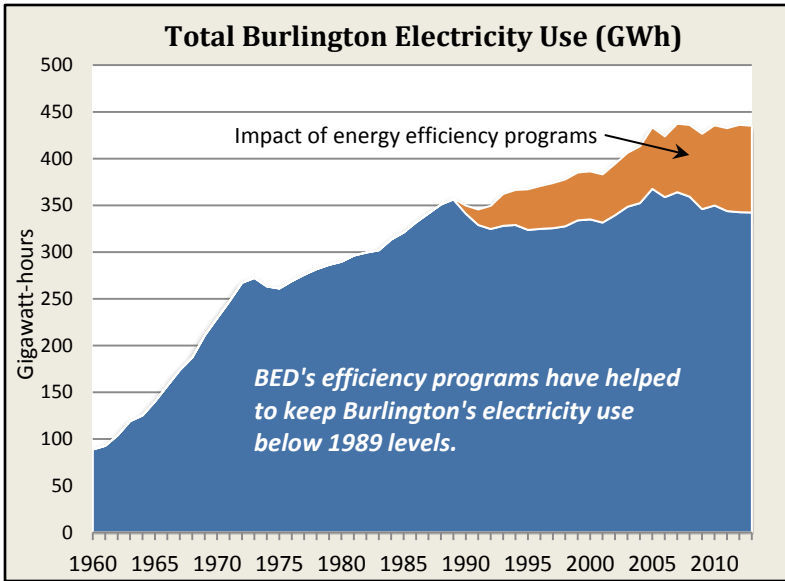
In addition, BED will make the final payment on the majority of its outstanding revenue bonds in 2014 (including those for the McNeil Plant). This will reduce costs and help stabilize rates going forward.

The bottom graph shows a comparison of BED's overall rates with other New England states. To the extent electric rates are a real or perceived issue for economic development, Burlington is in good shape within the region.

In any case, rates are still only half the picture. Along with the efforts to reduce rates, BED's Energy Services staff have helped C&I customers reduce their consumption through energy efficiency initiatives (see pages 5 and 6).



# ENERGY EFFICIENCY



BED has used its energy efficiency dollars wisely. Altogether, **BED has invested \$21.5 million in energy efficiency and has leveraged another \$24.4 million in private funds** from our customers. Almost all of these dollars re-circulate in the local economy.

**Overall electricity use in 2013 was 5.3% lower than in 1989.** During the same period, statewide use of electricity increased by 9.0%.\* Thus, we are meeting the needs of a growing local economy with less electricity than we used 21 years ago. The efficiency investments saved Burlington customers \$13 million in 2013 alone.

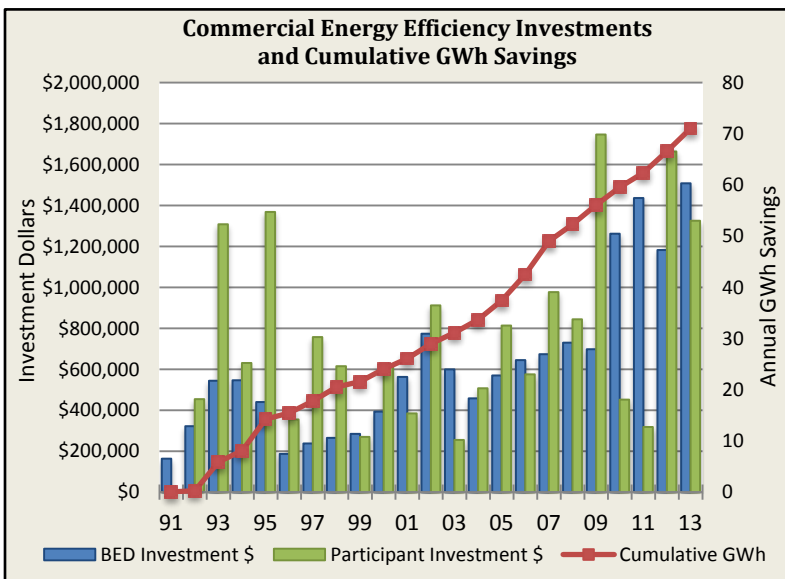
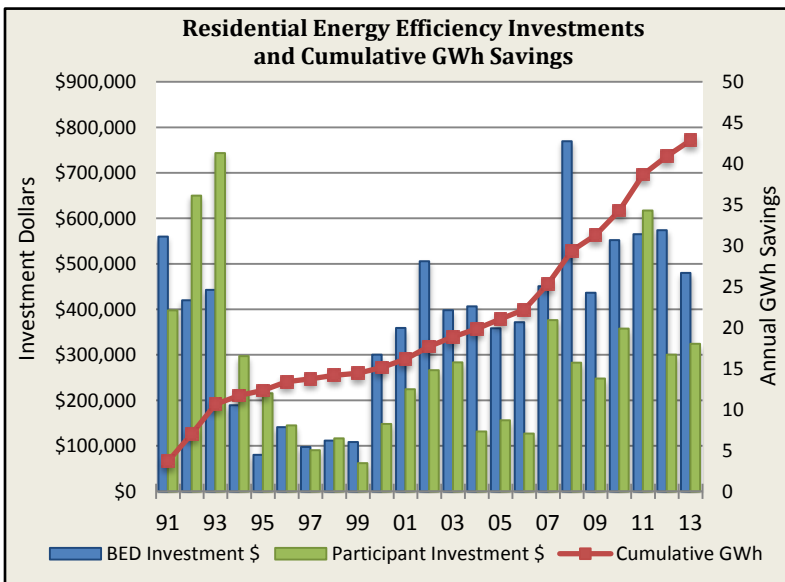
BED partners with Efficiency Vermont on the retail products program. Customers receive rebates for buying Energy Star lighting and appliances at local retailers. In 2013, BED customers purchased 43,300 compact fluorescent and LED bulbs and fixtures, 140 washing machines and 400 refrigerators.

**Furthermore, efficiency investments helped Burlington avoid the release of 24,100 tons of CO<sub>2</sub> in 2013, equivalent to removing 6,300 cars from the highways.**

All customers pay for efficiency in their bills, so BED has programs tailored for all rate classes. The graphs at left and below show the distribution of resources and savings for residential and commercial & industrial customers.

BED's Energy Services staff worked with dozens of customers in 2013 to implement efficiency projects that save energy, enhance facilities, and improve competitiveness. Total customer savings were \$1,241,032. For example (next page):

\*Note: Population growth was similar for Burlington and the state (8% v. 11% respectively), but statewide job growth was greater than Burlington's (17% v. 5%). This explains some portion of the variance.

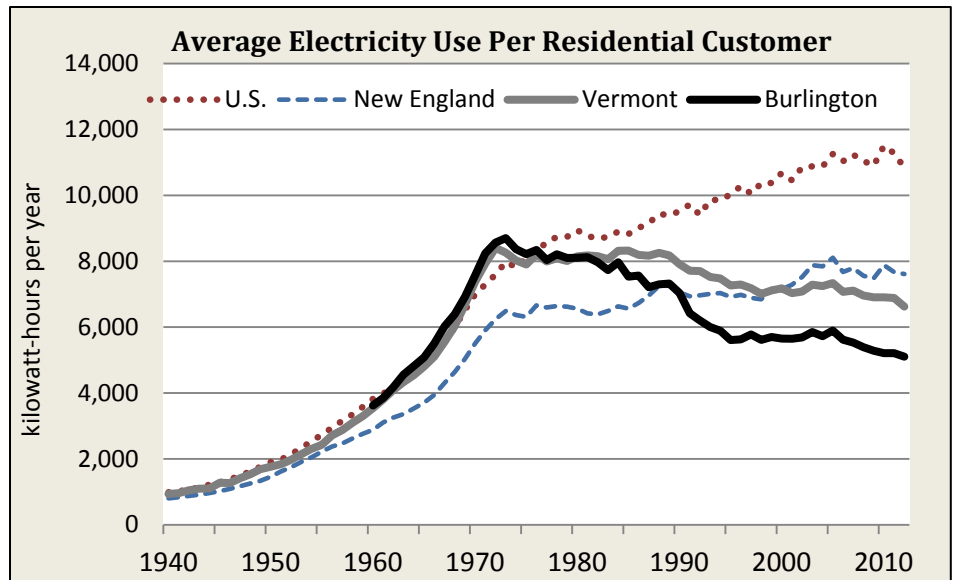


## ENERGY EFFICIENCY

BED's Energy Services staff worked successfully with dozens of retail stores to switch to LED lighting, which saves both energy and maintenance costs while providing high quality light. It is now difficult to find a downtown store that has not taken advantage of BED's LED lighting service.

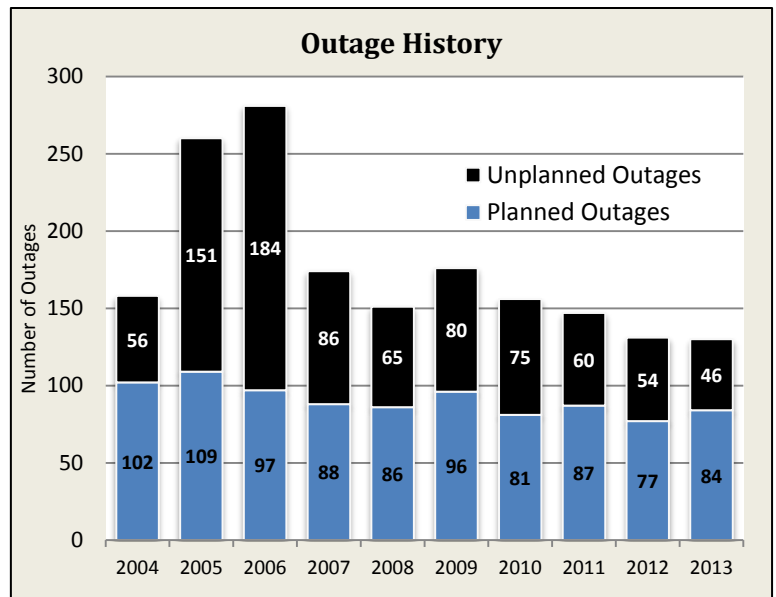
BED also continued to work closely with the Burlington School District (BSD) that completed dozens of lighting, ventilation and refrigeration efficiency projects in 2013. BSD also continues to partner with BED on the use of a building energy management software program "Energy Insight" that allows staff to monitor the energy usage of each school building to help ensure that buildings are being controlled optimally.

2013 was another strong year for energy savings at Fletcher Allen Health Care and at the University of Vermont. Several lighting, cooling and ventilation projects were completed. Both organizations are also partnering with BED on building energy management platforms to help better monitor energy usage and to help ensure that energy savings from completed projects persist. UVM is using the same monitoring service that is being used by BSD.



## RELIABILITY

An interruption of power is considered an outage if it exceeds five minutes. Outages are either planned or unplanned. Planned outages are generally shorter in duration, affect a smaller number of customers, and are warned in advance giving customers time to prepare. Planned outages allow BED staff to safely perform routine maintenance and upgrade facilities. Unplanned outages usually impact a larger number of customers, occur without warning, and are generally longer in duration. Most are caused by weather, equipment failure, wildlife or tree contact. BED has eliminated all of our 4.16 KV substations and over the next three years will upgrade the remaining pockets of 4.16 KV to our 13.8 KV system.



In 2013 BED continued with the replacement of its old underground direct-buried cables with new cables in new conduits, upgraded nine utility tops and replaced an entire utility hole in the downtown district. This is the first year of a multi-year plan to upgrade our older subsurface vaults and utility-hole entryways.

## POWER SUPPLY

BED's power supply reflects a number of considerations including cost, renewability, predictability & reliability, diversity, and other economic and environmental impacts. While cost is always critical, other factors influence purchase decisions. BED has succeeded in maintaining comparatively low and stable rates, while continuing our commitment to renewables and, to the extent possible, keeping money in Vermont by supporting Vermont-based renewable generation.

**Global Warming & Future Power Supply:** Generating electricity with fossil fuels contributes to climate change. BED has been a leader in renewable energy development. BED's 2008 Integrated Resource Plan established a goal to meet 100% of Burlington's needs with renewable resources by the end of 2012. Since the last report, BED has received approval for the long-term purchase of wind power from First Wind's Hancock, Maine wind project to be constructed in 2015, and has exercised its option to buy the Winooski One hydro facility, which will be the subject of a city-wide vote on the 2014 Town Meeting day ballot. In addition the Georgia Mountain Community Wind Project in Milton Vermont has come on line and begun delivering energy. BED anticipates that by 2015 energy from its renewable supply sources owned, contracted, or in process of being acquired will be sufficient to meet 100% of the city's electricity needs, before accounting for renewable energy credit transactions (see below for the effect of REC transactions on BED's ability to claim renewability). This milestone will give BED enormous flexibility in reacting to fossil fuel price swings, meeting future greenhouse gas regulation changes, and providing Burlington residents with affordable, environmentally friendly electricity well into the future.

**Integrated Resource Plan / Renewability:** Beginning in 2004 BED's analyses of supply options have consistently found that renewable resources were the best course of action (see <https://www.burlingtonelectric.com/>). However, such resources generally come at a premium price. In order to maintain stable rates, BED can sell the rights to the renewable aspects of the output from the McNeil Plant and other renewable resources (Renewable Energy Credits or REC's). When REC's are sold however, BED loses the right to claim the output from renewable resources.

BED calendar 2012 purchases were sourced 51% from renewable resources before accounting for renewable energy credit transactions. After accounting for the sale of REC's, 11% of BED's needs were met with renewable energy in 2012.

The REC's from these valuable sources were sold to reduce the rate impacts of purchasing long-term renewable resources. The BED Electric Commission has currently approved the sale of REC's through FY 2015 and continues to review the economics of selling REC's to control rates versus retaining the ability to claim renewability.

BED also buys RECs from some generators that have existed for many years and therefore command a lower price. By doing so BED can create revenue from REC sales to keep rates lower, while still maintaining a renewable power supply. After accounting for all REC transactions, including purchases of renewable energy credits, BED's supply portfolio was served 66% from renewable resources (the increase from 51 to 66 percent was due to purchase of RECs by UVM).

**The McNeil Station:** In calendar year 2013, McNeil Station produced 320,000 MWH of power! This is the highest production since the plant was built in 1984. On June 1<sup>st</sup>, the plant will celebrate 30 years of operation, and the bonds required to build the plant will be paid off!! In 2013 the plant utilized 488,062 tons of wood fuel, and provided Burlington with 45% of the total power requirements. In addition to power, McNeil produced 319,973 Connecticut Class 1 Renewable Energy Certificates.



## GENERATION – THE McNEIL PLANT

The McNeil Station is dispatched by ISO New England, which controls all of the region's power plants. The decision to run a plant is based on regional demand, reliability needs, and the bid price, which reflects fuel costs at each plant.

The Plant had a high capacity factor in 2013.

ISO does not consider the total cost of producing power because it excludes most "externalities" such as environmental and secondary economic impacts. However, ten states now require fossil fueled units to purchase carbon credits in order to operate. This incorporates environmental costs into the economics of these units. McNeil is net neutral from a carbon perspective (the fuel is sustainably harvested). The majority of the costs of operating the plant stay right in New England.

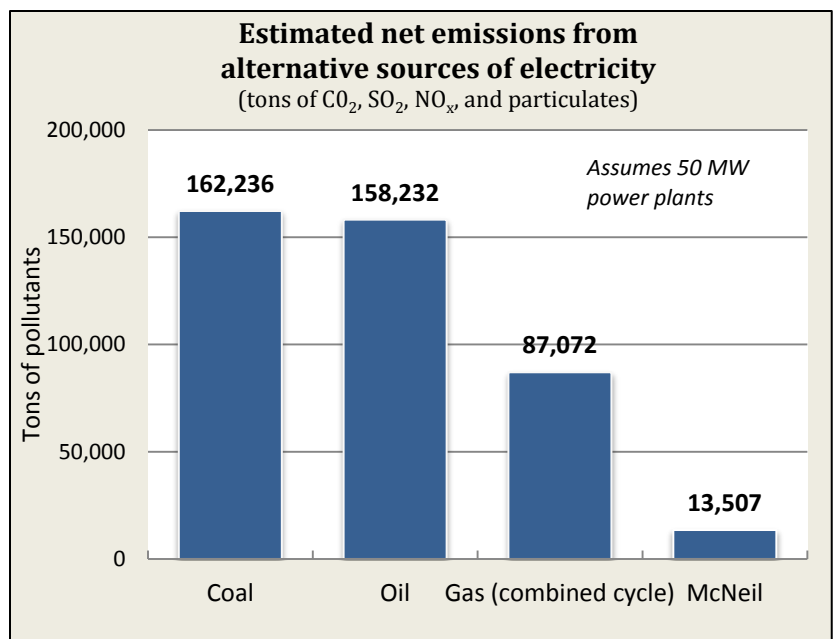
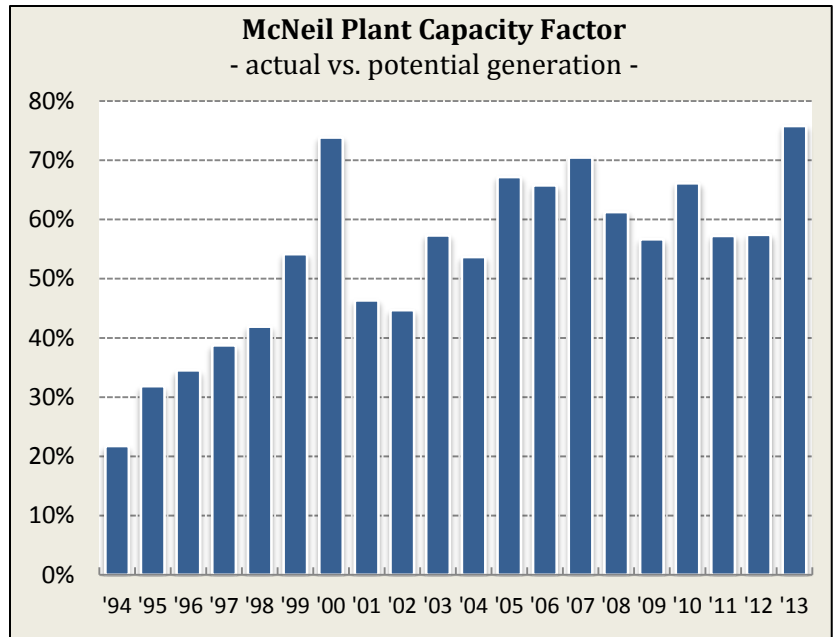
In 2008, McNeil Station voluntarily installed a Regenerative Selective Catalytic Reduction unit which reduces the NOx emissions from the plant to 1/3 of those allowed by the State of Vermont. The cost of this modification was \$12,000,000.

### HARVESTING BIOMASS

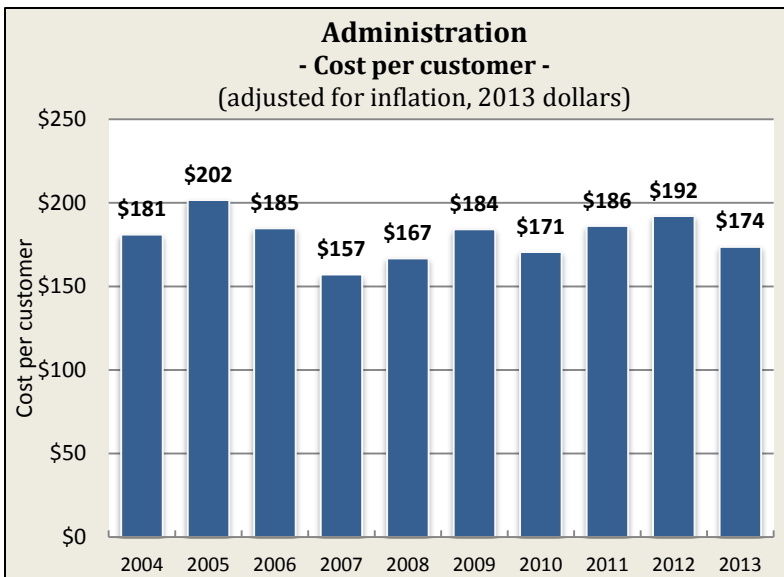
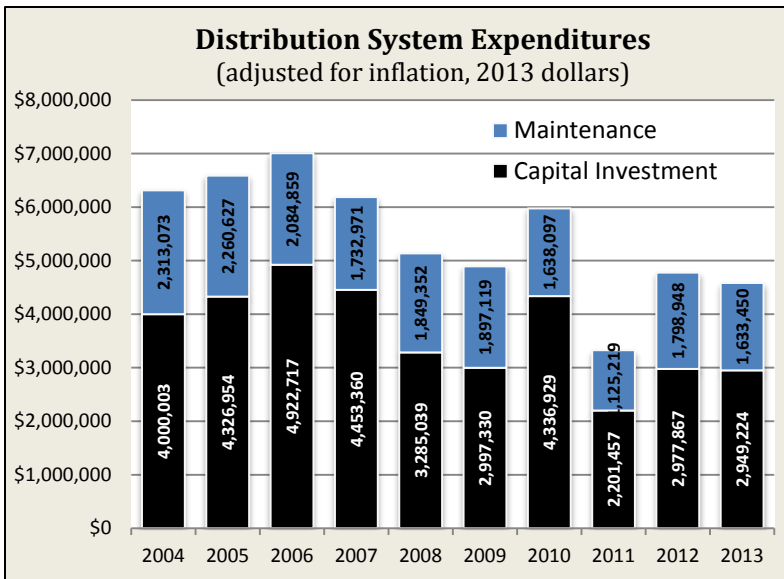
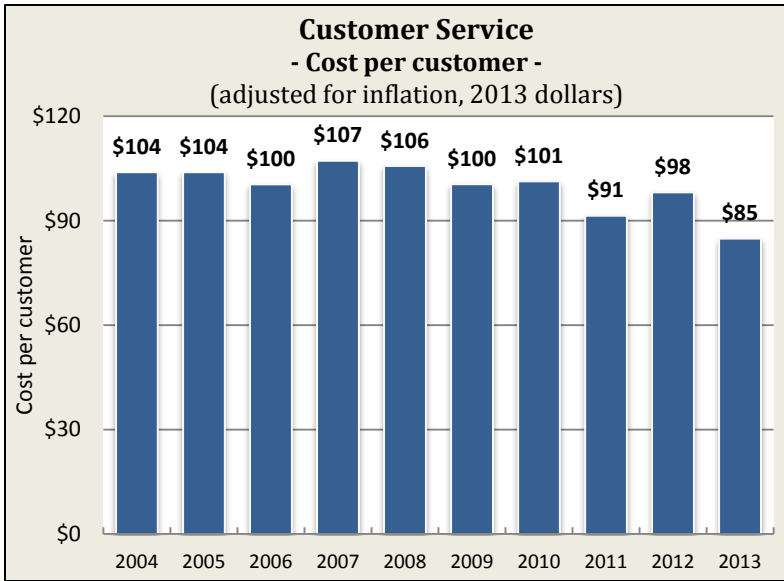
McNeil's wood harvesting standards are comprehensive, field-proven means to harvest biomass fuel sustainably, and have been used as a model in developing forest management certification criteria. In 2013, McNeil Station used 488,061.9 tons of wood; 95% harvest residue, 3% sawmill residue and 2% clean waste wood. McNeil foresters plan and monitor harvests on more than 5,000 acres per year within a 100 mile radius of Burlington. Harvest plans include protecting critical habitats and wetlands. For example:

- McNeil makes available portable skidder bridges for free (on loan) to loggers.
- McNeil foresters encourage the use of low-impact harvesting equipment on sensitive sites.
- McNeil manages its wood fuel inventory to minimize delivery disruptions during inclement weather and to avoid environmental impacts of harvesting during sensitive times of the year.

McNeil continues to operate the Burlington Waste Wood Depot, which provides local residents with a central location to dispose of clean waste wood at no charge. **In 2013, over 10,000 tons of waste wood were diverted from local landfills to McNeil and processed into fuel, which conserved nearly 32,000 cubic yards of critical landfill space and reduced McNeil fuel costs by \$108,417.**



# OPERATING EFFICIENCY



Approximately 6,000 of our 16,000 residential customers change locations each year, which is a primary driver of customer service costs. BED has managed to lower and stabilize these costs over the last ten years. **Adjusted for inflation, the cost per customer has declined 18% since 2004.** Among other things, this reflects considerable savings from consolidating job functions and the productivity of our staff.

Adjusted for inflation, the average cost of maintaining the distribution system is \$1.8 million a year. In addition, BED makes long-term investments to improve the system, to extend its useful life, and to accommodate new development. Capital projects include equipment upgrades, line extensions and new underground conduits and cables.

These investments improve system reliability and reduce unplanned outages. Distribution system efficiency measures include conversion from 4.16 KV to 13.8 KV, load balancing, installation of capacitor banks, etc. The changes have reduced line losses from 4% in 1996 to an estimated 2.0% in 2013 and are projected to reduce power costs by \$250,000 to \$300,000 annually.

Capital expenses were lower than usual last year because one planned project was delayed and another cost less than expected. The administrative costs of running BED have declined significantly since the late 1990s from staff reductions (down from 164 employees in 1996 to 126 today) and greater efficiencies. BED has continued to work hard to control costs. Since the customer base is stable, any cost increases (e.g., health care, salaries, insurance, etc.) result in higher costs per customer. Nevertheless, **adjusted for inflation, the administrative cost per customer has declined 4% since 2004.**

# ECONOMIC IMPACTS

## TAXES AND FEES

As a municipal entity, BED is not required to pay property taxes. However, BED makes an annual payment in lieu of taxes (PILOT) that makes us the largest property taxpayer in the City. BED also collects a 3.5% franchise fee for the City.

This is significant because these payments come from all customers (and the joint owners of the McNeil Station),

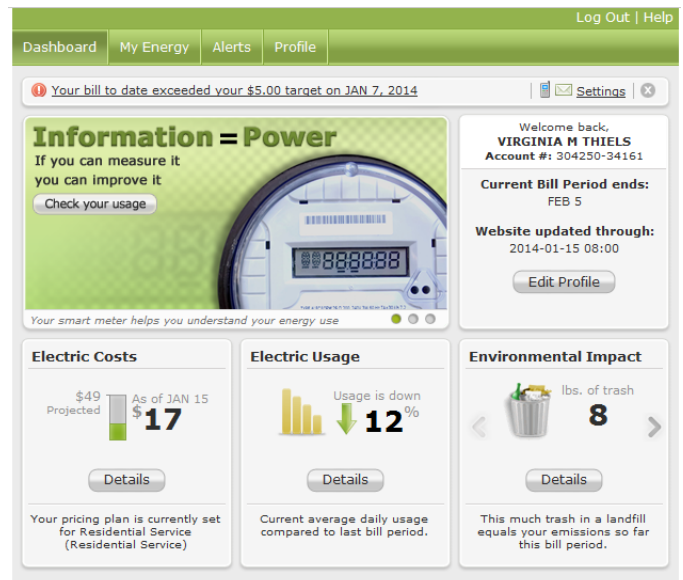
including nonprofit entities such as UVM and Fletcher Allen that don't pay property taxes. This is a more equitable distribution of the burden of financing City operations and is an important benefit of public power.

BED Payments in Lieu of Taxes and Franchise Fee Transfers			
Fiscal Year	Payment in Lieu of Taxes (PILOT)	City Franchise Fees	Totals
2007	\$1,329,161	\$1,561,087	\$2,890,248
2008	\$1,422,118	\$1,555,177	\$2,977,295
2009	\$1,545,262	\$1,581,818	\$3,127,080
2010	\$1,513,864	\$1,640,653	\$3,154,517
2011	\$1,570,954	\$1,678,281	\$3,249,235
<b>5 Yr. Totals</b>	<b>\$7,381,359</b>	<b>\$8,017,016</b>	<b>\$15,398,375</b>

## THE MANY BENEFITS OF SMART GRID

In 2010, BED was the recipient of a \$7.15 million Department of Energy grant that funded 50 percent of the installation of a smart grid system that included the conversion to advanced meters. This project has fundamentally changed every aspect of how BED operates. This "Platform for the Future" has truly moved us into the 21<sup>st</sup> century, allowing us to keep up with the changes and innovation in the utility industry that continue to accelerate with each passing year. We are only beginning to experience their impacts through continued increases in the reliability of the electric grid, improved efficiencies, reduced environmental impact, and fundamental changes in how BED and its customers interact.

All along the way customers have been asking about the benefits of such a large investment. Now that the initial installation funded by the grant is complete and some of the benefits are becoming measurable, we can report on our experiences to date. The benefits that we have seen so far include far fewer truck rolls around the city to read meters or to turn power on or off, which of course improves air quality and reduces costs of maintenance, gas and staff time. This new system allows small-scale local renewable energy to be more easily incorporated into BED's distribution system by allowing BED to simply re-program customer meters remotely if a generation source is added. It has also allowed BED to begin moving meter readers to new tasks, and to avoid some planned equipment purchases. Even so, the system has only been operational since April of 2013, and BED is not yet positioned to capture all expected benefits. *(Continued on next page)*



### Cut Costs

**Block incoming sunlight on hot days**  
Heat from the sun can raise indoor temperatures and make your air conditioner work harder. Keep it cooler inside by drawing your shades or curtains closed during peak sunlight hours.  
[More Ways to Cut Costs](#)

### Be Efficient

**Insulate your attic and air seal common leaks between the attic and the house**  
Your attic can be a large source of drafts and leaks, and it requires **proper insulation** to keep your home environment comfortable and energy-efficient.  
[More Ways to Use Less](#)

### Reduce Your Impact

**Install solar landscape lights**  
Avoid electric lights along your walkway and opt for a green alternative. Install solar lights that collect and store energy throughout the day and light up your walkway for free every night.  
[More Ways to Go Green](#)

## THE MANY BENEFITS OF SMART GRID

(Continued from previous page)

Benefit	Cumulative Benefit Estimate over Life of Investment	Actual Achieved Inception to Date
Power Cost Reduction - Energy	\$ 4,046,796	\$ -
Power Cost Reduction - Capacity	\$ 6,301,066	\$ -
Avoided Service Turn On/Off Cost	\$ 3,554,823	\$ 57,195
Meter Changeout Deferred	\$ 1,585,173	\$ 38,105
Avoided Off Cycle Read Costs	\$ 968,506	\$ 18,132
MV90 Software License Savings	\$ 383,346	\$ -
Avoided Manual Meter Reading Costs		\$ 56,834
Meter Reading Equipment Downsized (Salvage)	\$ 7,388	\$ 7,449
<b>TOTAL</b>	<b>\$ 16,847,098</b>	<b>\$ 177,715</b>

BED will soon be offering new Time-of-Use rate structures to begin capturing the anticipated power cost reductions. Some remaining legacy software will also be retired in the upcoming year, capturing those savings, and BED will complete the connection between the AMI system and its Outage Management System to further enhance the reliability benefits of the system.

With the new advanced meters and the online Energy Engage program, customers will be able to assess which new rates work best for them. When more customers switch some of their electricity usage from high-cost on-peak power to lower cost off-peak we all benefit as a municipal utility. With the new time-of-use rates the customer will see this benefit right on their monthly bill.

As the transportation sector continues to move from gas to electricity the advanced meters will help enormously in making sure that e-vehicle owners fill up during the off-peak times. This will ensure improved air quality and lower carbon emissions.

The electric utility industry is at the beginning of a fundamental change in how people receive their energy. BED's smart grid investment has positioned Burlington to be at the forefront of that change, and we are already enjoying some of the benefits. But, there is much more to come, and we look forward to using smart grid technology to provide Burlington residents with even more efficient, transparent, and responsive service in the future.