



2010 Performance Measures Report

Smart Grid

Building a platform for the future



An automatic temperature control system will better allow customers to save energy.

An emerging technology is "Vehicle-to-Grid". In the future, cars may be able to plug in at night to fill up and return some power to the grid during the day; smart meters will track the usage. Charging stations such as this are an integral part of this transition.



Renewable energy will be better integrated into the grid.

Burlington Electric Department
... successfully transitioning to a post-carbon economy

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Burlington Electric Commission
585 Pine Street
Burlington, Vermont 05401

Spencer Newman, Chair
Paul Hines, Vice Chair
Robert Herendeen
Scott Moody
Jean O'Sullivan

To: All BED ratepayers and citizens of Burlington
From: Spencer Newman
Date: March 2011
Re: Performance Measures Report

We are pleased to present Burlington Electric Department's Performance Measures Report for 2010. 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.

This year, we want to share our excitement as we begin the process of transitioning to a "smart grid." This project will move the electricity sector into the 21st century, making it more efficient, cleaner, and more reliable. We want to keep our customers informed as the process unfolds. The smart grid will further strengthen the relationship BED has with its customers, and customer involvement will make all the difference in how successful we are.

Unlike the way the grid has run for more than a century, a smart grid will provide two-way communication between BED and its customers, which will help reduce peak loads, improve energy efficiency and reliability, and allow for more locally owned renewable electricity to enter the grid. Visit our website at www.burlingtonelectric.com to see the latest updates on this major project, which will take place over several years. This is the beginning of an entirely new way of providing for the electrical needs of our customers, and will allow us to work even more closely with Burlington's residents and businesses to make the most efficient use of our natural resources.

At BED, we are proud of our 106-year history as a publicly owned utility. We are proud to have led with energy efficiency and renewable energy, and we now take on the smart grid with enthusiasm.

INTRODUCTION

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

In addition to not-for-profit rates, 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 supported the construction of the McNeil Generating Station 27 years ago); **energy efficiency** (residents approved an \$11.3 million bond to help reduce energy consumption in 1990); **system reliability** (residents approved a \$36.6 million bond in 2009 for upgrades and other projects), and environmental protection (reduced consumption means less pollution).

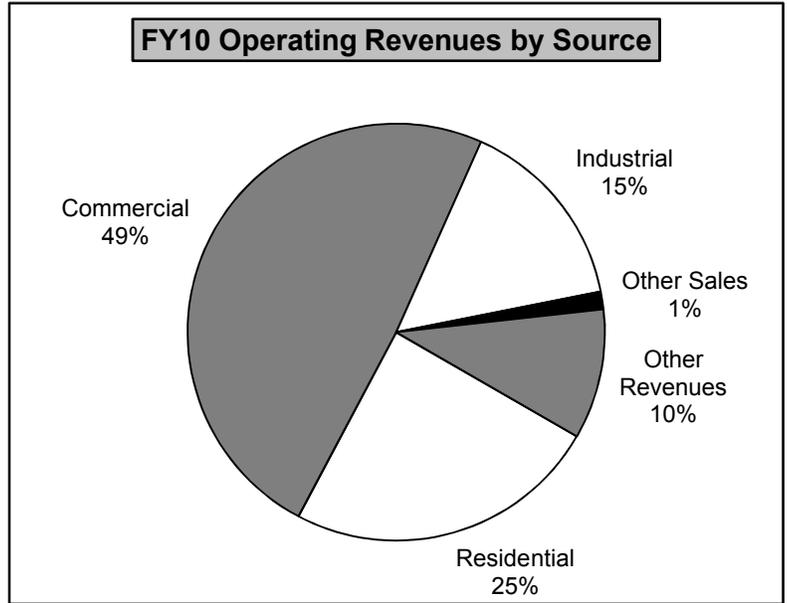
We're proud to serve Burlington and will continue to be responsive to the community. This report is intended to help explain what we do and to help us measure our progress over time. We invite your comments and suggestions.

MARKET & REVENUES

BED provides electric service to more than 16,000 residential customers and 3,700 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 64% 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, including the number of incorrect bills, worker injuries, customer notification of outages, and the time required to restore power following an unscheduled outage. Other categories are related to customer service and power reliability.

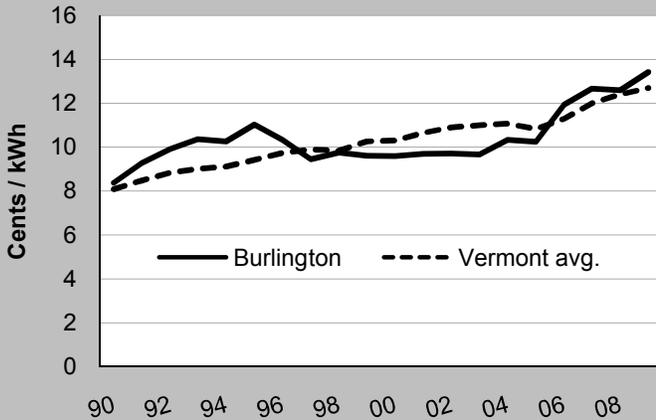
Each utility is expected to meet these minimum performance standards. BED performed far better in most categories than required and had no violations at all in some areas. In only one area did BED exceed the state standard: lost time severity. The reason is because an injured employee was unable to schedule needed surgery for two months (a backlog that was beyond his control). While waiting for the surgery, he worked in a “restricted” capacity, which (oddly) is considered lost time. Other than that, only two other employees lost time from work-related injuries after the day of an incident.

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%	0.0%
% Bills estimated	5%	0.3%
% Customer requested work completed by promised delivery date	95%	100%
Average # of customer interruptions per year	2.1	0.7
Average duration of customer interruption (hours)	1.2	1.0
Lost time incidents / year (injury leading to lost work time)	< = 3.5	2.8
Lost time severity (total work days missed due to injury)	< = 71	76.1

RATES AND BILLS

BED's average overall rates were 5.7% higher than the statewide average in 2009

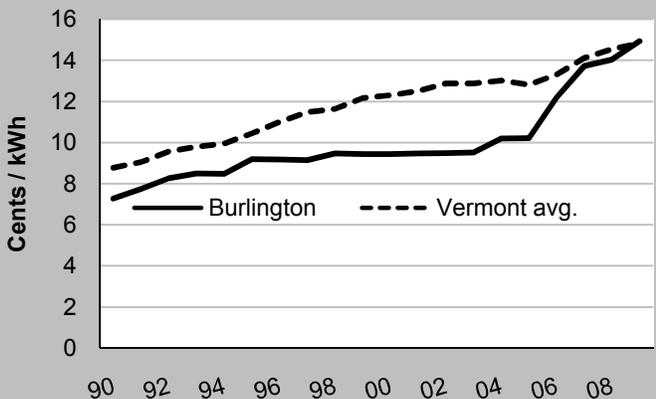


Utilities have different rate designs that make comparisons difficult. The easiest way to measure performance is to compare *average revenues per kilowatt-hour* - total revenue divided by kWh sales. This is called “average rates” and is a standard measure for the price of electricity to the consumer.

BED had a rate increase in 2009; it did not have one in 2010, and expects no increase for FY 2011 (which is more than half over); and – as of now – is not planning an increase for FY 2012.

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.

Even with recent increases, residential rates were only 1% higher than the statewide average in 2009



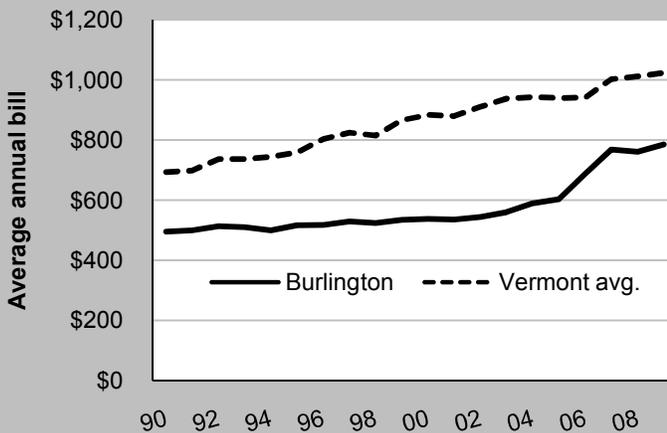
RESIDENTIAL CUSTOMERS

Even after recent rate increases, **BED's residential rates were only 1% higher than the statewide average in 2009.**

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 23% less than the statewide average in 2009.

Burlington's 2009 average residential bill was \$239 less than the statewide average



	Avg. res. rate (cents / kWh)	Avg. res. Annual bill
Burlington	14.94¢	\$785
Vermont	14.83¢	\$1,024

In 2009, an average Burlington residential customer paid \$239 less per year than the statewide average. Overall, this represented aggregate savings of \$3.9 million in 2009 -- 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 **2009 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 2009 was 82% higher than in 1990.

COMMERCIAL & INDUSTRIAL CUSTOMERS

Average commercial and industrial rates declined a bit in 2008 but rose in 2009. Although BED's rates remain higher than the statewide average, the gap is expected to close in the next few years.

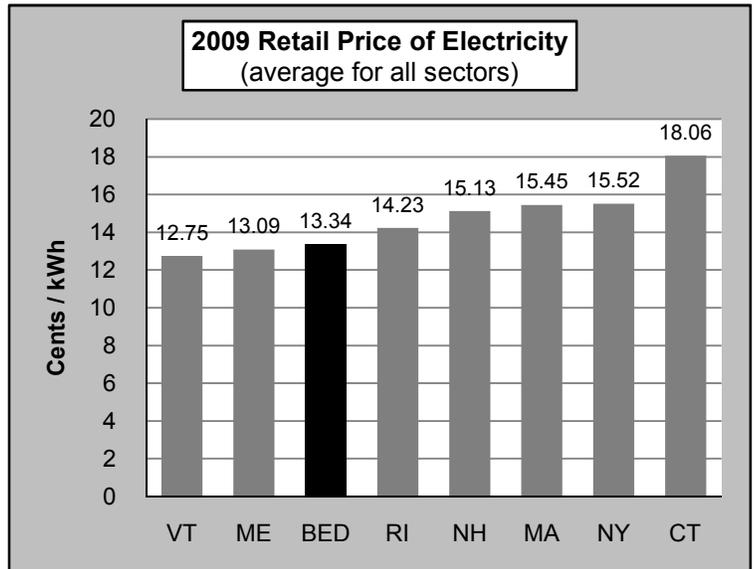
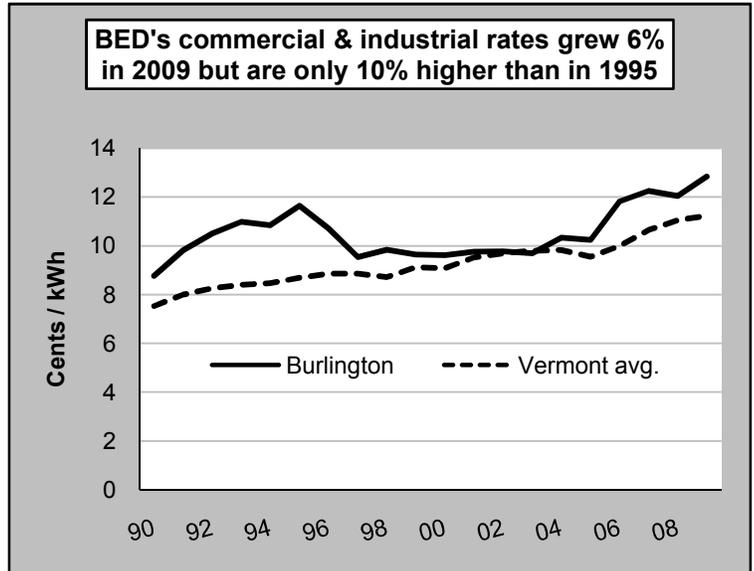
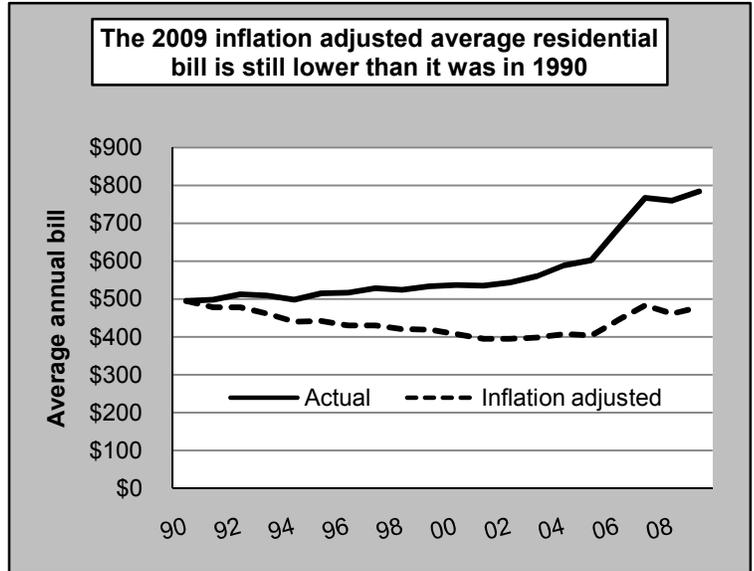
Recent rate increases were driven largely by expiring power contracts at old prices and the need to replace them with contracts at higher market rates. Fortunately, the majority of impacts from the deregulated markets are already built into our rates.

CVPS and GMP have not yet absorbed as much of the new market prices because of their existing Hydro Quebec and Vermont Yankee contracts. When the contracts expire in 2012, those utilities will have to replace them, probably at higher cost. At that point, their rates (and the statewide average) will very likely catch up with BED's increases.

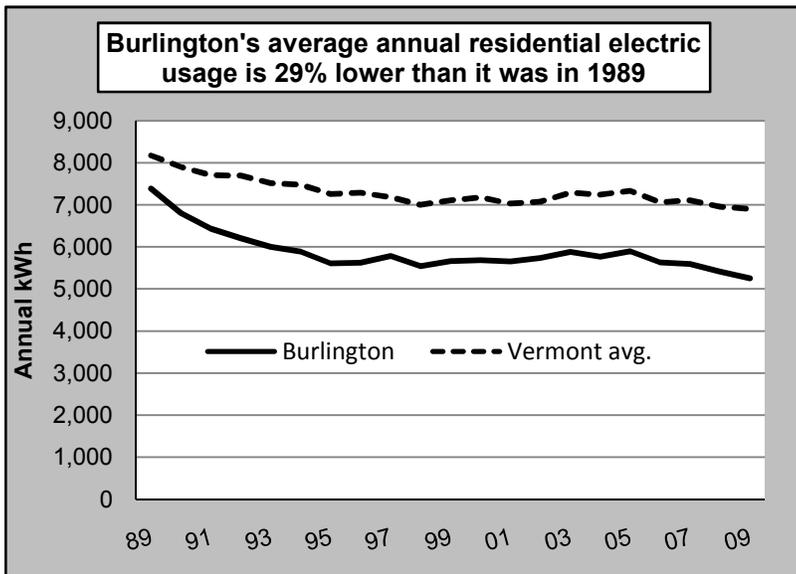
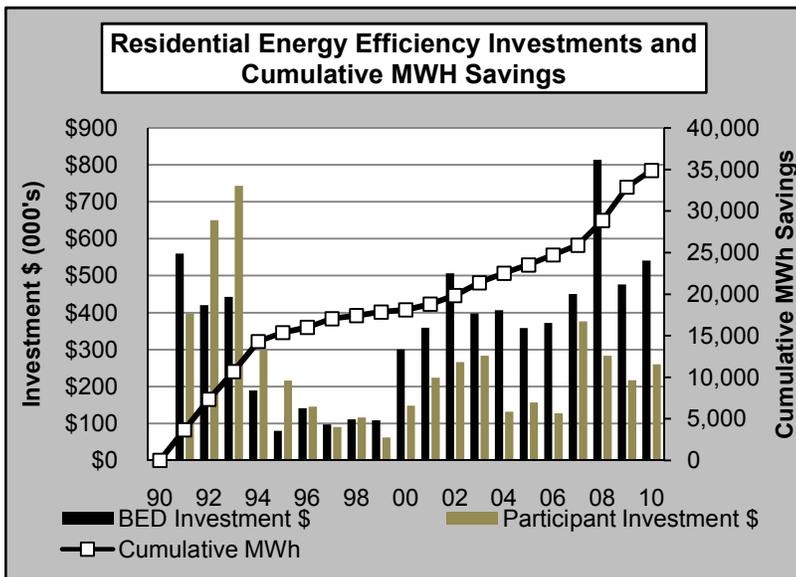
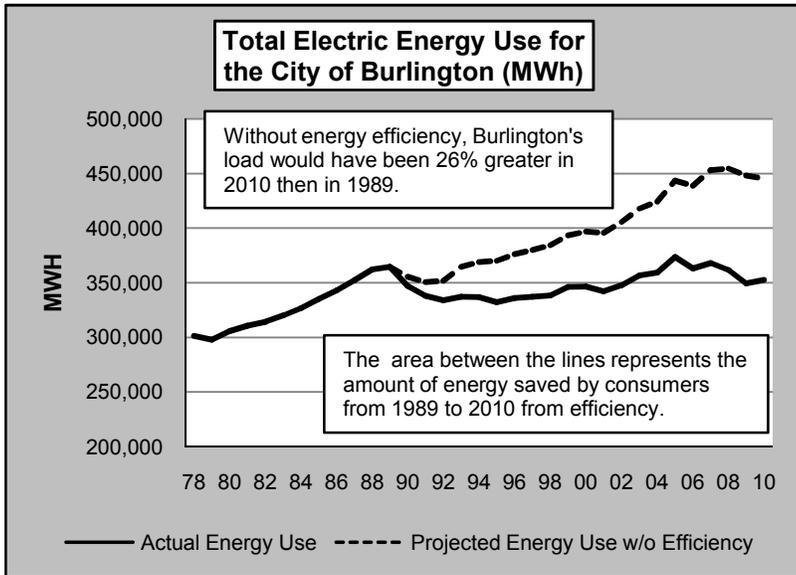
In addition, BED will make the final payment on the majority of its outstanding revenue bonds in 2014 (including those for the McNeil Plant). This will reduce costs and help stabilize rates going forward.

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). The combined effect is powerful.



ENERGY EFFICIENCY



Burlington voters approved an \$11.3 million energy efficiency bond in 1990. BED invested those funds wisely and the results are described below. BED customers (like all others statewide) pay a small monthly charge that supports BED's energy efficiency efforts.

BED partners with Efficiency Vermont on the retail products program. Customers receive rebates for buying Energy Star lighting and appliances at local retailers. In 2010, BED customers purchased more than 22,000 compact fluorescent bulbs, 239 washing machines, 225 air conditioners, and 285 refrigerators.

Altogether, **BED has invested \$15.6 million in energy efficiency and has leveraged another \$19.7 million in private funds** from our customers. Almost all of these dollars re-circulate in the local economy. The effect has been dramatic.

Overall electricity use in 2010 was only 2% greater than in 1989. During the same period, statewide use of electricity increased by 17%. Thus, we are meeting the needs of a growing local economy with about the same amount of electricity as we used 20 years ago. **The efficiency investments saved Burlington customers \$13.2 million in 2010 alone.**

Furthermore, efficiency investments helped Burlington avoid the release of 44,644 tons of CO₂ in 2010, equivalent to removing 11,656 cars from the highways.

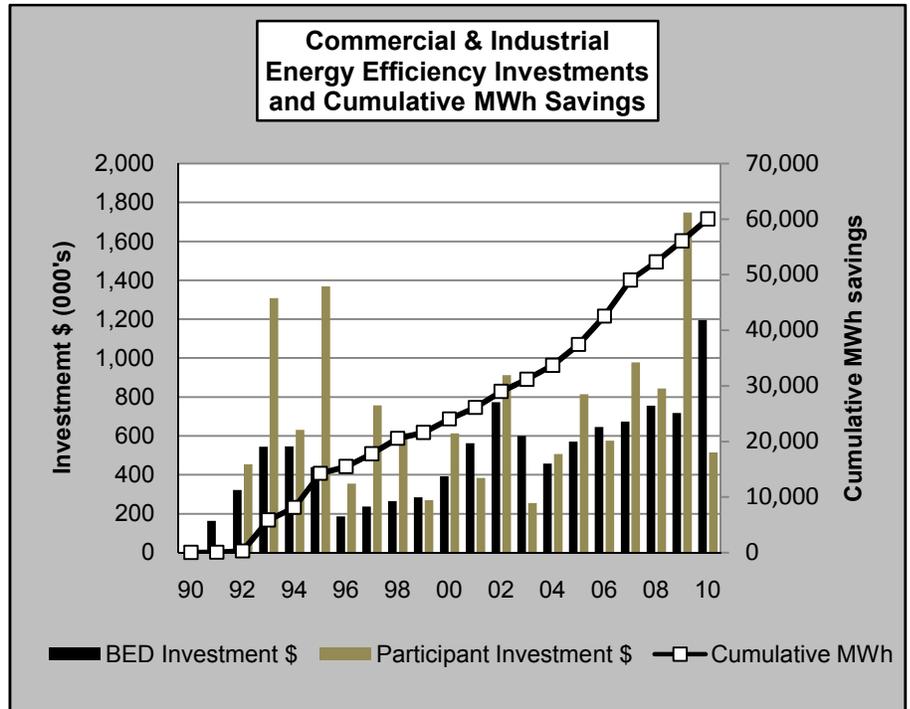
All customers pay for efficiency investments in their bills, so BED has programs tailored for all rate classes. The graphs at left and next page show the distribution of resources and savings for residential and commercial / industrial customers.

BED's Energy Services staff worked with dozens of customers in 2010 to implement efficiency projects that save energy, enhance facilities, and improve competitiveness. Total customer savings were \$1,029,864. For example:

ENERGY EFFICIENCY

BED's Energy Services staff worked successfully with Fletcher Allen Health Care on their new Radiation Oncology wing. The building is LEED certified and includes high levels of energy efficiency, especially with the lighting and controls package.

BED also worked closely with the Department of Public Works' Water and Wastewater Divisions on replacing aeration blowers with more efficient motors, as well as variable frequency drive controls. The project resulted in substantial energy savings and reduced maintenance costs.



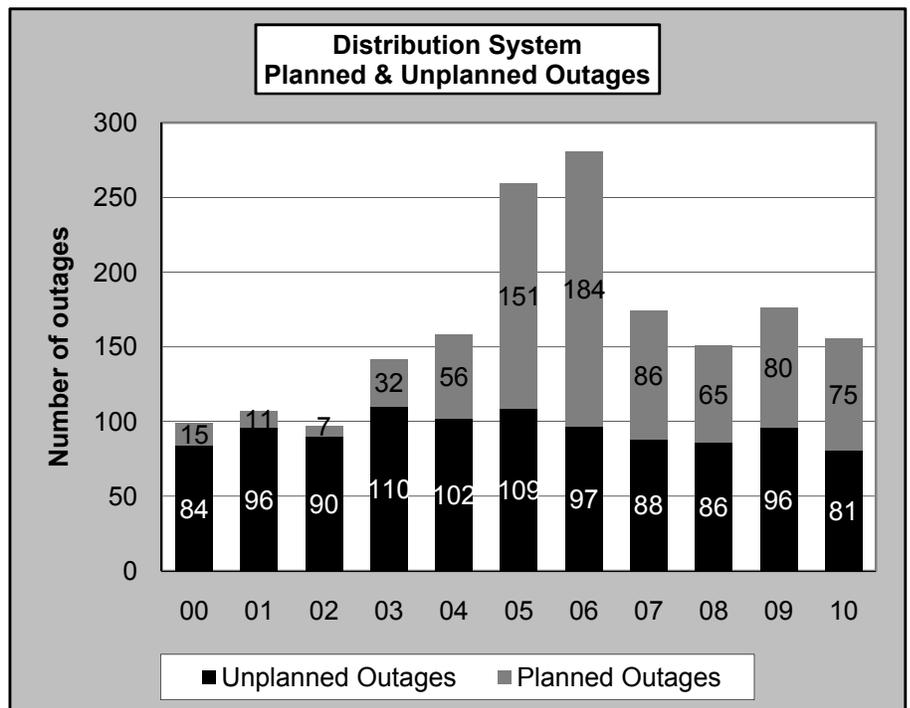
RELIABILITY

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, and animal or tree contact.

BED's increased investments in capital improvements are intended to improve reliability and they are paying off. Unplanned outages were down almost 16% last year.

BED moved a large transformer from the waterfront to the McNeil Plant and installed a new circuit between McNeil and the East Avenue substations. These changes have improved system reliability significantly and have reduced operating costs by eliminating GMP transmission charges.

According to a report from the Lawrence Berkeley National Laboratory (using data from 2006), BED ranked in the top 10% in the nation for reliability.



POWER SUPPLY

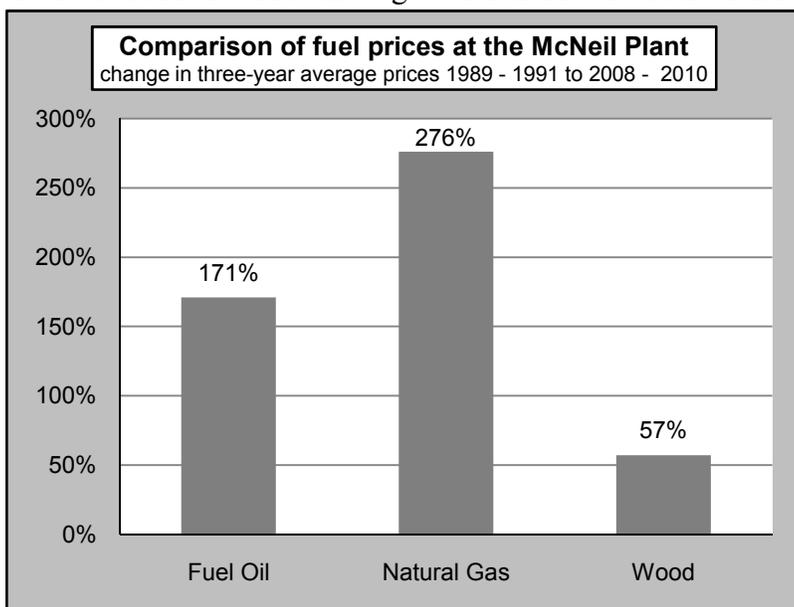
BED's power supply reflects a number of considerations including cost, renewability, reliability, diversity, and other economic and environmental impacts. While cost is always critical, other factors influence purchase decisions. BED has succeeded in maintaining comparatively low and stable rates, while 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: Fossil fuel electric generation contributes to climate change. BED has been a leader in renewable energy development, but more needs to be done. The goal is to meet 100% of Burlington's needs with renewable resources by the end of 2012. But in-state renewables are challenging. For example, wind energy is Vermont's most promising type of renewable power (and is cost effective relative to other sources), but implementation is moving slowly. In order to replace a long-term contract that expired at the end of 2009, BED contracted for 16 megawatts of wind power. The Vermont Wind project was delayed somewhat but construction has begun and power should begin flowing late in 2011. In the last twelve months BED has contracted for 100% of the power from the recently permitted Georgia Mountain Community Wind Project and is considering the possibility of pursuing an ownership interest in the Project instead of just contracting for the power. BED has also requested regulatory approval to purchase hydro power from Quebec, but any such purchase will need approval from Burlington voters.

Integrated Resource Plan / Renewability: BED's analysis of supply options found that renewable resources were the best course of action (see 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.

After accounting for the sale of McNeil REC's, 14% of BED's needs were met with renewable energy in 2010. **Prior to the sale of the REC's, BED received about 50% of its power from renewable resources** (the renewability percentages are lower than in prior years due to the expiration of a hydro-related contract coupled with the delay in the start of the wind contract intended to replace it).

The REC's were sold to recover the cost of state-of-the-art emission control technology installed in 2008 without putting pressure on rates. As of March 2010, the value of the RECs sold from McNeil paid for the \$12,000,000 cost of the emission controls. BED has committed to sell REC's only through 2011 and will review the economics of selling REC's to control rates versus retaining the ability to claim renewability.



The McNeil Station: In 2010, 38% of BED's power came from McNeil. Despite recent reductions in oil and natural gas prices, operating hours should remain high in 2011 due to volatility in the wholesale markets for electricity; the relatively low cost of wood; and the competitive advantage conferred by the new emissions controls. If necessary, the McNeil Plant can burn fuel oil or natural gas in addition to wood, although that is unlikely. As the chart at left shows, however, wholesale prices for natural gas and fuel oil have grown dramatically over the years while wood prices have remained relatively stable.

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.

ISO does not consider the total cost of producing power because it excludes most "externalities" (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. Because **McNeil uses a renewable fuel** (biomass, considered carbon neutral), it provides a competitive advantage.

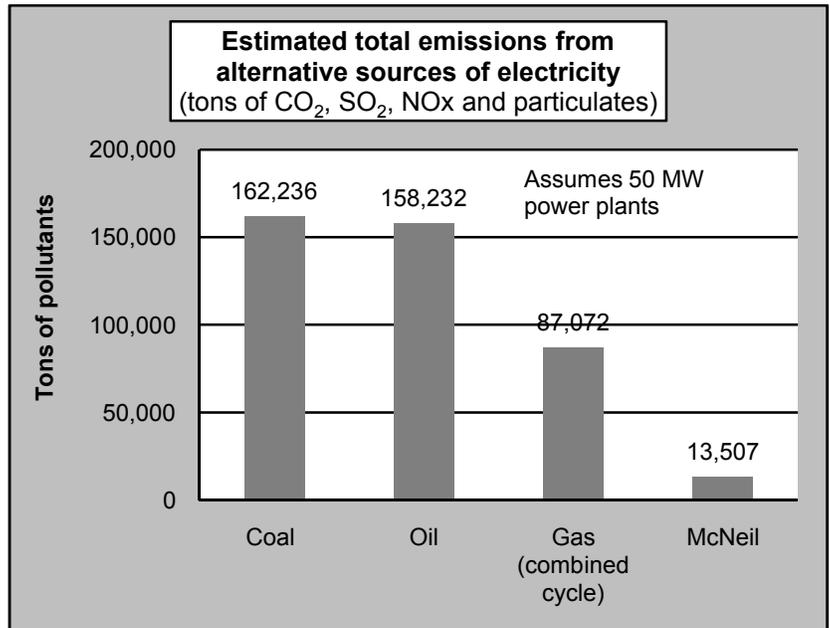
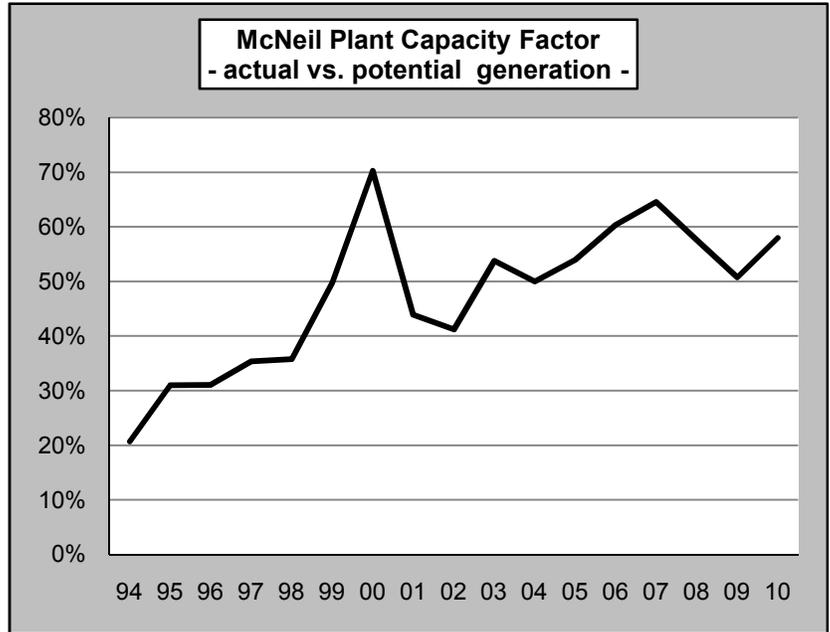
All power plants that burn fuel emit certain substances into the air. Until we are able to switch completely to pollution-free technologies like wind, solar, and hydro, we must continue to reduce demand whenever possible.

HARVESTING BIOMASS

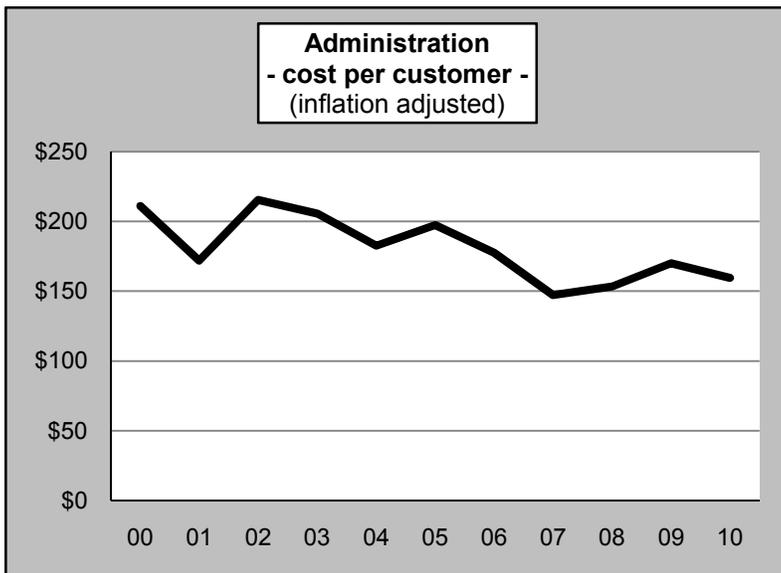
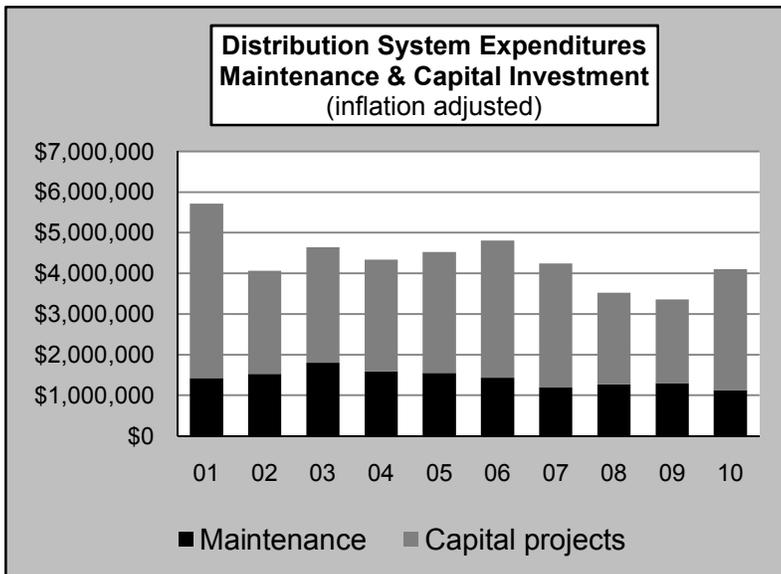
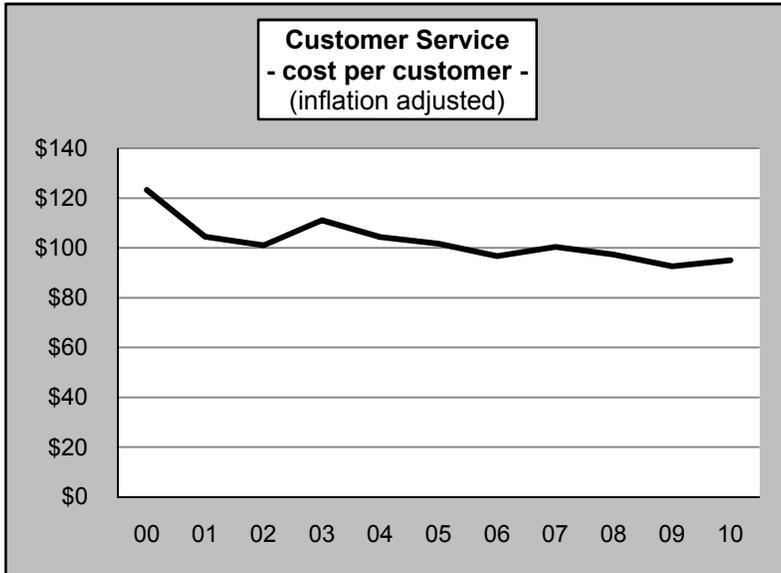
McNeil's wood harvesting standards are comprehensive, field-proven means to harvest biomass fuel sustainably, and have been used as a model in developing forest management certification criteria. In 2010, McNeil Station purchased 377,000 tons of wood; 91% harvest residue, 7% sawmill residue and 2% clean recycled 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 2009, 4,867 tons of waste wood were diverted from local landfills to McNeil and processed into fuel, which conserved nearly 21,000 cubic yards of critical landfill space and reduced McNeil fuel costs by \$58,400.



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 23% since 2000.** Among other things, this reflects considerable savings from consolidating job functions and the productivity of our staff.

The average cost of maintaining BED's distribution system is about \$1.4 million per 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. These changes have reduced line losses from 4% in 1996 to 2.1% in 2010 and are saving about \$578,000 annually.

Note: The spike in capital expenditures in 2001 resulted from three major projects occurring at the same time.

The administrative costs of running BED have declined significantly since the late 1990s from staff reductions (down from 164 employees in 1996 to 125 today) and greater efficiencies. Since then, BED has continued to work hard to control costs. However, 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 24% since 2000.**

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.

If not for BED's PILOT and the franchise fee, the combined property and school tax rate would be almost \$0.09 higher than it is today. That means a family with a \$200,000 home saves about \$170 per year in property taxes, while paying only \$27 in franchise fees, a savings of \$143 per year.

BED Payments in Lieu of Taxes and Franchise Fee Transfers			
Fiscal Year	Payment in Lieu of Taxes (PILOT)	City Franchise Fees	Totals
2006	\$1,204,542	\$1,306,525	\$2,511,067
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
5 Yr. Totals	\$7,014,947	\$7,645,260	\$14,660,207

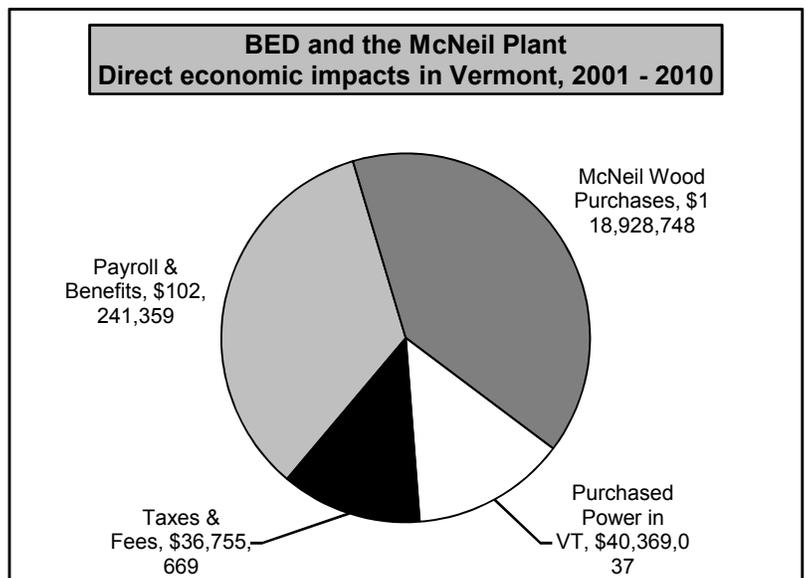
JOBS AND THE MULTIPLIER EFFECT

One of the benefits of the decision to build the McNeil Generating Station is that a considerable amount of money remains in Vermont and the region. In addition to providing 40 jobs for Vermonters at the Plant, BED's wood fuel purchases also contribute to the Vermont economy, supporting North Country landowners, processors, and haulers. It is especially noteworthy that much of this activity has occurred in the northernmost counties of Vermont, where most economic indicators lag behind the rest of the state.

In addition, sustainable harvesting of wood fuel results in environmental benefits and a reliable long-term fuel source. A sustained market for low-grade wood at McNeil allows landowners to improve the future value of their woodlands. This encourages residents to own and maintain undeveloped forestland, which provides many public benefits such as clean water, wildlife habitat, and land for recreation.

The economic impact of BED's operations includes payroll, local taxes, wood purchases, and other power purchased within Vermont. **BED's total direct contribution to the Vermont economy over the past 10 years was \$298 million.**

The indirect benefits are significant as well. For example, wood purchases have a powerful "multiplier effect" as the money circulates through the economy. Including transportation costs, **BED and the Joint Owners spent \$14.03 million for wood at the McNeil Plant last year. This led to \$12.4 million in additional economic activity, including \$6.1 million in wages for 167 jobs (one year only). Furthermore, we estimate that these activities produced \$759,000 in state and local tax revenues (not including the \$3.15 million in PILOT and franchise fees for Burlington).**



Smart Grid's Guiding Principles

Over the next several years, as we move toward a smart grid, BED wants to assure our customers that their interests and privacy concerns are paramount. We are working with the state-wide eEnergy Vermont Communications Group and together we have developed "Guiding Principles" that we believe align with fundamental consumer interests and expectations. The Principles are:

1. Expectation of privacy. Consumer billing and usage data will not be shared with any third party without the consumer's consent except as required by law.
2. Expectation of effective communication. Consumers will receive accurate, timely, clear communication that enables them to understand new services, technologies and rate structures and allows them to make informed energy choices suited to their lifestyles.
3. Expectation of security. The utility will secure all consumer data and comply with industry-standard cyber security protocols and practices.
4. Expectation of choice. Consumers will have choices among rate structures, in-home devices and appliances that enable them to take advantage of smart grid benefits.
5. Expectation of safety. Smart grid will be implemented using technologies and materials that meet industry standards and have been demonstrated by scientific research not to pose health risks to people and communities where they are installed.
6. Expectation of consumer benefit. The smart grid will be implemented in a manner designed to maximize value to Vermont consumers.

