# Utility Overview Presented to Senate Finance Committee

January 13, 2017

# BED Overview

- Municipal utility located in Burlington
  - Public Power since 1905
  - 121 employees, including 39 at the McNeil generating station
  - >6,000 residential accounts turn over each year
- 20,000+ customers
  - 16,763 residential
  - 3,829 commercial and industrial
  - Owned fiber optic loops and upgraded SCADA system
  - ~96% advanced meter deployment
- Electricity facts:
  - Summer Peak: ~65 MW
  - Energy Use: ~350,000 MWH
  - Third largest electric utility in Vermont
  - McNeil is the largest generator in Vermont with VY Retirement

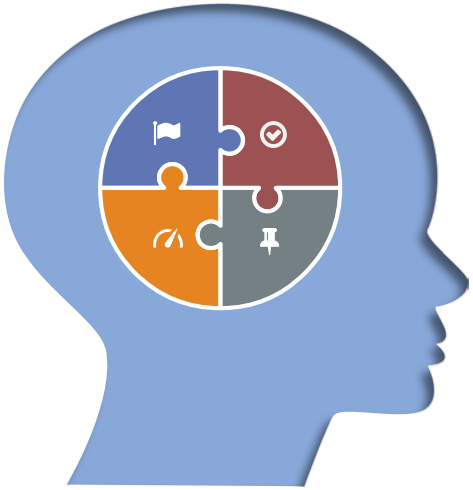
# Era of Utility Disruption

*The energy industry is undergoing a sea change. Think:*

Traditional Utility
Hub and Spoke Model
“One-Way Power System”

Utility 2.0
Peer-to-Peer Network Model
“Energy Cloud”

# **Adapt or perish**, now as ever, is nature's inexorable imperative. (HG Wells)



Why transform? Three driving factors:

1. Customer choice is a powerful force
2. Distributed generation and energy efficiency have changed demand forever
3. Energy technology is advancing at an ever-quickening pace

Key Observations.

1. Data has become as important as electrons
2. Extraordinary opportunity to strengthen grid both in resiliency & security
3. Energy regulation must keep pace with dynamic industry

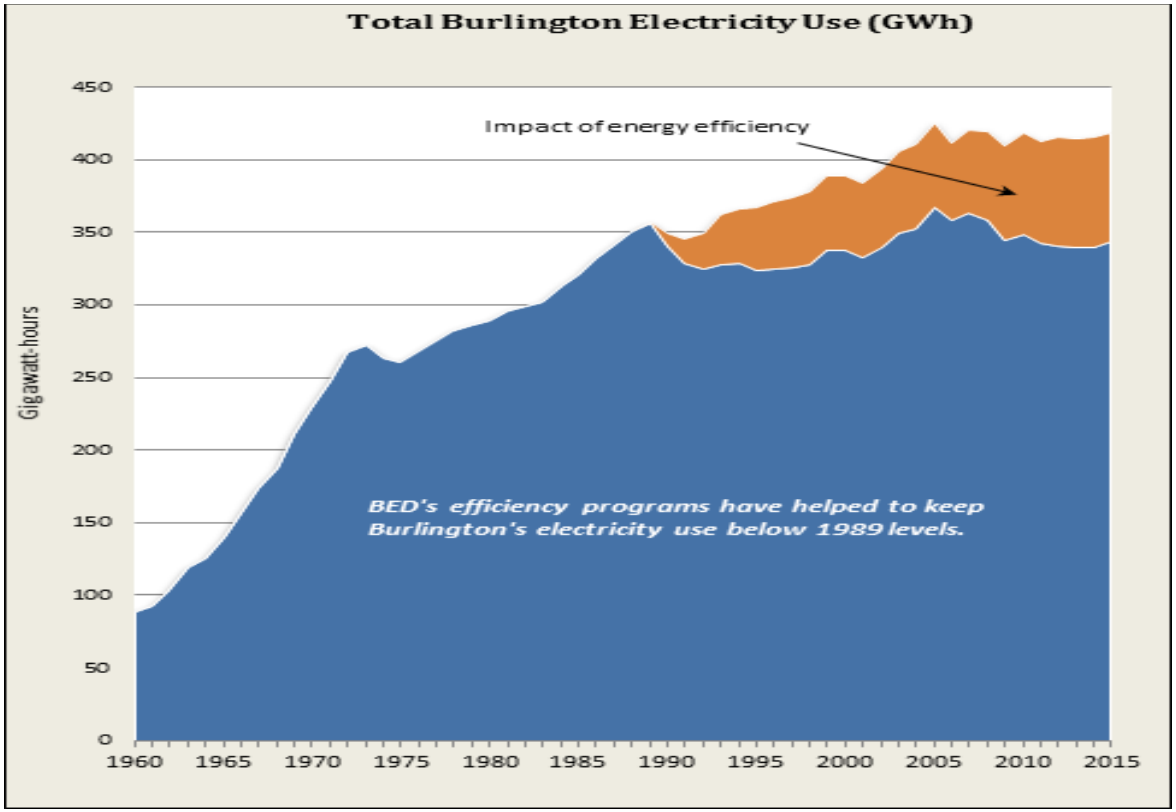
*These are all good things!*

# Recent Accomplishments

- Continued commitment to Energy Efficiency
- Transformation to renewably sourced power
- Strategic transformation
  - Structural reorganization
  - Extensive process improvement
  - Efficient operations translates to savings
- Improved reliability metrics
- Moody's bond rating improved to A3
- Formed strategic partnership with Corix Utilities on District Energy Project
- Started energyChamp (whole home efficiency) with Vermont Gas
- Added nine BED-owned charging stations in 2016
- Built two utility-owned solar arrays since 2014 (Airport garage and BED) – 600kw
- New wind resource began commercial operations in Dec 2016 (Hancock, Maine)

# BED is its own Energy Efficiency Utility

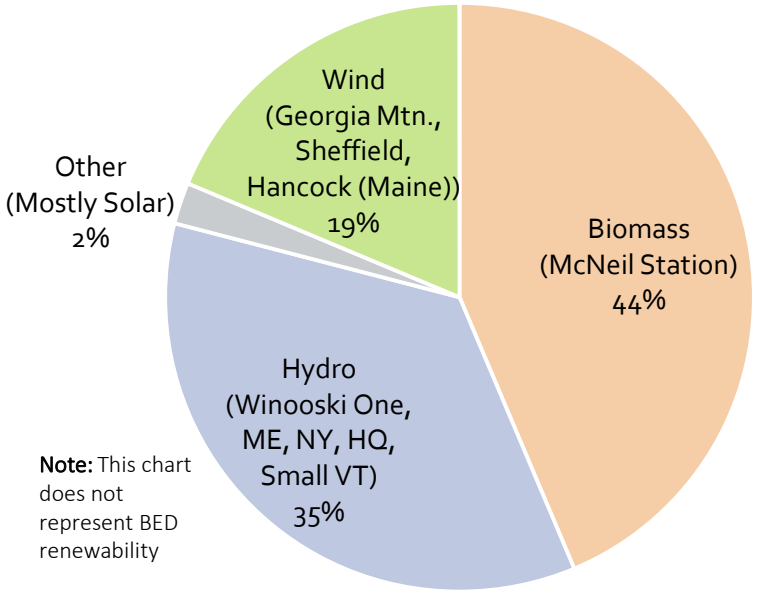
- *Burlington uses less energy today than it did in 1989*



# National Leader in Renewable Energy

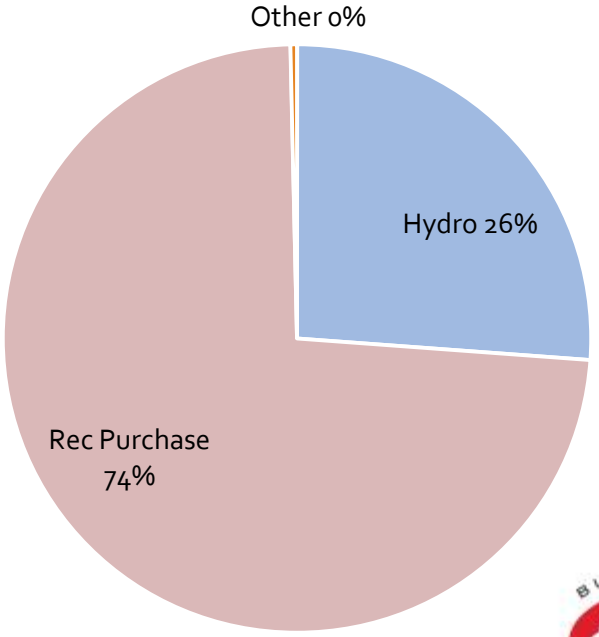
- *First city in the nation to source 100% of energy from renewable generation*

BED Owned & Purchased Power Resources CY2016




**Note:** This chart does not represent BED renewability

BED Renewability, including REC Sales & Purchases CY2016 (estimated)



# BED's transformation to renewable energy sources

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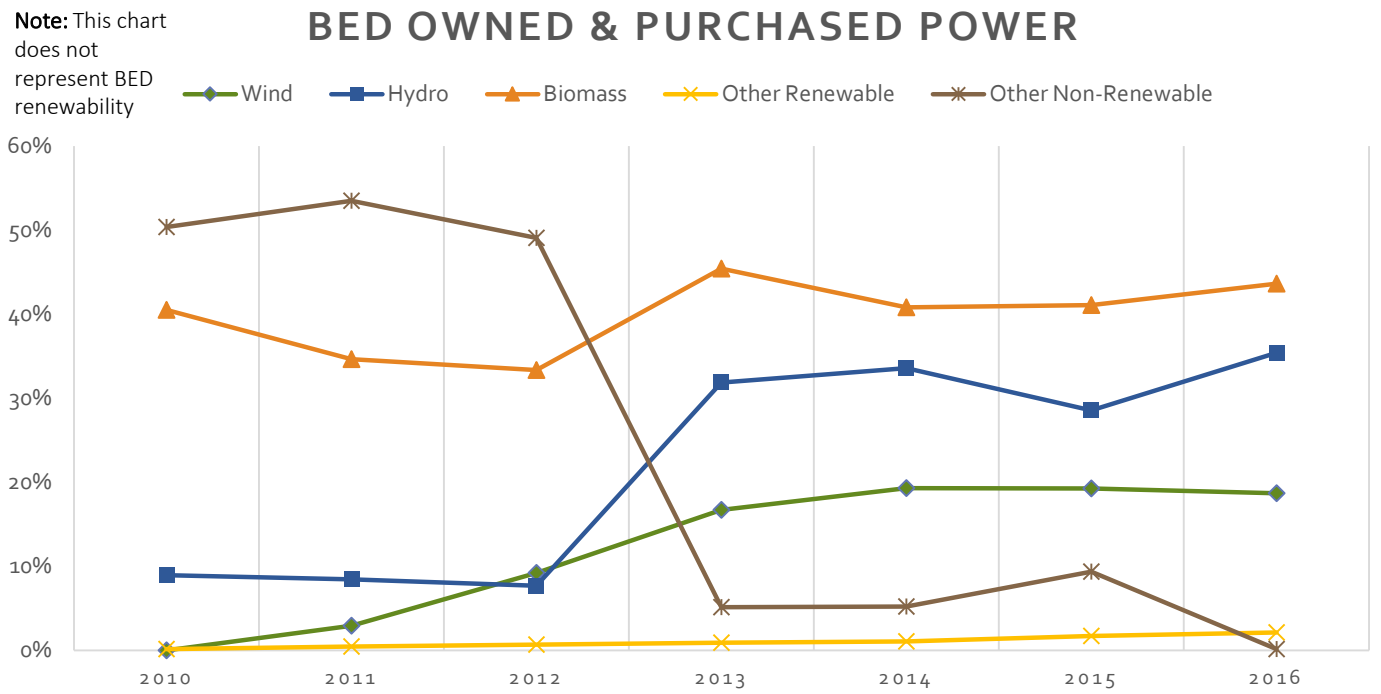

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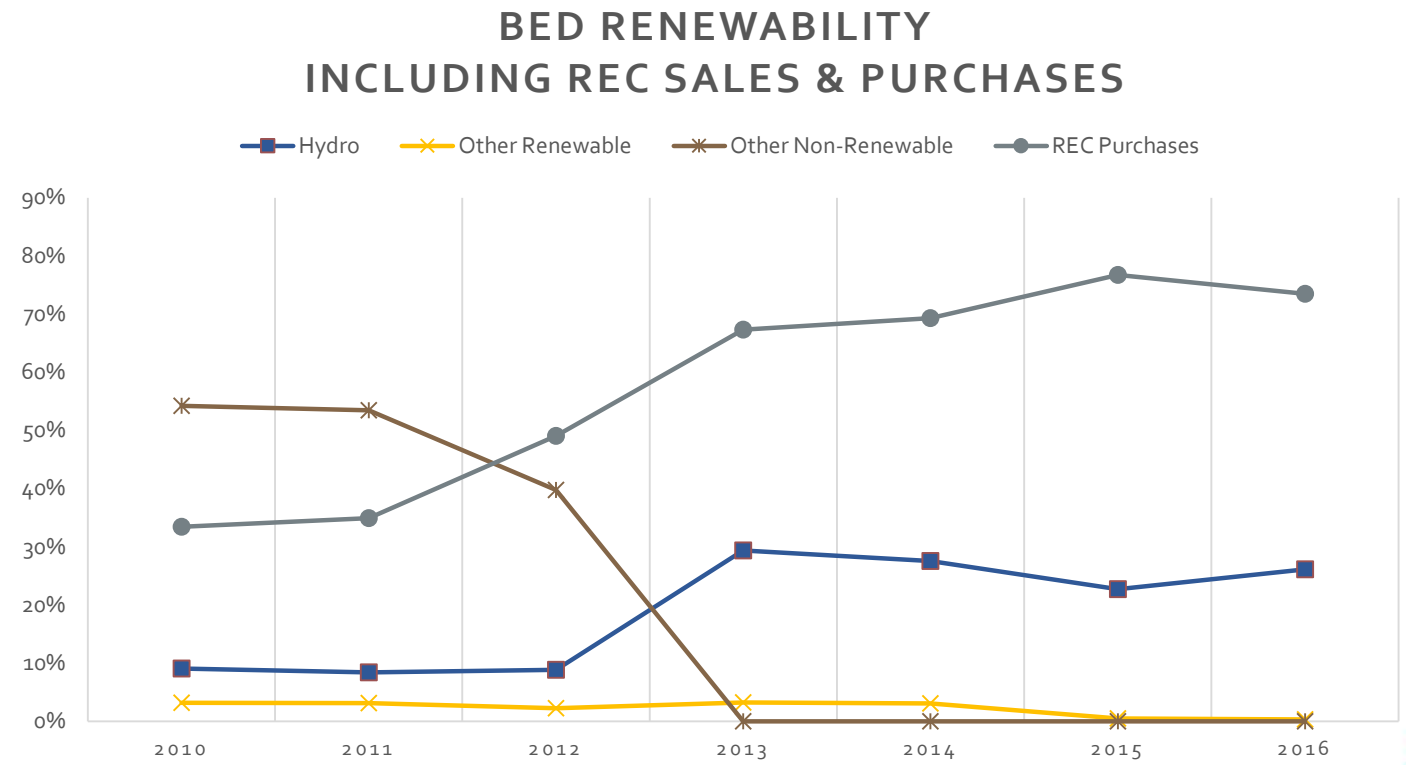
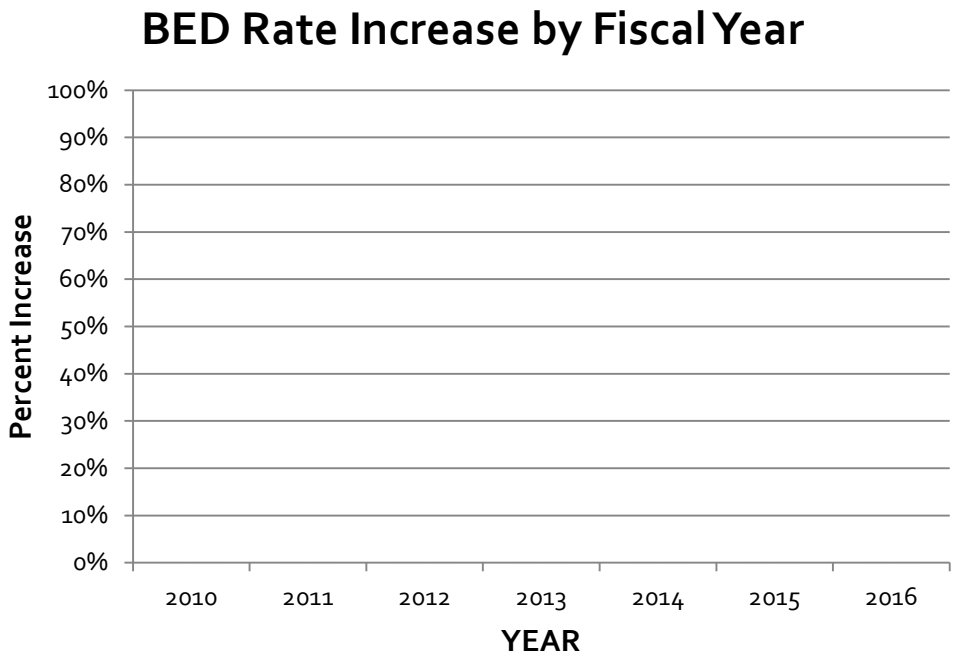


# No rate increase since 2009

- Keeping rates low and stable for customers while continuing to lead in renewable power

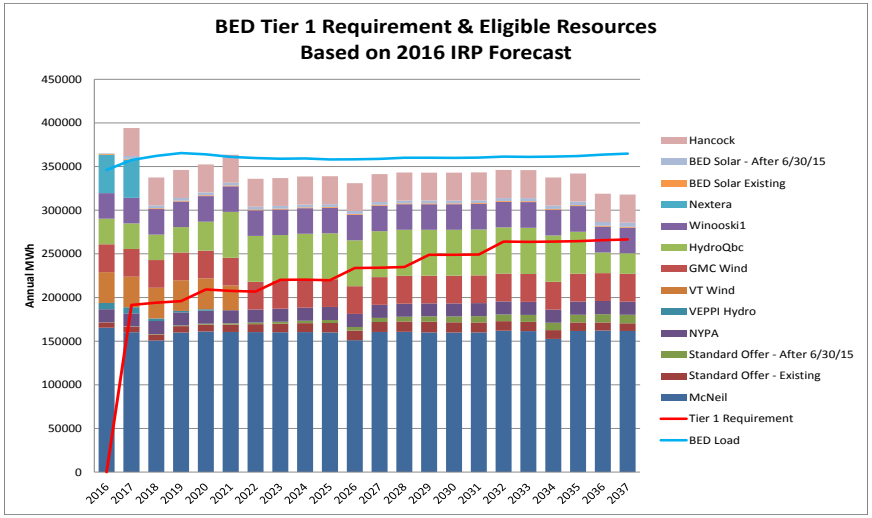


# Coming in 2017

- Continued Energy Efficiency
  - The most efficient kwh is the one you don't use
- Assist BED Customers with Solar Installations
  - In 2017, with BED assistance, UVM, the City of Burlington, and the Burlington Schools plan to deploy net metered solar arrays
  - Initiative to streamline solar permitting process for all customers
  - Positioning BED to become customers' "trusted partner" in all energy decisions
- New load control pilot program
  - Using water heaters as a "virtual power plant" using emerging technology identified by the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) as one of the most promising technologies for coordinated distributed energy resources

# Tier I – Total Renewable Energy Requirement

- A requirement to provide 55% of the energy delivered to customers in 2017 to be provided from renewable energy, increasing to 75% in 2032
- Failure to provide the required amounts results in a $0.01 per kwh "alternative compliance payment"
- BED well positioned to meet this requirement



# Tier II – Net Metering and Distributed Generation

- Requirement to have a portion of the total renewable energy come from net metering and generators less than 5MW (1% in 2017 increasing to 10% in 2032)
- BED currently exempt from a portion of this requirement based on its 100% renewability –
  - BED must continue to accept net metering, and must retire the associated RECs
  - BED is not required to have a specified amount of net metering energy nor is it required to have any new distributed generation at this time
- However BED is continuing to pursue local distributed generation
  - South Forty Solar (2.5 MW) - Tier II resource expected to begin operation in 2017
  - BED Building Solar - Tier II distributed generation resource began operations in late 2015

# Tier III - Energy Innovation & Strategic Electrification

- Designed to encourage the efficient use of electricity where it can reduce fossil fuel emissions
- BED's initial Tier III program proposal included:
  - Incentive for all-electric buses
  - Passivhaus activities
  - EV and public/at-work EV charging equipment
  - Incentives for Heat Pumps to displace oil and propane
- BED's Energy Efficiency staff is looking at additional options to include in plan updates (ground source heat pumps and weatherization)

# Looking ahead (Strategic Plan)

- See attached 2016-2017 Strategic Plan
- 10 Year Vision
  - Transform Burlington to a "net zero energy city" across electric, thermal, and transportation sectors by reducing demand, realizing efficiency gains, and expanding local generation, while increasing system resilience.
  - Including updated customer services and IT infrastructure, more efficient use of resources, distributed resources, micro-grids, growing local energy, and expanding "smart" capabilities city wide

# Thank you

- Questions?
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# BURLINGTON ELECTRIC DEPARTMENT
# 2016-2017 STRATEGIC PLAN

## MISSION

To serve the energy needs of our customers in a safe, reliable, affordable, and socially responsible manner.

## VALUES

Safety
Integrity
Community
Engagement
Innovation

## 10-YEAR VISION

Transition Burlington to a "net zero energy city" across electric, thermal, and transportation sectors by reducing demand, realizing efficiency gains, and expanding local renewable generation, while increasing system resilience.

## STRATEGIC OBJECTIVES

**Create a nimble organization** by transforming our business platform and developing our human capital to best leverage an era of rapid change in the energy industry.

**Deliver exceptional customer care** by enhancing personal service and increasing engagement across all channels to efficiently resolve customer issues and proactively promote energy efficiency and other program opportunities.

**Leverage our electric assets** to take advantage of high-intensity, bi-directional energy creation and use that comes with distributed energy.

## STRATEGIC INITIATIVES

**Establish modern, simple, full-function customer care platform**

Create service delivery model focused on high-quality customer care

Update IT backbone for core business functions

Create Vermont's first "whole-home" energy efficiency utility

**Strengthen grid and generation assets**

Optimize efficiency of generation

Complete SCADA rollout and disaster recovery site

Establish asset management approach

Enhance cyber security capabilities

Implement plan to integrate and operate distributed energy resources.

**Build 2-3 all-energy microgrids**

Microgrids combine renewable generation, energy storage, and a thermal solution, e.g., district heat, with "islanding" capability

Burlington International Airport to improve reliability

Pine Street Campus to support mission critical operations

Downtown District, including BTC to bolster economic development

**Develop "Grow Local Energy" program**

Create service delivery model to simplify customer adoption

Build a suite of financial options to support solar and storage purchases

Use OBF/OBR for customer capital creation

Complete citywide mapping of preferred locations

Launch a preferred vendor program

**Lead establishment of Smart City network**

Joint BED/City data center

Use smart grid for utility automation and efficiency

Build analytics capability (systems and skills)