



# NET ZERO ENERGY

BURLINGTON VERMONT



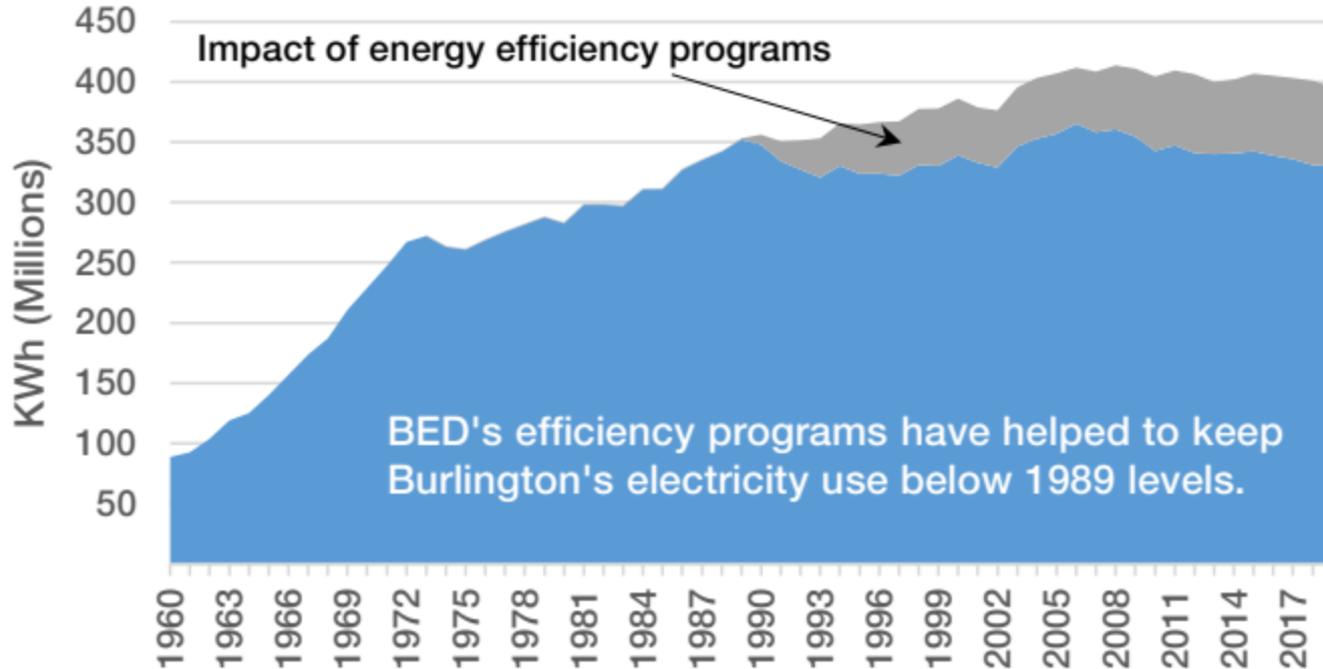
## Burlington Electric Department (BED)

- Burlington's municipal electric utility
  - Public Power since 1905
  - 118 employees, including the McNeil Generating Station
- 21,000+ customers
  - 17,309 residential / 3,953 commercial and industrial
  - >6,000 residential accounts turn over each year
- Electricity facts:
  - Summer Peak: ~65 MW / Annual energy Use: ~330,000 MWH
  - Third largest electric utility in Vermont
  - 100% of power from renewable generation as of 2014
  - No rate increase since 2009; statewide rates have increased approximately 21% during that time



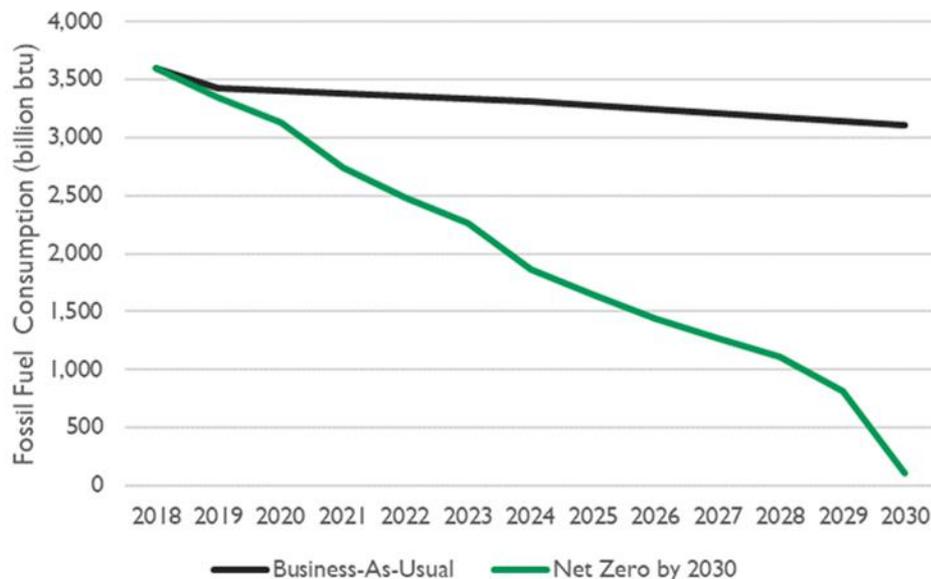


## Total Burlington Electricity Use





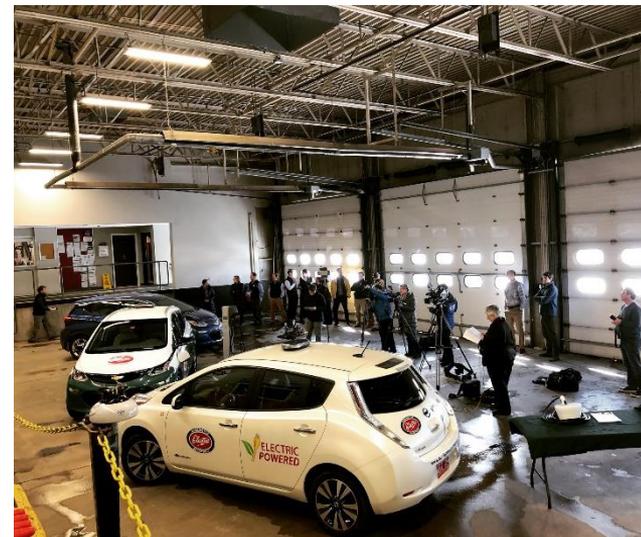
Burlington's Net Zero Energy Roadmap, recognized by the Smart Electric Power Alliance as the "first US Net-Zero 2030 plan". [www.burlingtonelectric.com/NZE](http://www.burlingtonelectric.com/NZE)





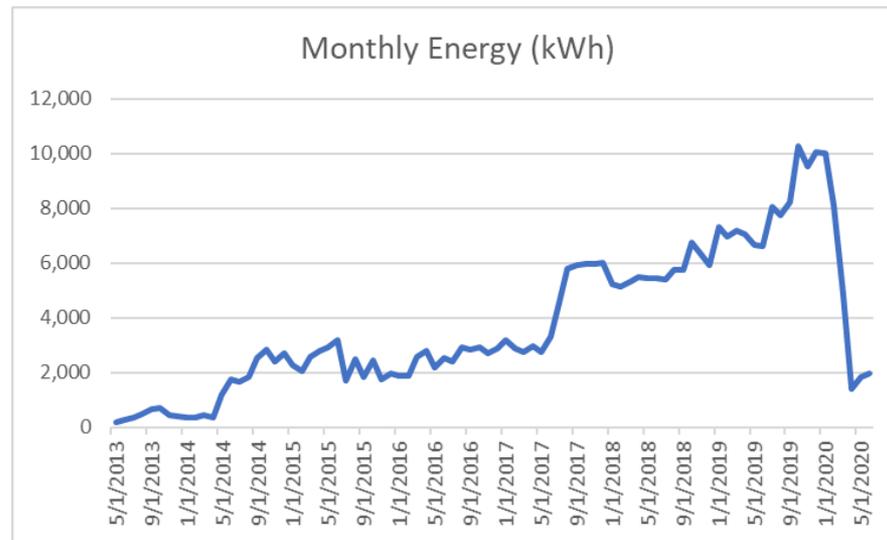
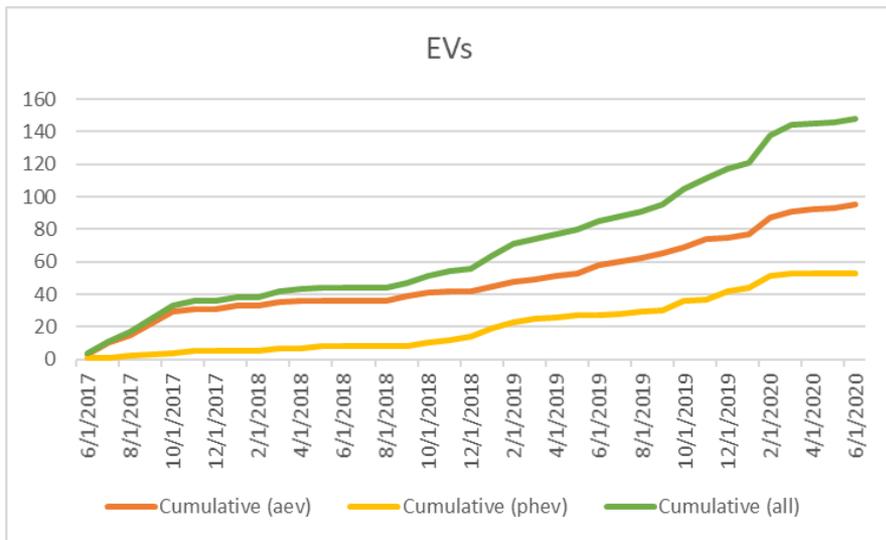
**BED Core Tier 3 and Net Zero Energy EV Programs** – as a regulated utility BED invests in customer incentives that reduce fossil fuel use under Tier 3 of Vermont’s Renewable Energy Standard, these include:

- ❑ **EV rebate** of \$1,200, or \$1,800 for low/moderate income customers
- ❑ **PHEV rebate** of \$1,200, or \$1,500 for low/moderate income customers
- ❑ **Pre-Owned EV rebate** - \$800
- ❑ **Green Stimulus** – temporary boost for new EVs to \$1,800, PHEV \$1,500
- ❑ **Tier 3 incentive for residential charger** tied to new BED Residential Charging Rate(credit) – charge off-peak for equivalent of 60 cents a gallon of gas
- ❑ **EV finance partnership with three credit unions**
- ❑ **EV Workplace Charging Station Incentive** of \$1,000
- ❑ **EV Public Chargers** – 15 stations and 27 ports around the City
- ❑ **Multi-Family Building EV Charging** – pilot with EVMatch
- ❑ **CarShare EV partnership**
- ❑ **Preferred EV Dealer Network**
- ❑ **BED and City Fleet EV/PHEVs**





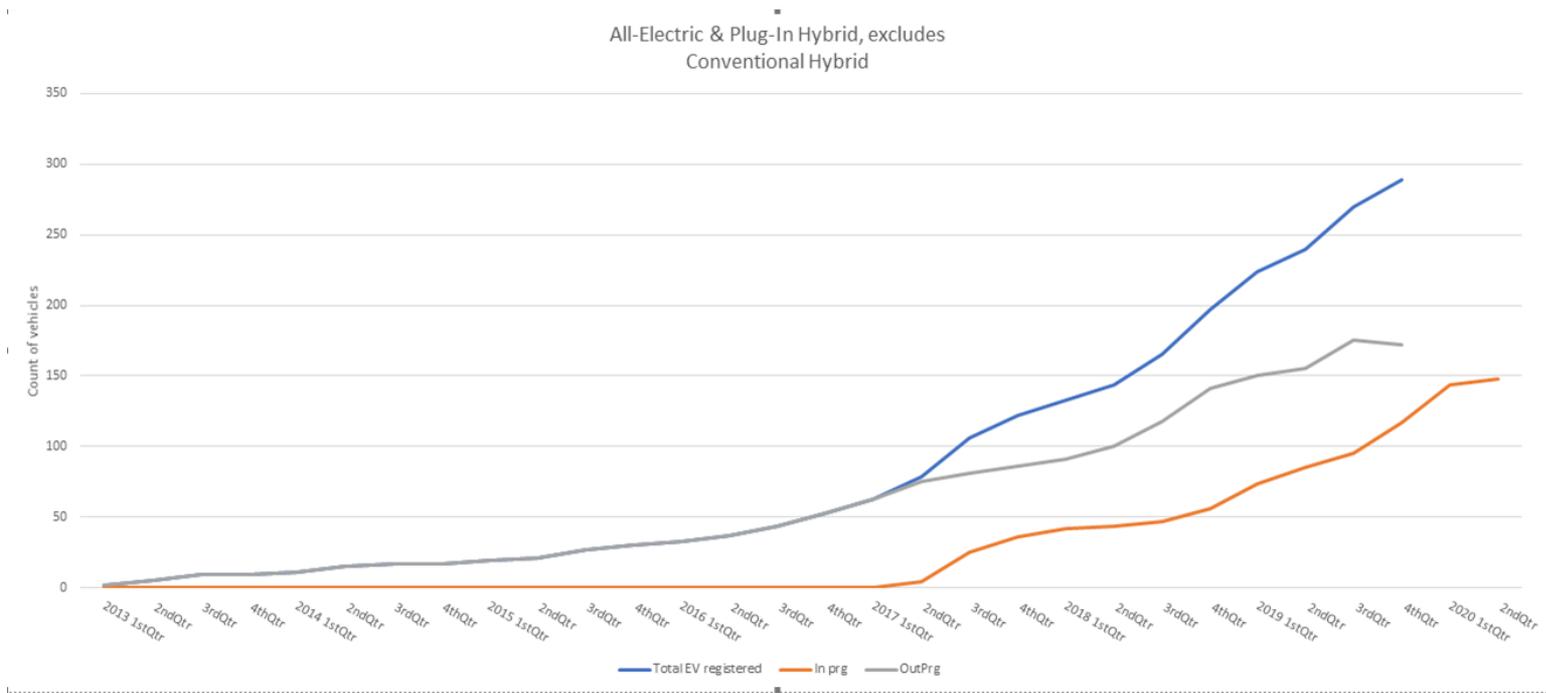
## Program Uptake – EV incentives and Charging Station Use



Downturn in EV public charging in 2020 due to COVID-19 related impacts



Approximately 298 EV/PHEVs registered in Burlington as of end of 2019. This is close to 2030 NZE goal of 337 in Roadmap for 2019.





BED has established an EVSE Evaluation program that uses its offices at 585 Pine Street to test demo chargers on four areas of functionality:

- **Data Access:** allows BED to interface and pull in data from the electric vehicle supply equipment's back-end. API documentation is critical for this step.
- **Metering Accuracy:** the device must be within +/- 5% of metered accuracy. We use a BED AMI meter (15-minute interval readings) to determine the accuracy on time-intervals and energy consumption.
- **User Interface:** the ability to schedule charging under the fixed time-of-use rate option (avoiding noon-10 pm).
- **Demand Response:** an optional function as BED currently offers a fixed time-of-use rate option as well as a flexible demand response option as part of the rate.



BURLINGTON  
ELECTRIC  
DEPARTMENT

## BED EVSE Evaluation

### Primary Test

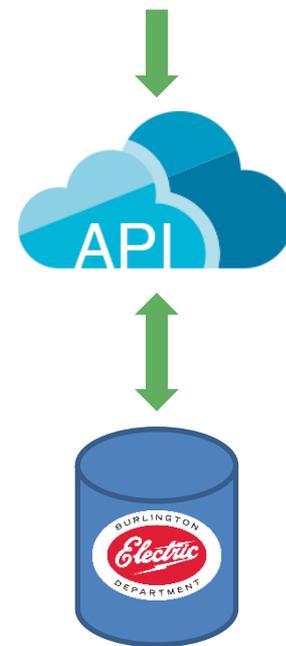
- I. Data Access
  - Ability for BED to automate data access EVSE interval usage through a desired interface (generally API / web services).
  - API has been fully documented and can be provided to BED.
  - Usage data has the ability to be queried by desired period of time with a granularity down to at least hourly readings.
- II. Accuracy
  - The device is accurate within +/- 5% of the readings recorded by BED's dedicated test meter for the duration of a charging session.
  - The EVSE usage data has a timestamp that syncs with that of BED's dedicated test meter for hourly interval readings.
- III. User Interface (UI)
  - Ability for the customer to schedule their charging to start/stop and/or follow the desired off-peak hours of the EV Rate (on peak: 12pm - 10pm).
  - Ability for the customer to access their charging data and see if they charged during an on-peak time.
- IV. Demand Response (*optional*)
  - Ability for BED to schedule a demand response event in advance or in real time that may include demand limiting, fleet limiting or full demand curtailment.
  - Ability for EVSE to resume charging upon the end of the demand response event or a pre-scheduled event.
  - UI: Ability for the customer to opt-out of a demand response event.
  - UI: Ability for the customer to receive notification of the demand response event.



BED uses metering from the Wi-Fi connected EV chargers and accesses their stored data through the Application Programming Interface (API) to bring in interval charging data for billing.



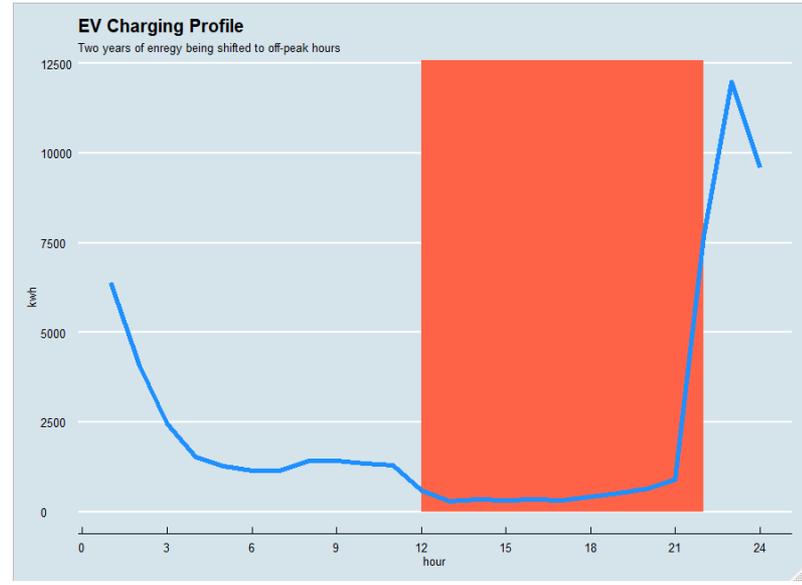
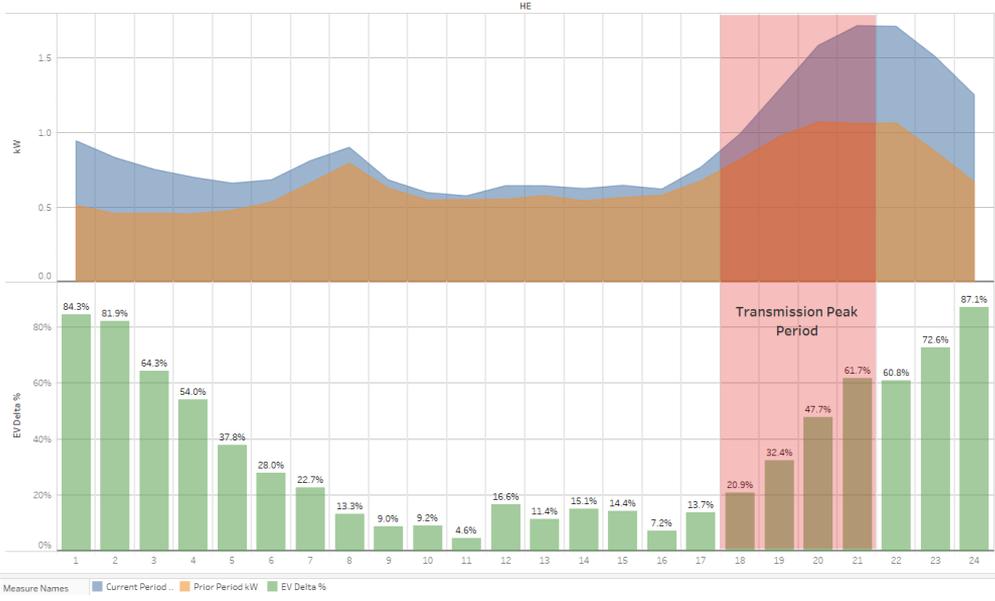
- **Metering:** as shown in the previous slide, BED ensures that they can connect to the charger and pull in accurate interval data. BED does run checks on the data to catch unlikely values.
- **Application Programming Interface (API):** each charger company typically has documentation on how to connect to their charger using a unique key. During the customer enrollment phase this key is obtained when the customer joins BED's EV charging rate.
- **BED Database:** Once access is granted with the unique key, BED pulls in all new interval usage data and stores them in a local database. These data are used to determine when charging occurred and what credit should be provided to each customer.





Uncontrolled home charging was shown to add 20% - 60% peak contribution by a residential account. The EV Rate has shifted almost all participant charging off-peak.

Weekday Lvl. 2 Charging





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