

# PROMOTING THE OWNERSHIP AND USE OF ELECTRIC VEHICLES IN THE STATE OF VERMONT

---

Presentation to VSPC by

Tom Knauer

Policy Director

Vermont Public Utility Commission

July 17, 2019



# REPORT TO THE VERMONT STATE LEGISLATURE

**2017–2018**

Required by Act 158 of the  
2017-2018 session

Submitted on June 27, 2019, by the PUC to  
Senate and House Committees on  
Transportation, Senate Finance, Senate  
Natural Resources and Technology, and  
House Energy and Technology

**27 June 2019**

# CONTEXT OF THE REPORT

The transportation sector is the largest contributor to greenhouse gas emissions in Vermont – about 47% of the total.

Vermont law seeks to reduce emissions of greenhouse gases from a 1990 baseline by 25% by 2012, 50% by 2028, and 75% (if practicable) by 2050. 10 V.S.A. § 578

The Vermont Comprehensive Energy Plan also seeks to reduce greenhouse gas emissions from the transportation sector by 30% by 2025.

The CEP seeks to increase the share of renewable energy in Vermont's transportation sector to 10% by 2025 and 80% by 2050.

As of the beginning of this year there were about 2,985 electric vehicles in Vermont. In order to meet the CEP goals, this number needs to grow to somewhere between 50,000 and 60,000 by 2025, that is a 54% compound annual growth rate.

# BARRIERS TO WIDESPREAD EV ADOPTION AND THE PUC'S RECOMMENDATIONS

## Barriers

- Up-front cost of new EVs
- Range anxiety
- Availability of public charging stations
- Lack of vehicle choice
- Misconception about vehicle performance

## Recommendations to Overcome Barriers

- **Actions by Vermont's electric utilities**
- Actions by State government
- Actions by third parties

# Role of Vermont's Electric Distribution Utilities



Develop Alternative Rate Designs



Implement time-of-use rates for EV charging



Offer incentives for EVs and EV chargers through Tier III



Plan for advancing EV ownership and charging



Facilitate deployment of EV charging infrastructure

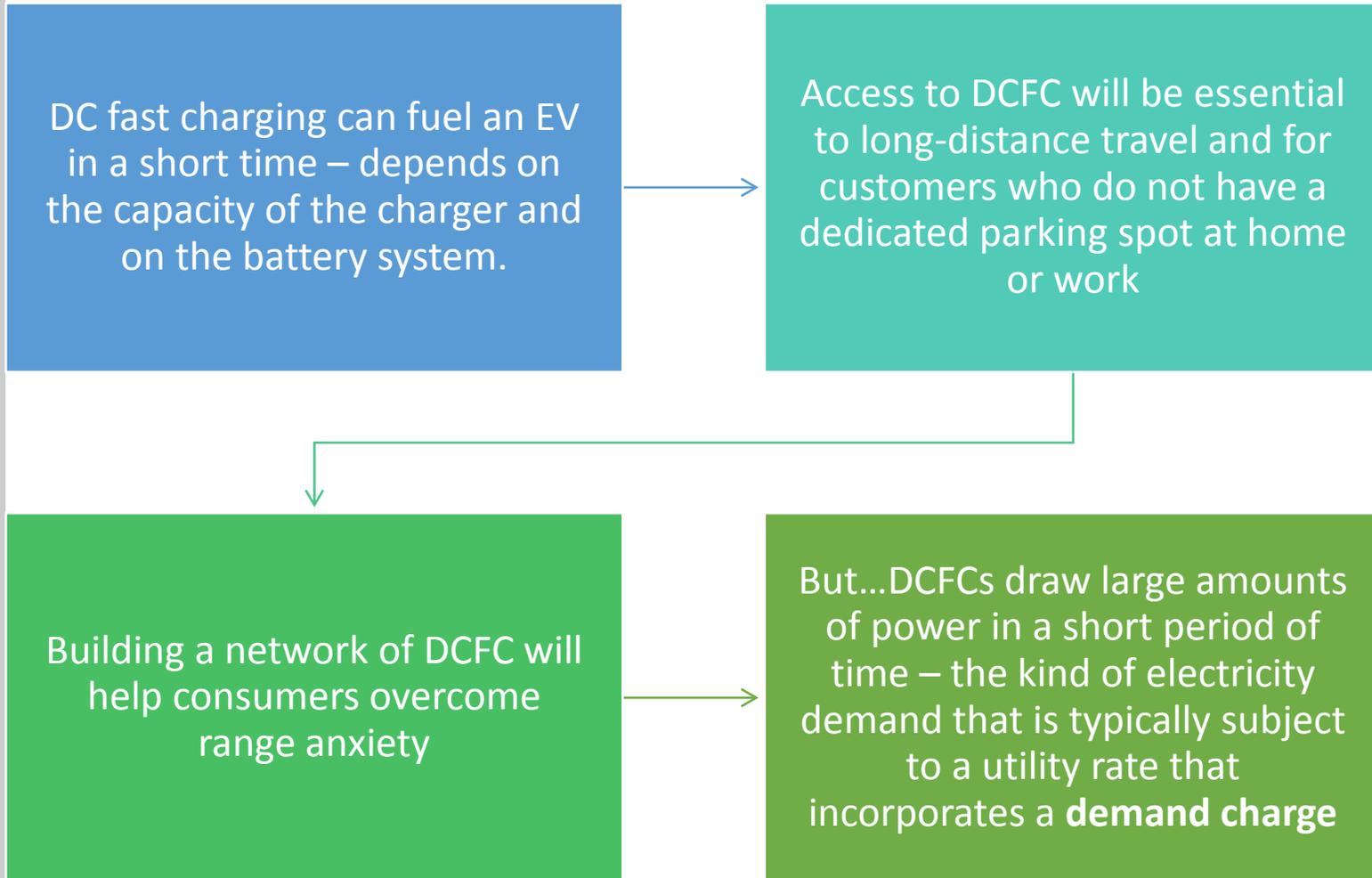


Educate the public about benefits of EVs and available incentives

# EVs and Rate Design

- The potential benefits of EV charging may be achieved, and the potential increased costs may be avoided, by utility strategies including well-formed rate designs and managed charging.
- Load management (including rate design that contains price signals) can be effective to avoid increases to a utility's load at peak times, increases in costs, and increases in grid infrastructure investment.
- Rate design structures should reflect the capabilities of the host utility and the level of EV deployment in its territory.
- EV rate designs should be simple and well-formed, so that consumers can understand the rates and manage their charging behaviors.
- Rates for both residential and workplace charging should offer steep discounts for off-peak or managed charging.

# Alternative Rate Designs are required to address Demand Charges



Demand charges present a barrier to the build-out of DCFC because, at present with a relatively small fleet of EVs, the demand charge represents a very large portion (up to 90%) of the EV charging station's monthly bill, and that is a prohibitive cost.

The PUC recommends that Vermont distribution utilities consider new rate designs to address the demand charge problem

Rate designs should recover the utility's costs, provide the EV charging station owner an economically viable option, and be consistent with traditional rate design principles



Examples:

- Replace or pair demand charges with higher volumetric pricing, such as energy (kWh) charges, with the result being revenue neutral for the customer class;
- Provide a monthly bill credit to commercial customers to reduce charges associated with installed EV charging stations;
- Provide a unique EV charging rate that is metered separately;
- Levelize estimated demand charges over time.

# Time-of-use rates for home, workplace, and public charging

TOU rates encourage electricity use when it is best for the grid and results in lower costs for customers

Consider multiple TOU periods with meaningful price differentials

For EV-only TOU rates, consider ways to reduce the metering costs or design rates in a way that is economic for customers

Consider use of sub-metering (including meters embedded in chargers and vehicles) to track time of day and the amount of energy used

# Utility Role in Deployment and Operation of EV Charging Stations

## **Part I – Utility ownership**

- Utilities may deploy and operate utility-owned EV charging stations and may encourage and facilitate non-utility-owned EV charging stations.
- Utility ownership and operation of EV charging stations may be appropriate in places or in situations not served by the private market
- Utility investment could be through the regulated entity or through an unregulated affiliate.
- Several states have introduced public-interest tests for utility investments in EV charging stations.
  - the Massachusetts Department of Public Utilities articulated a test for approval of EV-related investments that considers whether utility proposals: (1) were in the public interest, (2) met a need regarding the advancement of EVs in Massachusetts, and (3) did not hinder the development of the competitive EV charging market.

# Utility Role in Deployment and Operation of EV Charging Stations

## **Part II – third-party ownership**

- To support private-market investment in EV charging stations, the role of the utility will be to offer tariffs for non-utility-owned EV charging stations and to support engineering review and construction.
- The Commission encourages Vermont's electric distribution utilities to consult with the Department of Public Service to explore ways to develop tariffs for public charging stations that would encourage the deployment of charging stations while still providing appropriate cost recovery to the utility so that other customer classes are not subsidizing charging station customers.

# Potential Impacts to Electric Utilities and the Grid

Given the flat and declining load in Vermont, a significant increase in EV usage is not expected to have a negative impact on transmission and distribution system reliability.

Vermont's distribution utilities may face challenges on parts of their systems as loads increase to capacity levels and possibly beyond as a result of increased EV charging.

Clusters of EV charging could necessitate grid infrastructure upgrades and increase costs.

Vermont's distribution utilities will need to understand the pace and varying location of load growth associated with EV charging in order to plan to accommodate that growth.

# Utility EV Plans

Will address each utility's long- and short-term plans for advancing EV ownership and charging in its service territory

Collectively, the utility plans will form a roadmap indicating how Vermont will reach its energy and environmental goals as they relate to transportation.

Examples of utility actions that may be incorporated into transportation electrification plans

Investment in EV charging stations in areas that are not effectively served by third parties

Forecasts addressing where and when EVs will materialize on their systems

Load management efforts

Educating customers about EVs and charging

# Moving forward



**Address up-front cost of EV ownership.**

Vermont utilities, State agencies, and legislators should continue to identify and appropriate additional, meaningful, ***non-ratepayer funds*** that may be used as incentives to enable increased EV adoption and EV charging equipment deployment.



**Build network of publicly available charging stations.**

Charging stations will be needed along major transportation corridors, in city centers, in public parking structures, and at workplaces.



**Address electrification of mass-transit system**



**Educate the car-buying public about the total cost of ownership of an EV relative to a comparable fossil-fueled vehicle**

# Thank you!



Any follow-up questions,  
please contact me:



[Thomas.Knauer@Vermont.gov](mailto:Thomas.Knauer@Vermont.gov)



802-828-2358