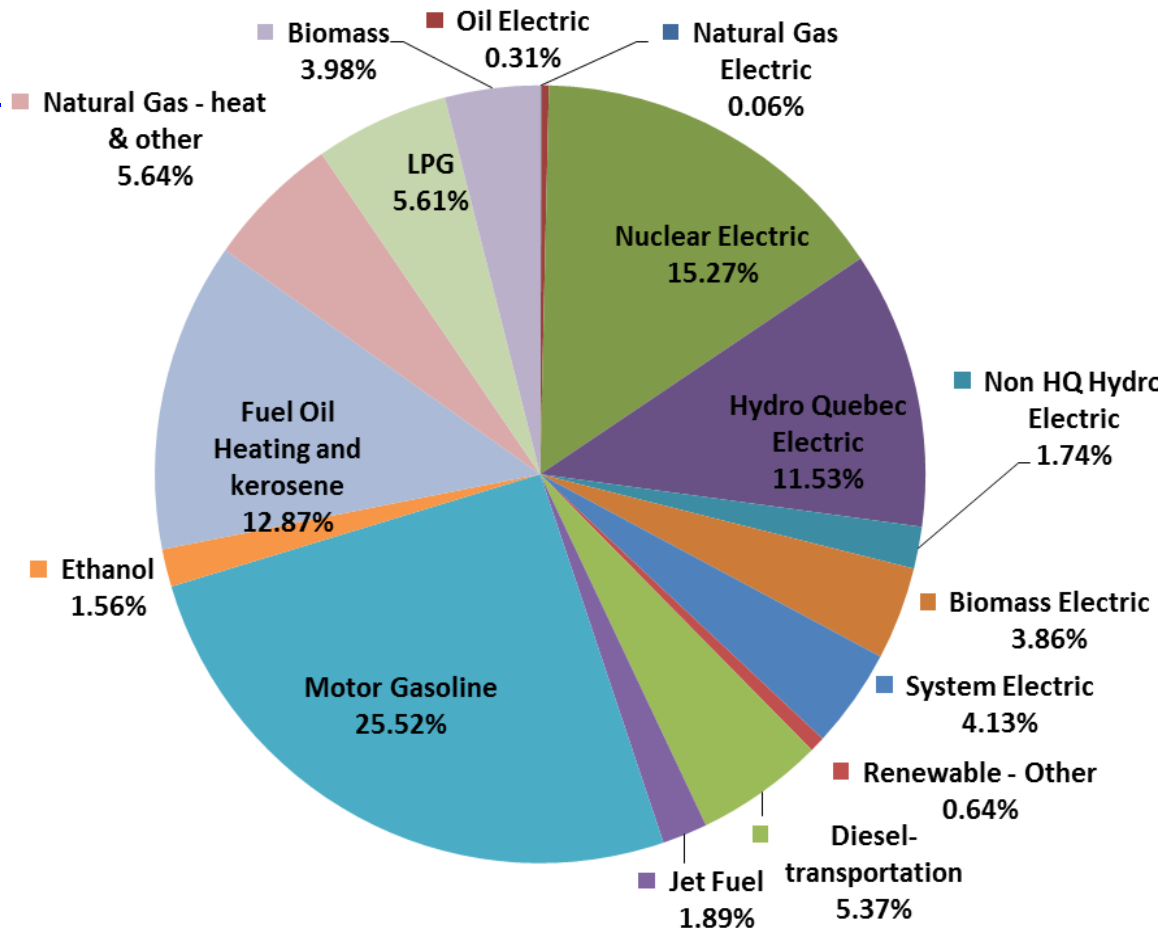


Why prepare for EVs in Vermont?



Public Service Department

- [EVs are the direction of the automotive industry](#)
- Vermonters and tourists are buying EVs
- Motor gasoline is 25% of VT energy use
- Energy independence, plus health & environmental benefits



Impacts to the Electric Grid



Public Service Department

**NIGHT TIME
CHARGING IS
ENCOURAGED**



Early Research shows:

- Impacts are negligible until penetration is high, 70% of charging is done at night
- Concentrations of PEVs on hot days could cause early aging of some electric distribution equipment
- Smart charging could eliminate impacts
- EVs could lower electric rates

Average residential annual cost and savings for house electric and vehicle gasoline with EV, PV, or both



	<u>ICE</u>	<u>w EV, EVSE</u>	<u>w PV</u>	<u>EV + PV</u>	<u>assumptions</u>
Gas \$	\$ 2,865	\$ 1,962	\$ 2,865	\$ 1,962	2 Corollas, 12,000mi/yr, 31 mi/gal, \$3.70 mi/gal
EV elec \$	na	378	na	378	replace 1 car w/ a Leaf, 7,560mi/yr
House elec \$	1,011	1,011	30	408	house avg 6876kwh/yr, 4kW PV
total \$	\$ 3,875	\$ 3,351	\$ 2,894	\$ 2,748	\$.15/kWh; \$.20 solar adder
\$ saved	\$ -	\$ 524	\$ 981	\$ 1,128	
GHG house	1,031	1,031	296	296	ghg in lbs
GHG cars	15,186	10,788	15,186	10,788	Corolla .63273lb/mi, Leaf .0051lb/mi
total GHG	16,217	11,819	15,481	11,083	
GHG saved	-	4,398	736	5,134	lbs/year

Purchase/Install costs	\$ -	\$ 39,200	\$ 20,000	\$ 59,200	Level 2 charger; \$5/W PV
Incentives		(7,500)	(3,140)	(10,640)	EV: \$7,500; PV: \$.55/W, 30% fed tax credit
Total costs	\$ -	\$ 31,700	\$ 16,860	\$ 48,560	

Very conservative estimates of EV usage

Leaf is used for 30 mi commute, 5 day/wk, 48 wk/yr, plus 30 mi additional travel each month

Leaf is only charged at home

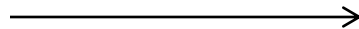
EVs charging in at night could charge at an off peak electric rate

EVSE Siting



- **Through Traffic**

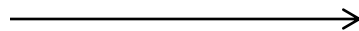
Rest stops
Fueling stations



- ✓ Interval – every 30miles
- ✓ Level – Fast Charge will evolve
- ✓ Layover time – up to 20 min.
- ✓ Fees - Yes

- **Tourists**

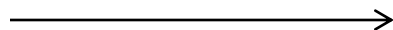
Tourist sites
Lodging



- ✓ Interval – per # parking spaces
- ✓ Level - 2
- ✓ Layover time – up to 4 hours
- ✓ Fees - consider

- **Vermonters**

– Home (70%)
– Businesses
– Towns



- ✓ Interval – per # parking spaces
- ✓ Level - 2
- ✓ Layover time – up to 4 hours
- ✓ Fees - yes

Consider – amenities, parking ordinances, private &/or public funding
EVSE installation & maintenance costs