

Electric Vehicles and Strata Complexes in Greater Victoria



VICTORIA EV CLUB

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What is an Electric Vehicle (EV) ?

Types of Electric Vehicles

HEV (Hybrid “Electric” Vehicles)

These vehicles use an electric motor for start/stop functions and low speed driving, and are not electric vehicles

Examples



Toyota Prius Hybrid



Toyota Camry Hybrid

All “Hybrids”

What is an Electric Vehicle (EV) ?

Types of Electric Vehicles

PHEV (Plug-In Hybrid Electric Vehicle) – transition to full electric

PHEVs can be plugged in and are capable of highway speeds in electric-only mode.

Examples



Ford Fusion Energi



Chevrolet Volt

Dozens more are entering the market in the next 18-36 months



What is an Electric Vehicle (EV) ?

Types of Electric Vehicles

BEV (Battery Electric Vehicle)

An electric vehicle powered by an electric motor, with the power exclusively stored in batteries.

Examples



Nissan Leaf



Kia Soul EV



BMW i3



Tesla Model S



Tesla Model X

Many additional BEVs are coming in the next 12 to 36 months

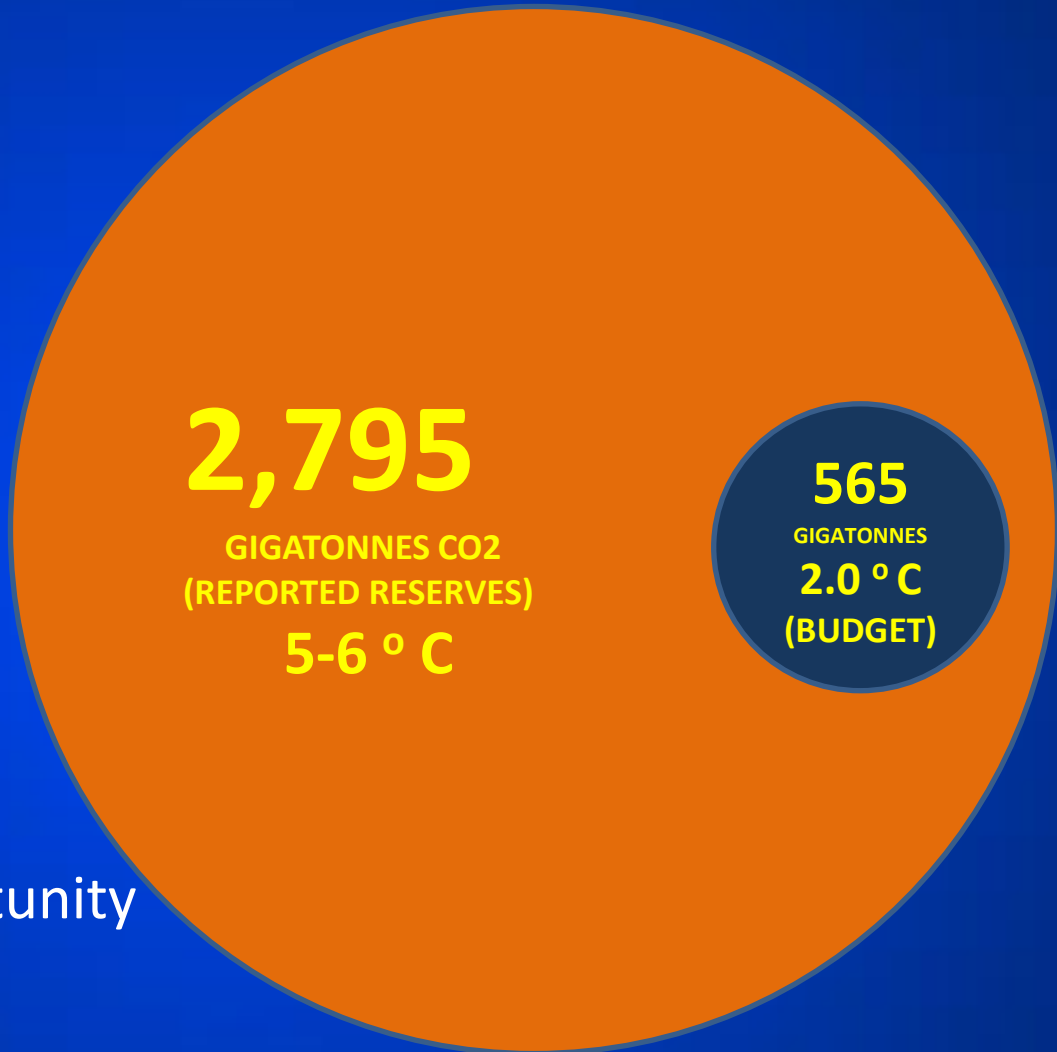


What is Driving EV Sales?

Climate Change Concerns

To hold the temperature increase to 2.0 degrees we can only emit another 565 gigatonnes of CO2

The transportation sector represents a major opportunity to reduce CO2 emissions



What is Driving EV Sales?

Pollution Concerns

Internal Combustion Engine (ICE) vehicles



Average ICE Vehicle (per year)	
Gasoline	2,270 litres (1.8 tons)
CO2	6 tonnes
NOx	40 lbs
VOCs	2 lbs
PM	Particulates (Diesels)

100% Electric vehicles



Electric Vehicle (per year)	
Electricity	4,300 kWh
CO2 (Carbon Dioxide)	0
NOx (Nitrous Oxides)	0
VOCs (Volatile Organics)	0
PM (Particulates)	0

What is Driving EV Sales?

The Simplicity of the Technology



Engine Compartment (BMW)

Engine compartment is filled with complex systems



Power Compartment (Leaf)

- No transmission
- No pistons, rings, rods, valves or camshafts
- No drive belts for A/C , steering, or alternator
- No sparks plugs, fuel injectors, or turbos
- No timing chain
- No Engine Control Module or sub modules
- No oil system, pollution controls, or sensors
- No headers, catalytic converters, mufflers or tailpipe

300 + moving parts to the drive shaft



- Only 3 moving parts to the drive shafts

What is Driving EV Sales?

Cost

- Operating costs
 - 15 - 20% the cost of gasoline per km
 - no oil changes
 - brake work is rare due to EV regenerative braking
 - no regular maintenance
- Vehicle should last twice as long as a fossil-fueled vehicle
- Cost-parity between gas and electric vehicles is expected by 2022
 - Battery costs are dropping at 8% per year
 - Gas engine manufacturing costs are increasing every year to meet pollution regulations

What is Driving EV Sales?

Cost

- Short term purchase incentives in BC of up to \$8,250



Up to \$5,000 off purchase or lease of an electric vehicle

and



\$3,250 off purchase or lease of an electric vehicle if old vehicle is scrapped

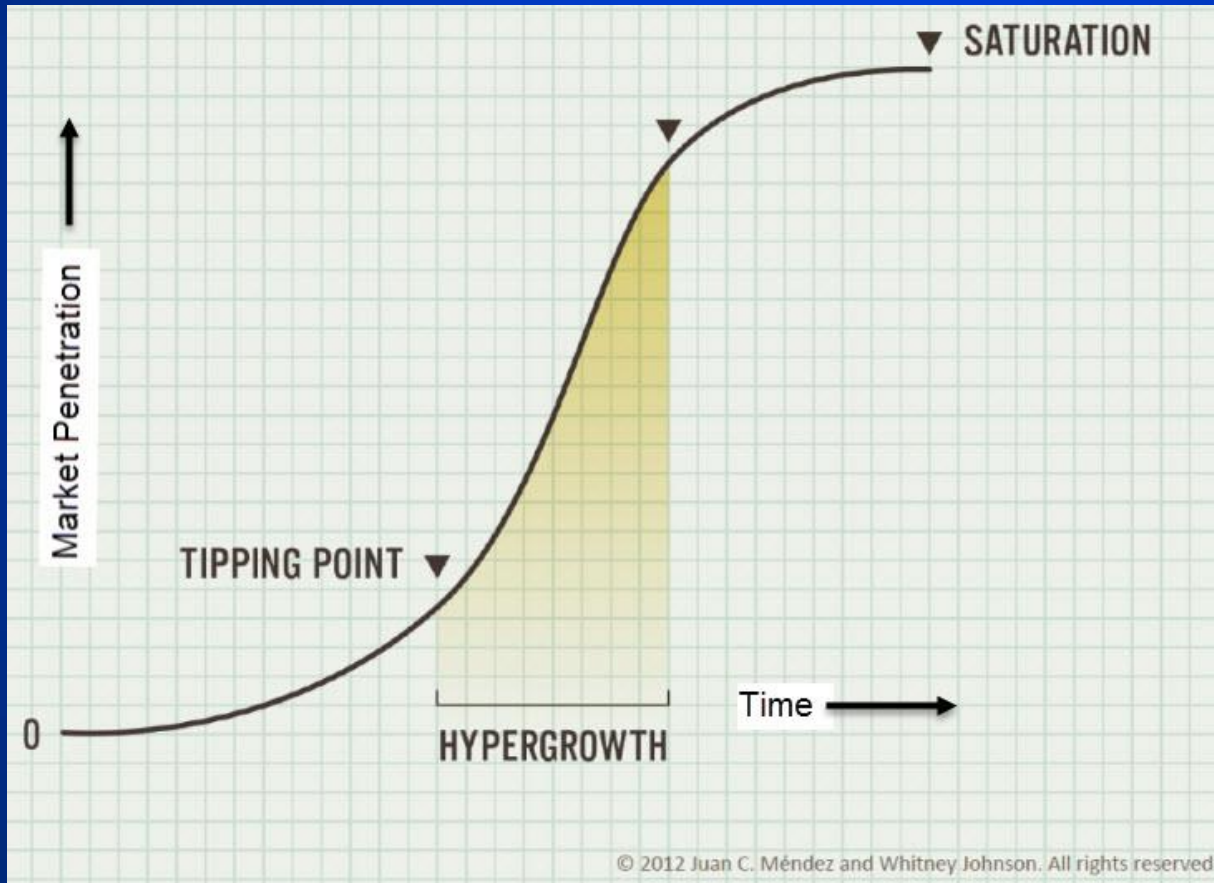
The Market for EVs in Greater Victoria

- Greater Victoria has 40,000 two car families
 - usually one of the two vehicles could be 100% electric
 - The other could usually be a plug-in hybrid electric
- Greater Victoria has many single car families with transportation needs that can be met with a plug-in (100% or hybrid) electric car
- Businesses can also go electric
 - save operating costs
 - project a “Green” image to their customers

The EV Market – The Disruptive “S” curve

Characteristic of a disruptive technology:

- a slow initial adoption rate followed by very rapid growth

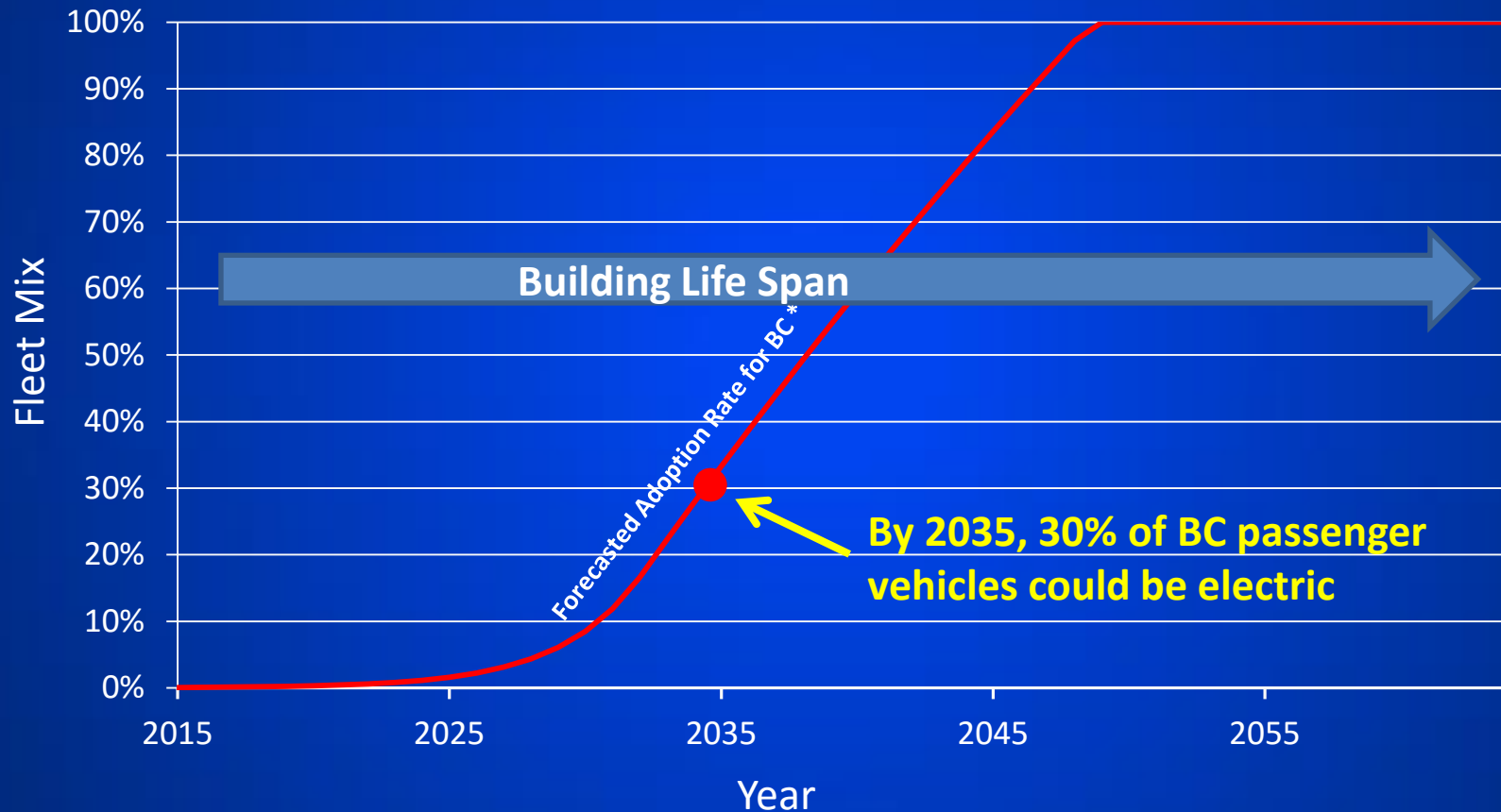


Examples :

- CDs
- Digital cameras
- Cell phones
- Flat Screen TVs


The EV Market – The Disruptive “S” curve

BC Light Duty Fleet Mix Projection



Impacts on Strata Value

Prospective Buyers Want:

- ✓ Parking
- ✓ In-unit washer and dryer
- ✓ Dishwasher
- ✓ Fireplace
- ✓ 2nd Bathroom
-  ✓ Electric Vehicle Charging

Impacts on Strata Value

EV adoption rates are (already) slower because of lack of access to chargers in apartments and strata units.

(50% of households in Victoria ^[1] are Strata units – 30% in BC)

“Future-proofing” buildings

- Property values will be affected as prospective buyers increasingly regard EV charging as a “must have”
- Being proactive and keeping up with EV demand will help to maintain property values and access to all prospective buyers
- The moral / ethical issue

[1] 2013

Types of EV charging for Residential Buildings

EV Type	Variable	Level 1 110 Volts	Level 2 220 Volts
Plug – in Hybrid	Charge Time	5 hrs	2.5 hrs
	Typical night Charge	5 hrs	2.5 hrs
	kW rate	1.7 kW	3.3 kW
100% Electric Gen 1 160 km Leaf /Kia/Smart	Charge Time	12-15 hrs	4 – 7 hrs
	Typical night charge	4-8 hrs	1-2 hrs
	kW rate	1.7 kW	3.3 - 10 kW
100% Electric Gen 2 320+ km Tesla/Bolt	Charge Time	24-30 hours	8 hrs
	Typical night charge	4 -8 hrs	1-2 hrs
	kW rate	1.7 kW	6.6 -15 kW

[1] Typical night charge estimated for Victoria (with lower commute distances and times)

[2] Charging rates in kW vary between 3.3 and 10 kW depending on make and model (Tesla exception)

[3] Level 3 450 Volt DC charging not applicable to residential units. Typical 80% charge in 30 minutes

[4] Teslas have access to the Supercharger Network providing up to 550 km of charge per hour

Types of EV charging for Residential Buildings

- Ways to reduce charging equipment costs
 - Separate hydro meter for EV charging (BC Hydro)
 - Shared charging – share power with multiple EVs
 - Shared charging spaces

- Every Building is different
 - Type of parking and ownership/control of spaces
 - Location of parking
 - Location of electrical room
 - Physical conditions around parking spaces
 - Ability to share charging infrastructure

Additional Information



Victoria EV Club www.victoriaevclub.com - membership is free

Inside EVs www.insideevs.com – EV news and information

Charging locations www.plugshare.com - EV charging locations for Canada and U.S.A.

CEV (Clean Energy Vehicles for BC) www.cevforbc.ca - \$5,000 off an EV

BC Scrap It Program www.scrapit.ca - \$3,250 off an EV