

Identifying PEV Early Adopters and Their Needs

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Electric
Mobility
Canada

Mobilité
électrique
Canada

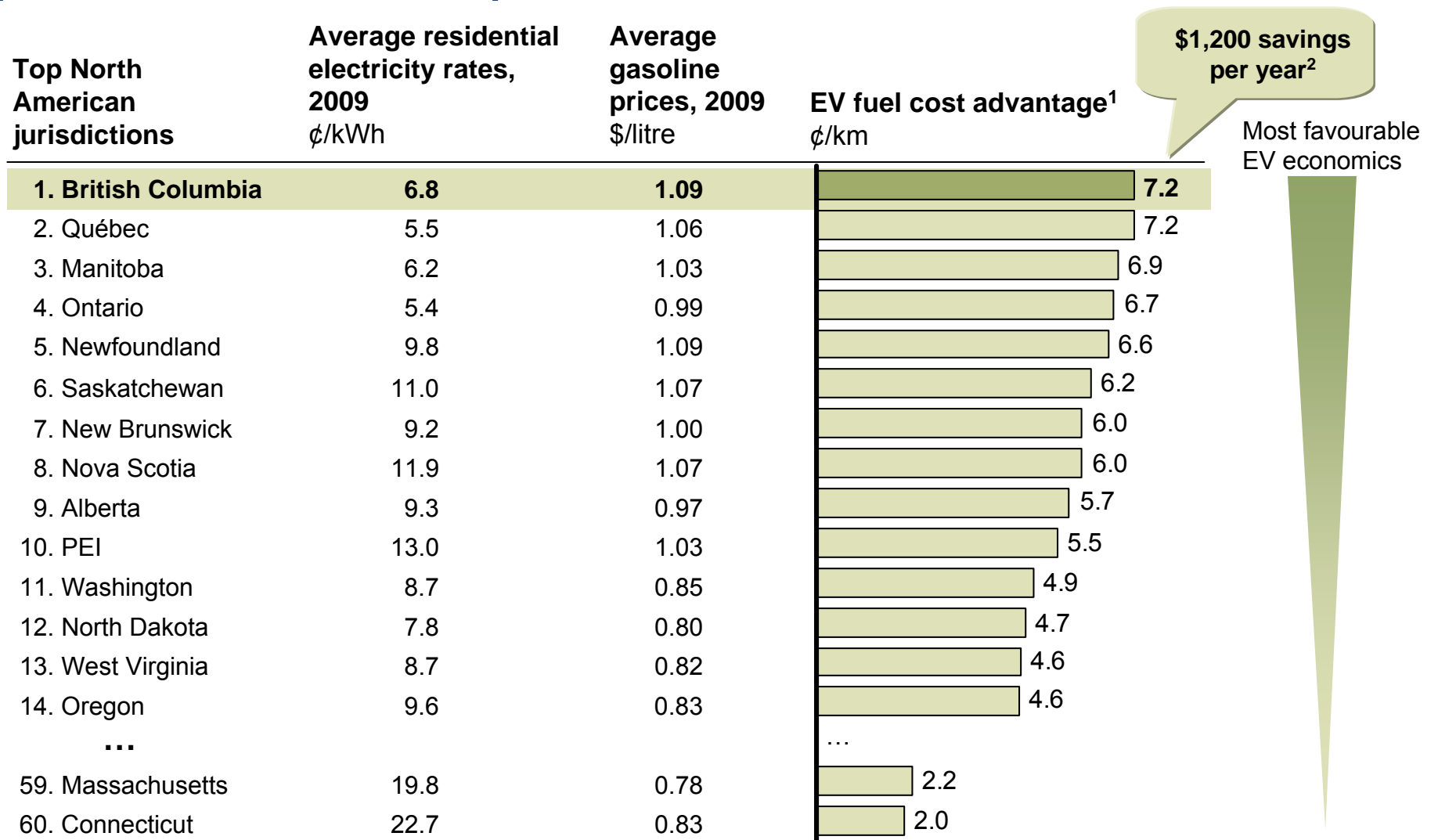
Overview

- Drivers & Incentives for EV adoption
- Utility Customer Impacts
- Preparation

Drivers & Incentives for EV Adoption

- 1 Largest electricity / gasoline price differential in North America, potential fuel cost savings of \$1,200/year
- 2 Hybrid adoption: 2.1 x Canadian average
- 3 73% of population concentrated in urban areas with 95% of trips less than 30 km
- 4 Highly supportive provincial and municipal governments,
- 5 90+% hydroelectric

BC has the most attractive combinations of low electricity and high gasoline prices of all 60 states and provinces in US and Canada



1 Using 0.2 kWh/km and 8 litres/100 km; does not incorporate the reduced cold weather efficiency of EVs
 2 Based on average annual driving distance in BC of 16,700 km

Drivers – Policy, Legislation and Regulation



Provincial Sales tax rebate – up to \$2000

Carbon Tax:

- Commenced July 2008
- \$15/tonne

Low Carbon Fuel Requirement Regulation:

- Effective January 2010
- \$5000-9000/tonne (based on California penalty levels)

City of Vancouver Building bylaws:

- Dedicated charging circuit for single detached homes since 2008
- Charging infrastructure for 20% of parking stalls for multi-unit residential buildings – November 2009

Utility Impacts - Customer Perspective

- Who are the customers?
- How many vehicles?
- What are the impacts?
- Where?

WHO? - EVs will create new key accounts and new demands for customer service

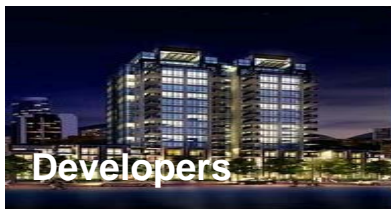


Example customer requirements

- Support during purchase decision of EVs
- Education on charging options for EVs
- Assistance in ensuring residence is safely wired for EV charging



- Information on vehicle and battery performance and operating costs
- Education on options for charging (i.e. Level 2 or Level 3)
- Support in determining EV impact on existing customer electrical infrastructure



- Need to meet bylaw requirements for EV charging in multi-residential buildings (e.g., 20% in Vancouver)
- Support in smart charging infrastructure to minimise cost in new developments and retro-fits of existing buildings
- Explore billing and metering options

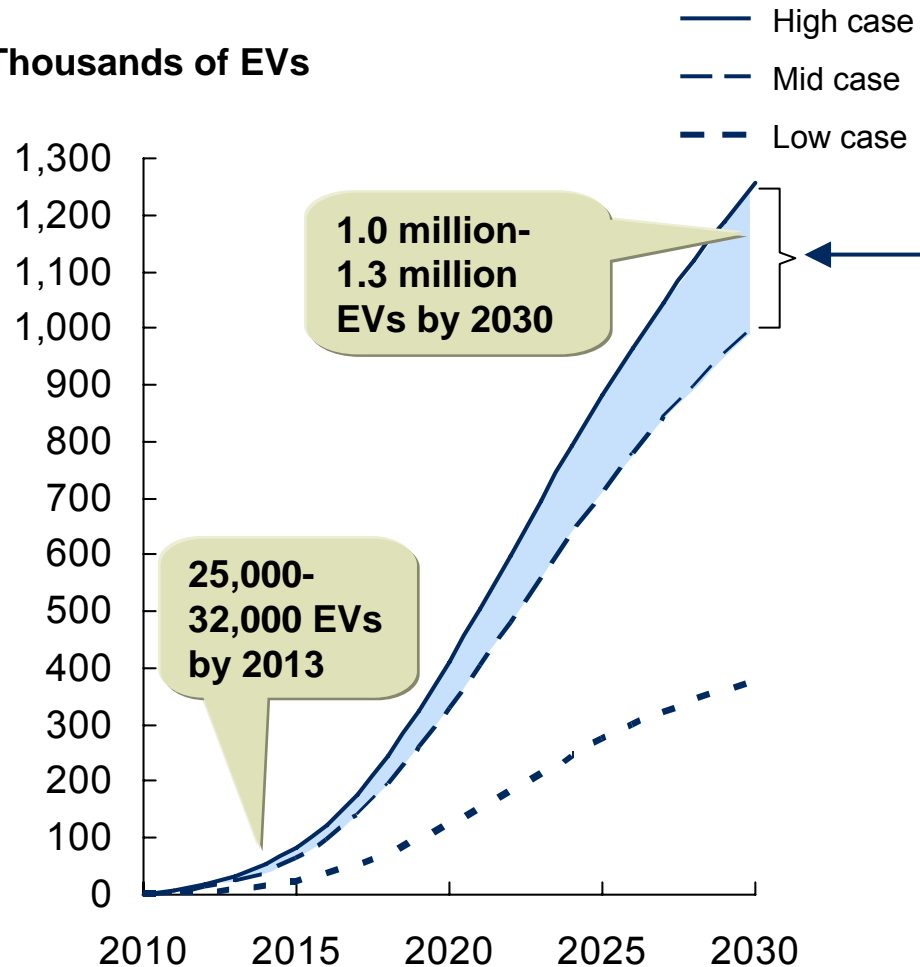


- Information on Level 3 charging technology
- Support in tariff and regulatory issues
- Support in installing charging infrastructure
- Support in determining EV charging impact on existing electrical infrastructure

BC is expected to have one of the highest EV adoption rates in North America

Projected number of EVs in BC^{1, 2, 3}

Thousands of EVs



Drivers of BC's high adoption rate

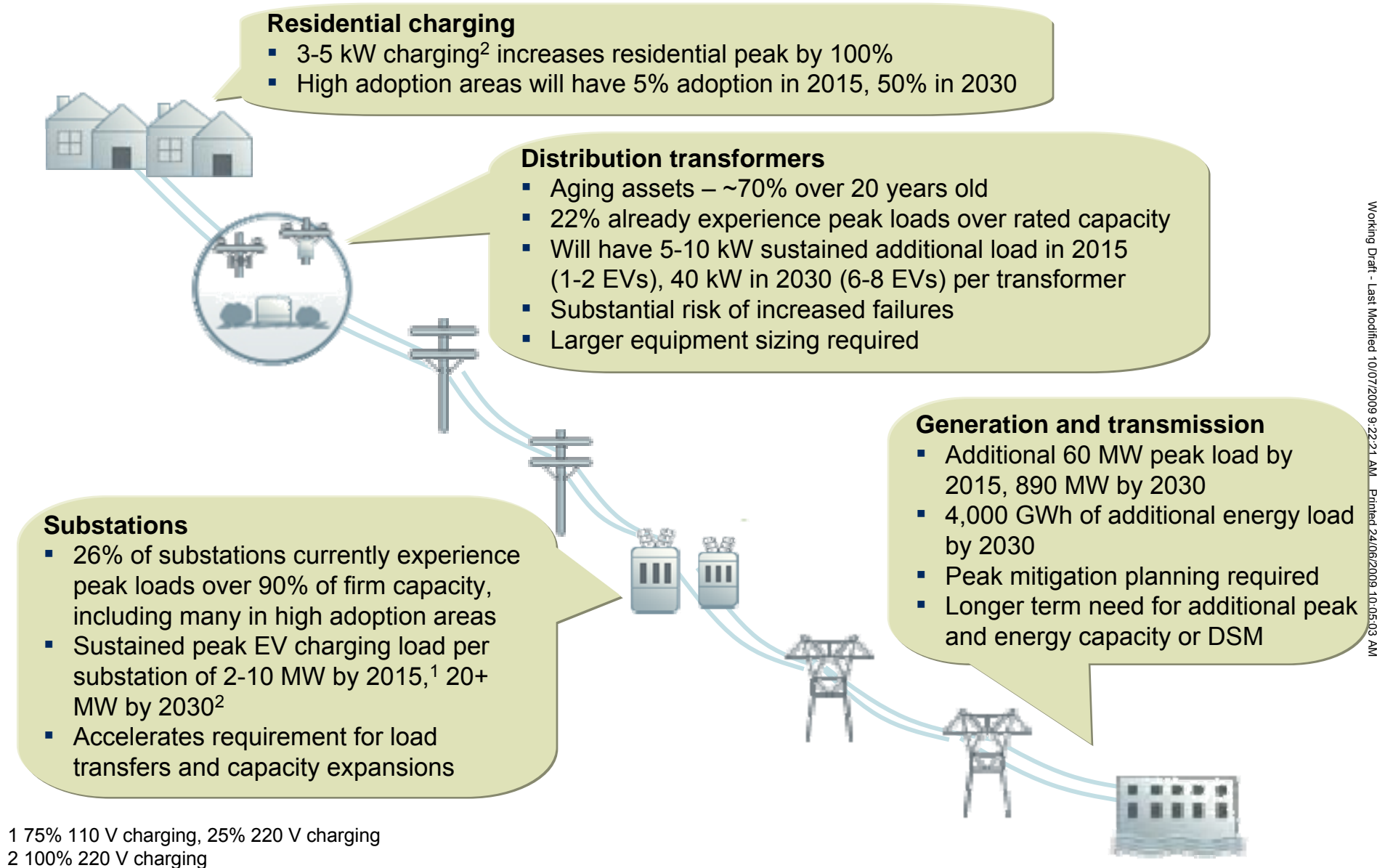
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1 Includes PHEV and BEV

2 Assumes average ICE vehicle life of 15 years and average EV life of 10 years

3 High-mid-low range based on EPRI adoption rates for the U.S.

Unconstrained EV charging will impact the grid as early as 2015



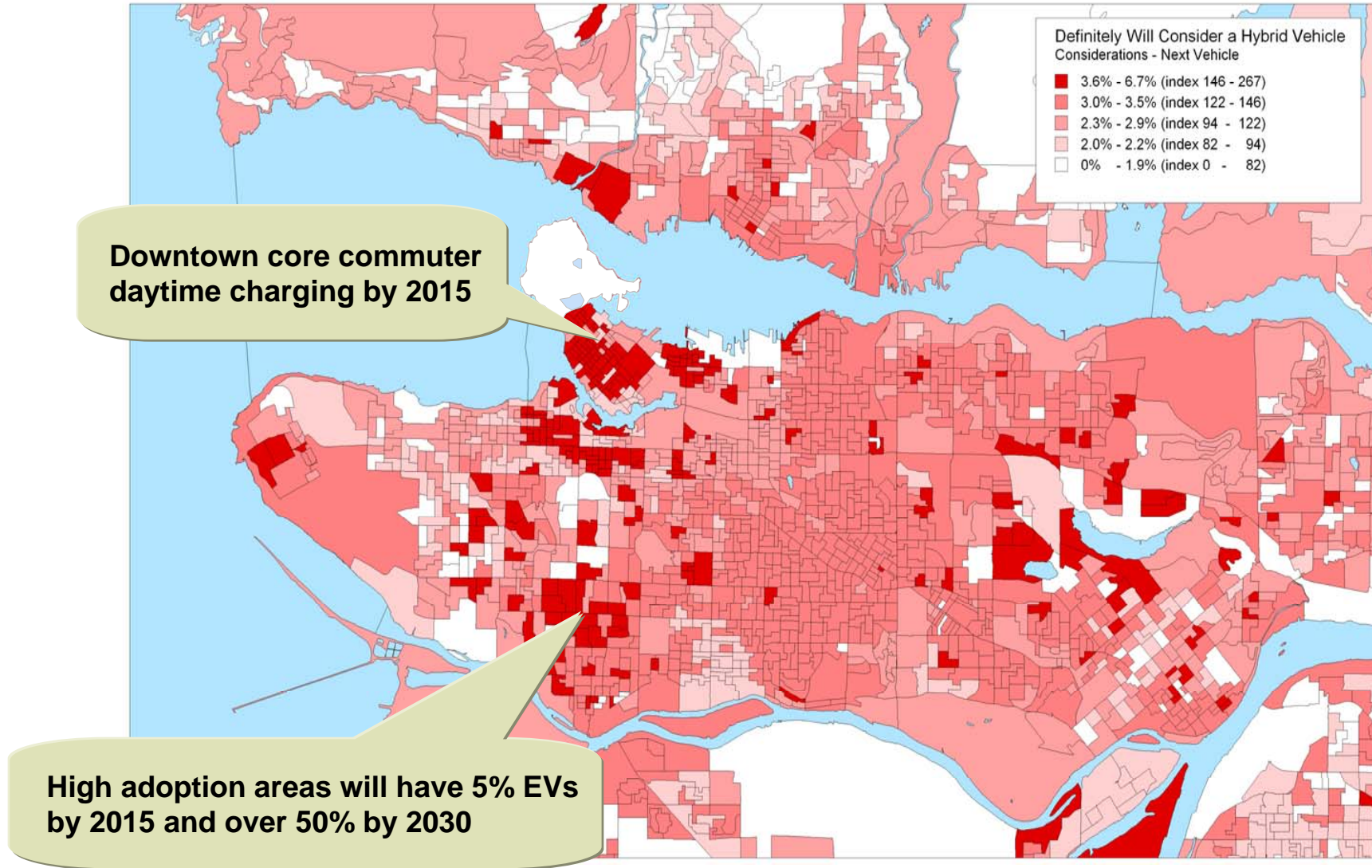
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Laneway House Analogy

- Service for laneway house triggers extension
- \$8-20k for service because of upstream capacity upgrade

EV adoption and home EV charging will be geographically clustered

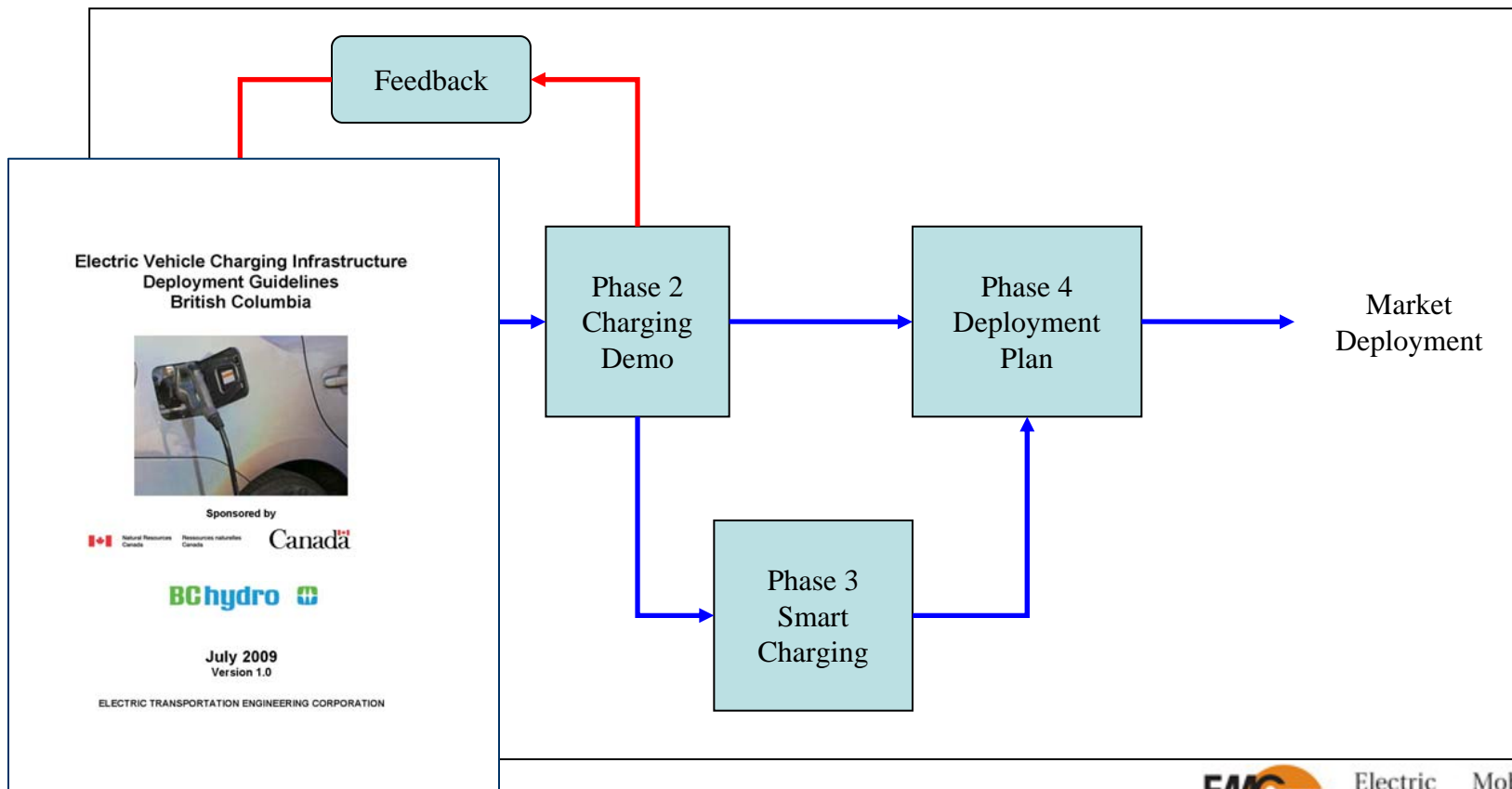
Likelihood of EV adoption¹



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¹ Based on consumers who will “definitely consider purchasing” a hybrid as their next vehicle
SOURCE: Environics; Customer Insights; team analysis

Preparing for Customer Impacts Charging Infrastructure Demonstration



Public Outreach and Education



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- National Plug-in Vehicle Initiative
- Objective: to create common material and tools for accurate & effective education
- Letter of Intent between EDTA & EMC

Preparation – next steps

- Charging efficiency 220V vs 110V?
- Peak mitigation – customer & utility benefits