“Are we there yet?”

Our path to a low-carbon transportation future

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Photo credit: Alternative Fuels Data Center
A bit about me.....
I moved to Vancouver 10 years ago for a career in energy system and policy modeling.
...but, modeling was not fun
...so I shifted gears *(pun intended)* to alternative fuel transportation.
Game time
“The electric-car future is not far off.”

-New York Times, 1993
The production of ethanol from wood waste and other nonfood vegetative matter a, "first of a kind"

- US Energy Secretary Ernest Moniz, 2013
“By the end of decade, there will be hundreds of thousands of fuel cells on the road...and fuel cell vehicles will be in broad usage by 2020."

- GM VP Larry Burns, 2002
The electric-car is “cleaner, quieter, and more economical”

-New York Times, 1911
Following media attention for different alternative fuels (1980-2013)

- 500,000 vehicles by 1996 - George Bush
- 1,000,000 PEVs on the road by 2015 - Obama
- Who killed the electric car? (EV1 & ZEV) - Ford, Chrysler, GM
- FCV available by 2004
- 7.5 billion gal. Blended by 2012
- 1,000,000 PEVs on the road by 2015

Source: Melton, Axsen & Sperling (2014)
What influenced BC's electric vehicle owners' decision to purchase their vehicle?

Markets for EVs
In our survey about 20-30% of Canadians expressed interest in EVs.

Source: Axsen et al. (2015), *Electrifying Vehicles* & Axsen et al. (2017)
...yet EVs are only 1% of sales in Canada

Source: Axsen et al. (2015), *Electrifying Vehicles*
Barriers to EV adoption

- Consumers’ interest in PEVs
- Are they familiar with EVs
- Do they have home charging
- Can they buy one and do they have choice?

Source: Axsen et al. (2015), *Electrifying Vehicles*
Policies can address barriers to adoption

Constrained consumer PEV Demand → Are they familiar with PEVs → Do they have home charging → Can they buy one and do they have choice? = Consumer PEV Demand

Source: Axsen et al. (2015), Electrifying Vehicles
Most new vehicle buyers are confused with how to fuel the EVs

“How would you fuel this vehicle?”

- **Toyota Prius Hybrid**
  - I don't know: 20%
  - Hydrogen: 8%
  - Gasoline + electricity: 22%
  - Electricity only: 9%
  - Gasoline only: 38%
  - Correct (9%)

- **Chevrolet Volt**
  - I don't know: 10%
  - Hydrogen: 16%
  - Gasoline + electricity: 21%
  - Electricity only: 26%
  - Gasoline only: 27%
  - Correct (23%)

- **Tesla Model S**
  - I don't know: 6%
  - Hydrogen: 0%
  - Gasoline + electricity: 12%
  - Electricity only: 43%
  - Gasoline only: 34%
  - Correct (43%)

- **Nissan Leaf**
  - I don't know: 0%
  - Hydrogen: 0%
  - Gasoline + electricity: 15%
  - Electricity only: 26%
  - Gasoline only: 59%
  - Correct (26%)

“[W]hat’s the deal here? You don’t plug this in, the hybrid?” - Clair

“I did not even know this existed!”

“Is the Leaf electric or is it hybrid?” – Mr. Chen

Axsen et al. (2017)
Acceptance of policy and fuels
“B.C.’s clean-fuel regulation is probably one of the best greenhouse gas emissions policies you have never heard of.”
BC’s Low Carbon Fuel Standard: Renewable & Low Carbon Fuel Requirements Regulation (RLCFRR)

The regulation requires:

Minimum renewable content in fuel

and

10% less lifecycle greenhouse gas emissions

5% renewable content in gasoline
4% renewable content in diesel

Can you name climate policies in BC?

Is the RLCFRR a climate policy in BC?

Do you think this policy will effectively reduce GHGs

Do you support this policy?
BC’s Renewable and Low Carbon Fuel Requirements Regulation

One person (0.3%) could name it as a BC policy without prompting

152 people (32%) could identify it as a BC policy when prompted with a list to choose from

After the policy was explained to them, 314 people (66%) felt it would be effective in reducing GHG emissions and...

428 people (90%) supported the policy

The role of cities and fleets in a low carbon transition
There are only two vehicle lifetimes between now and 2050.
The role of cities & fleets in a low carbon transition

Market acceleration & awareness

Demo. viability

Encourage tech & fuel supply

GHG and energy savings

Project Participants:

Projected lifetime cost of ownership
21% reduction

Projected lifetime fuel usage
70% reduction

Projected lifetime CO₂ emissions
57% reduction

27 PHEVs
Recommended

41 BE
Recommended

17 vehicles
Not recommended for replacement

Sources: City of Vancouver, FleetCarma, Vetter, Hydra
Drive change with us

Let’s shape Canada’s transportation future

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