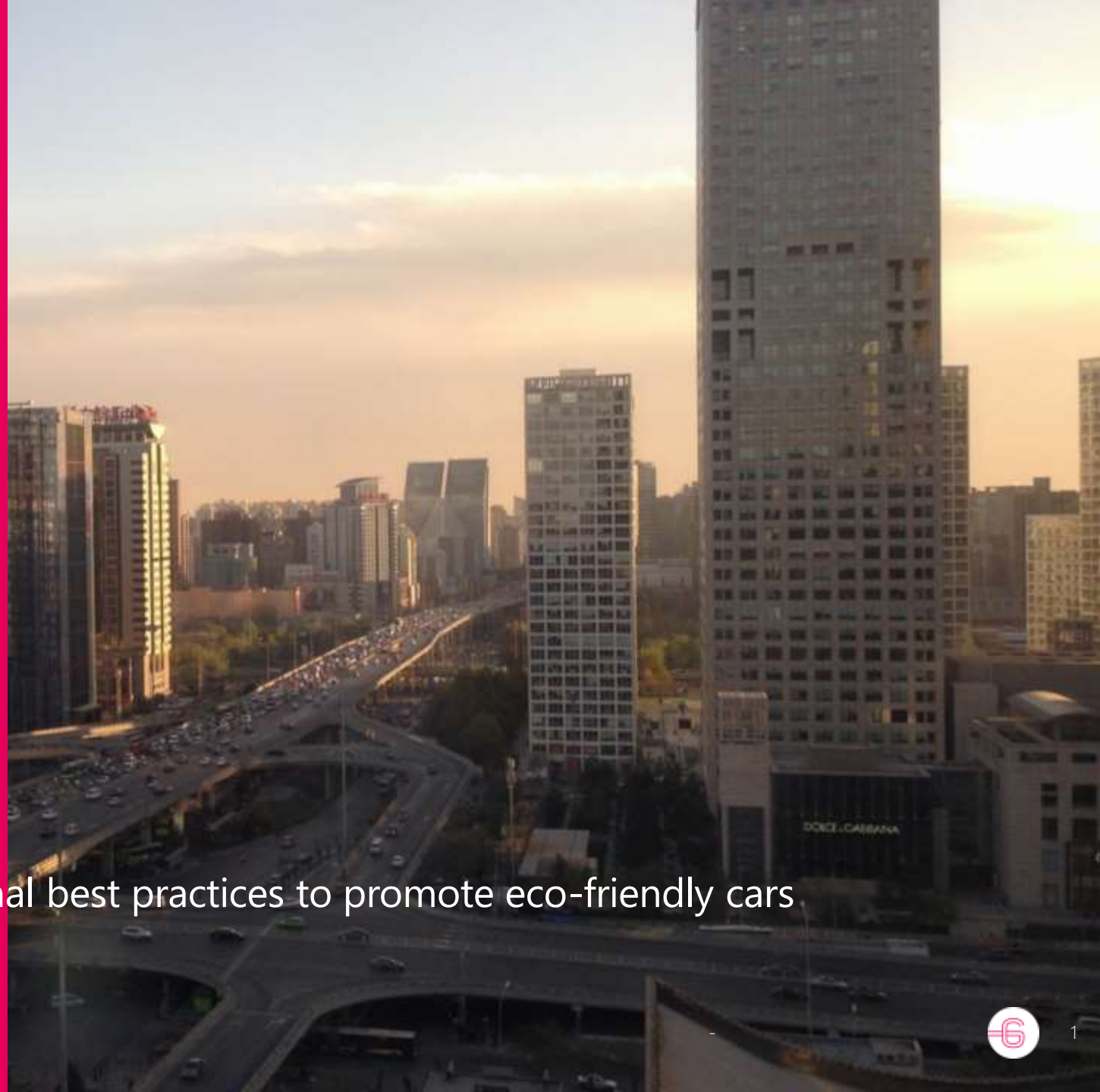


Electrification and a need for road user charging

Highlighting discussions and
issues from The Netherlands and
Vancouver, CA.

Dirk van Amelsfort, Goudappel Coffeng
Presentation at Expert Workshop on International best practices to promote eco-friendly cars
26 January 2021



Presentation outline

- Two cases: The Netherlands and Vancouver
- What are some of issues public agencies are facing regarding electrification where road user charging could make a difference.
- What are the contributions and issues with road user charging (interpreted as a distance based charging policy)
- How are the needs for charging policies different between cities and regions/nations
- How could we acknowledge all needs in a common transition path

The Netherlands

- A long history of discussing (and failing to introduce) different form of pricing
- Currently working on distance based charging for both freight (more or less decided) and private vehicles. The latter in large part from a motivation of decrease fuel excise revenues as a result of electrification
- A distance based scheme with OBUs to track and charge individual vehicles will replace part of the current fixed registration fees and fuel taxes in a budget neutral way.
- The Ministry of Finance is the driving force

Vancouver

- Independent commission looked at a variety of mobility pricing policy options and conducted a large public outreach effort to understand public opinions
- Both point based and distance based policies were considered
- Three main objectives
 - Regional congestion reduction
 - Fairness
 - Infrastructure funding



Congestion

- A. Deliver meaningful reductions in traffic congestion
- B. Ensure everyone pays a fair share
- C. Coordinate all the ways we pay for mobility, including new and emerging services



Fairness

- A. Be consistent and explainable
- B. Support equity
- C. Align prices for road use with access to transit



Support investment

- A. Ensure accountability in the way revenues are used
- B. Not have raising revenue as its primary aim



Other considerations

- A. Deliver positive economic benefits
- B. Protect individual privacy
- C. Be predictable, but adaptable
- D. Support goals for regional growth, climate change, and the environment
- E. Continue to be explored with the public and stakeholders

Policy issues with EVs

- Nations depending on gas taxes or other fuel based taxations see a decline in revenues.
- Lower marginal costs of car travel can lead to 20%-30% more delay time
 - Longer trips
 - More trips (if EVs are comparable in price to ICE)
- Distribution effects of EV subsidies

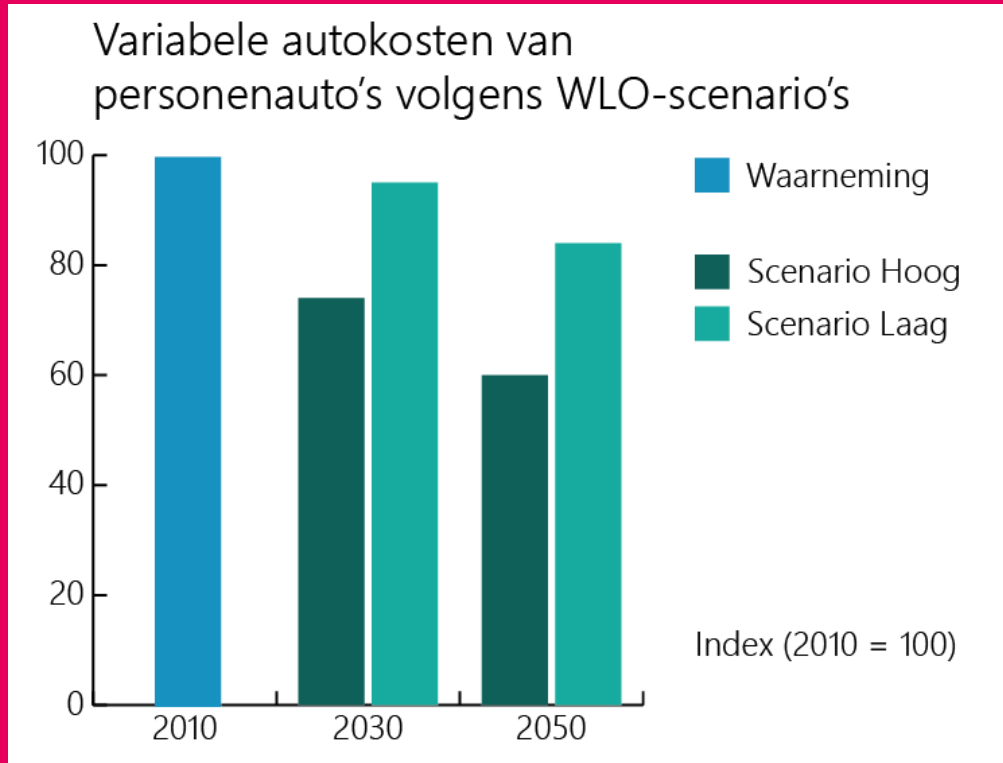
Tabel 3.3

Verandering overheidsinkomsten (mld euro) bij elektrische personenautomobiliteit

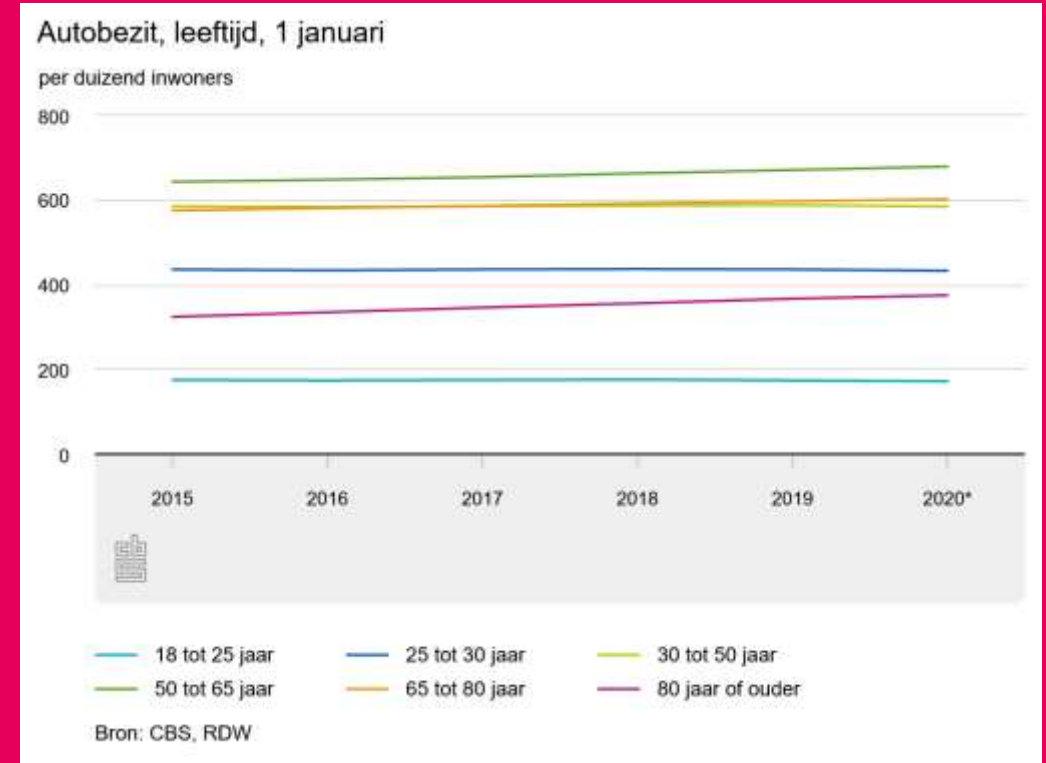
	BPM	MRB	accijns + BTW/ energieheffing	Totaal
Inkomsten in 2010	2	5	5½	12½
2030 Conventioneel	2½ tot 3	5½ tot 7½	6½ tot 8½	14½ tot 18½
2030 Elektrisch	--	4½ tot 6½	4 tot 5½	8 tot 12
Verschil	- 2½ tot - 3	- ½ tot - 1	- 3	- 6 ½

Bron: PBL

Marginal costs for car use decrease



Car ownership still increases



Road user charging part of the solution?

Two cases: Vancouver, The Netherlands



Societal benefits of revenue neutral kilometer charges in the Netherlands

- In the base case all scenarios have negative societal outcomes
- With larger economic growth or higher valuation of CO2 the societal effects become positive

Tabel 2 Maatschappelijke kosten en baten gevoeligheidsanalyses betalen naar gebruik (effecten ten opzichte van referentie, contante waarde effecten 2020-2050, prijspeil 2020, in marktprijzen, in € miljarden)

	V0	V1	V2	V3A	V3B	V3C
Basispad-scenario	-5,5	-3,4	-4,9	-6,7	-6,4	-3,6
WLO Laag-scenario	-9,4	-3,7	-9,1	-11,2	-11,1	-9,0
WLO Hoog-scenario	1,5	-2,7	2,5	1,7	2,4	6,6
Discontovoet van 2,5%	-5,7	-3,6	-5,1	-7,1	-6,7	-3,7
Ondergrens CO ₂ -prijs in 2 gradenscenario	-2,1	-2,9	-1,4	-2,0	-1,6	1,2
Bovengrens CO ₂ -prijs in 2 gradenscenario	23,8	0,3	26,0	34,4	35,7	38,6

Vancouver indicative societal benefits

Evaluation criteria	Units	Regional congestion point charges	
		Min	Min+
Economic benefits			
Total net economic benefits	\$ million/year	\$220	\$290
Congestion			
Total regional congested time savings	% change from baseline in 2030	-20%	-25%
Travel time reliability	% change from baseline in 2030	17%	20%
Visible congested time savings ⁵	% households that will achieve >10 mins savings per day	25%	44%
Revenue			
Total net revenue ⁶	\$ million/year	\$1.050	\$1.460

Evaluation criteria	Units	Multi-zone distance-based charges	
		Min	Min+
Economic benefits			
Total net economic benefits	\$ million/year	\$180	\$350
Congestion			
Total regional congested time savings	% change from baseline in 2030	-20%	-25%
Travel time reliability	% change from baseline in 2030	18%	23%
Visible congested time savings ⁹	% households that will achieve >10 mins savings per day	25%	41%
Revenue			
Total net revenue ¹⁰	\$ million/year	\$1.030	\$1.640

High system costs for distance based technology?

- The distance based charging policy in the Netherlands is to replace existing taxes in a revenue neutral way (about 16 billion Euro per year)
 - 2.3 billion Euro estimated investment costs for distance based charging in the Netherlands for a policy that applies to all vehicles
 - Operational and maintenance costs 750 million Euro per year for a policy that applies to all vehicles
 - These costs (5%-8% of revenues) replace a taxation system that has zero costs. Since demand decreases the remaining drivers see cost increases that are higher to preserve budget neutral outcomes
- Vancouver MPIC project reports higher percentages of gross revenues going to system costs for distance based (18%-40%) than for point based policy alternatives (11%-22%)

Public opinion on distance based charging (Vancouver MPIC)

- There is a higher level of public support for charging that targets congestion (user cost) than for charging by use (user pay). By a two-to-one margin in the public polling, residents expressed a preference for user cost charging (49%) over user pay charging (25%).
(Vancouver MPIC)
- Possible explanations
 - In time and place differentiated system it is harder to predict costs before making the trip
 - Privacy concerns based on OBU equipment
 - All trips are charged leaving no behavioural adaptation to avoid charging besides not using a car

The national versus city perspective in the Netherlands

- Secure infrastructure funding as the primary objective
- Climate change and electrification
- Motorway congestion
- Changing from fixed to variable taxation (increases car ownership)

- Congestion and air quality are primary objectives
- Climate change
- Space, car ownership and parking and moving traffic through centers to ring road structures
- Investments in public transit and cycle infrastructure

The paradox is that the lower the charge, the more it can be described as a “tax grab” – only at relatively higher charges do the congestion benefits start to appear.

Allan Seckel, Vancouver Mobility
Pricing Independent Commission

For discussion: How could we transition?

- A logical end goal is to have differentiated distance based charging, in a multimodal context and with mobility services (a level 4 MaaS)
 - Wait or Demand from OEMs that new vehicles are distance based charging ready (no OBU is needed to enable distance based charging)
 - Start with addressing the transportation related problems around cities with ANPR/DSRC based cordon/area/point based charging policies
 - Use a low technology distance based tax solutions for EVs (or all vehicles) like periodic registration of kilometers travelled or within car insurance policies.

Questions and discussion

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