Ministry of Transport
TE MANATŪ WAKA

EVs – findings from Japan

July 2015 | Prepared Bronwyn Lauten

About the trip

We visited Japan for five days from 19 – 26 June 2015

Purpose

- **establish Japanese expectations for the uptake of electric vehicles and other low emission technologies**
- discuss plans for the deployment of ITS technology and especially the potential use of the 760 MHz frequency for connected vehicle technology
- get an update on vehicle exhaust emission standards and testing in Japan
- discuss possible considerations for the Minister's visit to Japan in July 2015.

Targets for uptake of Next Generation vehicles

In 2010, Japan released its "Next Generation Vehicle Strategy" which set out the following targets for uptake:

Diffusion Targets by types of vehicles (Targets set by the Government)

		2014 (actual)	2020	2030
Conventional vehicles		75.8%	50-80%	30-50%
Next Generation vehicles		24.2%	20-50%	50-70%
	Hybrid vehicles	21.3%	20-30%	30-40%
	Electric vehicles (including PHEVs)	0.7%	15-20%	20-30%
	Fuel cell vehicles	0.0%	<1%	<3%
	Clean diesel vehicles	1.7%	<5%	5-10%

This targets are aspirational and no one we spoke to thought all targets would be met.

Projections vs targets

Diffusion projections
(with private-sector efforts)

	2020	2030
Conventional vehicles	**80% or more**	**60 - 70%**
Next-generation vehicles	**Less than 20%**	**30 - 40%**
Hybrid vehicles	10 - 15%	20 - 30%
Electric vehicles Plug-in hybrid vehicles	5 - 10%	10 - 20%
Fuel-cell vehicles	Miniscule	1%
Clean diesel vehicles	Miniscule	- 5%

Diffusion targets
(government targets)

	2020	2030
Conventional vehicles	**50 - 80%**	**30 - 50%**
Next-generation vehicles	**20 - 50%**	**50 - 70%**
Hybrid vehicles	20 - 30%	30 - 40%
Electric vehicles Plug-in hybrid vehicles	15 - 20%	20 - 30%
Fuel-cell vehicles	- 1%	- 3%
Clean diesel vehicles	- 5%	5 - 10%

Source: NEDO, 2010

Vehicle subsidies

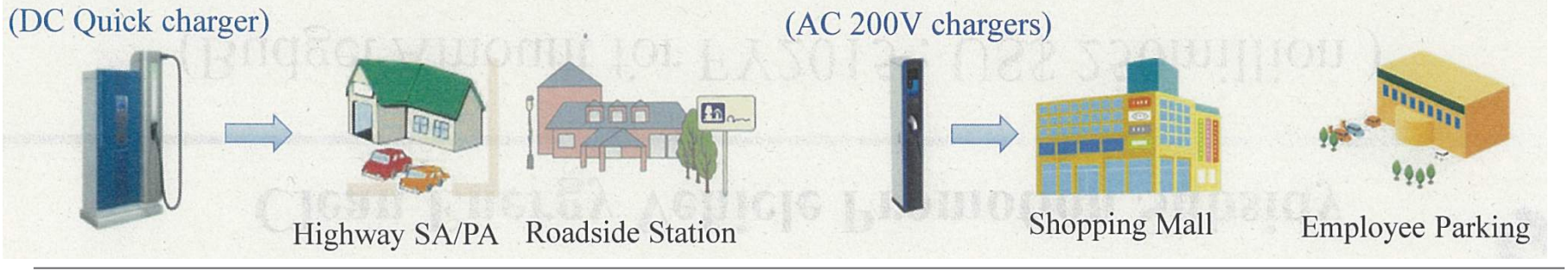
For FY2015, the Japanese Government has made available US$250 million for next generation vehicle subsidies…

Eligibility Vehicle		The amount of subsidy
Electric Vehicles		~max 7,100USD (ex; Nissan Leaf : 2,300USD)
Plug-In Hybrid Vehicles		~max 7,100USD (ex; Toyota Prius PHV : 2,100USD)
Clean Diesel Vehicles		~max 3,000USD (ex; Mazda CX-5 : 830USD)
Fuel-Cell Vehicles		17,000USD (Toyota MIRAI)

Developing charging infrastructure

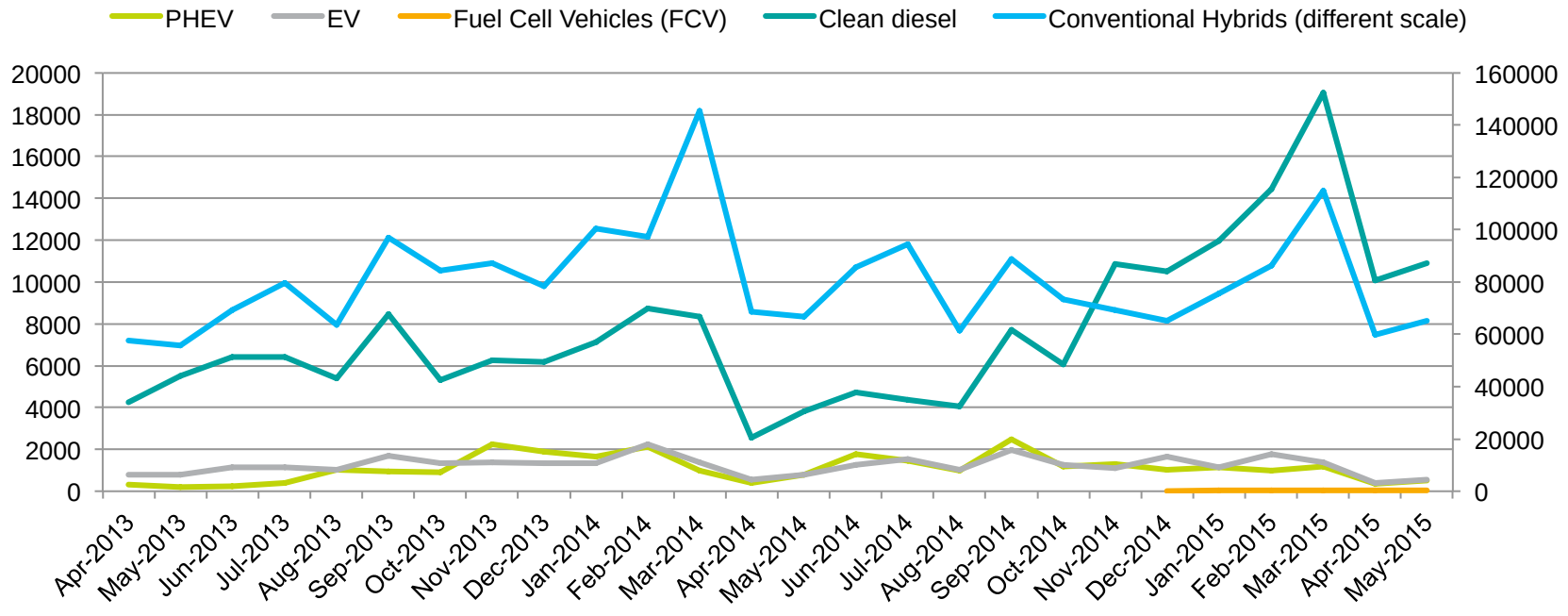
…and a further US$250 million for charging infrastructure.

- Standard power supply in Japan is 100V so home charging is not easy.
- Japan uses an elaborate model to determine the density of chargers – essentially means that they aim to have public chargers available at 8km grids in urban areas and 20km grids in rural areas.



Sales of new Next Generation vehicles in Japan

Sales of ‘Next Generation' vehicles in Japan
April 2013 - May 2015



Source: JAMA

Key messages from manufacturers

We canvassed the issue of EV battery cost and performance with a range of people.

- Two companies indicated that they are confident of a technical development before 2020 that will significantly reduce costs but would not specify what this technology was or when it would be available.
- The current expectation is that the battery packs will be fully guaranteed for their first five years and should be at a minimum of 70% capacity in 10 years.
- Both Nissan and Mitsubishi showed examples of using batteries in EVs to help power households and businesses.
- They said that the batteries were now sufficiently advanced that the extra cycling of charging was not a concern, but that it had been a drawback to such schemes in the past.

Second-hand electric vehicles

We met with the Manager of the USS Yokohama Auction site

- EVs are not treated any differently at auction – no additional information about battery condition is provided.
- Customer perception is that EVs are now reliable and do not need any specific information.

Hydrogen fuel cell vehicles

We went to a hydrogen fuelling station and showroom for the Toyota Mirai

The Mirai

Top: Hydrogen dispensers

Right: Storage tank at refuelling station

Hydrogen fuel cell vehicles

- The production, transportation and storage of hydrogen is complex and seems extraordinarily expensive, especially compared to electricity.
- One refuelling station that we visited did not appear to be charging for hydrogen and only served about 18 regular customers.
- The current direct subsidy for purchase of a FCV in Japan is USD$17,000 (compared to the purchase price for a Toyota Mirai of US$60,000).
- Currently more money goes to EVs than FCVs but the Government will reassess where it invests depending on how the technologies develop.

Thank you