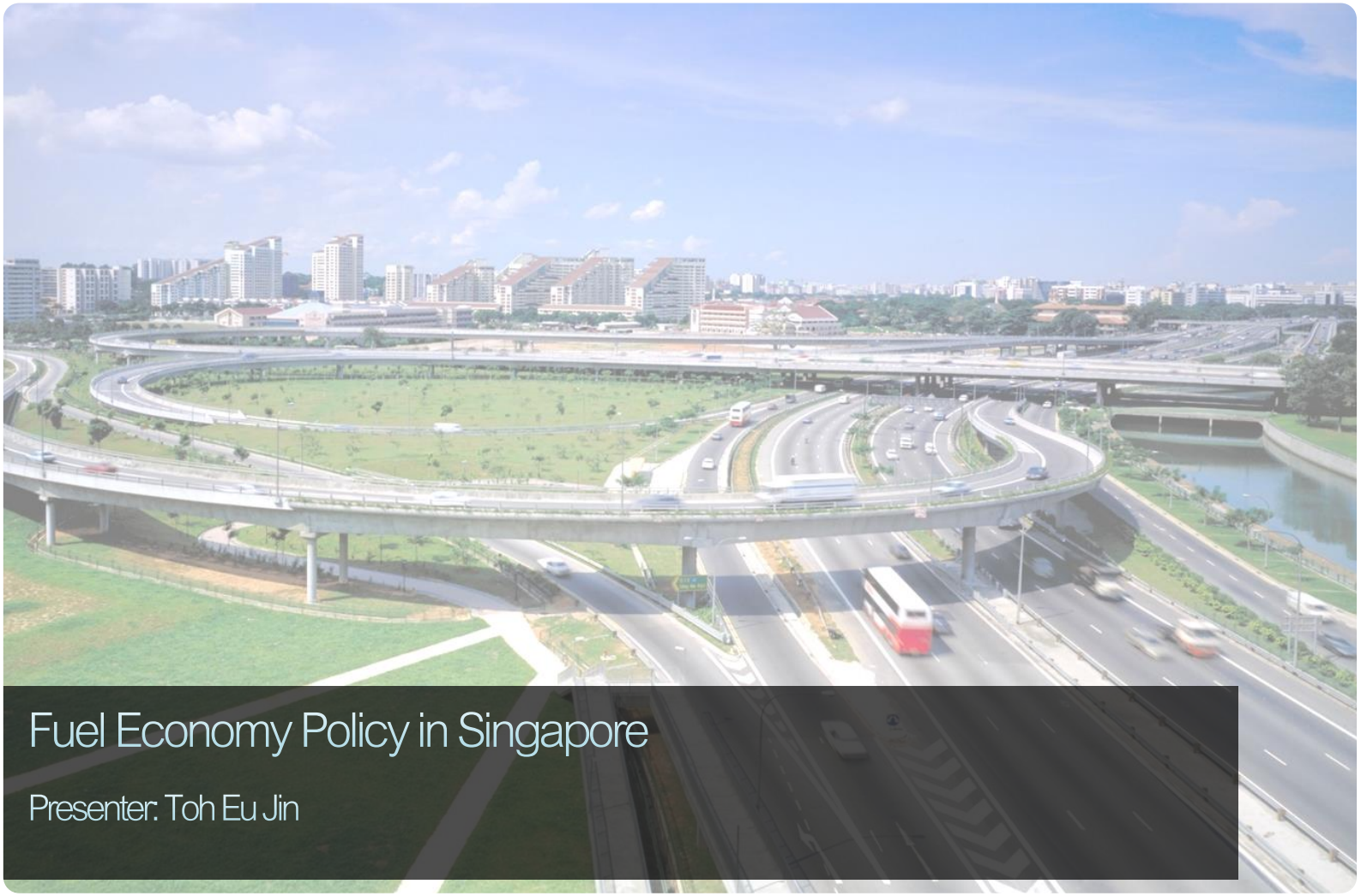


Fuel Economy Policy in Singapore

Presenter: Toh Eu Jin

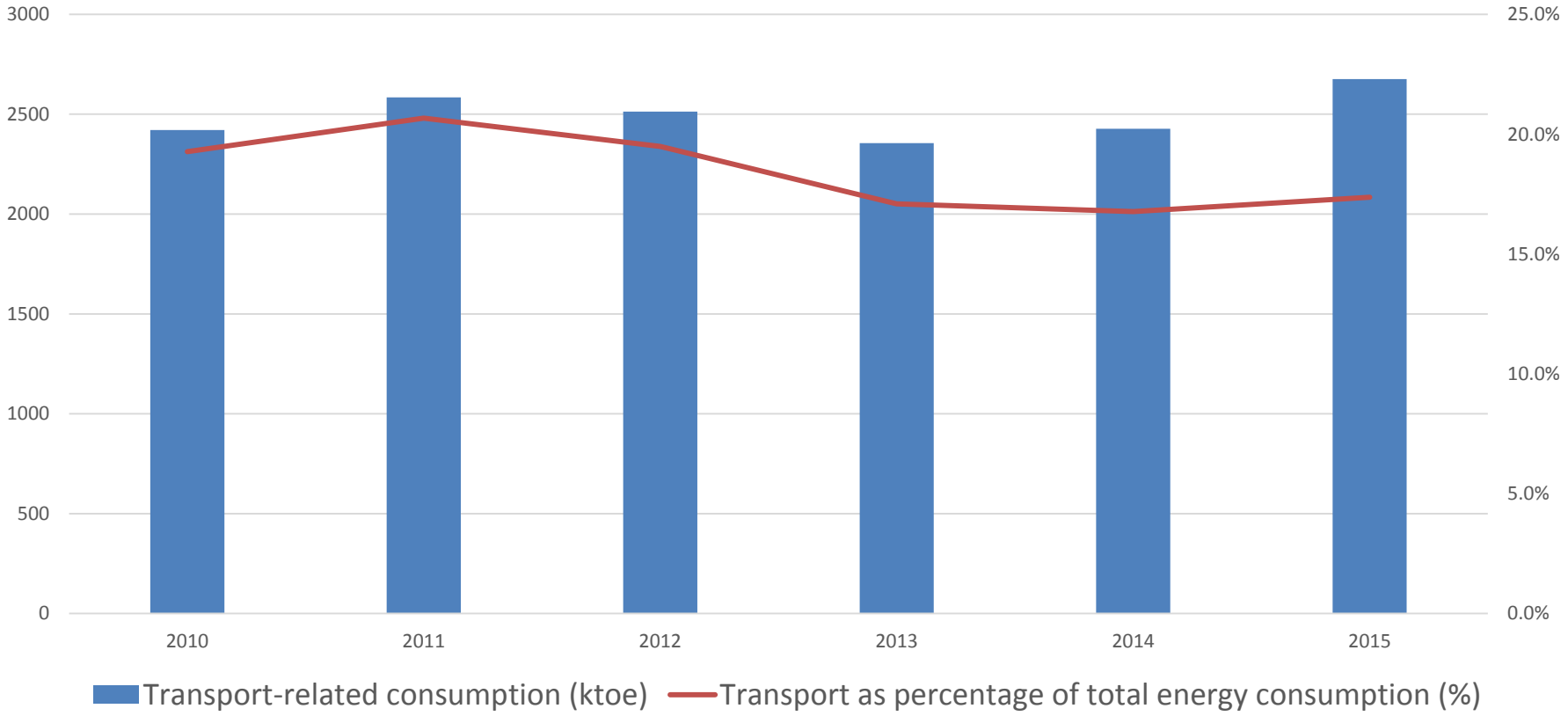
Land Transport Authority

Outline

1. Energy Consumption Trends in Singapore's Transport Sector
2. Controlling Usage of Vehicles
   a) Vehicle Quota System (VQS)
   b) Electronic Road Pricing (ERP)
3. Promoting Fuel Efficiency
   a) Fuel Economy Labelling Scheme (FELS)
   b) Electric Vehicles (EVs)
4. Improving Air Quality
   a) Carbon Emissions-Based Vehicle Scheme (CEVS) (2013-2017)
   b) Vehicular Emissions Scheme (VES) (2018-)
   c) Early Turnover Scheme (ETS) for Diesel Commercial Vehicles

Transport-related Energy Consumption in Singapore

Transport energy consumption in Singapore has been fairly stable



Source: Singapore Energy Statistics, 2017

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Controlling Usage of Vehicles

3, 348 km	164 km	956,430	601,257
Road Network Length (Exclude Expressway)	Expressway Network Length	Vehicle Population	Private Car Population

Source: LTA Policy (PVT), TRO
31 Dec 2016

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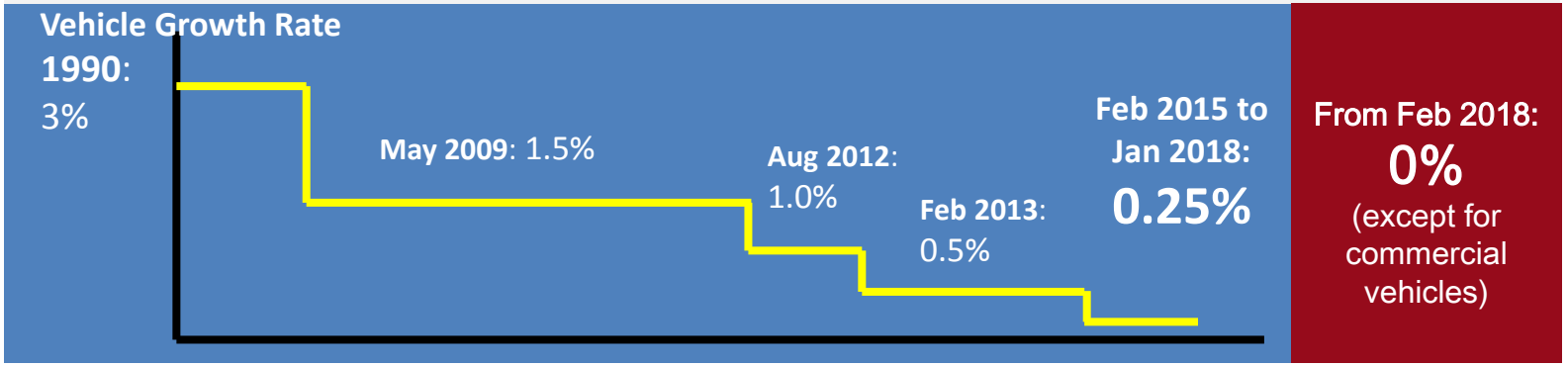
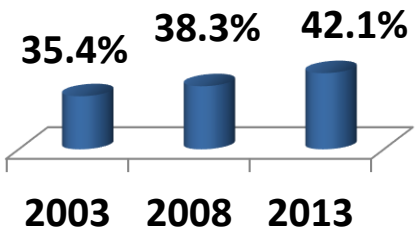
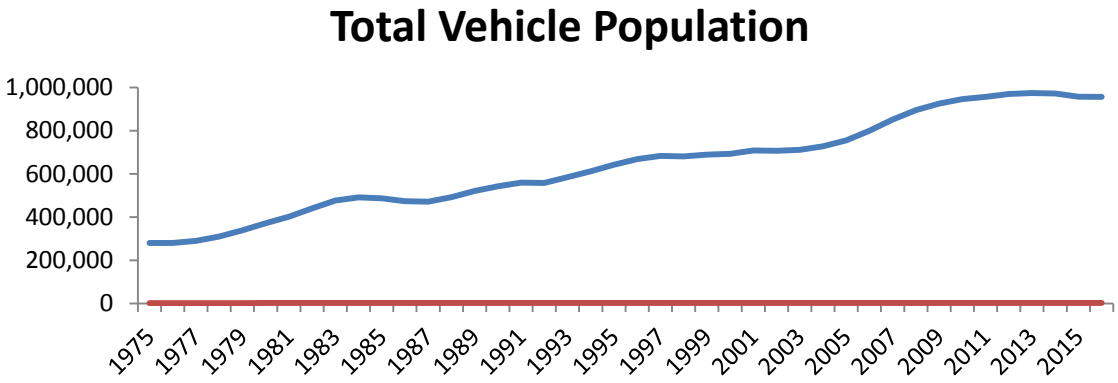
Vehicle Quota System (VQS)

We have relied heavily on the COE quota system which controls the vehicle population at the macro level with the vehicle growth rate.





Car-owning households



Source: LTA Policy (PVT), Jun 2017

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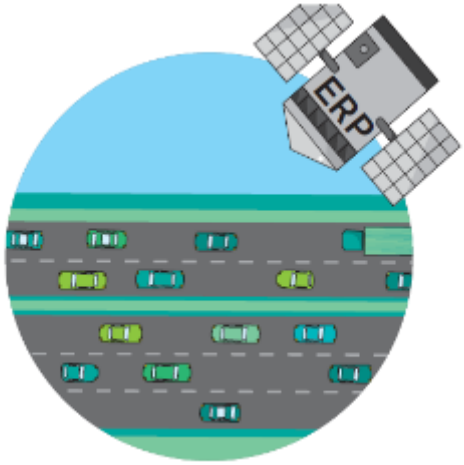
Electronic Road Pricing (ERP)

- **Continue to add ERP gantries where needed**
  - 78 ERP gantries as of Jul 2017
- **Develop ERP2 to replace current ERP system by around 2020**
  - ERP2 tender awarded in Feb 2016 (consortium of NCS Pte Ltd and Mitsubishi Heavy Industries Engine System Asia Pte Ltd)
  - Paves the way for distance-based congestion pricing and for other approaches for pricing road usage in the future



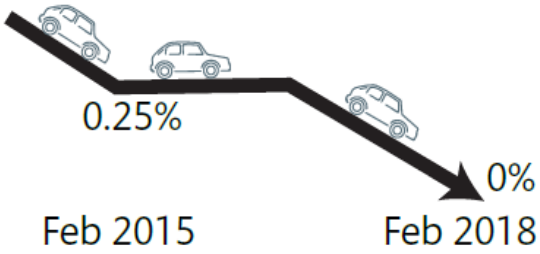
Source: LTA Road Pricing Project, Jun 2017

Getting around in tiny Singapore?

12% of our land space is taken up by roads.

- Limited room for expansion of the road network
- Zero car growth from Feb 2018*

*For Categories A, B and D



Going **car-lite** would be more sustainable in land scarce Singapore.

BUS

- Greater capacity
- Shorter waiting times
- Better service levels

RAIL

- Better connectivity with 5 MRT lines
- Expanding network to 360km by 2030
- Resources put in to renew and upgrade rail assets

Promoting Fuel Efficiency

- Singapore's target as submitted to UNFCCC:

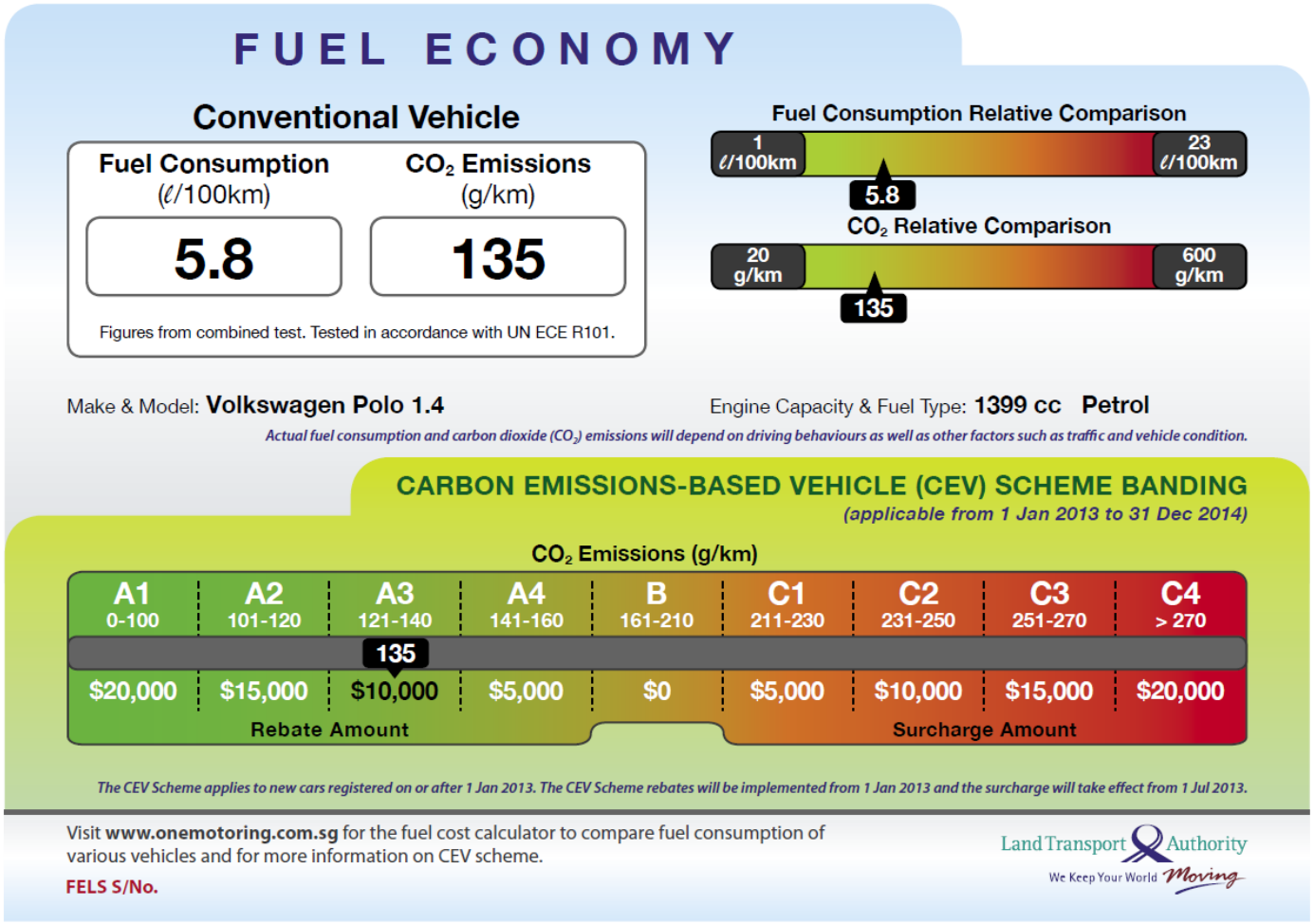
  Reduce emissions intensity by 36% from 2005 levels by 2030, and stabilise emissions with the aim of peaking around 2030

- Transport sector initiatives to support target:
  - ❑ Promote low emissions and energy efficient vehicles
    - ➢ Carbon Emission-based Vehicle Scheme (CEVS)
    - ➢ Fuel Economy Labelling Scheme (FELS)
  - ❑ Test-bedding of energy efficient technology
    - ➢ Electric vehicle (EV) test bed
    - ➢ EV car-sharing scheme
    - ➢ EV taxi trials
    - ➢ Hybrid and electric bus trials

Fuel Economy Labelling Scheme (FELS)

- Mandatory fuel economy labelling for passenger cars and light goods vehicles was implemented in 2009
- The scheme provides consumers with fuel economy information to enable informed decision-making
- Sellers are required to display the FELS label in the showroom and state fuel economy in printed advertisements
- The Government maintains an online tool for comparing the fuel economy of different vehicle models

Fuel Economy Labelling Scheme (FELS)



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Nation-Wide EV Car-Sharing Programme: BlueSG

- A fleet of 1,000 electric cars, with 2,000 supporting electric charging points, to be rolled out progressively within 4 years starting mid-2017.
- 20% of charging points will be opened up to the public.
- EV car-sharing to be made available in every single housing estate by 2020.

BlueSG Electric cars and charging points at HSO. Photo credit: Straits Times

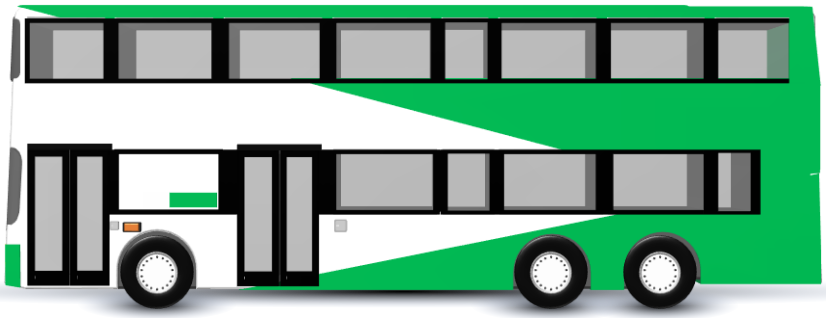
Source: LTA Policy (PVT), Aug 2016

Electric Taxi Trials

- First fleet of 100 e-taxis launched in June 2017 by HDT Singapore Taxis Pte Ltd
- Part of trial by LTA and EDB to study viability of fleet-based electric vehicles
- Pilots a new employer-employee model for taxi industry

Hybrid and Electric Bus Trials

- Advancing from unitary bus trials to larger-scale trials for alternative energy buses
- Fine-tune approach for wider adoption of alternative energy buses
- Tender for 50 diesel hybrid buses awarded to Volvo in October 2017, for delivery by end 2018
- Tender for 60 electric buses awarded to three different OEMs in October 2018, for delivery in 2019-2020



Improving Air Quality

- Emissions from motor vehicles are the second largest source of air pollution in Singapore

- Need to control emissions to maintain high level of ambient air quality for Singaporeans

Carbon Emissions-Based Vehicle Scheme (CEVS) [2013-2015]

- The Carbon Emissions-based Vehicle Scheme (CEVS) was first introduced in Jan 2013 to incentivise the purchase of less carbon-intensive vehicle models.

- Low carbon emission vehicle models receive a rebate on registration taxes.

- High carbon emission vehicle models incur a surcharge on top of prevailing registration taxes.

- Due to high mileage and time on the roads, taxis get 50% more rebate/surcharge than normal cars.

Carbon Emissions-Based Vehicle Scheme (CEVS) [2013-2015]

Band	Carbon emission (CO_2g/km)	REBATE (FROM 1 JAN 2013)		SURCHARGE (FROM 1 JULY 2013)	
		Cars	Taxis	Cars	Taxis
A1	0 to 100	$20,000	$30,000		
A2	101 to 120	$15,000	$22,500		
A3	121 to 140	$10,000	$15,000		
A4	141 to 160	$5,000	$7,500		
B	161 to 210	$0	$0	$0	$0
C1	211 to 230			$5,000	$7,500
C2	231 to 250			$10,000	$15,000
C3	251 to 270			$15,000	$22,500
C4	271 & above			$20,000	$30,000

Carbon Emissions-Based Vehicle Scheme (CEVS) [2015-2017]

- The CEVS was revised in Jul 2015 to take into account improvements in vehicle technology
- Emissions bands were tightened
- The maximum rebate/surcharge was increased to $30,000 to further incentivise carbon efficient vehicles
- The average CO_2 emissions of new cars and taxis have decreased by 15% since the start of CEVS

Carbon Emissions-Based Vehicle Scheme (CEVS) [2015-2017]

Band	Revised CEVS (Jul2015 - Jun2017) CO_2 g/km	Rebate (-)/Surcharge (+) for Cars ($)	Rebate (-)/Surcharge (+) for Taxis ($)
A1	0 to 95	-30,000	-45,000
A2	96-105	-15,000	-22,500
A3	106-120	-10,000	-15,000
A4	121-135	-5,000	-7,500
B	136-185	0	0
C1	186-200	+5,000	+7,500
C2	201-215	+10,000	+15,000
C3	216-230	+15,000	+22,500
C4	231 & above	+30,000	+45,000

Vehicular Emissions Scheme (VES) [2018-]

- The Vehicular Emissions Scheme (VES), introduced in Jan 2018, covers 4 new pollutants in addition to the carbon dioxide (CO_2) criterion in the CEVS.
  - Hydrocarbons (HC)
  - Carbon monoxide (CO)
  - Nitrogen oxides (NO_x)
  - Particulate matter (PM)

- A vehicle's rebate/surcharge is determined by the worst performing pollutant
- The FELS label has also been enhanced to include the pollutant levels of all 5 emissions assessed for the VES

Vehicular Emissions Scheme (VES) [2018-]

Bands	CO_2 (g/km)	HC (g/km)	CO (g/km)	NO_x (g/km)	PM (mg/km)	Rebate/ surcharge(-/+) for cars ($)	Rebate/ surcharge(-/+) for taxis ($)
A1	A1 ≤90	A1 ≤0.020	A1 ≤0.150	A1 ≤0.007	A1 ≤0.0	-20,000	-30,000
A2	90< A2 ≤125	0.020< A2 ≤0.036	0.150< A2 ≤0.190	0.007< A2 ≤0.013	0.0< A2 ≤0.3	-10,000	-15,000
B	125< B ≤160	0.036< B ≤0.052	0.190< B ≤0.270	0.013< B ≤0.024	0.3< B ≤0.5	0	0
C1	160< C1 ≤185	0.052< C1 ≤0.075	0.270< C1 ≤0.350	0.024< C1 ≤0.030	0.5< C1 ≤2.0	+10,000	+15,000
C2	C2 >185	C2 >0.075	C2 >0.350	C2 >0.030	C2 >2.0	+20,000	+30,000

Early Turnover Scheme (ETS) for Diesel Commercial Vehicles

- Gives discounts to encourage owners to replace their old diesel commercial vehicles before the end of their statutory life (20 years)
- Discounts are tied to remaining statutory life
- Heavy goods vehicles receive more discounts than light goods vehicles because they produce more pollution
- Higher incentives for replacement vehicles of higher emission standards

Early Turnover Scheme (ETS) for Diesel Commercial Vehicles

- The ETS was first implemented in 2013 and has been extended and revised 3 times

ETS Phase	Eligible vehicles	Replacement vehicles
1	Pre-Euro/Euro 1	Euro 5/6
2	Pre-Euro/Euro 1/2/3	Euro 5/6
3	Pre-Euro/Euro 1/2/3	Euro 5/6
4	Euro 2/3	Euro 6

Thank You