

Are we Ready for Electric Cars? *(and other electric vehicles)*

There is increasing worldwide demand
to replace petrol and diesel vehicles
with electric powered
**to reduce the adverse effects
on Global Warming**



Global Warming and electric vehicles

Transport is responsible for 13%
of Global Warming

So there are increasing demands
to change from petrol and diesel fossil fuels.

Are we ready for this change?

What are the respective advantages and disadvantages of making this change?



Electric cars

Would you like one?

Fuel per year --
Petrol \$1,218
Electricity \$5

Nissan Leaf
15,000 Km /year

Charging station



Home charging station installation
Slow \$500
Fast \$2,500

But what about road tax?

Who pays for electric cars?

Petrol \$1,218 – tax included \$487

It can't be claimed from electricity

Who pays in future?

5% of Australian tax
comes from petrol/diesel

Fuel per year --

Petrol \$1,218

Electricity \$5.12

Nissan Leaf

15,000 Km /year



How many brands of electric cars are available in Australia ?



Hyunda, Nissan, Mistsubishy, Porsche,
Renalt, Ford, Kia Soul, Bev, Tesla , BMW,
Mercedes, Jaguar, Audi, Volvo and others



Electric car prices

Model	Prices From*	Battery Size	Range
Tesla Model X	\$150,000	100 kWh	594km
Jaguar I-Pace	\$119,000	90 kWh	470km
Tesla Model S	\$105,000	75 kWh	565km
BMW i3/i3s	\$68,700	33 kWh	260km
Hyundai Kona	\$59,990	64 kWh	449km
Nissan Leaf	\$54,482	40 kWh	270km
Renault Zoe	\$47,490	40 kWh	300km
Mitsubishi Outlander PHEV	\$45,990	12 kWh	54km+petrol
Hyundai IONIQ EV	\$44,990	28 kWh	230km
Hyundai IONIQ PHEV	\$40,990	8.9 kWh	50km+petrol
Kia Niro EV	TBC	64 kWh	455km

Hybrid

Hybrid



The major problem – initial cost

Renault small car example

Clio \$20,000

Electric Zoe \$47490

230% dearer

same size cars



The major problem – initial cost

Hyundai SUV example

Kona petrol \$27,990 (on special)

You can buy 2 of these



**Kona elect \$59,990
210% dearer**

For 1 of these



Hyundai proof of cost --

“But when viewed against its conventionally-powered sibling, it’s a proposition that attracts a \$36,490 premium -- more than double the asking price of the entry-spec Kona Go (from \$23,500 plus ORCs) and still \$20K more than the range-topping Kona Iron Man all-wheel drive (from \$39,990 plus ORCs).”

Kona elect \$59,990 210% dearer

You can buy 2 of these



For 1 of these



Estimated Total annual costs

**Hyundai Kona
15,000 Kms PA**

Active (petrol)	\$8,500
Electric	\$13,430

Mostly depreciation --
electric vehicles
are not cost effective



Batteries are just as dangerous as petrol

---- fire



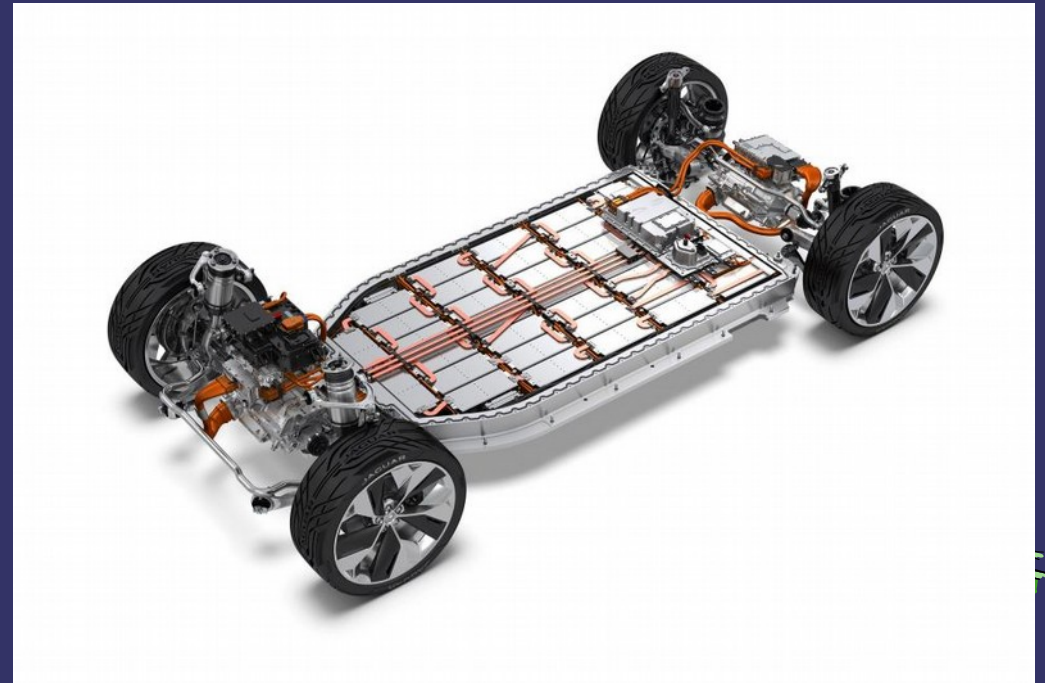
Major differences

electric versus Petrol and diesel

- More than double purchase price
- Increased insurance cost
- Very much lower fuel/running cost
- Much lower maintenance cost
- No oil, oil filter, air filter costs
- Much lower emissions
- 50% increase in weight
- Increased tyre costs
- No effective recycling yet of batteries at end of life
- Cost of replacement battery
- Greater depreciation cost
- Impact on the power grid – 1 charger = 100 homes**



**Battery cost and weight
the most critical problem yet to be solved**
cost of car - double or more
weight about 50% more
disposal at end of life?



Government and Industry challenges

How to replace petrol/diesel tax?

- *this tax is 5% of government income*
- *probably one of the fairest tax – user pays*

Installing charging stations?

- *how to address queues/delays at stations?*
- *upgrading electricity supply both supply and distribution?*
- *every charging station = power for 100 homes*

Will severity of accidents increase –

- *extra weight – more damage?*



Other Electric vehicles

Busses, trucks, small vehicles

- ➔ Busses and trucks are contributing heavily to Global Warming.
- ➔ Many countries are finding that CO2 savings in power generation are being offset by increasing CO2 in transport.
- ➔ The use of smaller cars is being encouraged in some countries, Australian safety regulations do not allow many smaller cars.
- ➔ European road rules allow much more flexibility.



Electric Busses

- World wide 2019 – 425,000 electric busses
- China leads the world **99% approx 420,000 busses**
- Example - Shenzhen city is all electric - 16,000 busses
- 40,000 charging stations, 180 depots
- Consuming 4000 MWH/hour, = power for 120,000 home
- Shenzhen was greatly subsidised by Chinese government
- Also 22,000 electric taxis by 2020
- Already problems with queues arguments at charging stations



Shenzhen terrain and climate temperature is favourable for battery life and performance

“There is also geography to consider. Shenzhen is fairly flat, but the hills of nearby Hong Kong have proven too much in trials of electric buses.

Other cities in northern China have struggled with battery power in the extreme cold of winter.



Electric trucks

There are significant developments in electric trucks

Mercedes, Volvo, Man, Mitsubishi, Freightliner and others.



Electric trucks



Other Electric Vehicles



Small electric commercial vehicles are common in Europe. Australian regulations prohibit many of these at present.

Buses like this would be ideal for retirement villages. Easy access, low step, space for walkers.



Smaller ones are also becoming available.



Vehicles for Short distance travel



Australia needs to review its vehicle rules to allow a greater range of vehicle types. Many European countries have adapted to more economic types of short range electric vehicles



Electronic vehicles for seniors ---- and others



Unlikely to meet Ausi rules

Australian rules only allow
mobility vehicles for 6Km/hr
and for mobility impaired users



Small Electronic vehicles
this one would not meet Aussi road rules.

But you are allowed to ride a motor bike.
No seat belt, no crash protection, totally vulnerable

Which would you consider safer?



Small cars



Seniors are already using electric vehicles



Scooters for all



Australia has excellent public transport access for seniors mobility

- Providing the size is within these limits, Mobility scooters and wheelchairs have access to government trains and buses
- Unfortunately regulations vary from State to State
- Mobility scooters have to be registered in QLD



In many ways electric vehicles are very desirable and good for the environment.

But the problems to be resolved are:-

- Initial cost, the extra weight and the disposal of batteries, to succeed long term they must become economic.***
- Rules governing small vehicles.***
- Replacement for road tax.***



Questions ?

Comments ?

--- Lynton

