Transport Fuels:
Electricity

Overview

Electricity is better known as a stationary energy, however it has started making in-roads into the transport sector.

Mass-produced electric vehicles first entered the South Australian market in 2010. There are now several plug-in electric vehicle variants available.

Electric vehicles are fundamentally different to conventional vehicles. See our fact sheet on plug-in electric vehicle technology.

Electricity in South Australia

Most of SA's electricity is generated from gas and renewable sources, such as wind power. It has a lower emissions intensity than all other mainland states.

Electricity in Transport

Electricity for road vehicles is typically supplied in several variants, categorised by the level of power and the sophistication of recharging controls. Recharging in SA usually takes one of the following forms:

General Power Outlets (Level 1, Mode 1)

These are usually 15 A power outlets supplying 240 V_{AC}, though standard 10 A outlets may be suitable for some vehicles, particularly motorbikes and scooters.

All charging control is in the vehicle.

Smart Recharging (Level 2, Mode 3)

Level 2 electric vehicle recharging stations are also 240V_{AC}, but support higher currents and, therefore, faster recharging.

These recharging stations use standardised, dedicated vehicle plugs instead of an ordinary appliance socket. The system has additional 'intelligence' for safety.

Rapid DC Recharging (Level 3, Mode 4)

Rapid recharging uses high voltage, direct current electricity to supply power at more than 20 times the power of a standard power outlet. Rapid recharging is recommended for occasional use, not regular use, as it can degrade battery performance.

Rapid DC charging stations include safety and control intelligence as well as high power electrical conversion components. They are typically large equipment, resembling a petrol bowser.

Further information:
Email: DPTI.LowEmissionVehicles@sa.gov.au
Web: www.lowemissionvehicles.sa.gov.au

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Australia's first Level 3 recharge station is located at Mitsubishi Motor's Australian headquarters at Tonsley Park.

Cost Effectiveness of Electricity

Electricity is usually more expensive, per unit of energy, than conventional fuels. However electricity has a very low entropy – meaning it can be converted to mechanical energy very efficiently.

All else being equal, electricity is cheaper on a per-kilometre basis than conventional fuels. The actual savings will depend on the cost of your electricity, but around half the cost of conventional fuels is a reasonable guide.

Where Can I Recharge my Vehicle?

Most electric vehicle recharging is done at home or at a depot or base.

There is an emerging network of public recharging facilities in South Australia. See our website for further details.

Why consider Electricity?

- Electric vehicles are quiet, efficient, smooth and cheap to operate.
- Electric vehicles have no drive-time emissions – no greenhouse gases or air toxics. In fact, in purely electric vehicles, there is no tailpipe.
- South Australia's electricity has a relatively low (and decreasing) emissions intensity, meaning attributable greenhouse gas emissions are lower than conventional vehicles (in most cases).
- Using GreenPower™ or other renewable sources allows zero-emission driving.

What issues are there?

- Electric vehicles, whether mass produced or conversions, are expensive to buy. Even so, prices have already fallen considerably since they were first released.
- Typical electric vehicles have a maximum electric range of 100 km between recharging.
- Batteries cannot be recharged as quickly as liquid or gaseous refuelling. Normal recharging may take several hours. Rapid recharging will, typically, take 10 to 30 minutes.
- Range limitations and recharging times restrict purely electric vehicle applications – though the vast majority of daily trips in South Australia could be made on electricity. Innovative solutions to deal with this issue exist – see our fact sheet on plug-in electric vehicle technology.

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See Also:

- *Vehicle Technologies: Plug-in Electric Vehicles*
- *Transport Fuels*
- *Transport Fuels: Conventional Fuels*
- *Transport Fuels: Liquefied Petroleum Gas (LPG)*
- *Transport Fuels: Natural Gas (CNG and LNG)*
- *Transport Fuels: Ethanol (E10 and E85)*
- *Transport Fuels: Biodiesel (B5, B20 and B100)*
- *Transport Fuels: Emerging and Future Fuels*

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