

## 'Electric driveway' to plug hybrid cars into zero-emission house

**Toyota Prius vehicles are being refitted by CSIRO engineers as part of an 'electronic driveway' initiative to transform family cars into low-emission mobile power units that could feed into low-emission homes.**

By replacing the small Prius battery pack with a larger one and adding a battery charger, the engineers are converting the cars from standard hybrid electric vehicles (HEVs) to plug-in hybrid electric vehicles (PHEV) that can be charged by plugging the battery into the grid or a renewable power source.

The main function of the small batteries in HEVs – which recharge during braking – is to achieve better fuel economy than a conventional fuel-only

vehicle. Engineer Chris Phyland from CSIRO's Low Emission Distributed Energy section says the PHEV adaptation will not only allow hybrids to be driven further on low-emission electrical power – up to 40 km – instead of fuel, but will also turn the parked car into a 6 kWh battery bank for a family home.

'This power can be discharged to run appliances in the home, or it can be used for driving the vehicle,' he adds.

'PHEVs are not new technology but we are modifying them to support a completely unique application, that of using the car as a large mobile battery which can be integrated and used in our homes.'

The CSIRO electric driveway

project links in with CSIRO's earlier zero-emission house project – managed by Dr Greg Foliente – in which researchers have been working with Sustainability Victoria and property developers to design and build a carbon-neutral Australian home, currently under construction.

The new house is expected to use up to 70 per cent less energy than a traditional home of similar size.

The two groups are investigating possible synergies between a low-emissions car and house – for example, using the car battery to store energy from solar panels during the day that could be used to run appliances at night. A domestic



**Chris Phyland and Rob Dark work on converting a Toyota Prius into a plug-in hybrid electric vehicle.**  
CSIRO

mobile power source could also help minimise demand during peak load times on the grid.

## Remaining paddock trees in peril

**Australia's south-east temperate grazing region could be virtually treeless within decades, according to ANU research recently published in the US-based *Proceedings of the National Academy of Sciences (PNAS)*.**

The research team concluded that most of the trees scattered across millions of hectares of

temperate grazing land in New South Wales and Victoria are old and close to death. Existing land management practices have prevented regeneration of young trees to replace them.

The study pointed out that disappearance of paddock trees would lead to loss of shelter for livestock, loss of habitat for birds and other wildlife,



**Paddock tree in the Lachlan River Catchment, NSW.** Kate Sherrin

decreasing water infiltration and other detrimental flow-on effects over the entire ecosystem.

'The good news is that management practices exist that can reverse the tree regeneration crisis,' said the ANU's Dr Joern Fischer. 'We found that trees are more likely to regenerate in unfertilised pastures [and] under high-intensity rotational grazing than under conventional, continuous grazing.'

## States' smart moves to save energy

**More than 1 million Victorian households and businesses are a step closer to having internet-linked 'smart meters' after CitiPower & Powercor – electricity distribution companies that manage 40 per cent of the state's transmission grid – announced they will commence rollout at the end of this year.**

Smart meters are being installed across Victoria by electricity distribution

businesses following the government's decision to complete a statewide rollout by the end of 2013.

IP-enabled smart meters record the time of energy use, allowing consumers to take advantage of off-peak tariffs and monitor their energy consumption via meter display interfaces and web applications.

Smart meters should also facilitate the uptake of electric and hybrid vehicles by allowing

the use of off-peak grid capacity to charge vehicles as well as 'buy back' of energy stored.

On the other side of the country, the Western Australian Government has become the first state to commit to introducing gross feed-in tariffs, which will see households paid up to 60 cents a kilowatt hour (kWh) for the power they generate from domestic solar systems.

Existing solar power feed-in tariff schemes only provide payment for power returned to the grid in excess of household requirements.



**Smart meters will allow consumers to monitor energy use and tap into off-peak energy.**

CitiPower & Powercor