

The Future is Electric!

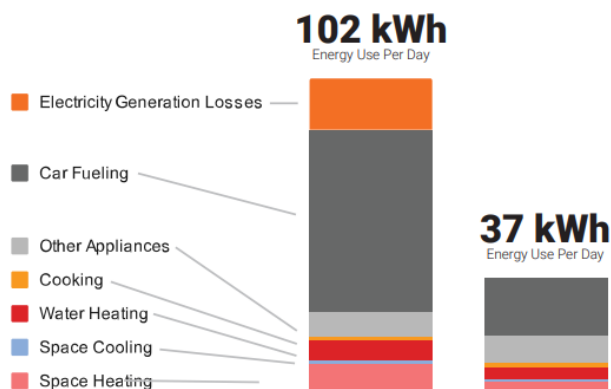
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“Electrifying everything” at home and at work will allow us to significantly reduce our energy use and at the same time lower our costs of living.

The “average” Australian household currently releases 11,000 kg of CO₂ greenhouse gas into the atmosphere every year. Much of this is the result of the inefficiency of using conventional fuels like natural gas and petrol. These fuels are both expensive and highly polluting. Our current electricity grid wastes a huge amount of energy using fossil fuels. Many coal power plants are only 25% efficient and natural gas plants only 45% due to the thermal losses involved in combusting these fuels.

Energy use in average Australian households can be simplified into different categories: space heating and cooling, water heating, cooking, vehicles, and other appliances which are largely electric already. These include fridges, dishwashers, washing machines, dryers, computers, and phone chargers.

The average household has 2.6 people, and 1.8 vehicles. When thinking about households it's useful to think about the appliance energy use as well as the vehicle fuels used by the household. Recreational activities and travelling holidays are lifestyle choices that can be energy intensive, although are not included in the below graph.



Energy consumed by an average Australian household compared to electrified household

If we fully electrify the average Australian household, gas appliances will be replaced with efficient electric ones. Solar panels will be installed on the roof, with a home battery and there will be an electric vehicle in the garage.

By doing this, the average household's energy use (based on 2.6 people, and 1.8 vehicles) will drop significantly from 102kWh to just 37 kWh per day and further reductions will occur with improved insulation and draught proofing. This will reduce home and vehicle running costs by around \$5,000 per year and significantly lower carbon emissions.

With abundant solar energy as well as a favourable regulatory environment, Australia is leading the world in rooftop Solar panels. This allows us to move towards full electrification of all our energy sources much sooner than many other countries.

Our lower population density and large land mass has been supplied by a very extensive electricity and gas transmission network that is costly to build and maintain. This results in higher costs per capita for our energy supplies, compared to other more densely populated countries. Our large houses and sprawling roof spaces do however make us highly suitable to continue embracing high use of solar PV for decentralised energy generation.

Our transport costs are equally proportionally high due to this low population density and the move towards full electrification of all our vehicles will result in biggest reduction in household energy use and cost.

Many households are already familiar with increased use of energy efficient heat pumps for reverse cycle heating and cooling. Heat pumps are now increasingly used for hot water services which provide significant savings in reduced running costs. Induction cooktops are equally more advanced and provide far greater temperature control & safety features compared to the traditional ceramic types.

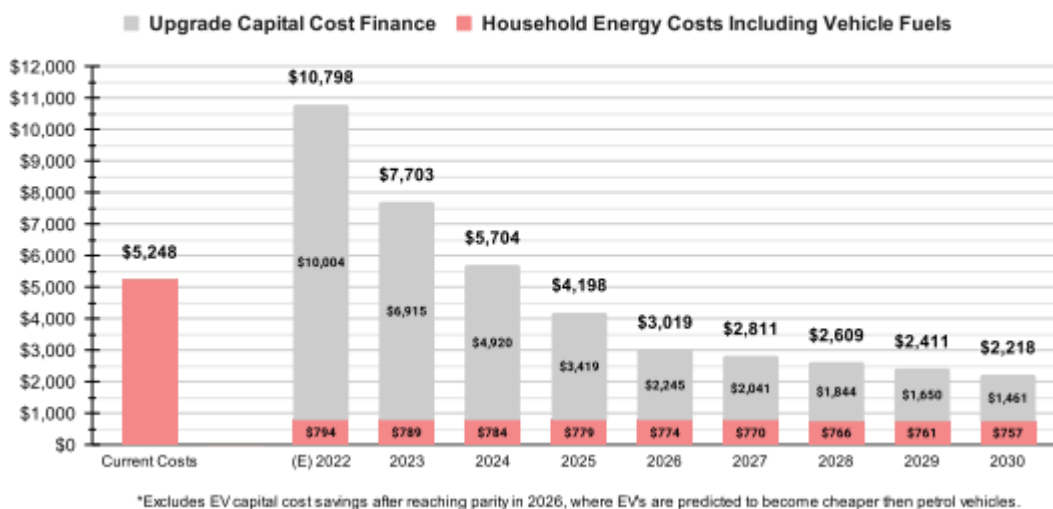
These more advanced types of electric household appliances are typically more expensive to purchase, but much cheaper to operate, compared to their fossil fuel predecessors.

To help accelerate this transition to a full electric economy, we need more incentives to replace our biggest energy consumer being Internal Combustion Vehicles (ICE) with Electric Vehicles. With the reducing revenues of fuel excise, these new policies will need to consider other road taxes and maintenance costs. Advancing technology will provide new solutions to encourage lighter more efficient EV's, fewer kilometres travelled and more public transit, electric scooters, and electric bicycles. All these initiatives create safer and healthier communities.

Finance is a piece of the puzzle that needs to be considered to bring forward these savings opportunities. Banks are now considering how best to provide additional products to support consumer financing for these items.

Current Energy Costs and Costs with Electrification

Electrified household has solar, battery, electric appliances, and electric vehicles. *Excludes more EV savings after 2026.



Current average household energy cost compared to the cost of ‘electrifying everything’

Average household savings forecast by year for an electrified household with rooftop solar, battery, electrified appliances and electric vehicles.

Australia is putting the foundations in place for a comprehensive policy for our transition to full electrification. More than three million households have invested in solar; several agencies have funded important trials and deployment projects in electrification.

Victoria is funding community batteries and assisting households and businesses to upgrade to energy efficient electric appliances. They are also investing in community-owned renewable energy hubs such as the Hume Community Power Hub, who works with communities to provide advice and resources that support upskilling, engagement, and the development of community-based renewable energy projects. Snowy Hydro -2 will provide flexibility for dispatching electricity.

New South Wales is retiring four of their five coal fired electricity generators early and promoting fuel switching (to electric devices) under their energy savings scheme. South Australia is prioritising and supporting the installation of home batteries in public housing. Queensland has the highest penetration of rooftop solar and is working on demand response including water heaters, pool pumps and smarter air conditioners. The NT is providing considerable rebates on home batteries and offering free registration for EVs. The ACT is providing stamp duty exemptions and interest-free loans for EVs and phasing out its natural gas network with plans for newly built homes in 2023 to be fully electric. Tasmania is working on being interconnected more tightly to Victoria’s electricity network, thus using Tasmanian hydro to feed into the national network.

Households in Tatura can play their part in electrification of their households. Consider installing solar to take advantage of the glorious Australian sun, replace old and outdated appliances with energy efficient electric ones, and phase out gas appliances. Check government websites such as <https://www.energy.vic.gov.au/energy-efficiency/victorian-energy-upgrades> to see what rebates are available when purchasing these products.

Works Cited

Griffith Saul, E. J. (2021, October). *CASTLES & CARS SAVINGS IN THE SUBURBS THROUGH ELECTRIFYING EVERYTHING TECHNICAL STUDY and DISCUSSION PAPER*