Your house energy systems in 2030

Lighter Footprints Seminar
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Household energy impacts for next 5+ years: Headwinds

- Anthropocene climate change
- Complications of moving grid to solar, wind and storage and electrifying transport
- Grid may become less reliable and struggle at times to supply electricity
- Very expensive retail energy in Australia

Household energy impacts for next 5+ years: Tailwinds

- Very cheap solar in Australia
- Battery prices dropping
- EV prices dropping
- Easy to make big improvements to thermal envelope at most Australian homes
- Increasing availability of onsite smart energy management
- Innovative electricity tariffs
- Increasing government support for residential energy efficiency and solar in low-income homes

Household energy impacts for next 5+ years: Other factors

- Electrification replacing fossil gas
- Virtual power plants
- Demand response
- Dynamic Operating Envelopes and static limits on your PV/Battery export to the grid
- Emergency Backstop external control turning off your PV generation

The transition should be fast, cost-effective and customer focused

Transition financial benefits should mainly flow to energy customers

Likely household transition energy futureproof goals

- Reduce energy cost
- Increase house comfort
- Increase house energy and economic resilience
- Reduce GHG emissions

How to achieve these goals

- Solar
- House thermal envelope/passive energy systems
- Active energy systems
- Manage home energy systems
- Enablers

2030 home: most important energy system

Most important							
Element	**Reduce energy cost**	**Increase comfort**	**Increase resilience**	**Reduce GHG emissions (petrol/gas)**	**Control / access with onsite EMS or VPP**	**Cost**	**Impact**
Rooftop solar	xxx	x	xx	xxx	xxx	Moderate	High

2030 home: Thermal envelope/passive energy systems

Thermal envelope/passive energy systems							
Element	**Reduce energy cost**	**Increase comfort**	**Increase resilience**	**Reduce GHG emissions (petrol/gas)**	**Control / access with onsite EMS or VPP**	**Cost**	**Impact**
Insulation	xxx	xxx	xxx	xx		Low	High
Draught proofing	xx	xx	xxx	x		Low-moderate	High
Window covers	xx	xx	xxx	x		Low	High
NatHERS 8-9*/ Passivhaus renovations	xxx	xxx	xxx	x		High	High
Retrofit double glazed windows	x	x	x			High	Low
Cocoon room for extreme heat	x	xx	xxx	x		Low	High

2030 home: Active energy systems

Active energy systems							
Element	**Reduce energy cost**	**Increase comfort**	**Increase resilience**	**Reduce GHG emissions (petrol/gas)**	**Control/ access with onsite EMS or VPP**	**Cost**	**Impact**
Battery	xxx		x	x	xxx	High	High
Battery/inverter capable of islanding	xxx	x	xxx	x	xxx	High	High
Type 1 or 2 EV charger	xxx		xxx	xxx	xxx	Low	High
Reverse cycle AC for cooling	x	xxx	xx		xx	Moderate	High
Reverse cycle AC replacing gas heating	xxx	x	xxx	xxx	xx	Moderate	High
Heatpump replacing gas hydronic/ducted heating	xx	x	xx	xxx	xx	High	Moderate-High
Hot water heatpump replacing gas	x		xx	x	x	High	Low
Hot water heatpump replacing electric resistance	xx		xx		x	High	High
Induction cooktop replacing gas	x		x	x		Moderate	Low - Moderate
Resistance element hot-water system replacing gas	x		xxx	x	xxx	Low	Moderate
Energy efficient appliances	x		xx	x	xx	Low-moderate	Moderate

2030 home: Manage energy systems

Manage home energy systems			
Element	**Comments**	**Cost**	**Impact**
Inhouse energy system display	Track where energy is consumed, if solar, battery AC units working correctly etc	Low	Moderate
Individual energy system apps (solar, battery etc)	Track individual household system elements. Using multiple apps can be a nuisance.	Low	Moderate
Energy management system	Optimise energy system usage with what the customer wants, solar generation, tariff etc	Low	High
Weather station	How does the house respond to wind, ambient temperature etc as shown by heating/cooling energy consumption	Low	Low-moderate
Internal temperature monitoring	With weather station data can be used to inform preheating/cooling decisions	Low	Low-moderate
Circuit level electricity consumption monitoring	Where and when is energy used at the house.	Low	Moderate

2030 home: Energy system enablers

Enablers			
Element	**Comments**	**Cost**	**Impact**
24 pole switchboard	Plenty of space for more electric loads, monitoring, control etc	Low	High
3 phase wiring	Should be considered as more electric loads added. Hydronic/ducted heatpumps can draw 5KW. Type 2 chargers 7KW.	Moderate	Moderate -high
Energy systems support access/ control through open standards	Rather than locked into what individual vendors offer.	Low	High
Cheap time-of-use energy tariff	Solar and more householder agency over energy use increases the ability to use cheap offpeak tariff periods for residual electricity demand	Very low	High
Solar sponge midday electricity tariff	Some retailers are offering free electricity between 11am-2pm!	Very low	High

What's the best way to help households with transition energy systems decisions?

Government information, subsidy and loans?

Pop-up sessions at the Tower Hotel?

Community energy groups?

Energy sector information?

Equipment vendors?

Neighbours?

Tradies?

?

Please feel free to contact me:

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