

***Helping households with energy system
decisions***

***Lighter Footprints
Knowledge is Power Seminar
17 July 2024***

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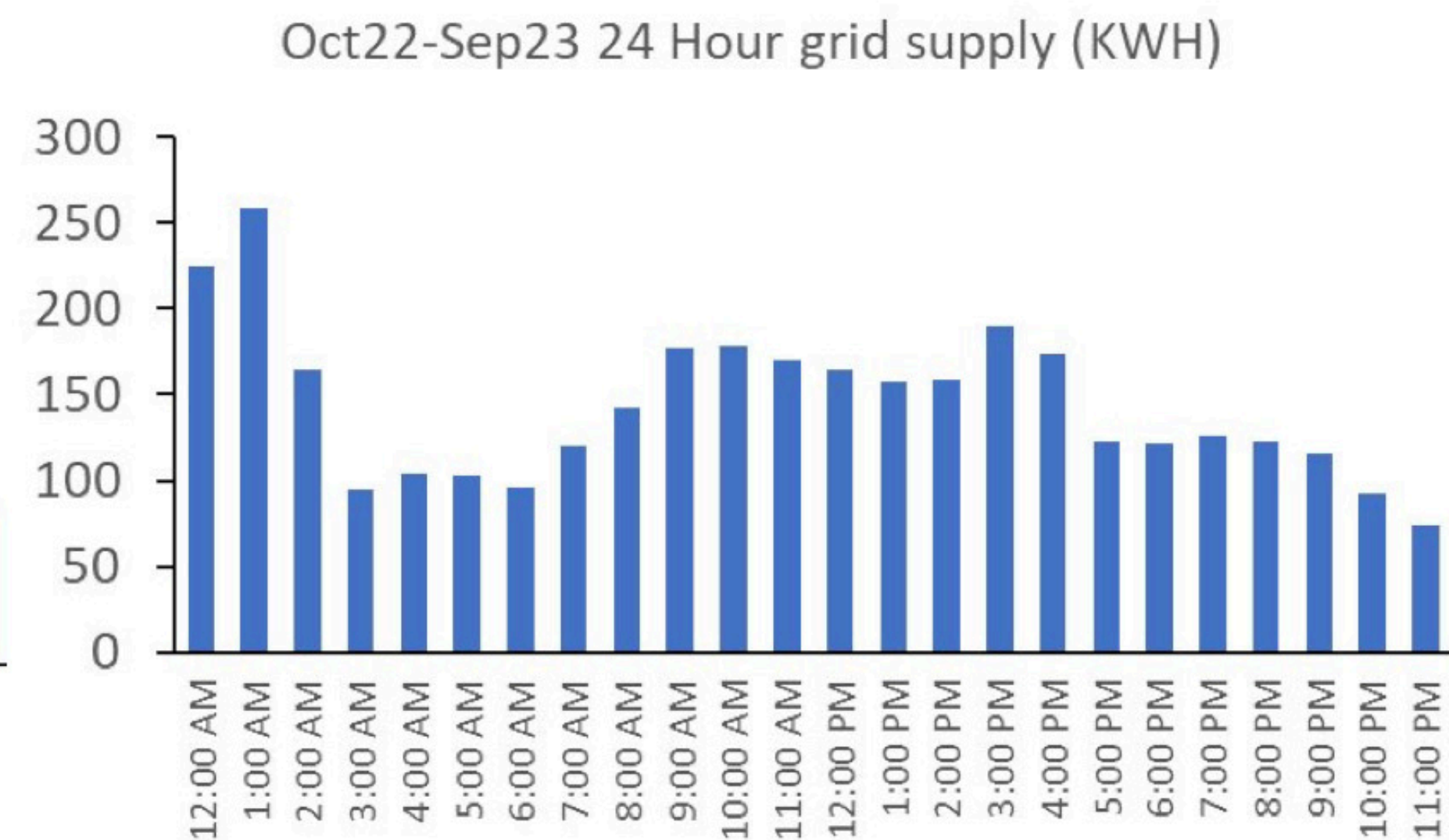
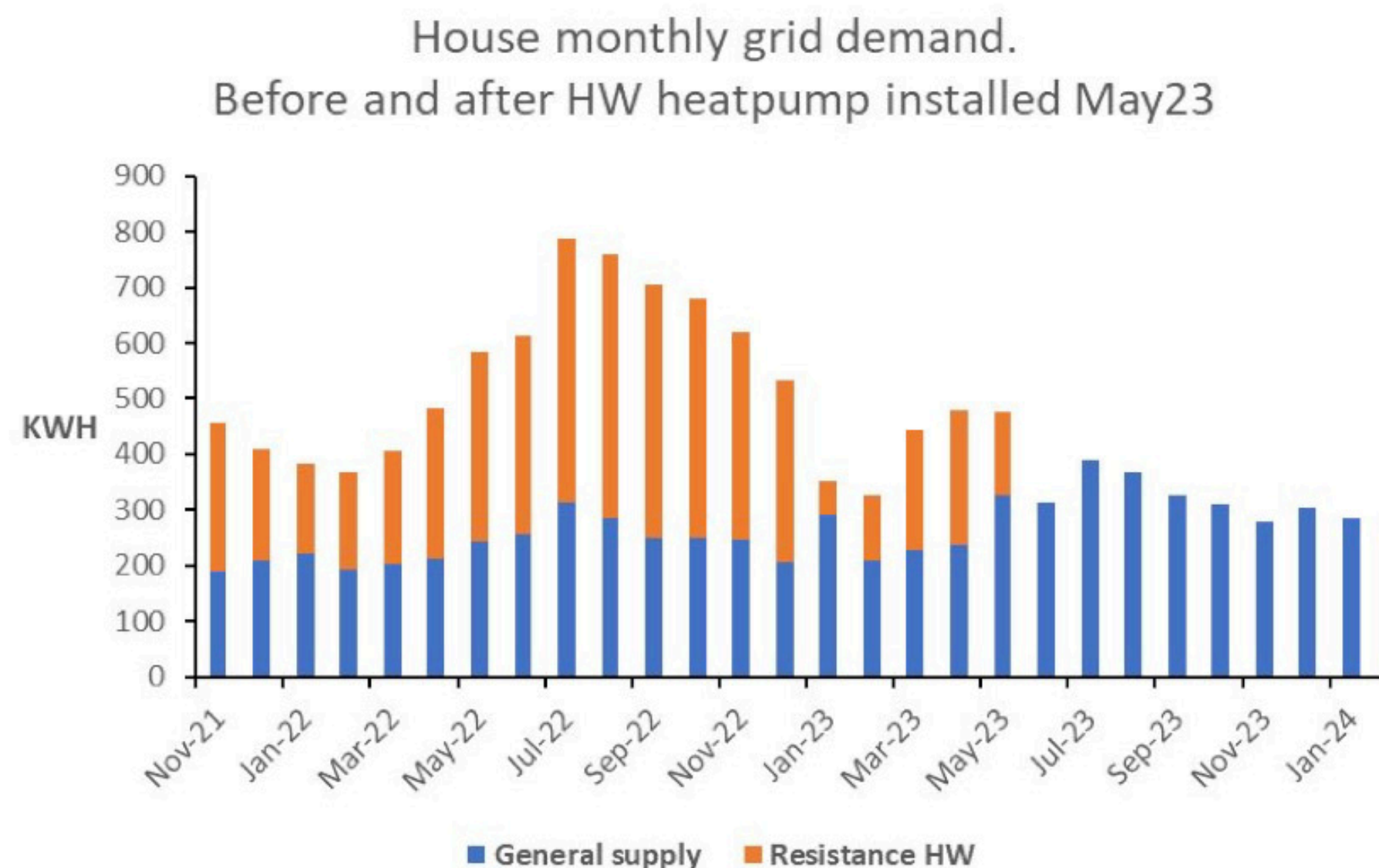
**The transition should be fast, cost-effective
and customer focused**

**Transition financial benefits should mainly
flow to energy customers**

- House at comfortable temperature, lighting, showers, TV/computers/audio, washed and dry clothes ...
- Low cost for these outcomes
- Reliability/Resilience
- Control
- Reduced exposure to energy retailers etc

- Send potential client detailed questionnaire
- Analyse current energy consumption and cost
- Use client questionnaire answers to identify current and longer-term energy systems
- Model energy systems cost and performance for likely future energy demand
- Prepare report for client
- Help client with installers

Sample current consumption analysis



Nov22-Oct23 consumption cost using previous vs new electricity tariff from same retailer										
	Rates/unit	Current retailer - previous plan				Current retailer - new plan				
		Times	Oct22-Sep23	Plan change notice	Cost (\$)	Times	Oct22-Sep23	New plan	Cost (\$)	
Single rate	c/KWH	All hours/single rate	3,455	21.70	749.76	All hours/single rate	3,455	28.71	991.97	
Supply connection	c/day	All days in year	365	116.23	424.24	All days in year	365	115.25	420.66	
Solar feedin (KWH)	c/KWH	All hours/single rate	1,566	4.90	- 76.76	All hours/single rate	1,566	4.90	- 76.76	
Total					1,097.25	Total				
						1,335.88				

Client's main goals

- Reduce electricity cost?
- Decrease GHG emissions?
- Electrify house?
- Warmer in winter?
- Cooler in summer?

- Switchboard photo
- Install new/more solar
- Battery
- Current space conditioning systems
- Reverse-cycle air-conditioning
- Thermal envelope
- Current windows
- Hot water
- Water pumps/irrigation
- EV charger
- Induction cooktop

- Smart grid
 - Client is interested in inhouse energy system display and internal temperature monitoring?
 - To use PV generation and cheap tariff periods more effectively can potentially monitor and control
 - Reverse cycle AC heating and cooling
 - Battery
 - PV
 - EV charger
 - Hot-water resistance heater or heatpump
 - Water pumps if any irrigation

Report analysis and recommendations excerpts

Hot-water HP, reverse-cycle AC, PV and battery scenario indicative best case estimates											
	Battery size (KWH)	0				10			14		
	PV	0	4.8KW	6KW	8.4KW	4.8KW	6KW	8.4KW	4.8KW	6KW	8.4KW
2022 grid supply	Peak (KWH)	1436	1027	985	960	32	26	22	10	7	6
	Offpeak (KWH)	3732	1236	1147	1012	767	556	304	679	460	193
	Total (KWH)	5168	2263	2132	1972	799	582	327	689	467	199
	Cost (\$)	1469	721	682	641	190	139	80	160	109	47
	5KW export curtailment (KWH)	0	0	0	386	0	0	0	0	0	0
Solar feedin	KWH	0	3813	5113	7725	2183	3394	5966	2065	3270	5826
	Benefit (\$)	0	-191	-256	-386	-109	-170	-298	-103	-164	-291
Retailer services	Cost (\$)	526				526			526		
	Annual electricity cost/credit (\$)	1994	1056	952	780	606	495	307	583	471	281
	Battery benefit	NA				449	458	473	473	482	499
	Total benefit (\$)	NA	939	1042	1214	1388	1500	1687	1412	1523	1713

Reverse cycle AC

- Install ~3KW (input) reverse-cycle AC unit in living area
- Install ~1KW (input) reverse cycle AC unit in children's bedroom
- Install ~1KW (input) reverse cycle AC unit in children's bedroom
- Assume efficient reverse-cycle AC units with COP of at least 3
- Old unit in office can be replaced with new more efficient system
- This setup provides inherently zoned heating and cooling.
- Analytical Engines can assist brand and model selection. Choice have recently published an excellent guide to reverse-cycle AC units available in Australia.

- Report is a snapshot of what client thinks they want at that time
- Actionable outcomes!
- Help interpret between installers and client
- Check systems are working once installed

Other client assistance

- Best electricity tariff for home
- Advice on whether to join VPP
- Is battery/solar working?
- Schedule battery charge/discharge
- Something left on
- Is hot-water heatpump/poolpump timer set for best time (tariff/solar)
- ...
- Current project with retailer using my toolkit to examine anonymised customer interval data for cost-saving opportunities



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