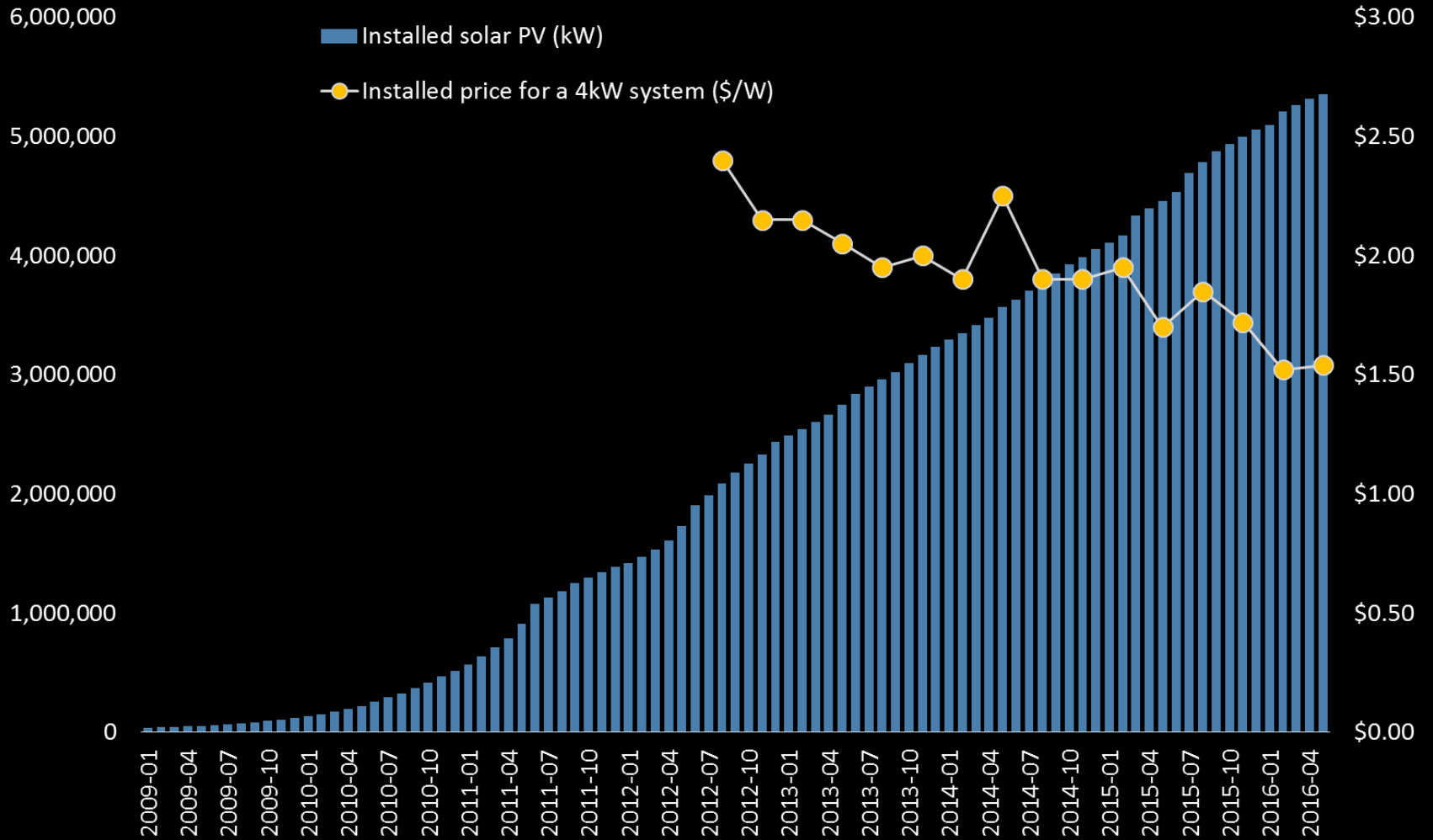


Solar Generation & Battery Storage

Simon Evans — Director, Beast Solutions

Why go solar?

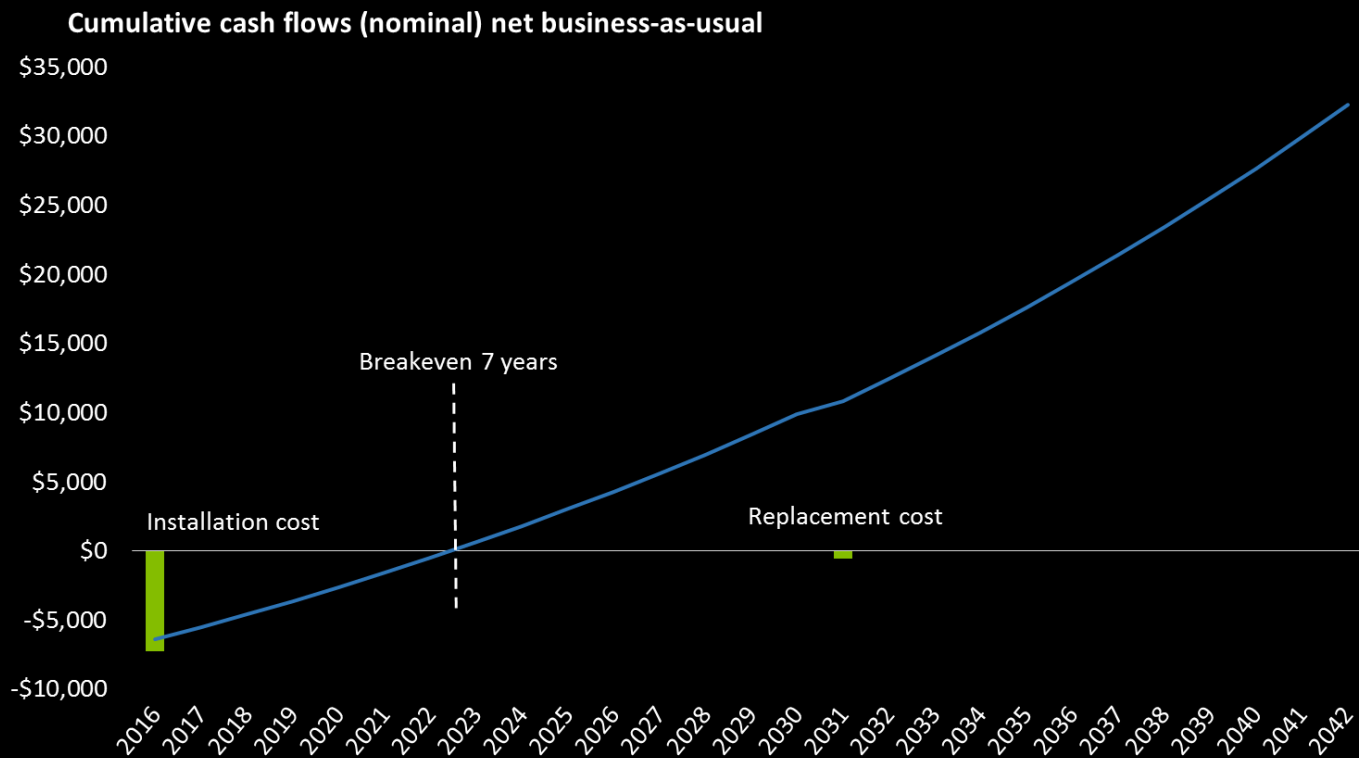


Why go solar?



Example: 4 kW residential solar system (\$1.81/W)

- Pays for itself in 7 years
- Annualised return on investment 18%
- Internal rate of return 17%

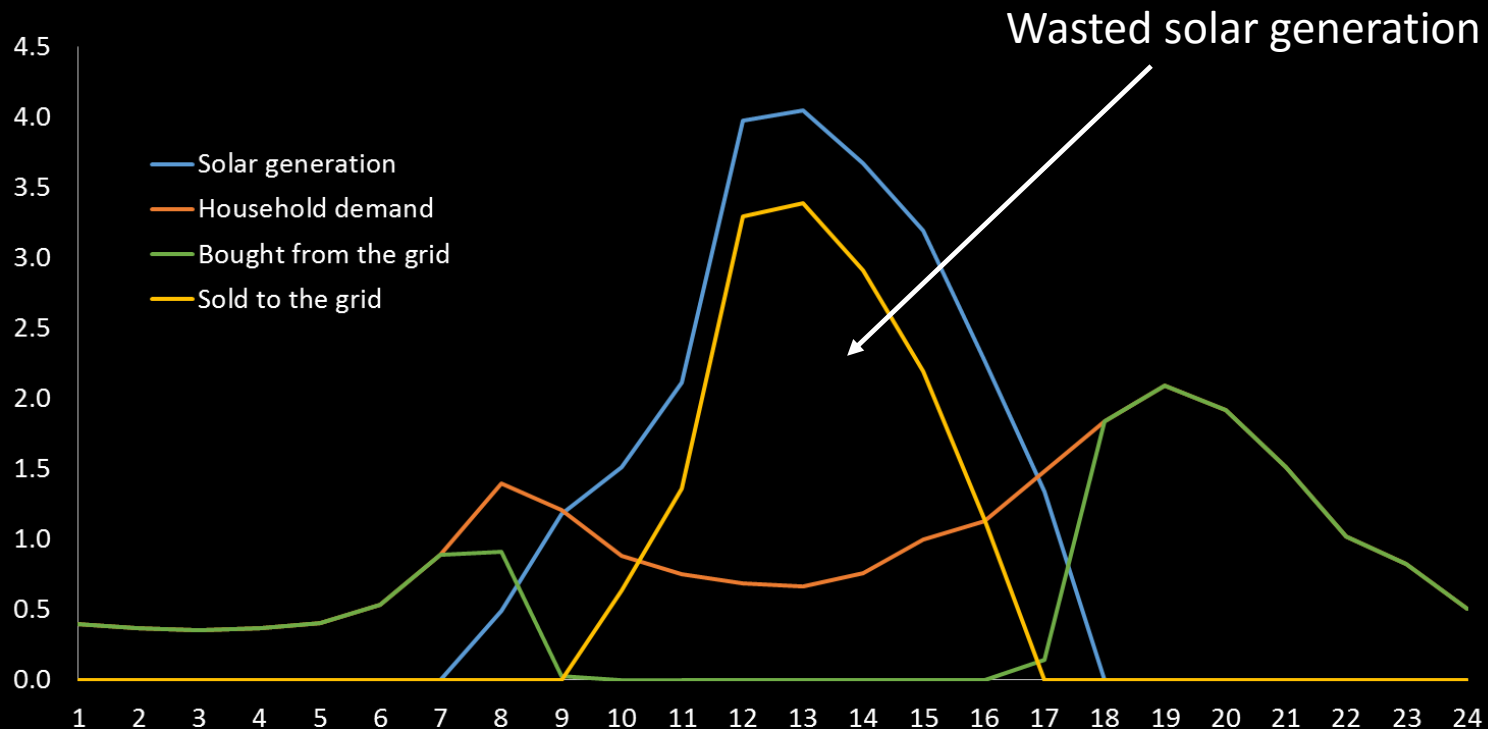


Why go solar?



Example: 4 kW residential solar system

- Reduces grid consumption by 30%–35%

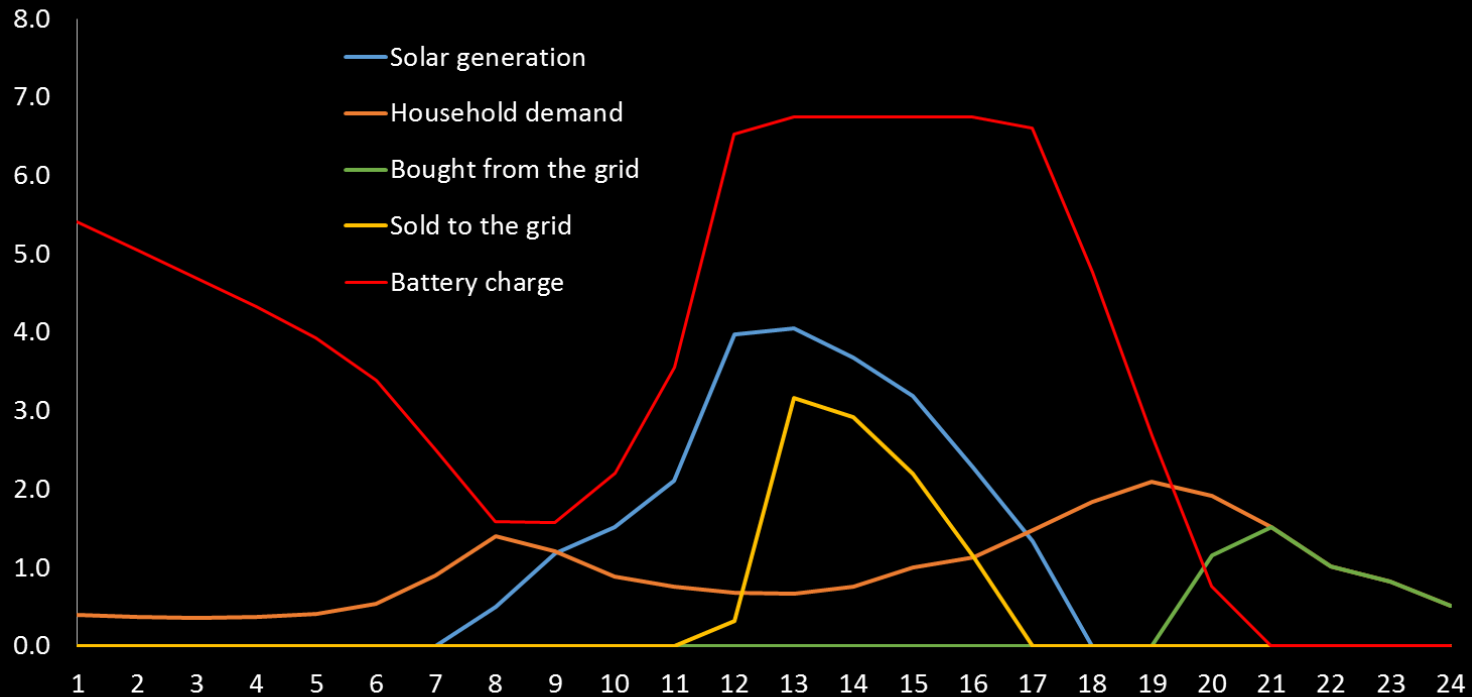


Why go batteries?



Example: add 9 kWh of Li-Ion storage

- Reduces grid consumption by 50%–60%

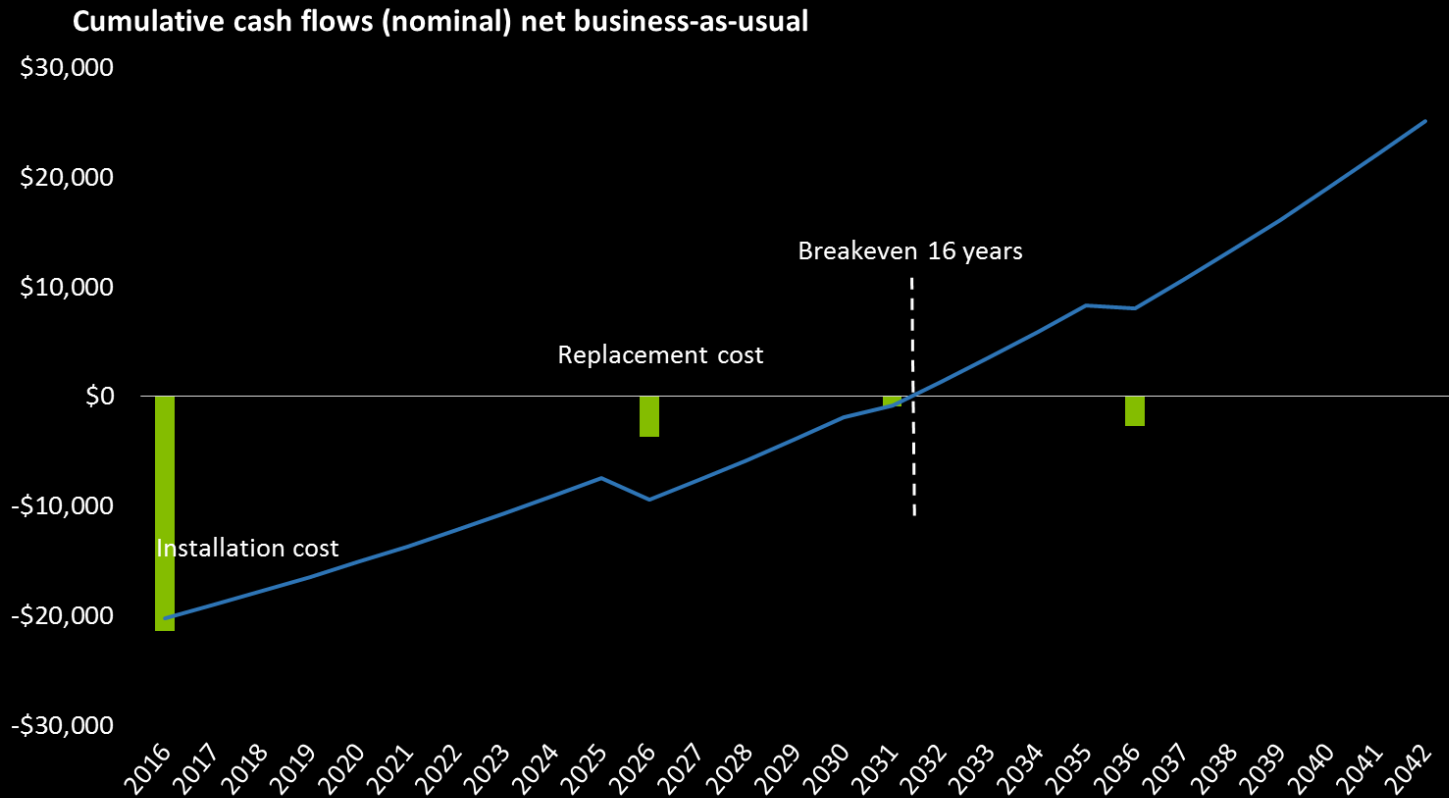


Why go batteries?



Example: add 9 kWh of Li-Ion storage

- Pays for itself in 16 years
- Annualised return on investment 5%
- Internal rate of return 6%



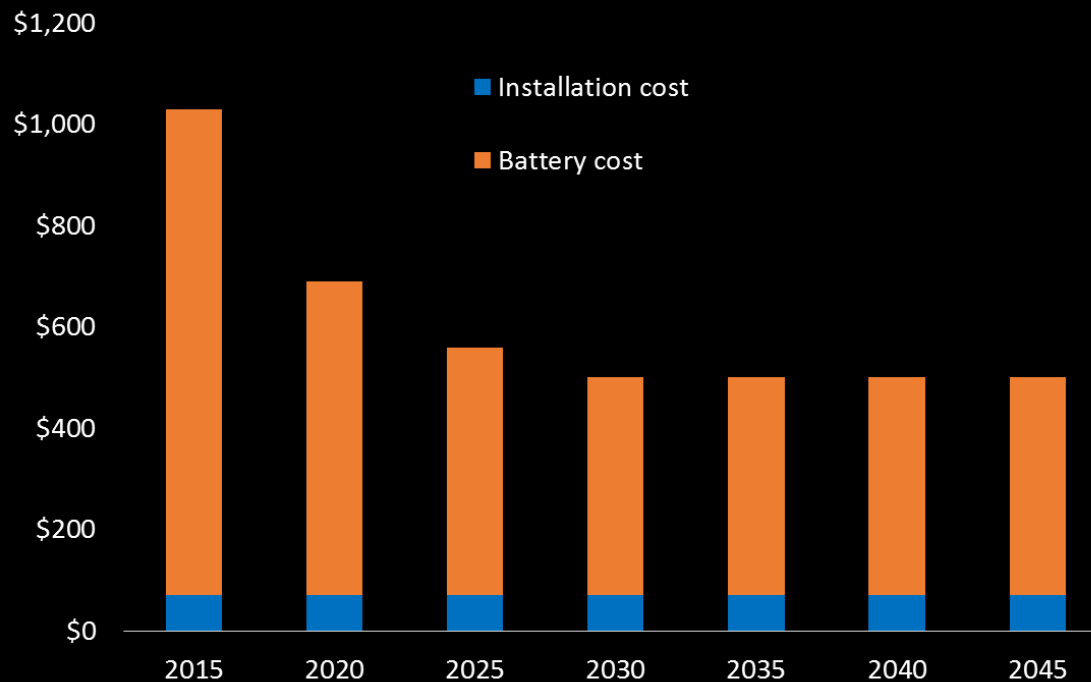
Why go batteries?



A vanilla residential battery is still mostly a green choice, not a financial one.

But...

Lithium-Ion battery price forecast



Better value from batteries



Smart energy management systems

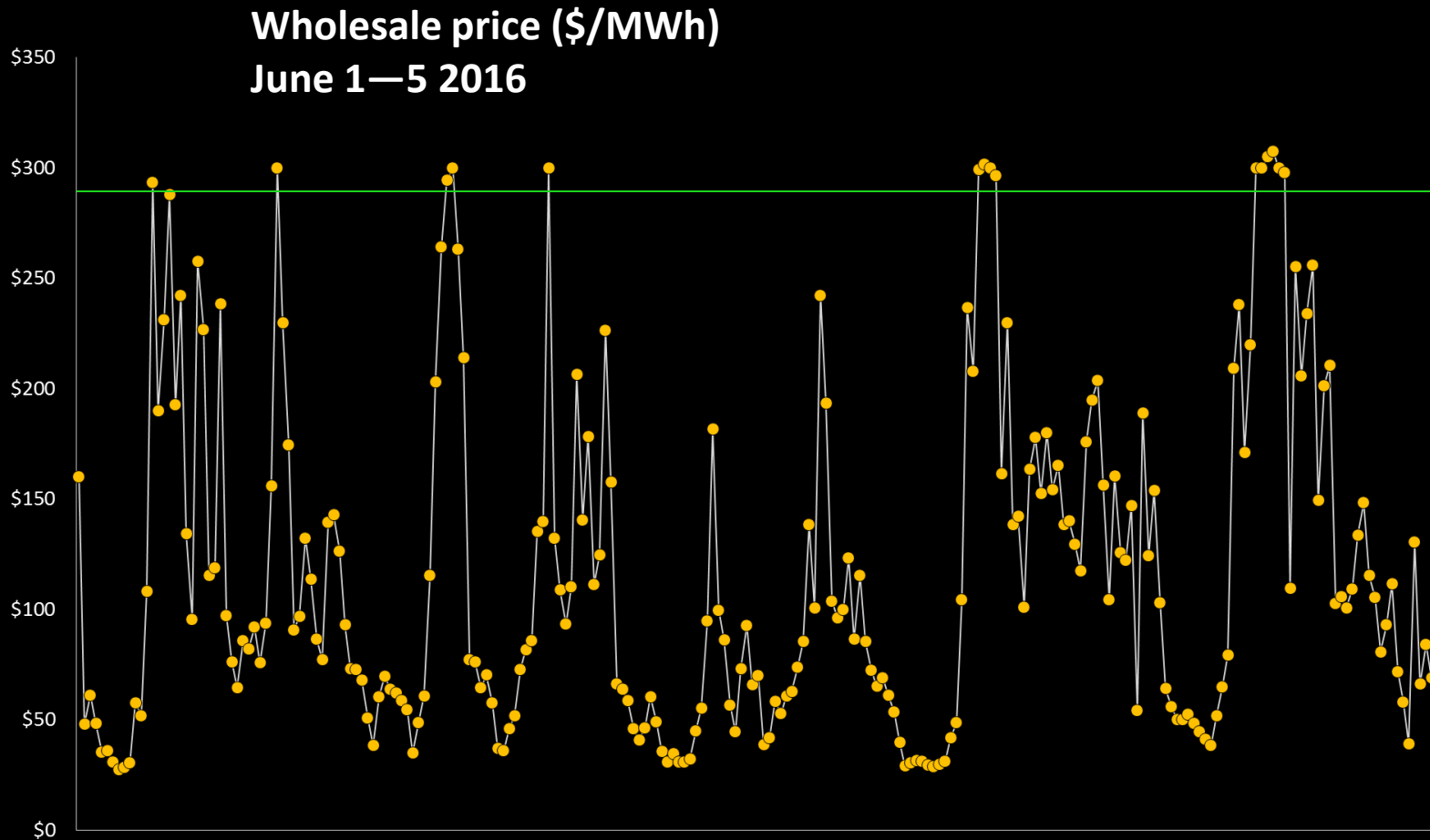
- CarbonTrack
- Evergen
- etc.



Better value from batteries



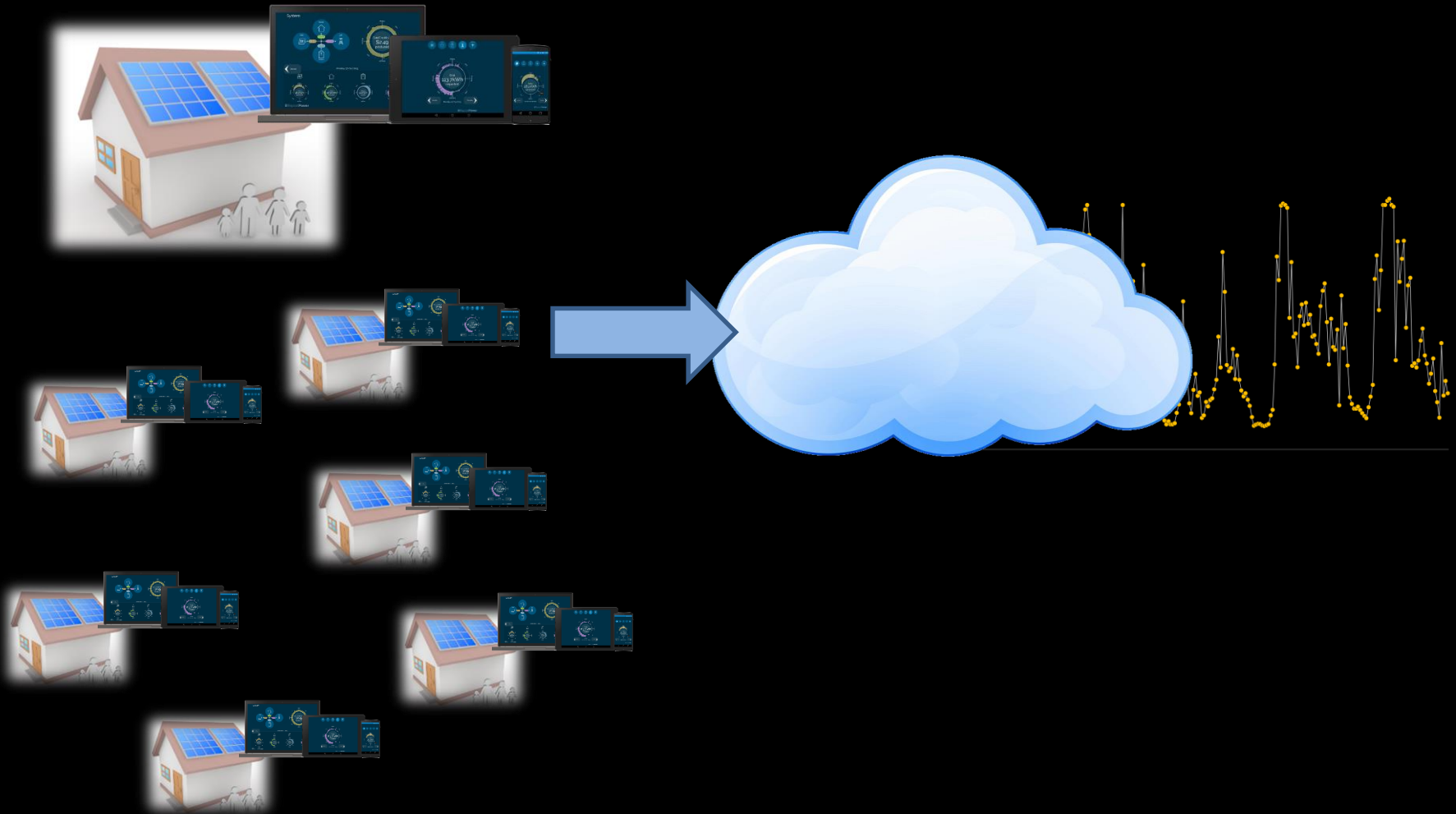
Reposit Power



Better value from batteries



Reposit Power

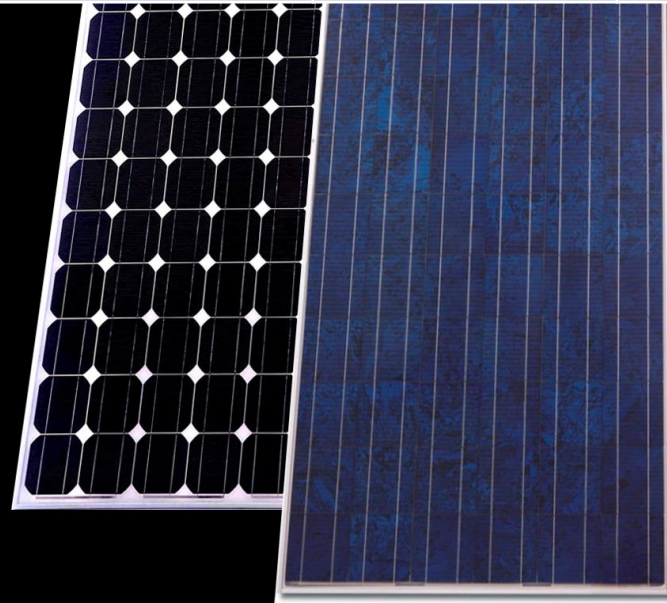


Buying solar & batteries



	Monocrystalline	Polycrystalline	Thin film	Inverter
Efficiency	15%–20%	12%–16%	6%–10%	>90%
Degradation per year	0.35%	0.64%	0.64%	–
Warranty	25	25	10–25	10
Lifetime	>30	>30	15–30	10–15
Space efficiency (W/m ²)	180–200	170–190	80–100	–

Grade	Market share
Tier 1	2%
Tier 2	8%
Tier 3	90%



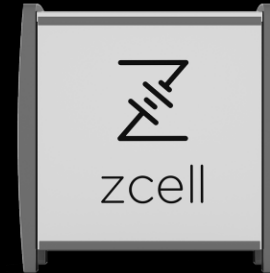
Buying solar



Top tips

- Ask for Tier-1 manufacturers (Trina, Kyocera, and others)
- Ask for an inverter with a 10-year warranty (SMA, Fronius and others)
- Look for an installer with industry accreditation (Solar Gold, Australian Solar Council, Clean Energy Council)
- Look for an installer with after-sales monitoring & maintenance
- Ask to see a financial and energy analysis

Buying batteries



	Tesla Powerwall	Samsung ESS	Redflow Z-Cell	Aquion Aspen
Chemistry	Lithium-ion	Lithium-ion	Zinc-bromide	Aqueous hybrid ion
Cost	\$8,000	\$12,000	\$12,600	\$7,500 (3 × \$2,500)
Usable storage	5.4 kWh	6.5 kWh	10 kWh	6.6 kWh
Warrantied total kWh	18,000	35,000	30,000	39,600
Cost/warrantied kWh*	\$0.44	\$0.34	\$0.42	\$0.19
Round-trip efficiency	92%	95%	80%	90%

* does not include battery inverter

Buying batteries



Top tips

- Do your research on battery types and models — they vary widely
- Look at safety and end-of-life disposal
- Look for an experienced installer
- Look for an installer with after-sales monitoring & maintenance
- Ask to see a financial and energy analysis

The near future: microgrids



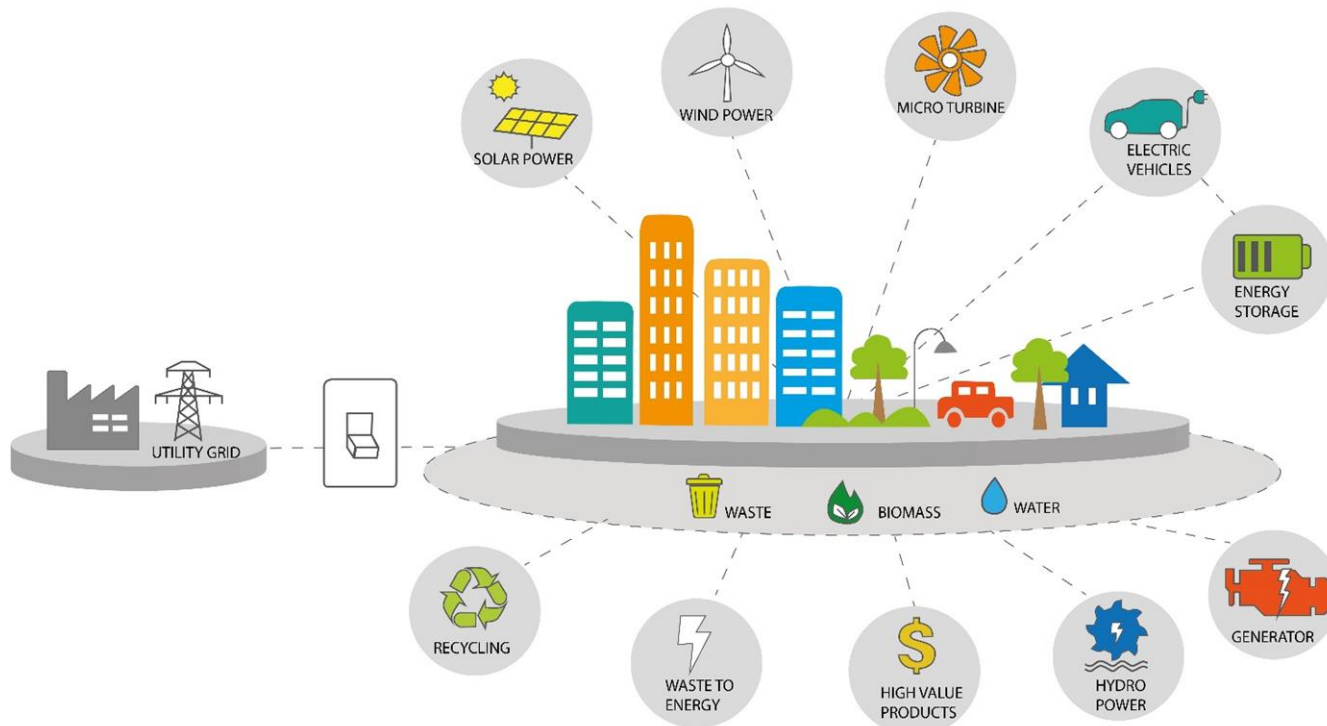
A **microgrid** is a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries.

A **microgrid** acts as a single controllable entity with respect to the grid.

A **microgrid** can connect and disconnect from the grid to enable it to operate in both grid-connected or island mode.

— US Department of Energy

The near future: microgrids



THANK YOU

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