GRATTAN Institute

Impacts of cost-reflective pricing on the economics of battery storage

David Blowers
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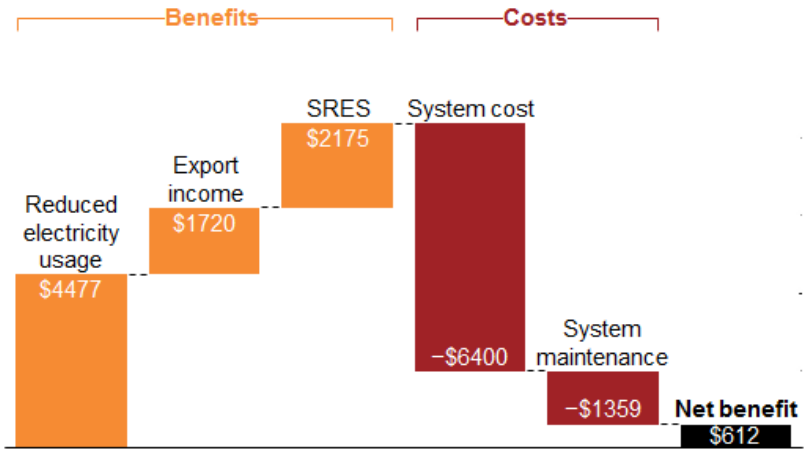
Solar PV and batteries as a disruptive technology?

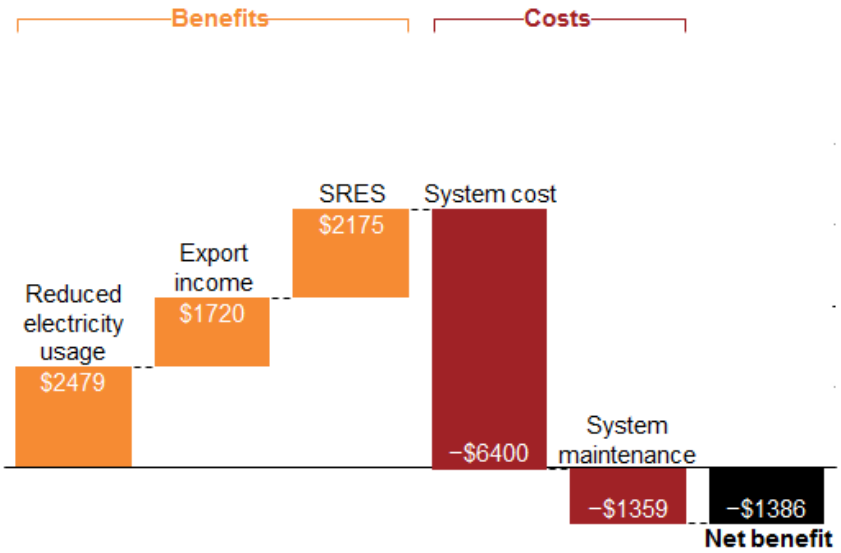
- Traditionally, all consumers, with the exception of those in some remote areas, have relied on centralised generation and the grid
- Generous subsidies have driven very high adoption of solar PV, as more and more urban households have some form of distributed generation
- Emergence of battery technology provides the opportunity for consumers to leave the grid altogether
- The death spiral and the end of the grid?

Demand tariffs will make solar PV less attractive

Solar PV in the money now

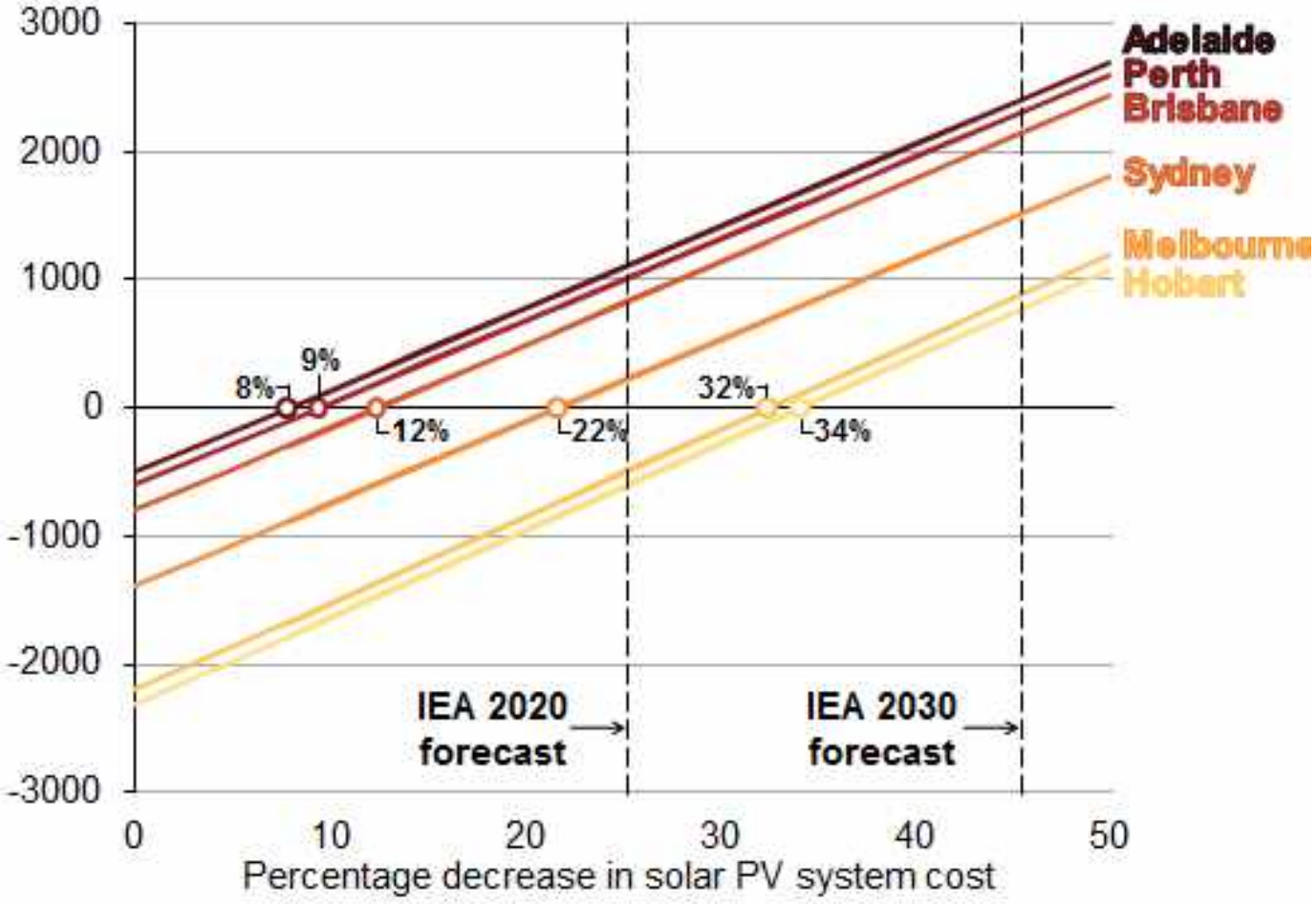


But a lot further away under demand tariffs



But it won't be long before solar PV is back in the money

The cost of solar PV will fall even further



More cost-reflective tariffs incentivise batteries

- **Under existing flat-rate tariffs, consumers with solar PV batteries will save the unit cost of electricity (c/kwh) minus the feed-in tariff**

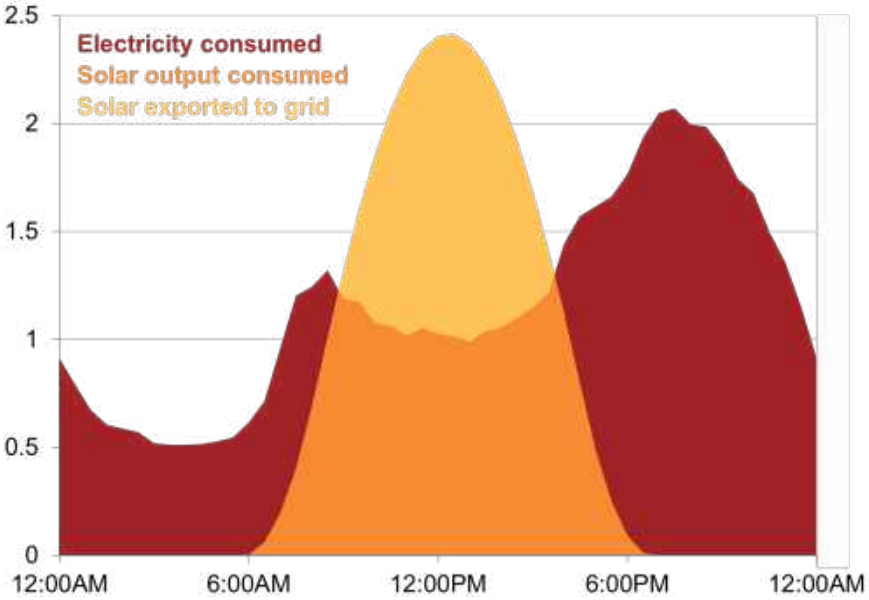
- **If more of the electricity costs are recovered through higher pricing during peak periods, consumers who can reduce consumption from the grid at peak times can save**

- **Options are:**
  - **Time-of-use (or flexible pricing)**
  - **Demand tariffs**
  - **Critical-peak pricing.**

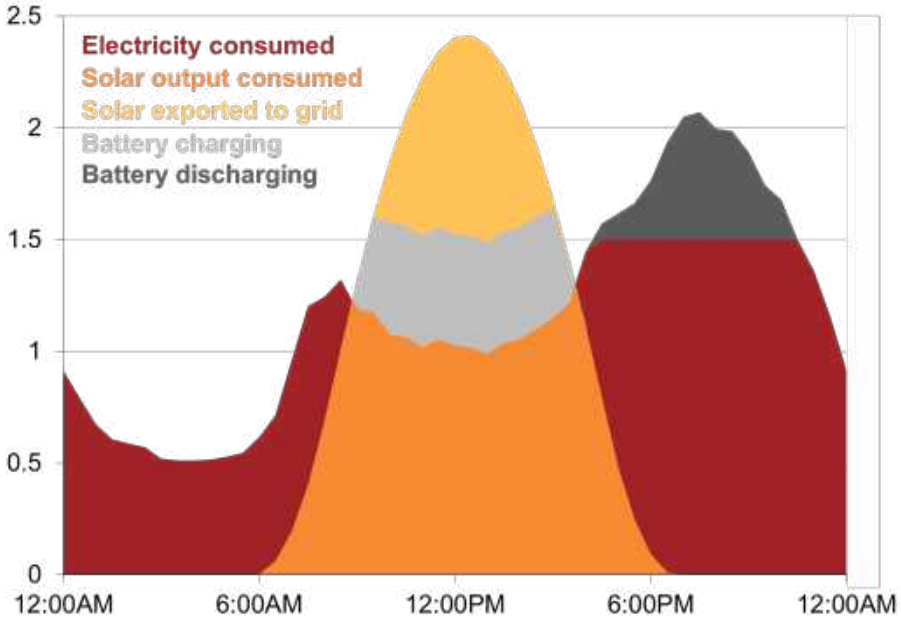
- **Savings equate to peak period saving + unit cost of electricity – feed-in tariff**

Battery technology will change the way we use electricity

Solar PV is limited in reducing peak consumption



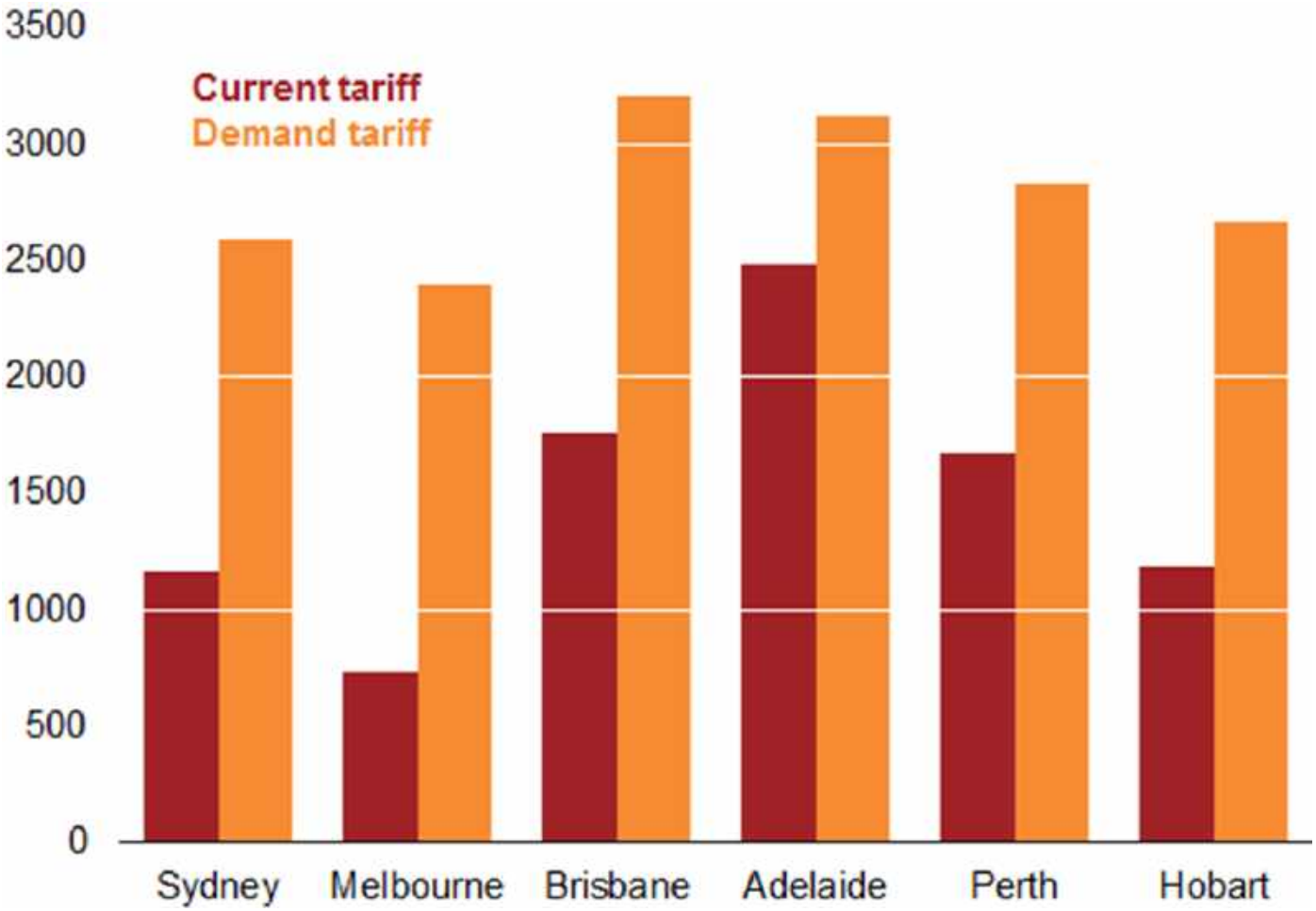
Batteries are not



More savings with demand tariffs than volumetric tariffs

- A household with a three-kilowatt solar PV system already installed will save an additional $300 to $400 a year on their electricity bill if they install a seven-kilowatt-hour battery under a demand tariff
- This is about $100 more a year than the same household would save under the current tariff structure
- Battery life can be as much as doubled if used under a demand tariff than under a volumetric tariff
- Under a demand tariff, the decision to install a seven-kilowatt hour battery without solar becomes economically feasible at an installed price of $2300 in all cities apart from Sydney and Melbourne.

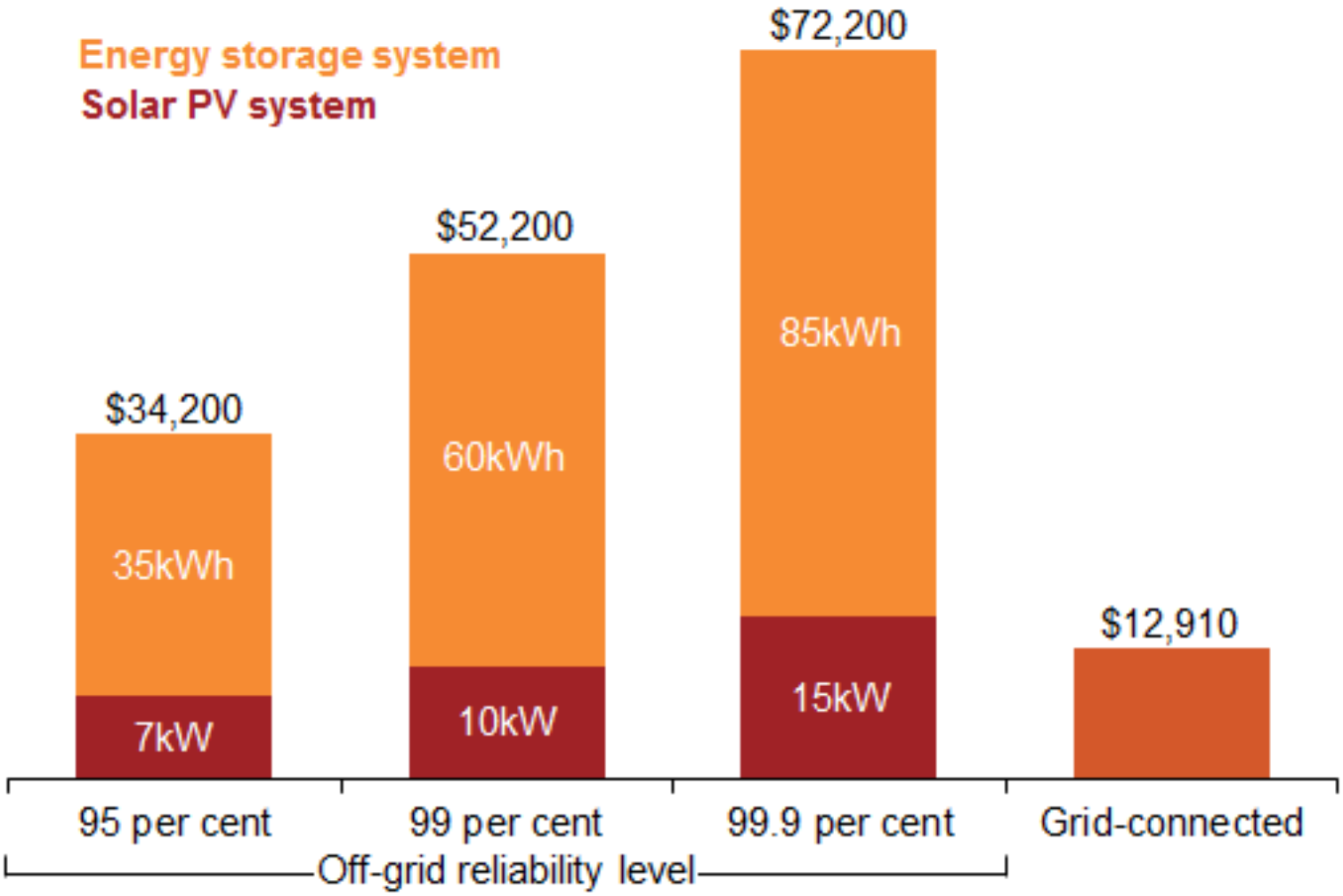
Demand tariffs will benefit the adoption of battery storage



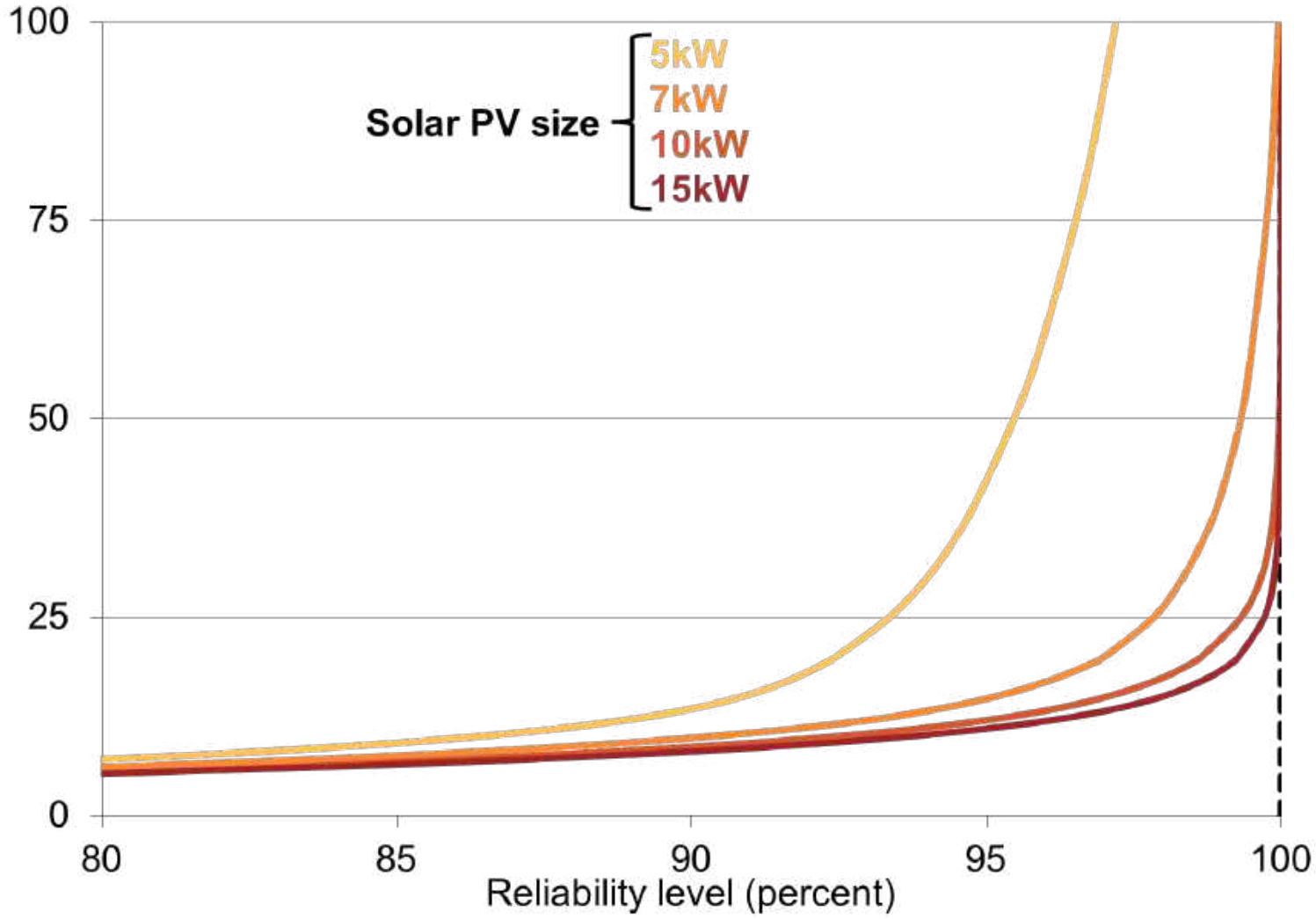
… but the level of incentive will rely heavily on the structure of the tariff

- Much will depend on where networks/retailers choose to place the residual – the price paid for existing infrastructure
- The higher the cost of the time-specific component of the tariff, the greater the incentive to adopt battery storage. Either:
  - peak period;
  - critical peak period; or
  - demand tariff.
- The higher the fixed component, the lower the incentive for battery storage (and solar PV)
- But a high fixed component could be perceived as increasing the incentive to leave the grid

But going off-grid is unlikely for most urban households



The price you pay will depend on the reliability you want



There will be challenges for the electricity sector

- **Death spiral unlikely, but batteries with cost-reflective pricing can have consequences for generation and networks**
- **Lower peak prices for all generation may question the economic viability of some generators**
- **High cost of future network investment could be reduced or avoided**
- **But falling demand could also impact network businesses revenue recovery**
- **There may still need to be asset write-downs and policy makers must face the question of who will pay for the parts of the grid that are not needed.**

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