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Efficiency of tariffs for new and emerging technologies in the NEM

Findings and results

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Insight in Economics™

Task

- Our analysis is based on four case studies:

1. Air conditioners in Victoria
2. Solar PV in South Australia
3. Battery Storage in Queensland
4. Electric Vehicles in New South Wales

Case Study 1:
Air conditioners and SP AusNet

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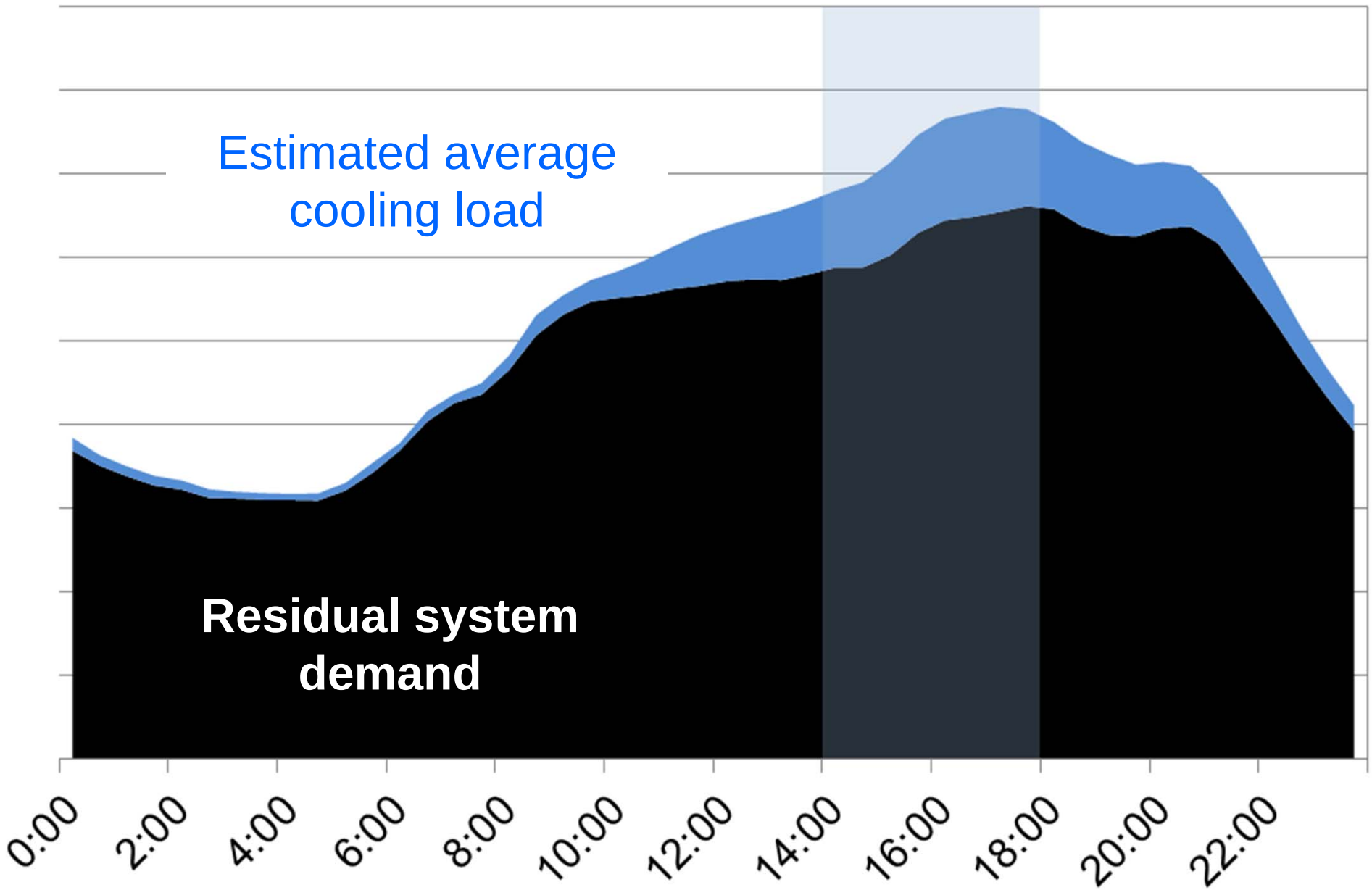
SP AusNet™
A member of Singapore Power Group

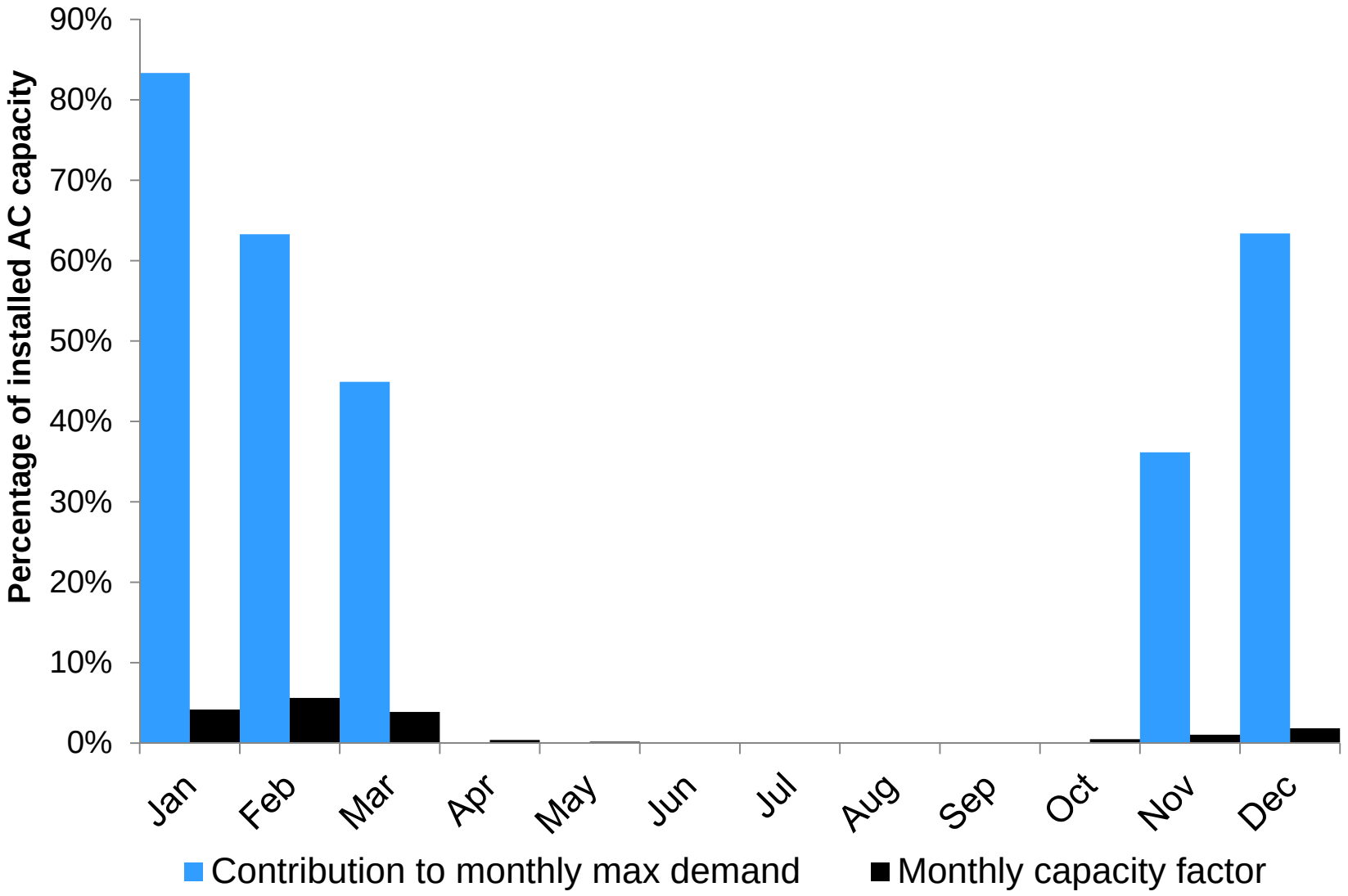
- We developed the shape of the load profile as a function of temperature
- Network tariff
  - Residential flat tariffs (NEE11– DUOS)
  - Residential ToU tariff (NSP11– DUOS) [1]
- Retail tariffs
  - Residential flat tariff (standing offer)[2]
  - Residential ToU tariff (standing offer)[2]

1. Only a handful of customers are on this tariff. All input data is for NEE11. 2. Energy Australia and Origin Energy.

Air-conditioner contribution to system demand – 2013



Air-conditioners have low capacity factors, but still contribute to MD



Using an air conditioner increases a customer's network bill

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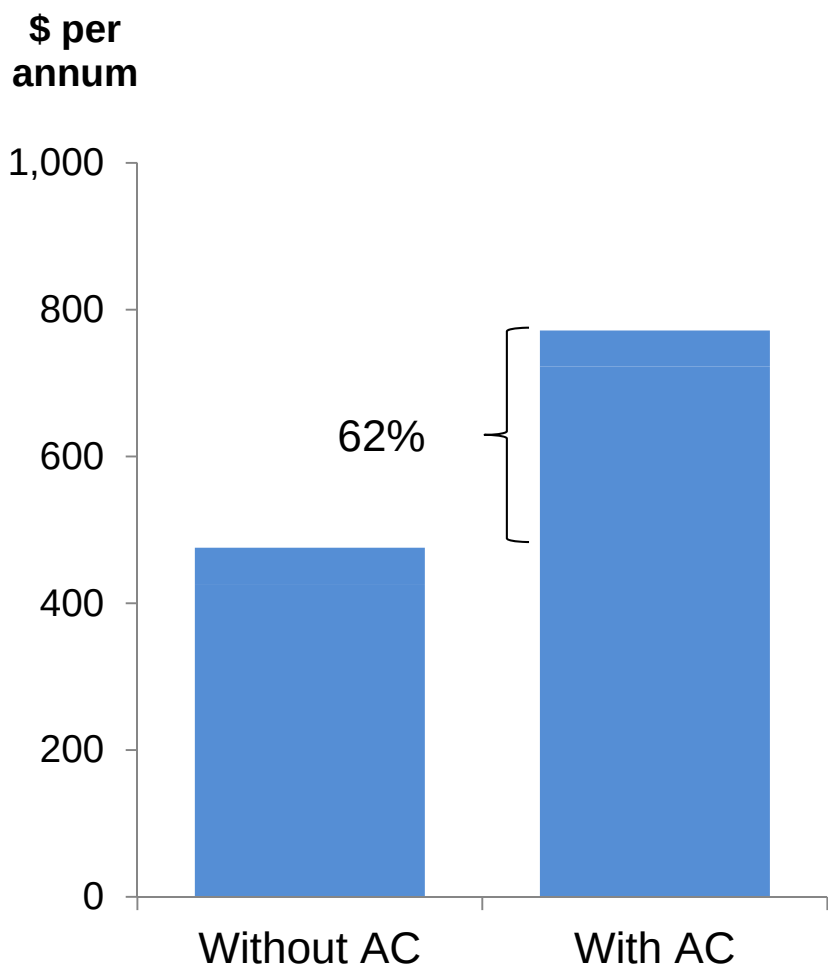
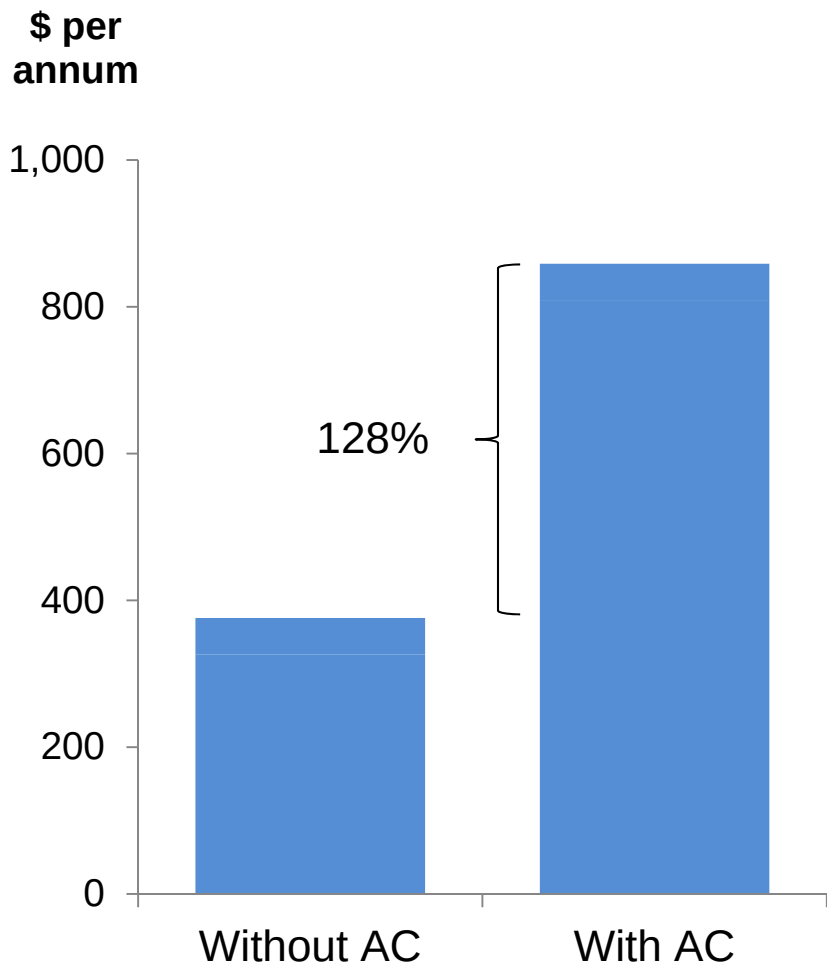
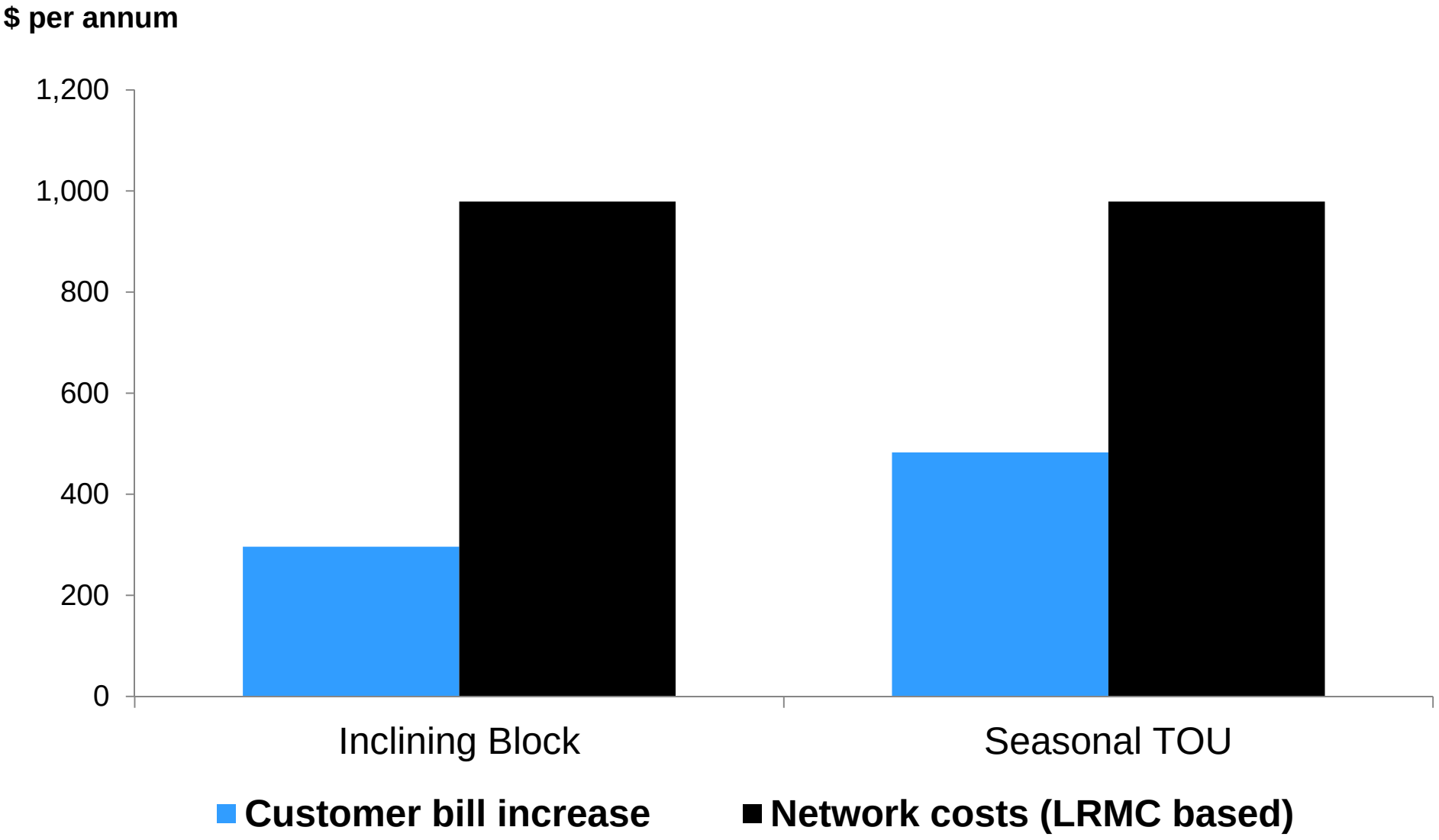
Inclining block tariff



Seasonal TOU tariff



Air-conditioners impose costs on the network that exceed costs to the consumer



Using an air conditioner increases a customer's retail bill considerably

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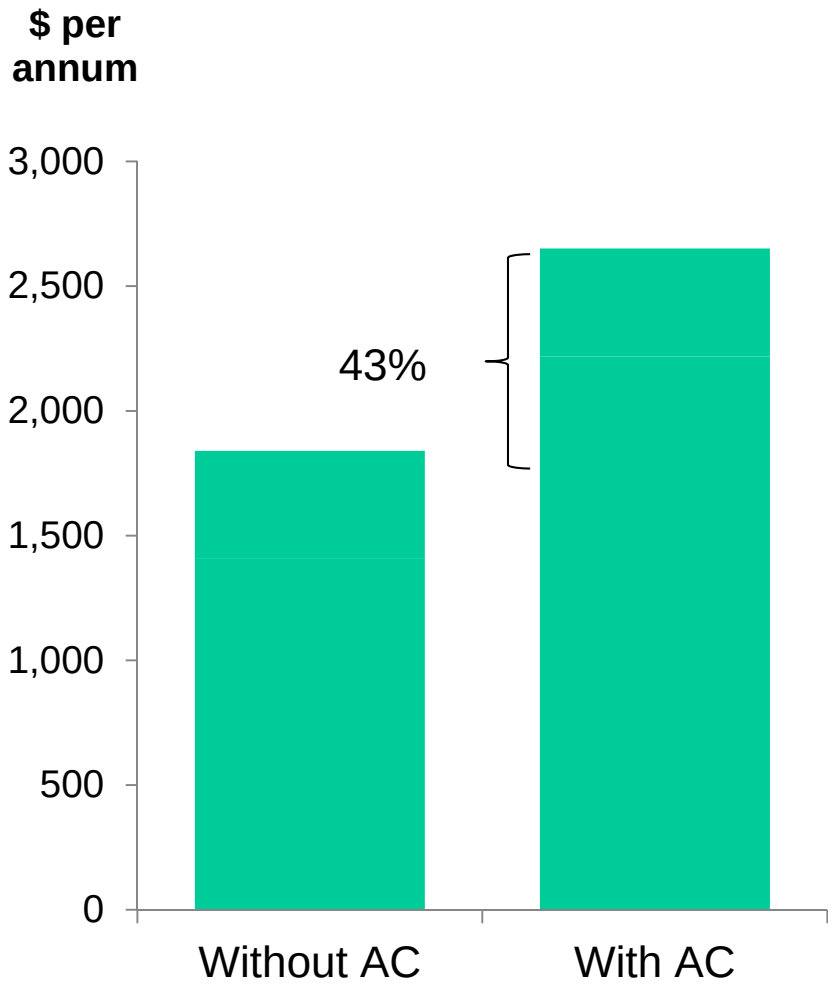
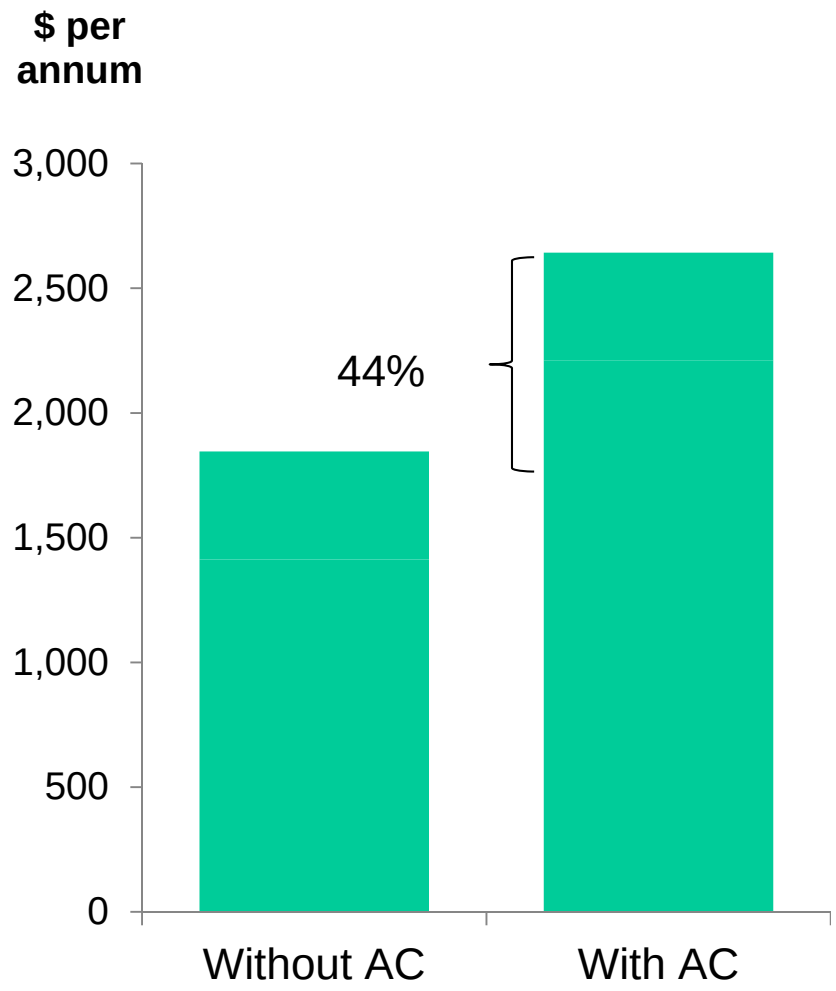
Inclining block tariff



TOU tariff

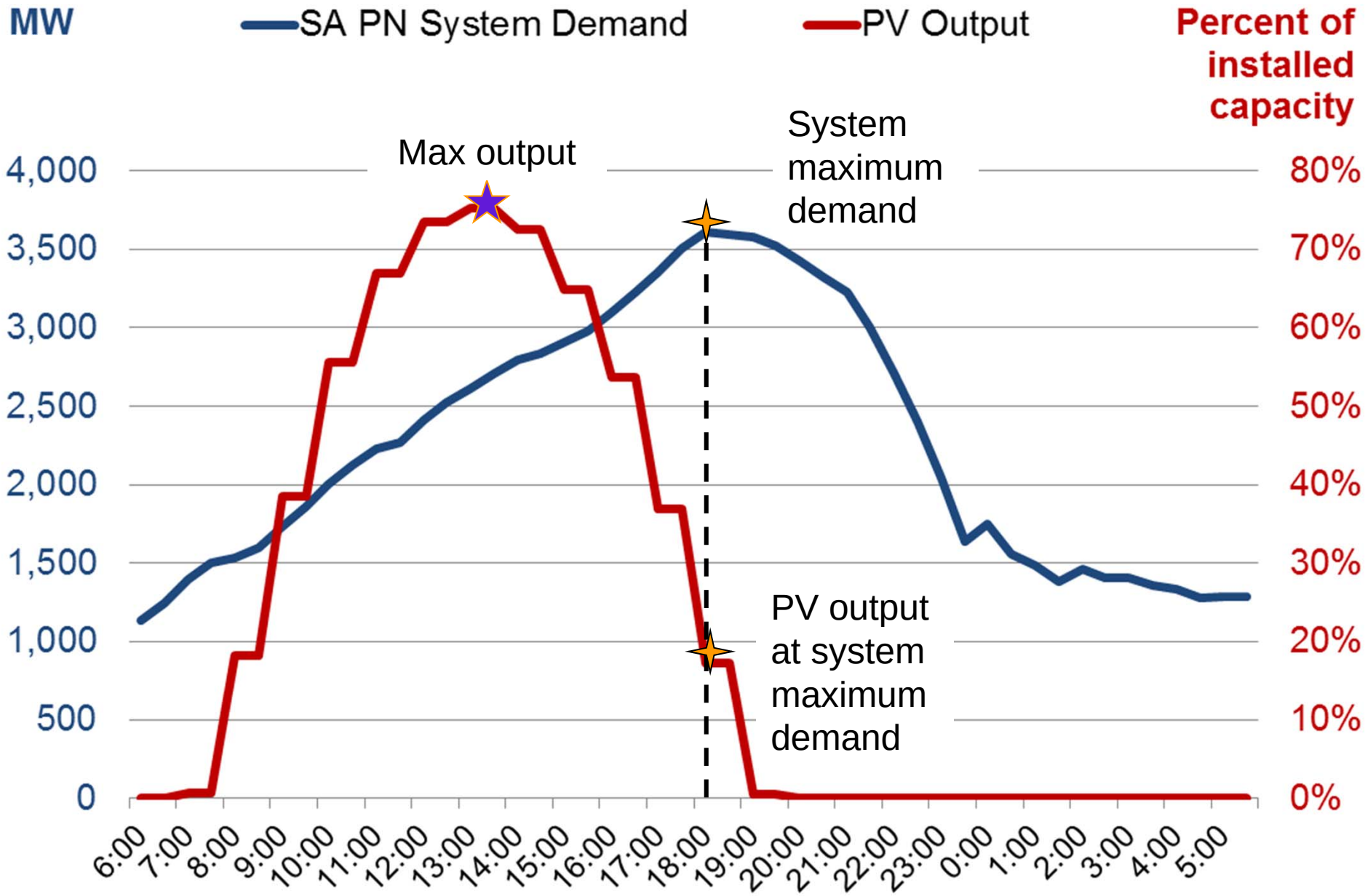


Case Study 2:
Solar PV and SA Power Networks

- Assumed PV installation size:
  - 3 kW installation with 5 MWh annual consumption
- Network tariffs
  - Incining block residential tariff (MRSR)[1]
- Retail tariffs
  - Seasonal inclining block residential tariff (Standing offer of AGL and Origin Energy)

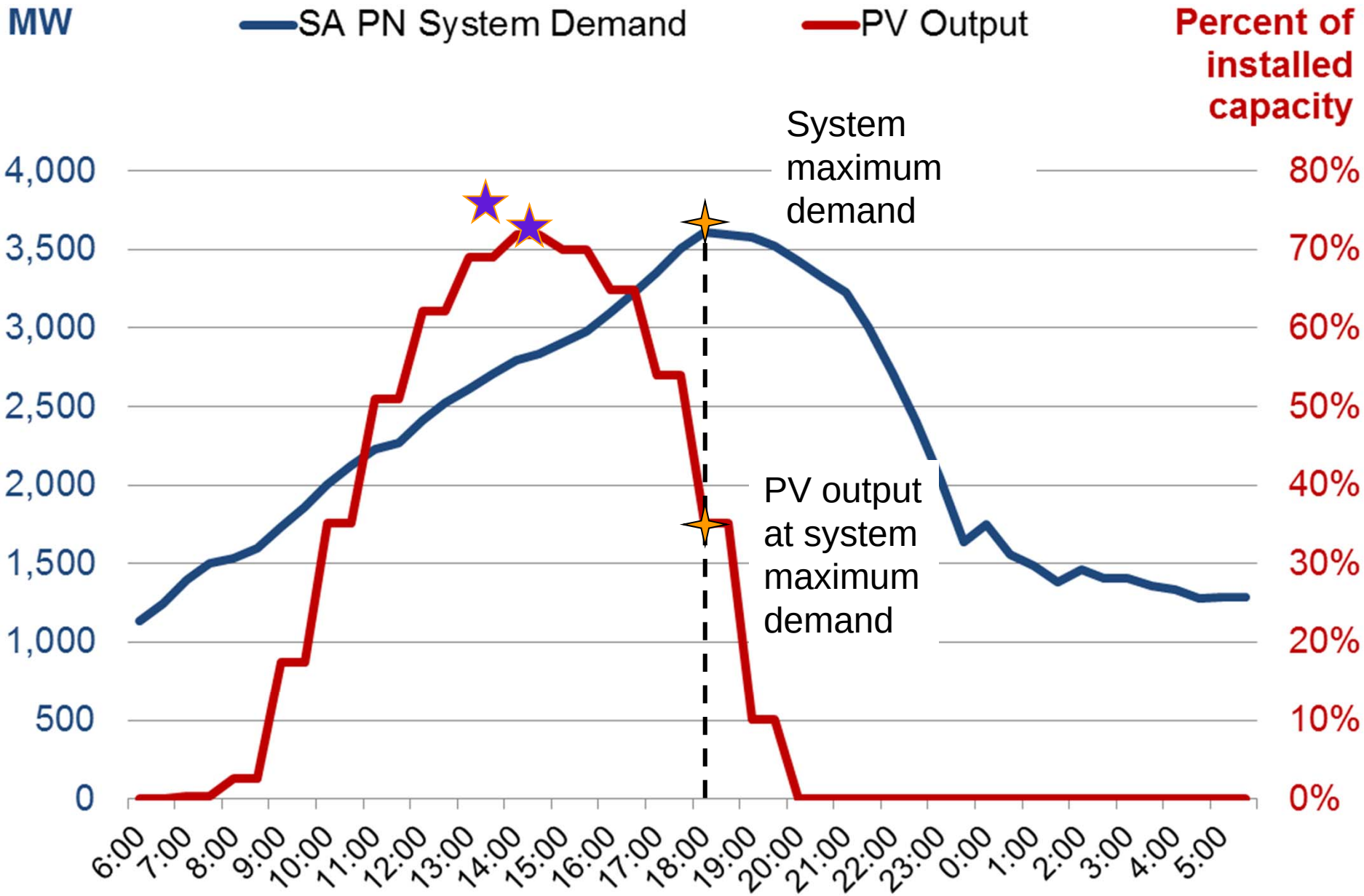
1. Monthly Residential Single Rate

North-oriented PV output is low during the system max demand



Note: The system maximum demand represented here is for SA Power Networks for 2011. The solar PV output is derived by NERA using the System Advisory Model and information on installed capacity published by the Clean Energy Regulator

West-oriented PV output is higher during system max demand



Under standard tariffs, PV systems reduce a customer's DUOS bill

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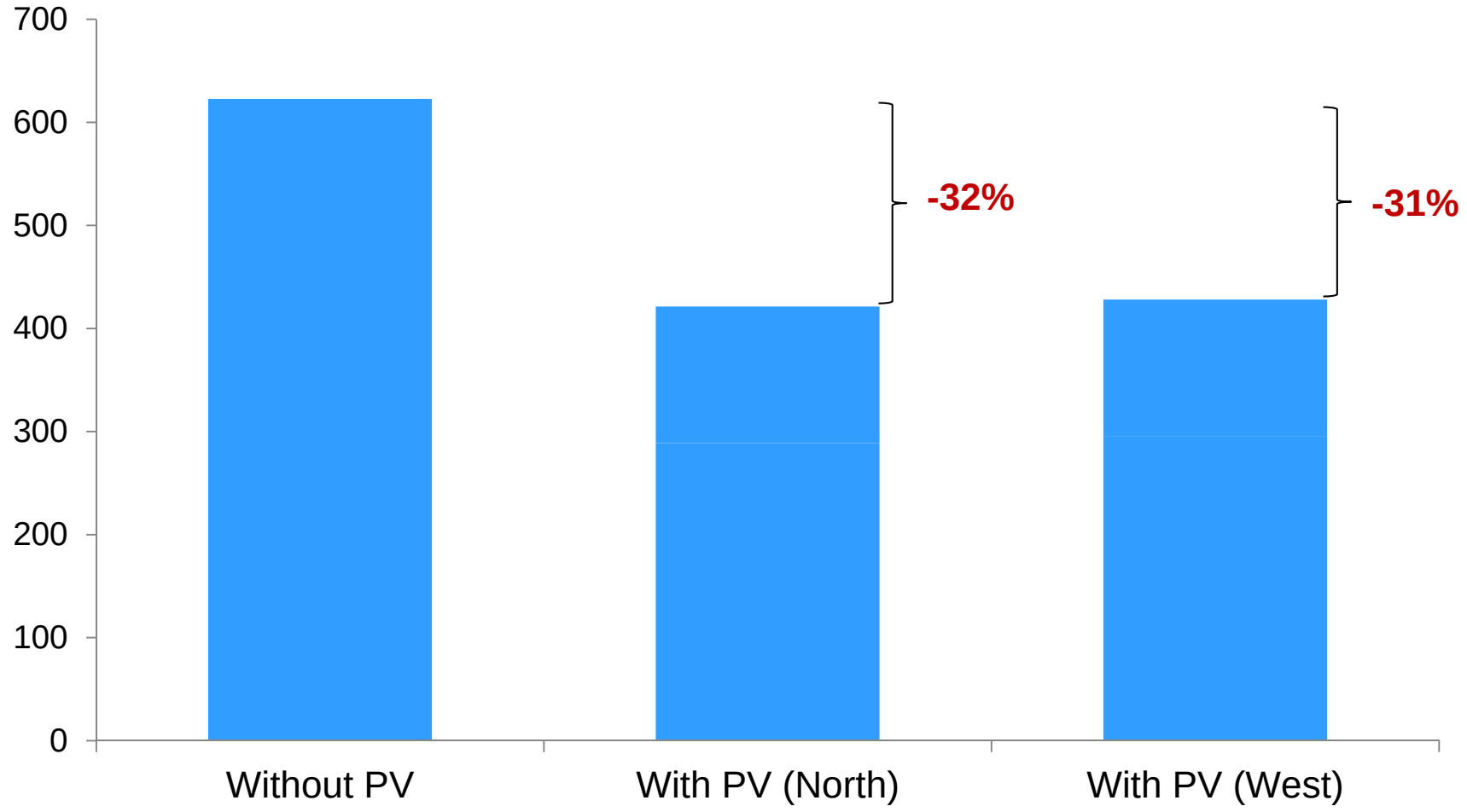
$ per annum



Customer bill reductions from PVs exceed the network benefits

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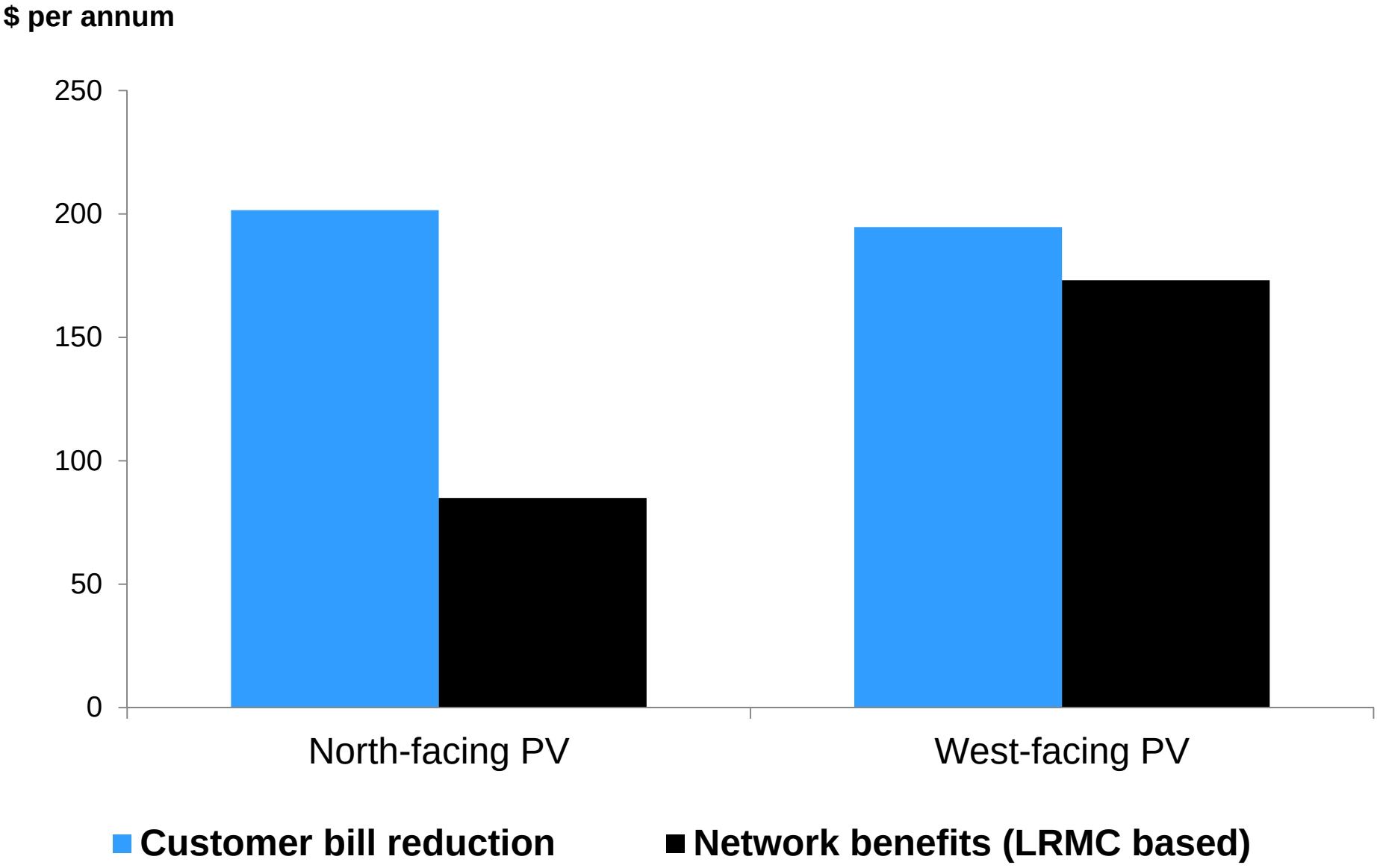

PV systems result in considerable retail bill reductions

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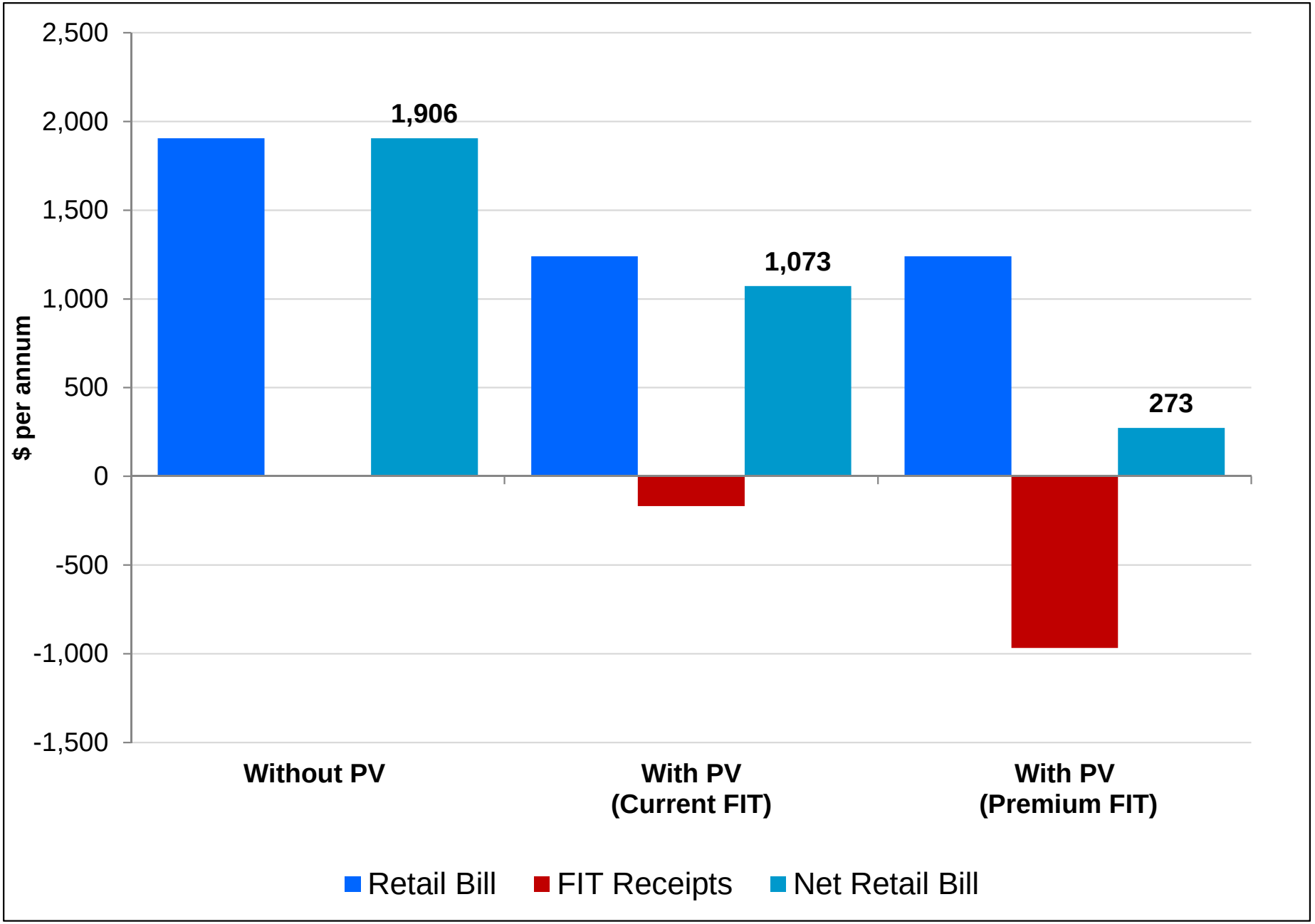
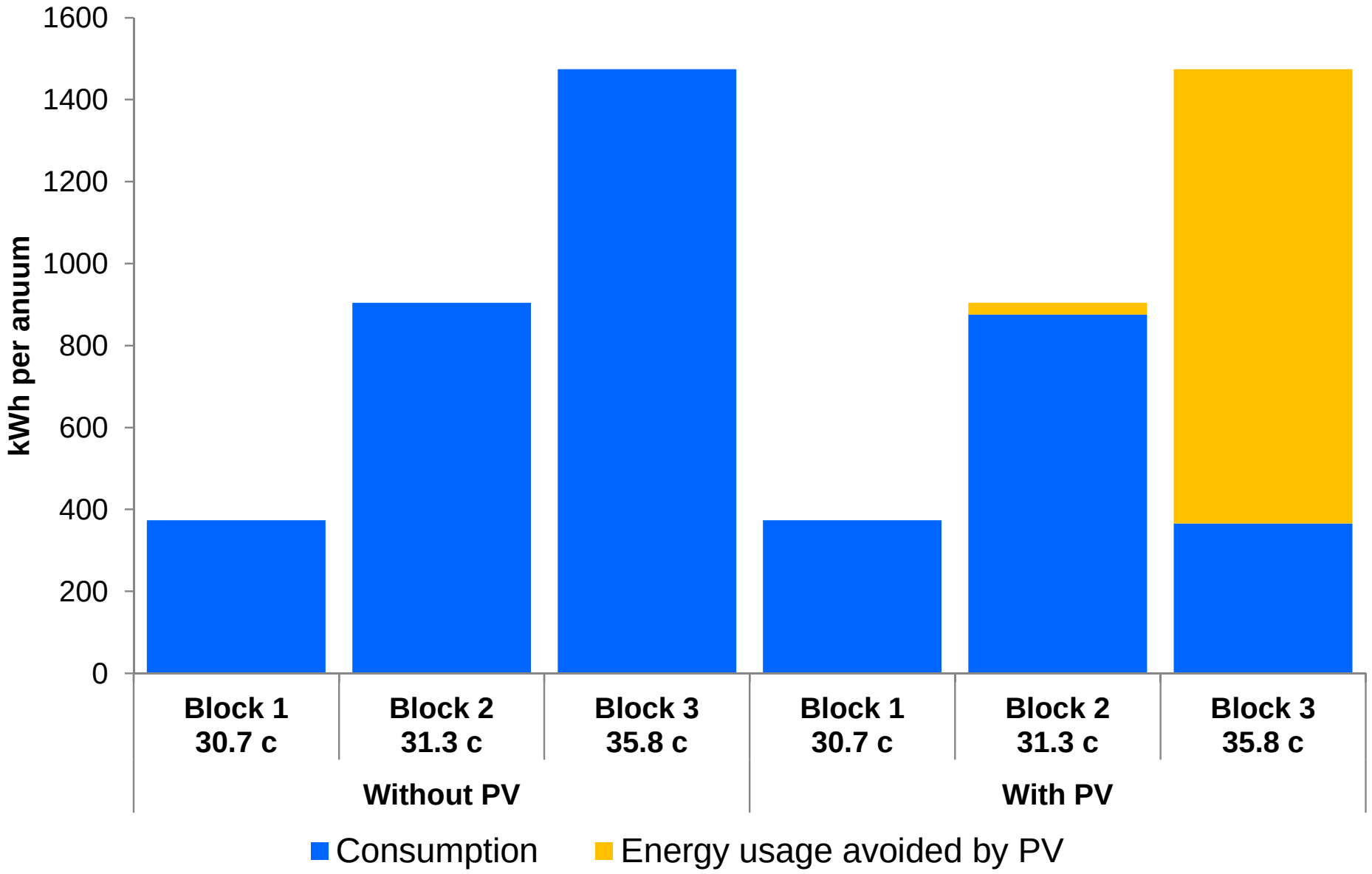


PV systems take advantage of inclining block tariff structure

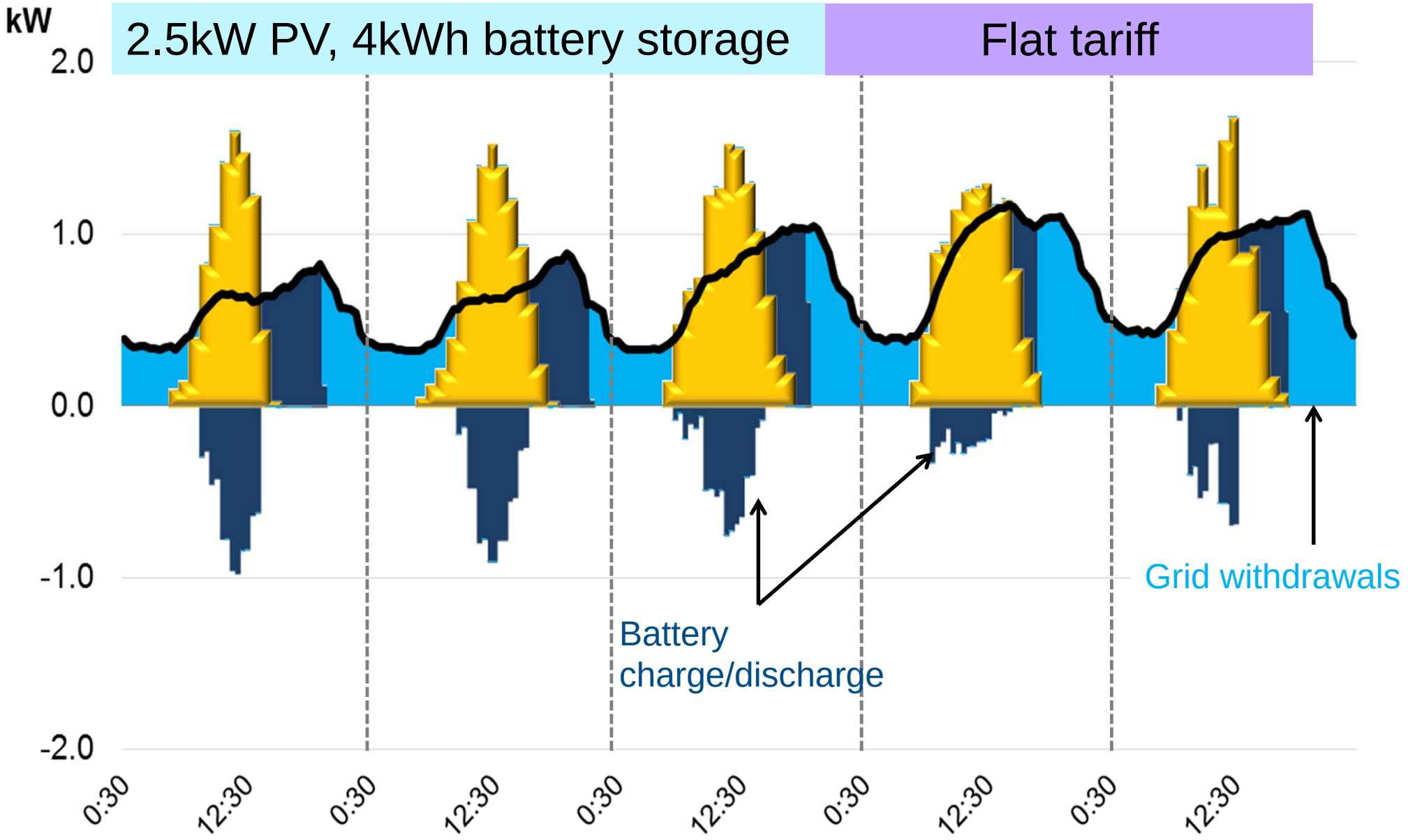


Case Study 3:
Batteries + PV and Energex

- Assuming a small and large system:
  - 5kW PV system with 8kWh of battery storage
  - 2.5kW PV system with 4kWh of battery storage
- Network tariff
  - Residential flat tariffs (8400 – DUOS)
  - Residential ToU tariff (8900 – DUOS)
- Retail tariffs
  - Residential flat tariff (regulated)[1]
  - Residential ToU tariff (regulated)[2]

1. Tariff 11 as set by the Queensland Government. 2. Tariff 12 as set by the Queensland Government

Excess energy can then be extracted from storage during peak periods



Batteries can lessen peak demand

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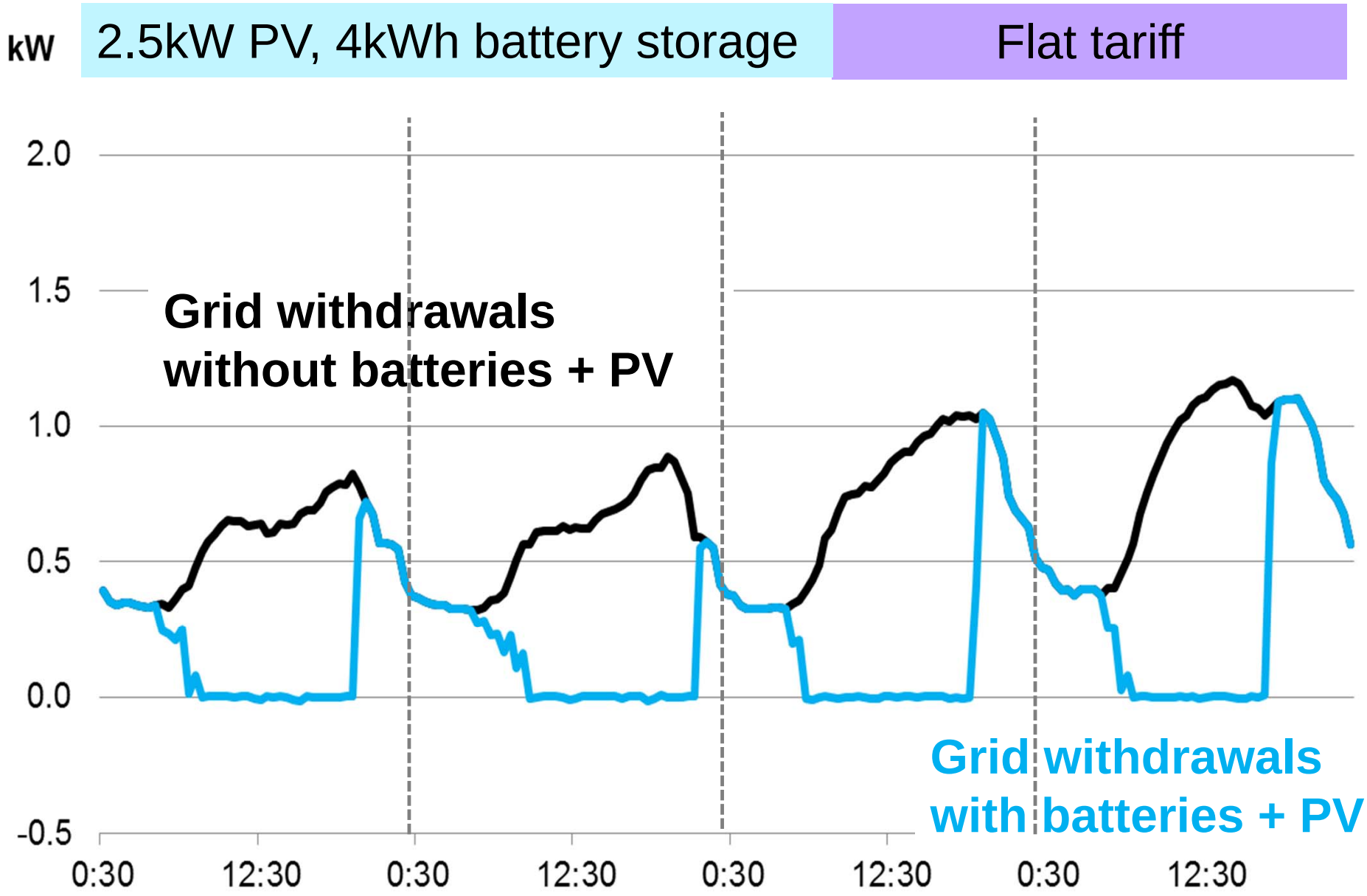

Batteries have the potential to make withdrawals more volatile

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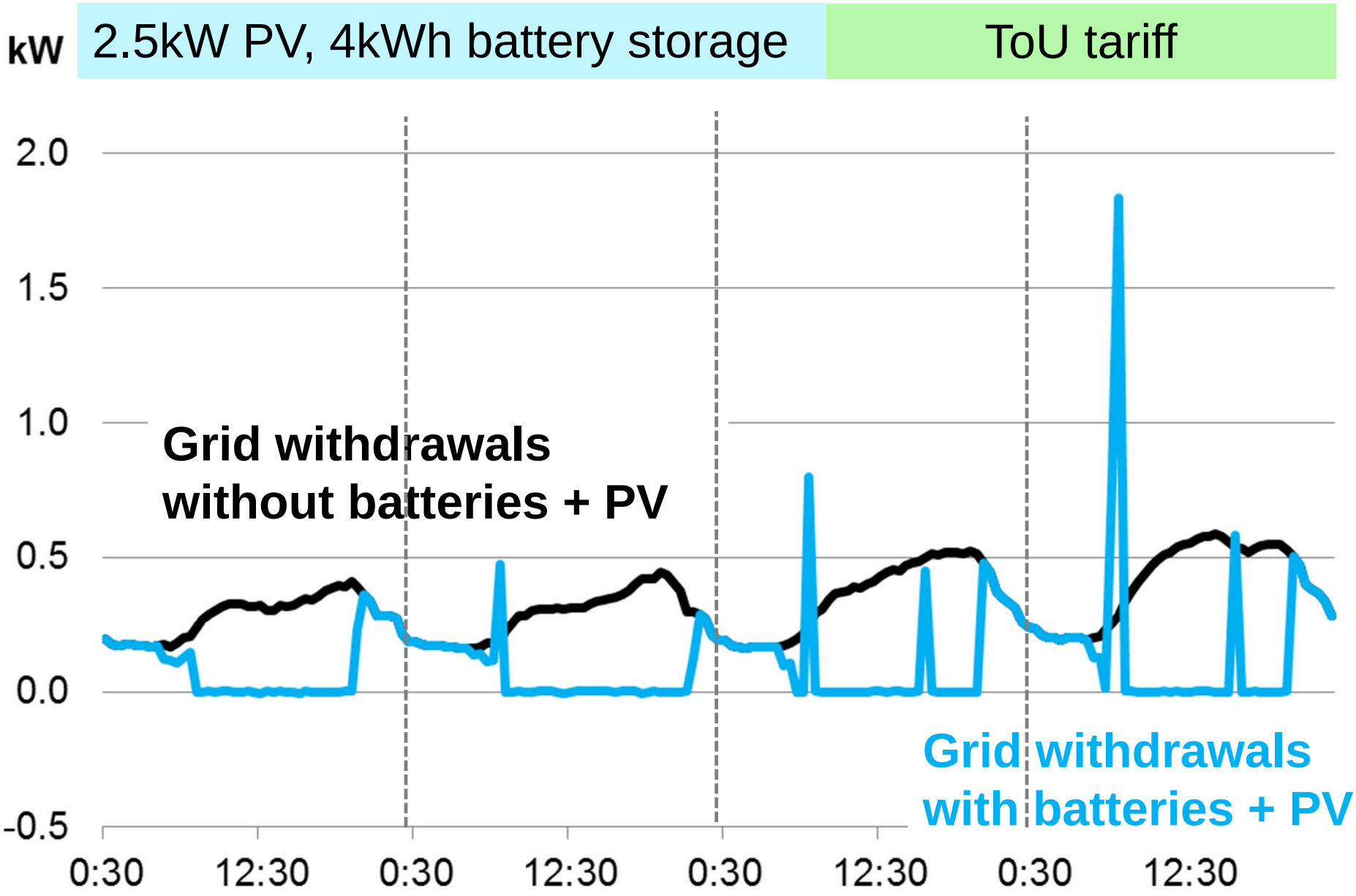

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