Household energy upgrades can slash energy bills

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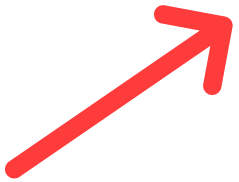
Australian household energy bills have increased

Recent increases in energy bills have been seen in many jurisdictions across Australia including the NT

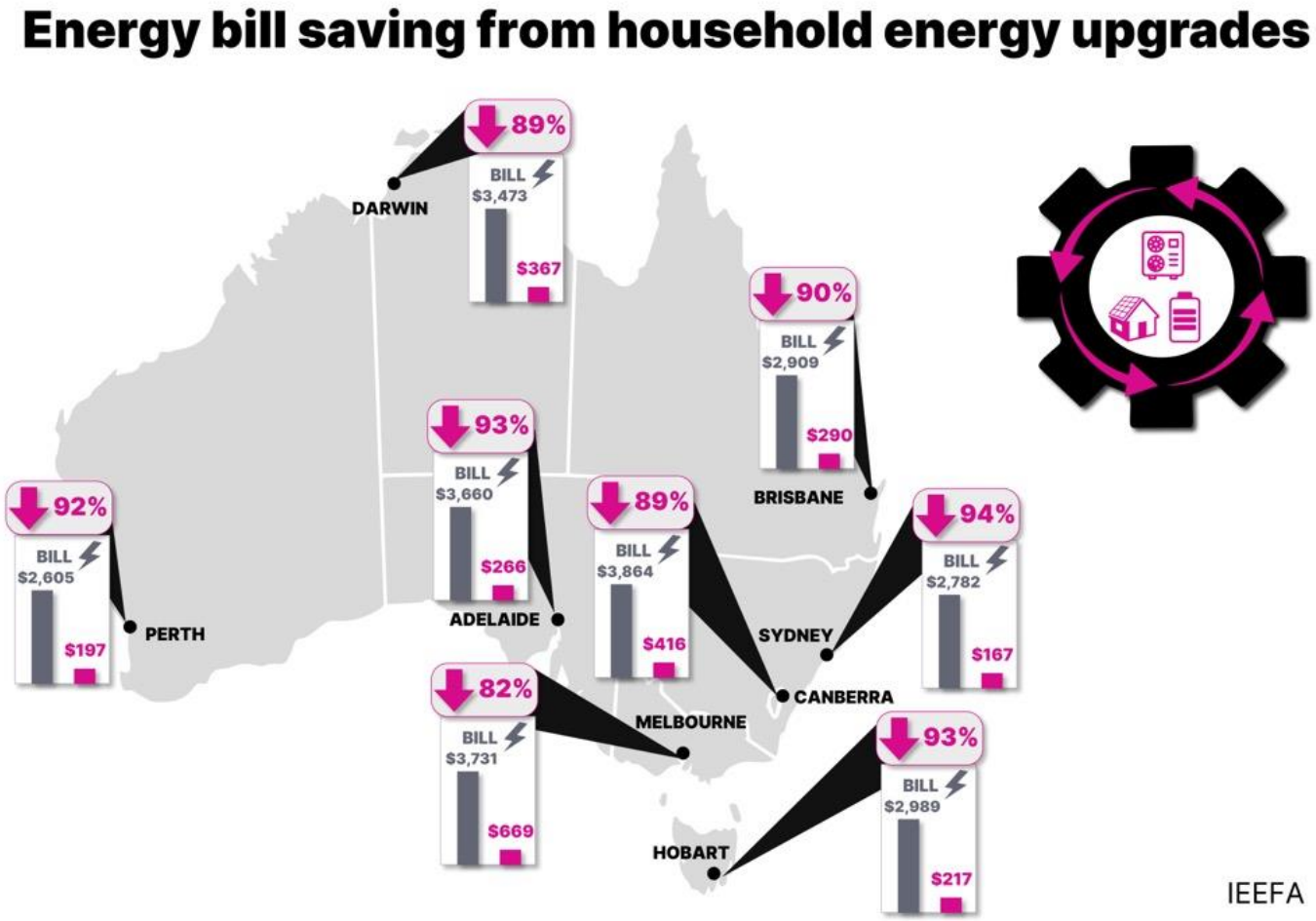


One factor leading to high bills is higher than necessary consumption levels

Over 10 million Australian homes rely on inefficient gas or resistive electric appliances so are using more energy

More than half of Australian homes are under-insulated or leaky, leading to poor thermal performance

Households across Australia's capital cities could reduce their energy bills by around 90% though household energy upgrades



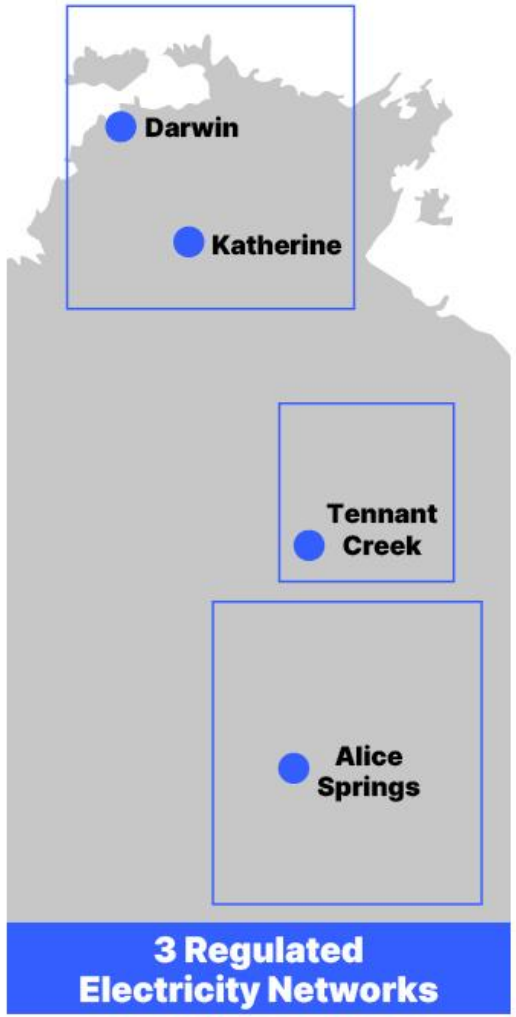
Bill savings gained from:

- Switching from inefficient gas or electric appliances to efficient electric ones
- Installing solar and storage

Further savings can be gained from thermal efficiency improvements

The NT portion of our study is focused on Darwin

- Our research is focused on Darwin (as we have studied the capital cities across Australia)
- Darwin-Katherine = nearly 60% of NT population
- Our modelling:
  - NatHERS Climate Zones 1 and 37 cover top of the NT (excludes Alice Springs, Central Desert)
  - Tariffs used were Power and Water – Jacana tariffs (as at Jan 2025) - flat rate / Time of Use (TOU)
  - Solar and battery installation costs for Darwin

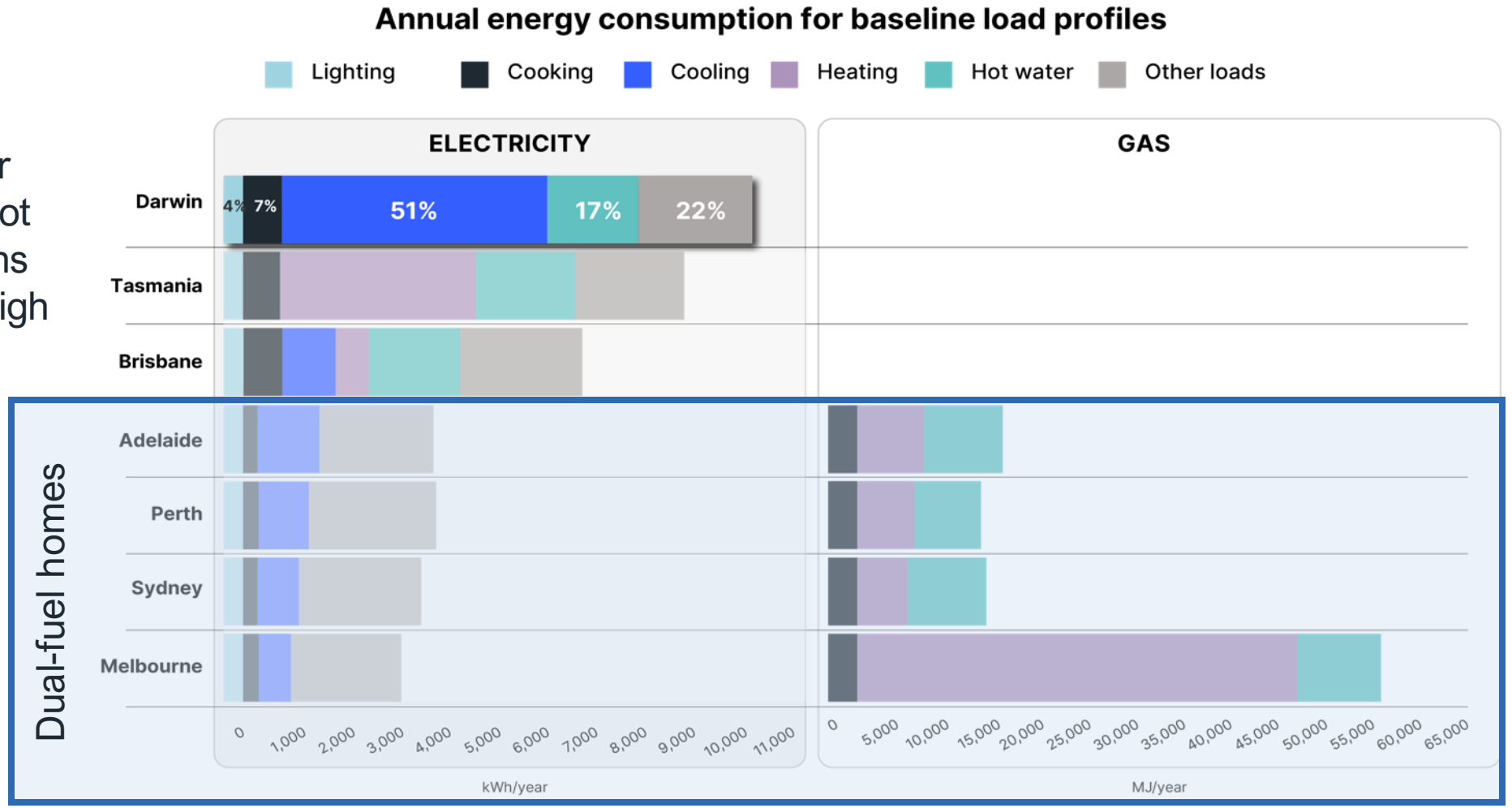


Grid	Approximate population coverage
Darwin-Katherine	**150,000**
Tennant Creek	7,000
Alice Springs	28,000
Other	75,000
NT Population	260,000

Source: Power and Water Corporation, NT Government

Darwin customers have high energy use driven by high cooling demand

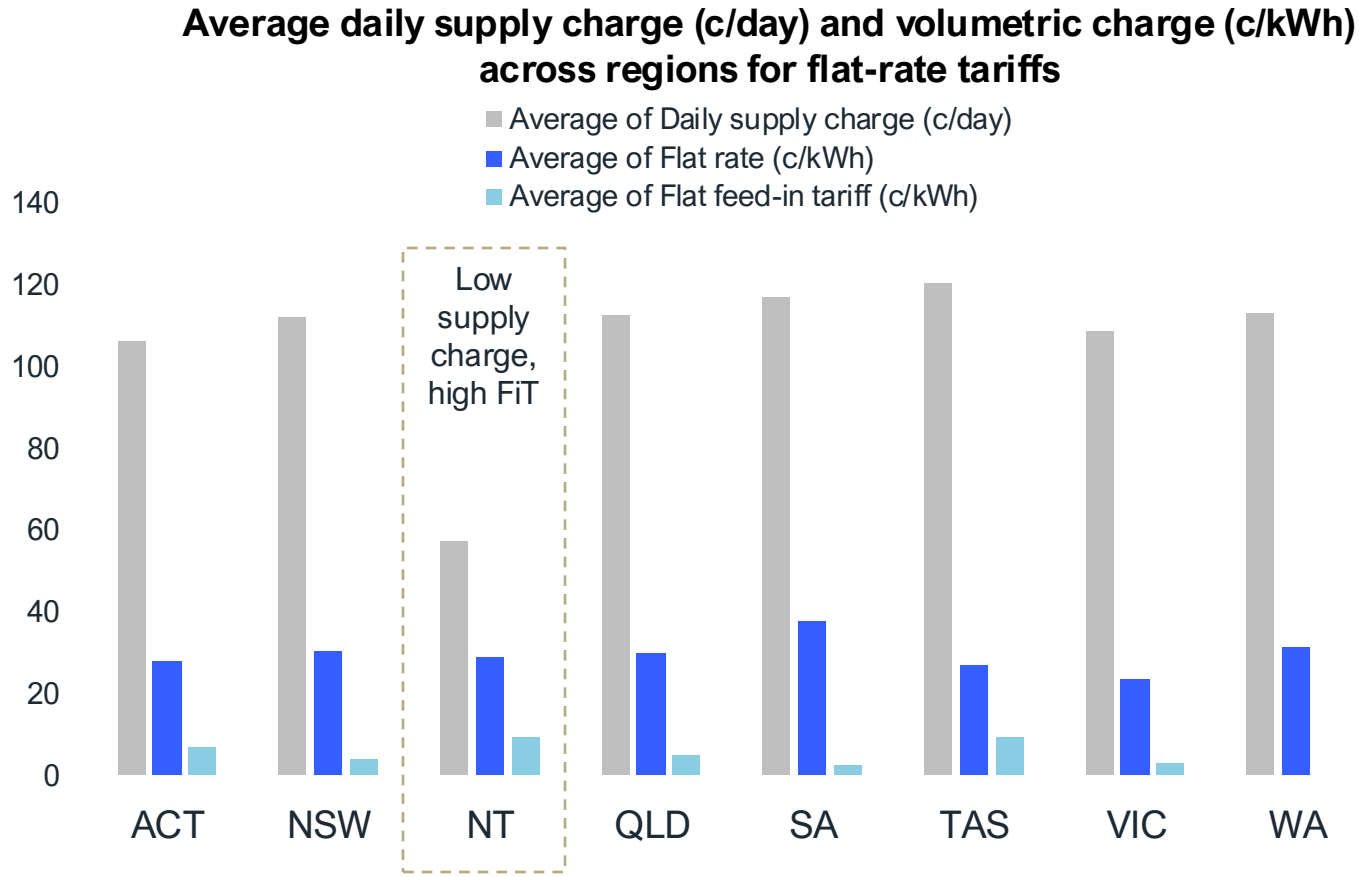
High power demand for cooling driven by the hot climate in Darwin means bills are usually quite high



Source: IEEFA

NT customers are facing rising bills

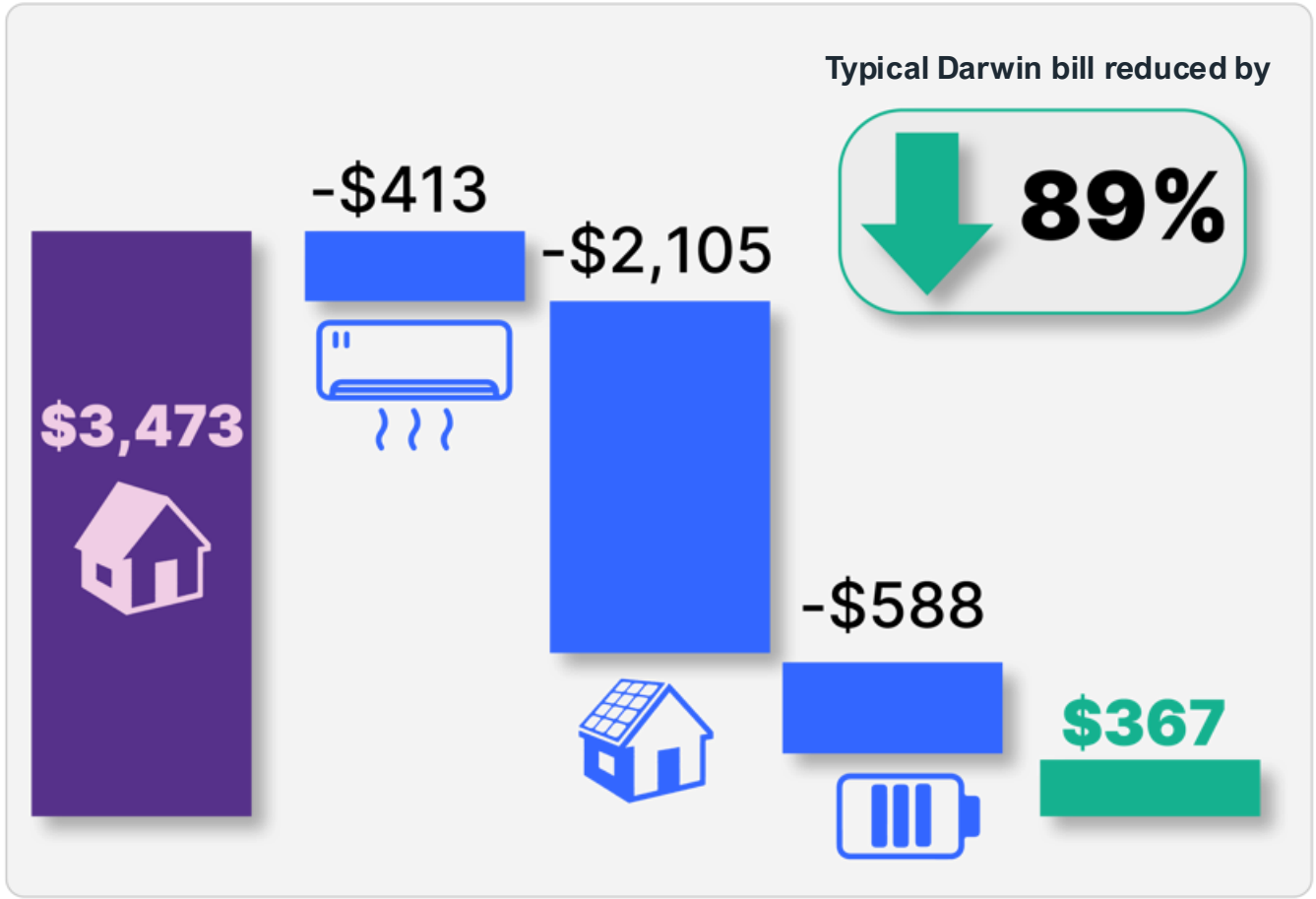
- NT bills are rising – regulated electricity prices will increase by 3% in 2025-26
- High household power demand means bills are usually quite high
- Households have an incentive to improve energy efficiency



Source: IEEFA analysis of tariffs as of March 2025
NT figures are based on tariffs from Power and Water Corporation distribution network

Darwin households could reduce energy bills by 89% through household energy upgrades

Energy bill changes from appliance upgrades, rooftop solar and batteries



Source: IEEFA

What are the household energy upgrades involved?

From

"Typical" Darwin home

1 x resistive electric cooktop

1 x resistive electric storage water heater

To

Fully upgraded

1 x induction cooktop

1 x heat pump hot water system (optimised for midday operation)

Uses 1/3rd of the power consumed by resistive electric

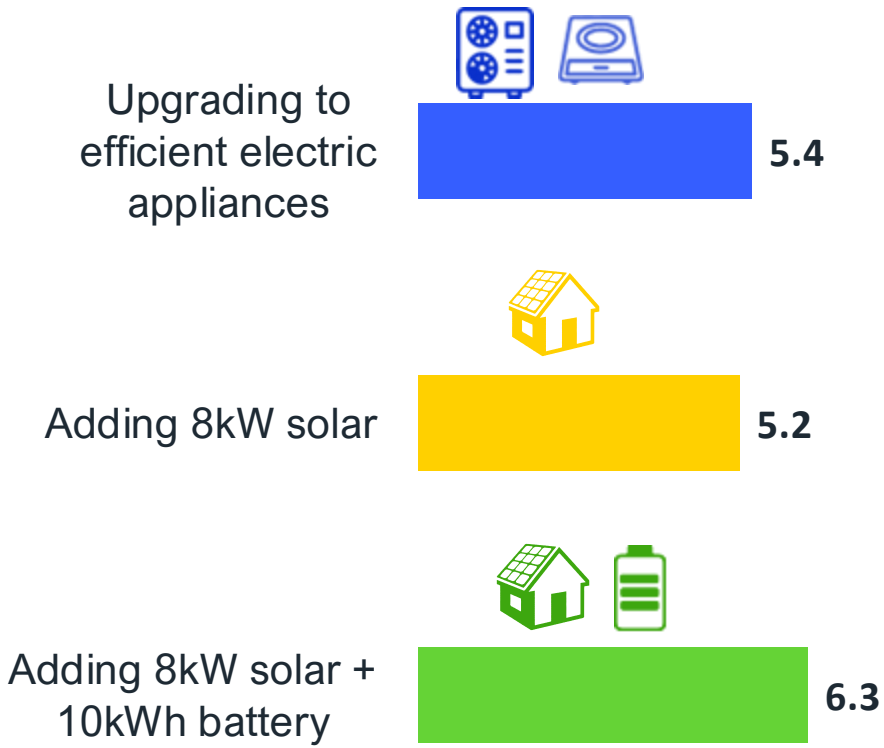
8kW solar

10kWh battery

Image sources: Getty, Wikipedia, Rinnai, Bosch, Rheem, RenewEconomy

The payback periods for household energy upgrades are reasonable

Payback periods after rebates (years)



- Switching to a heat pump hot water system and induction cooktop (instead of resistive electric) pays itself back in 5.4 years

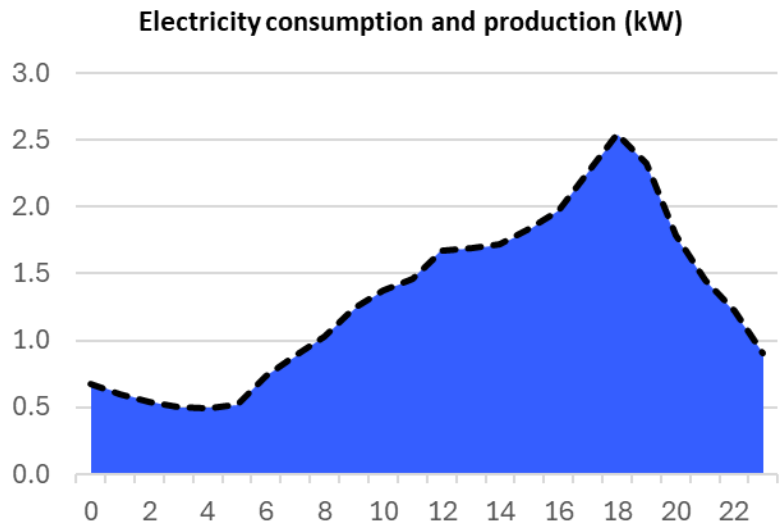
- Darwin has the highest installed cost for an 8kW rooftop PV system of all cities analysed: on average, installing 8kW of solar in Darwin is ~1.6x the cost in Sydney, based on analysis of Solar Choice data
- NT has high solar insolation levels and reasonable feed-in tariffs
- Rooftop solar delivers decent payback periods (middle of the pack compared with other jurisdictions)
- 27% of NT households already have rooftop PV according to CEC

- The new feed-in tariff introduced in the NT – of 18.66 c/kWh for regulated households and businesses that export electricity to the grid between 3pm and 9pm from 1 July – will strengthen the case for batteries (not yet included in our model)

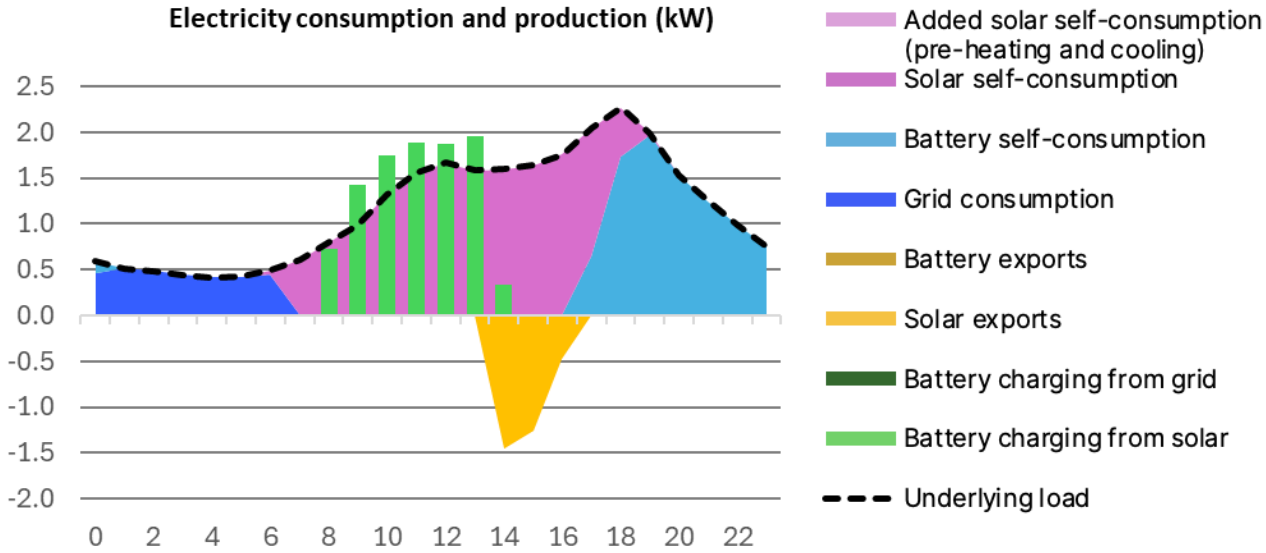
Source: IEEFA

Household energy upgrades change households' grid consumption profile significantly

Before household energy upgrades (average January day)



After household energy upgrades (average January day)

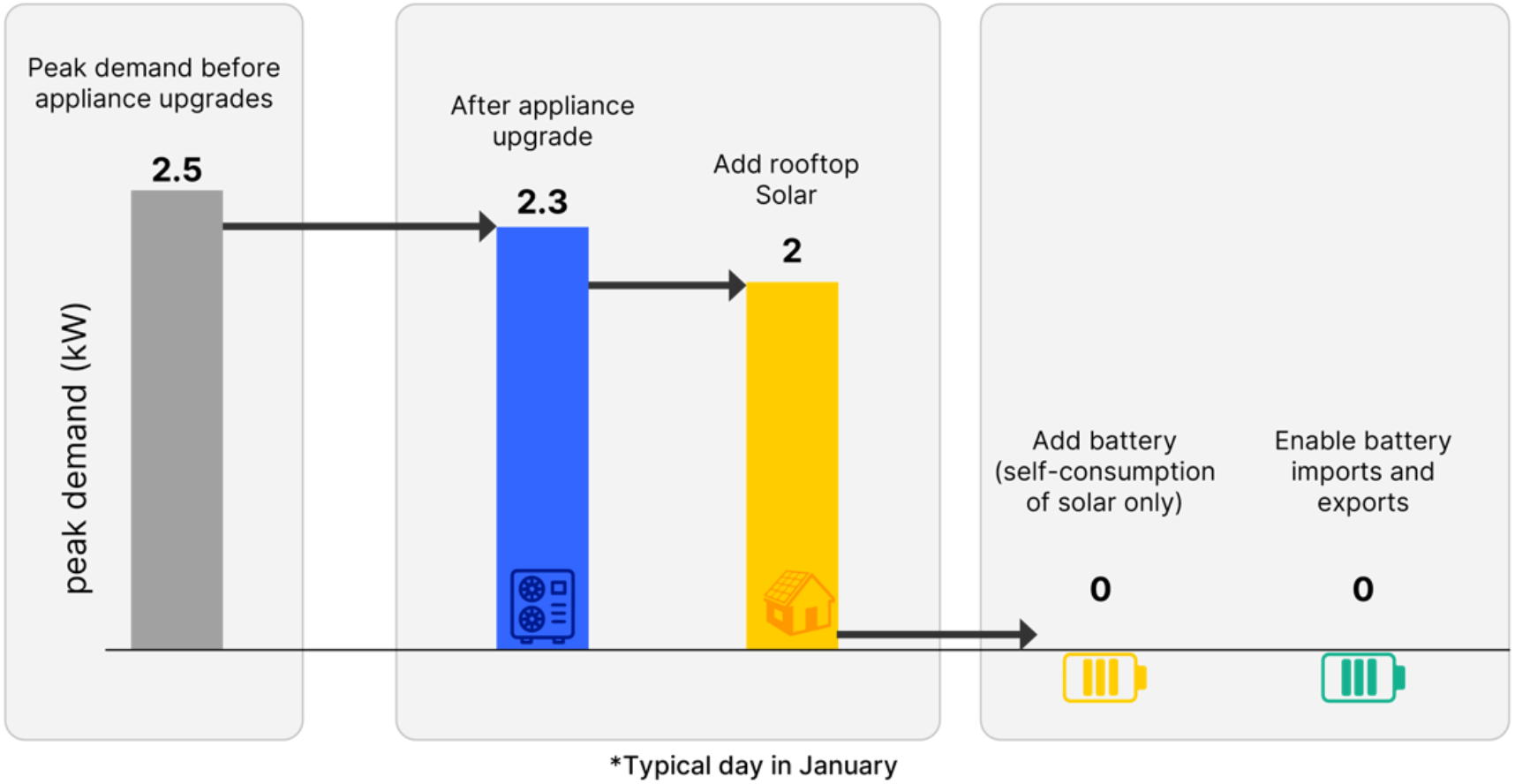


- Grid consumption is high and peaking at about 2.5kW

- Underlying load reduces due to higher efficiency in hot water / cooking
- Household self-consumes a large amount of solar, exports some, and stores a significant amount in the battery to consume in the evening
- Grid consumption is low – only seen in the morning (Jan)

Source: IEEFA

These upgrades can reduce the household's average daily peak demand – reducing the need for large-scale system build



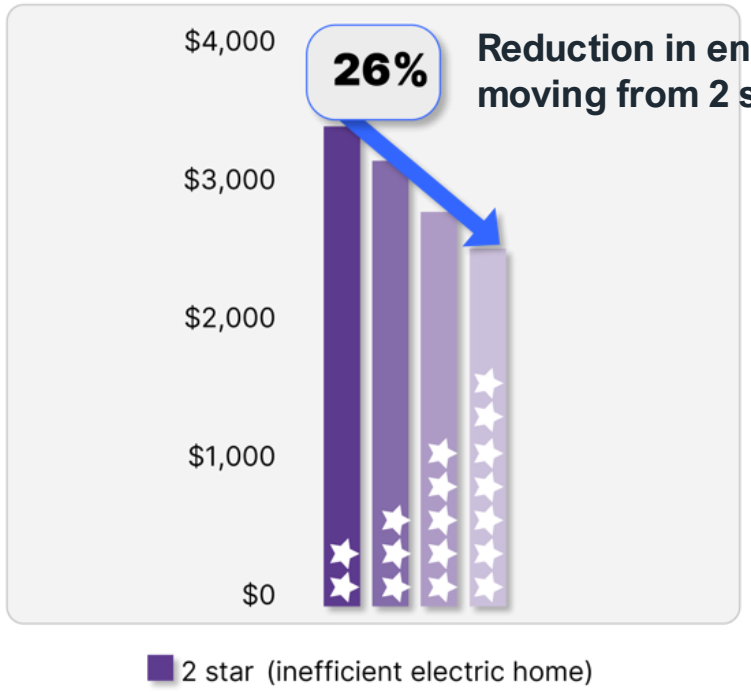
Installing solar and batteries eliminates household peak demand

This has major implications for system planning and reliability considerations

Source: IEEFA

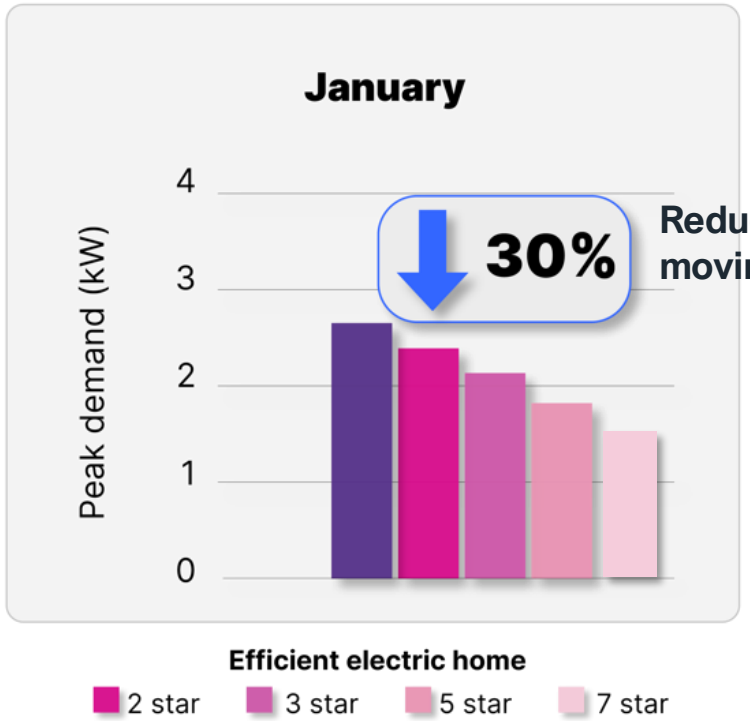
Thermal efficiency improvements can offer further energy bill savings and peak demand reductions

Energy bill by NatHERS star rating



Reduction in energy bills from moving from 2 stars to 7 stars

Peak demand for typical homes, by NatHERS star rating



Reduction in peak demand by moving from 2 stars to 7 stars

Source: IEEFA

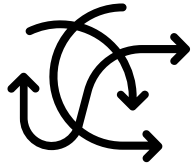
Why aren't more households taking up upgrades?

Many households have no access to upgrades

31% of homes are rented +
11% in social housing in the NT

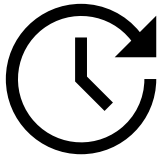
Upfront capital costs can be a barrier

'Bounded rationality' impacts our decisions



Decisions around energy use are complex

Consumers often lack time, ability and motivation to engage with energy decisions



We tend to undervalue future savings ("hyperbolic discounting")

The NT policy landscape contains some support for household energy upgrades; further action could increase uptake

	Existing federal and NT schemes	IEEFA recommendations
Financial incentives	• **Feed-in tariffs** • **Federal rebate schemes** available for **rooftop solar and storage** (NT battery grant scheme has reached its funding cap), and heat pump hot water	• **Extend federal rebate schemes** for solar and batteries **to cover efficient electric appliances** more broadly and **thermal efficiency upgrades** like insulation
Social housing upgrades	• $10 million Social Housing Energy Performance Initiative for supporting installation of reverse cycle air conditioners	• Extend the **Social Housing Energy Performance Initiative** • Set star rating target for existing social housing, and transition houses over time
Standards and regulations	• New houses must meet 5-star energy rating and apartments 3.5 stars • No requirements for disclosure on energy performance	• **Update federal energy performance standards** (via Greenhouse and Energy Minimum Standards) for appliances to encourage efficient appliances • **Increase requirements on new home star ratings in NT** • **Introduce energy performance disclosure at point of sale** and point of lease (as per the ACT)
	• No minimum energy efficiency standards for rentals	• **Introduce minimum energy performance standards for rentals**, ideally including a star rating
Planning	• The Utilities Commission NT Electricity Outlook highlights that the demand side could play a greater role, but details are limited	• Increase focus on the demand side and household energy upgrades in **NT power system planning**

Federal and jurisdictional governments should work together on a strategy to halve energy bills based on these measures

Conclusion

Darwin homes could **reduce their bills by 89%** by undertaking the full suite of **household energy upgrades**: efficient appliances, solar and batteries – with further bill reductions on offer via thermal efficiency improvements.

Remote communities also stand to **benefit from solar + battery systems and efficient electric appliance swaps**, particularly where network extension or diesel costs are high – though we have not modelled the savings for those communities.

With **strong policies, planning and regulations**, the NT can enable these household energy upgrades to cut energy bills, reduce emissions, and ease pressure on the grid.

Read the full report

Thank you

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