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Knowledge Sharing Session

Residential Electricity Customer Segmentation

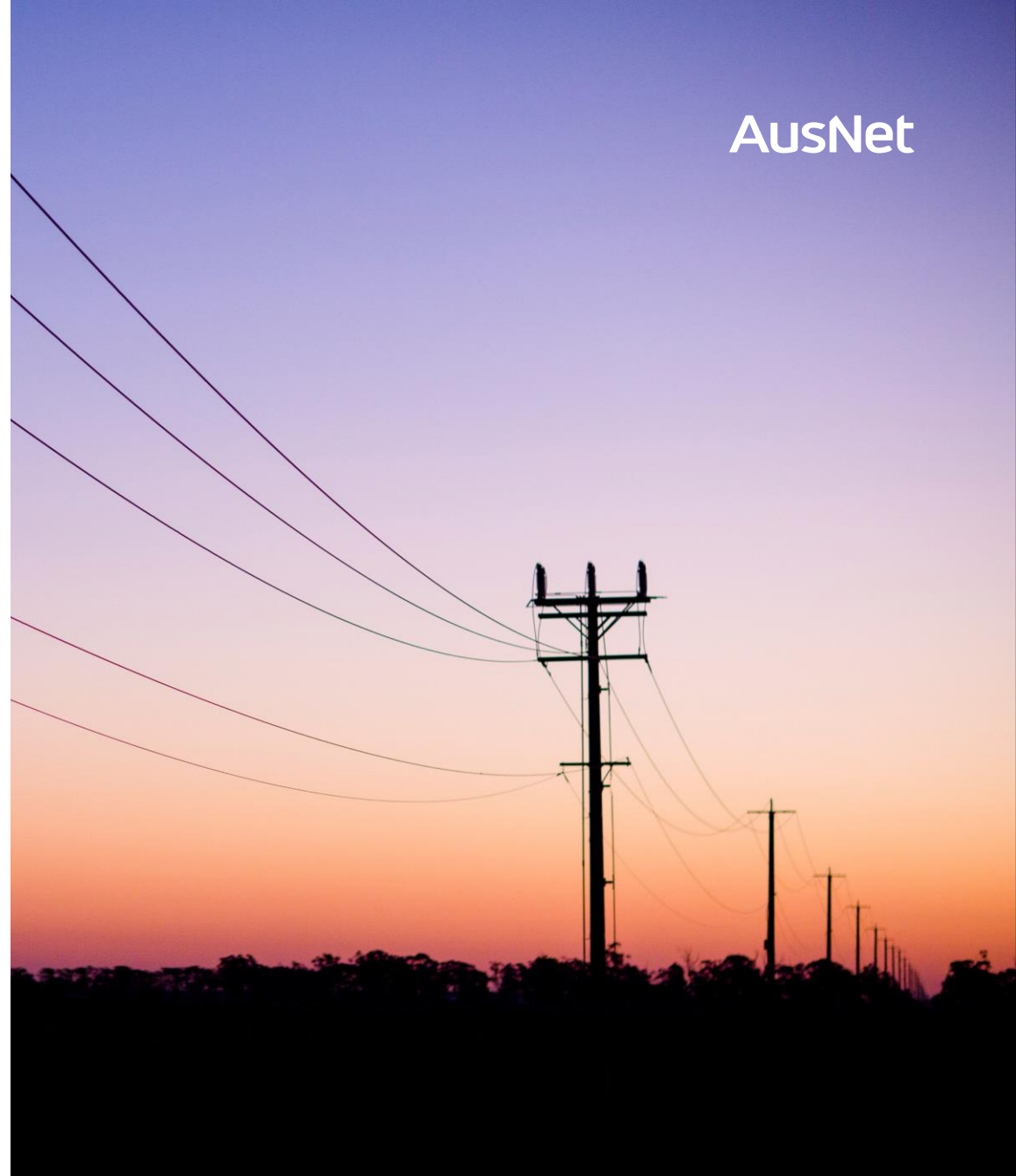
7 June 2023



Acknowledgement of Country

We acknowledge Aboriginal people as the Traditional Owners and Custodians of the land we live and work on, and we pay our respects to Elders past, present and emerging.

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Introduction

Objective

Segmenting and profiling our residential customer base to better understand:

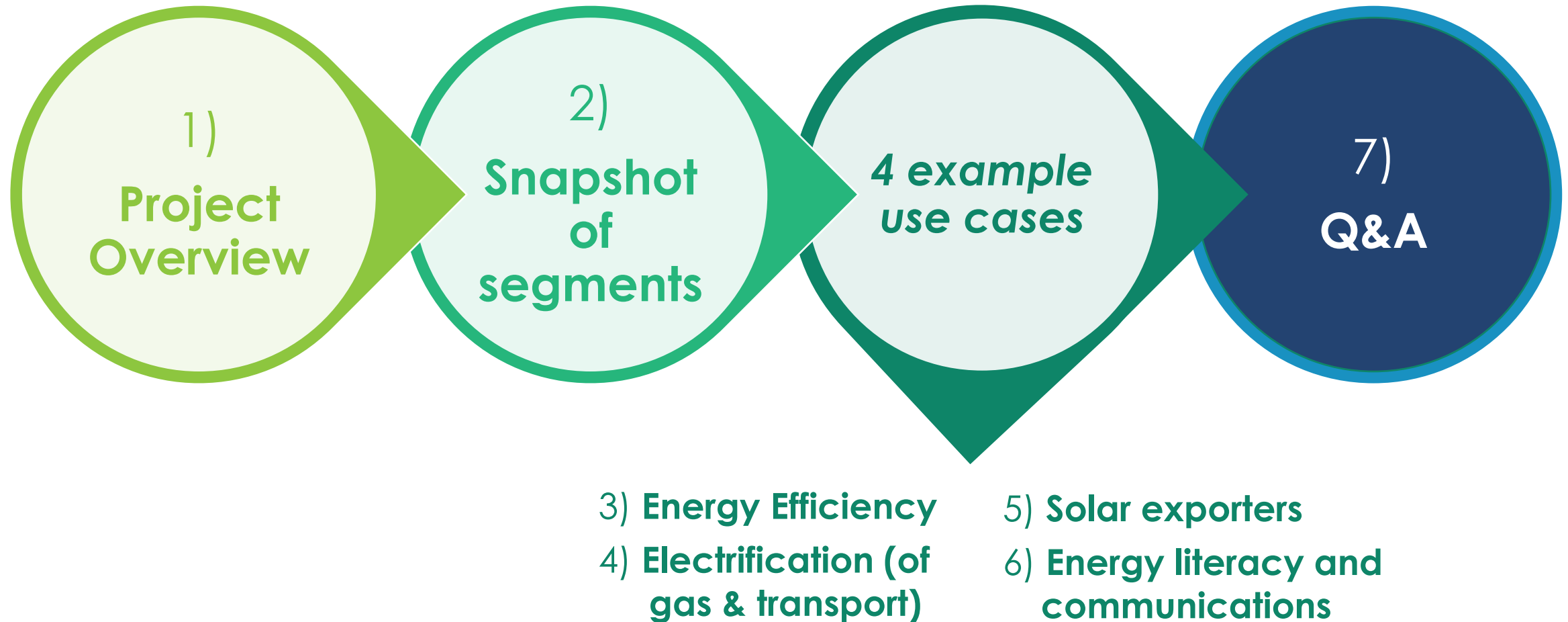
- a) how households are interacting with the network (i.e. usage patterns)
- b) demographics of households and their drivers
- c) what could change energy usage over time.



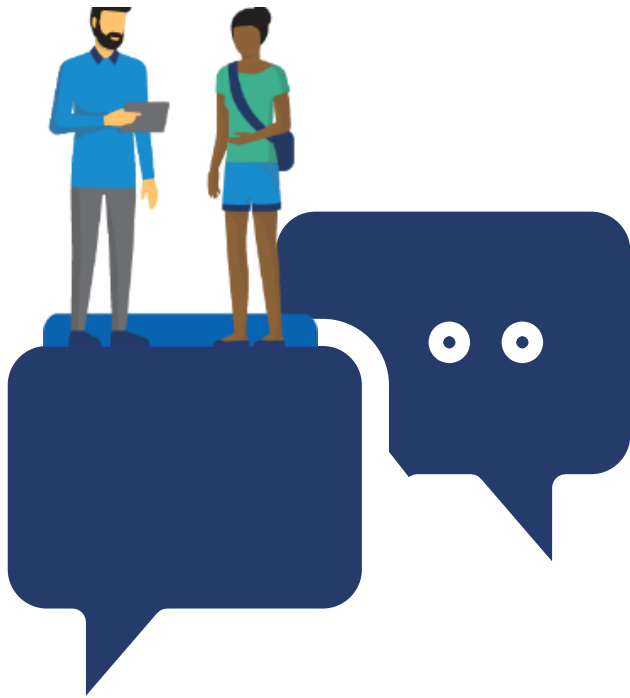
Segmentation by usage pattern

A novel approach

- ✓ We'd never seen this analysis done
- ✓ Many applications ... *incl. in areas of planning that are traditionally "difficult" to bring customer insights into*
- ✓ Makes use of the vast amount of data we have
- ✓ Shift in segments are easily tracked.



There will be time for Q&A at the end



Please open Slido and add your questions
through the session (*and like those you
want answered!*)

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01 Project Overview

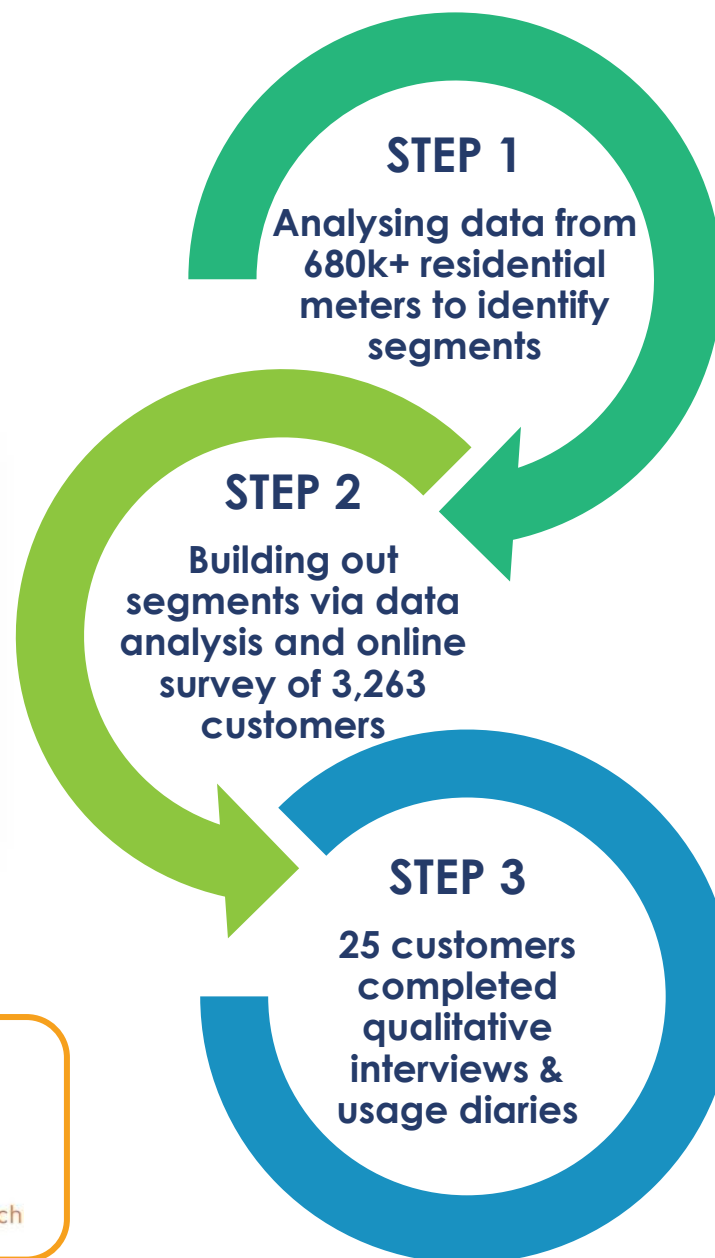
Methodology



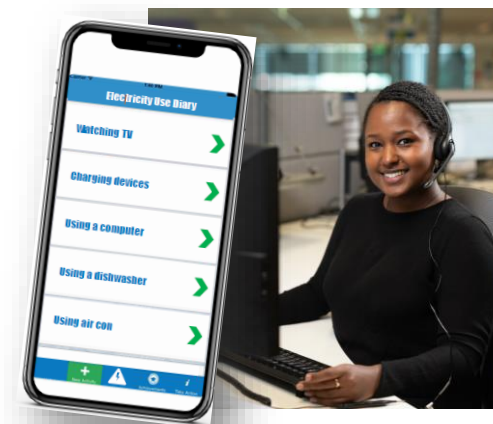
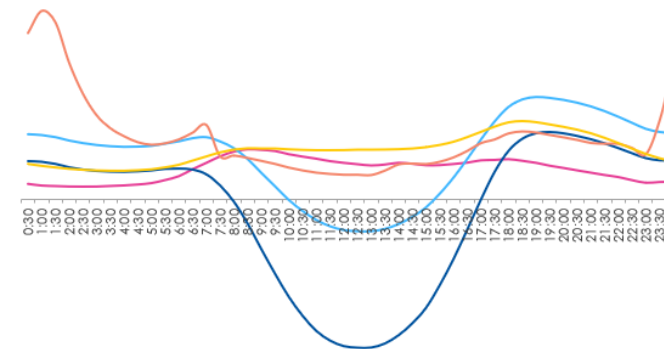
Research in Stages 2 & 3 was undertaken with research partner



Painted Dog Research



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There are a lot of insights we can attach to the segments

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- **geographic spread**
- **usage data** at 30 min intervals, year-round
- **age of connection** (indicates age of home)
- **solar capacity** (indicates solar installed)
- **battery ownership**
- **tariff class**
- **life support registrations**

AusNet-held data



Data from primary customer research

- **usage of energy** source beyond electricity inc. main gas, solar, LPG etc.
- **household demographics** (age/no./size/income/renters + others)
- **building age and efficiency features**
- what **appliances** they have and **how they're used**
- **energy saving behaviours**
- **intention to change** appliances and energy source/s
- **opportunities to shift** usage
- **energy literacy.**



Note customer-reported data is based on perception (i.e. what customers think to be true) which may or may not be the same as fact.

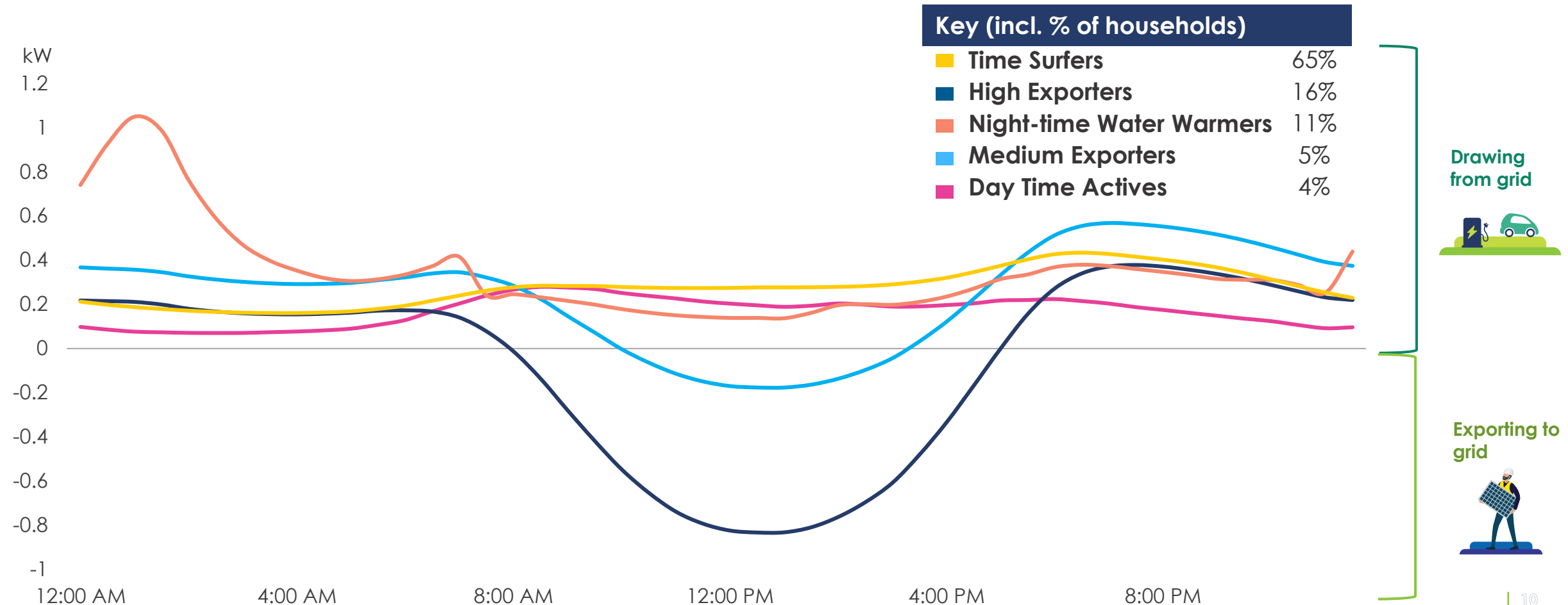
02

Snapshot of the segments

5 Main Usage Patterns (Segments)

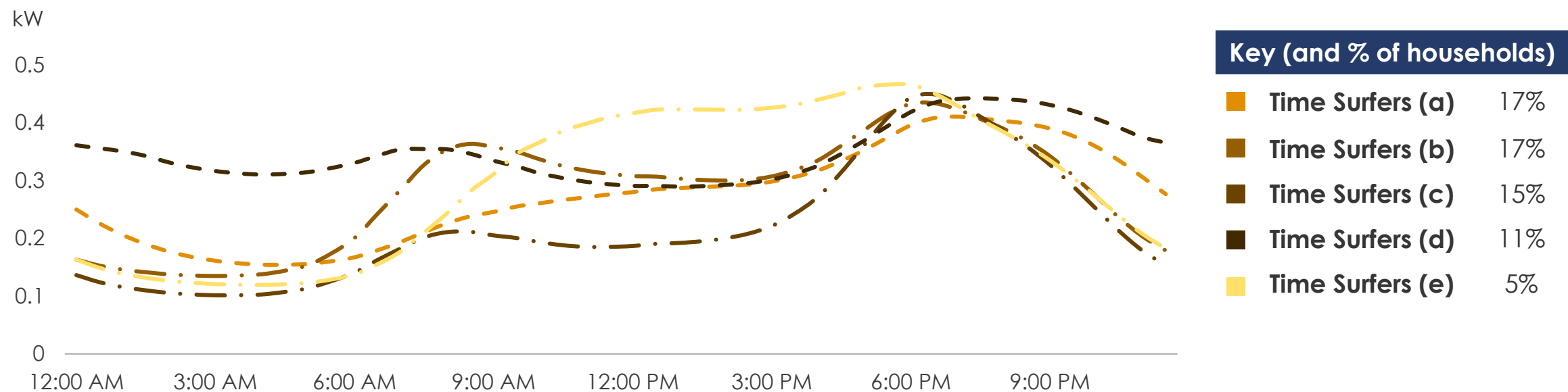
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The graph below shows the 5 key usage patterns of households, which each curve representing the average behaviour of an individual household in that group, on an average day in a 12-month period.

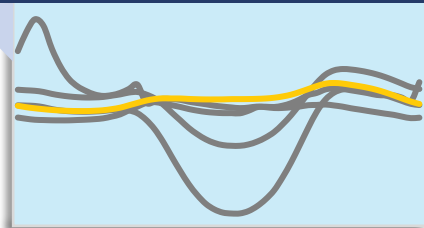


Time Surfer Sub-Segments

Given there are so many *Time Surfers* (2 in 3 households) and some variation within, we further broke this segment up into 5 sub-segments.

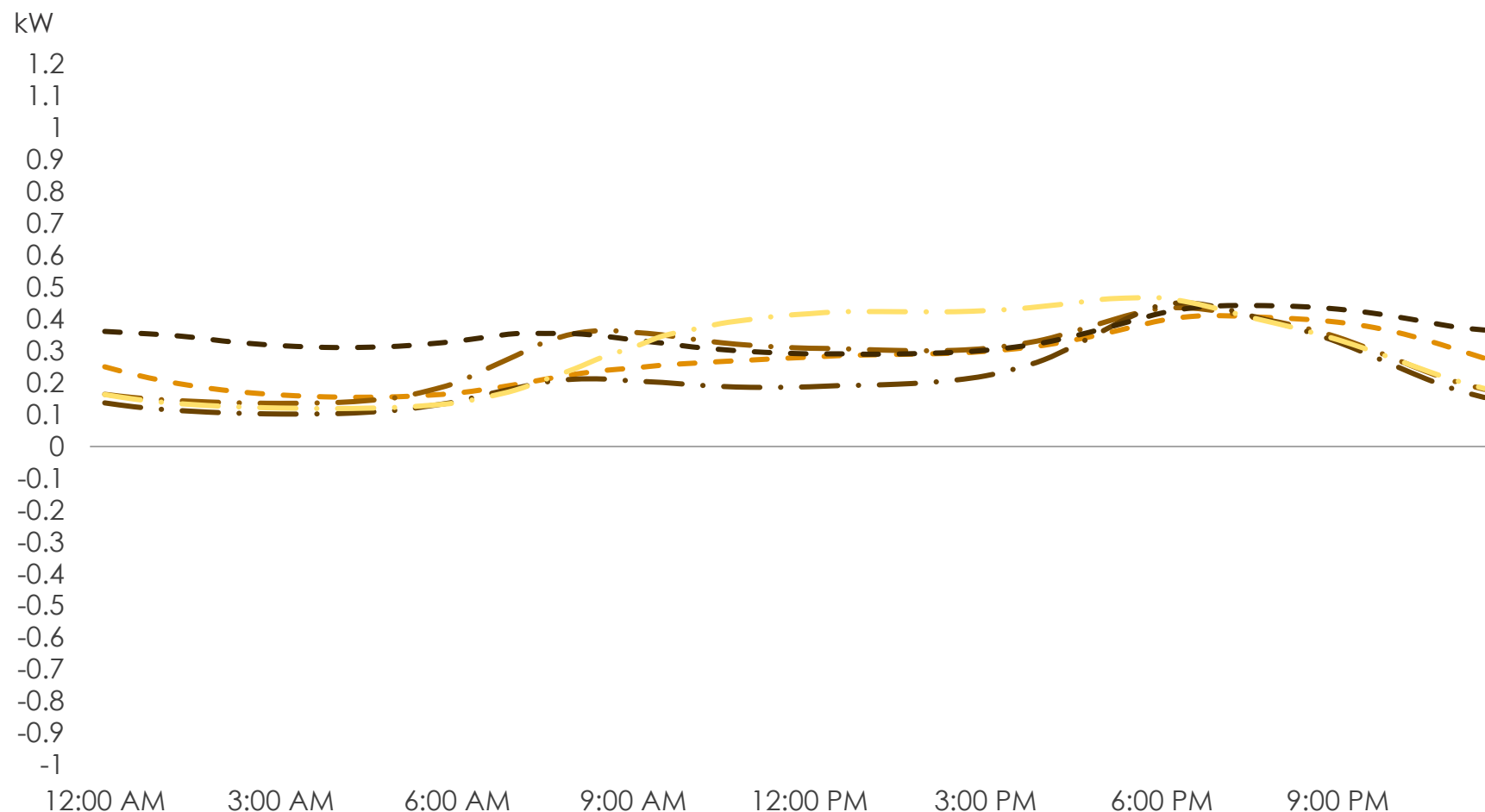


Time Surfers vs other segments



Time Surfer Sub-Segments

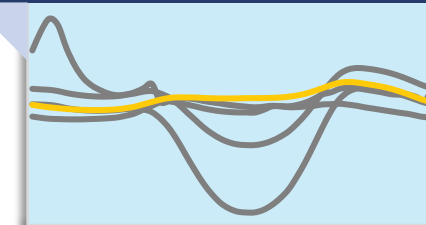
Given there are so many *Time Surfers* (2 in 3 households) and some variation within, we further broke this segment up into 5 sub-segments.



Key (and % of households)

Time Surfers (a)	17%
Time Surfers (b)	17%
Time Surfers (c)	15%
Time Surfers (d)	11%
Time Surfers (e)	5%

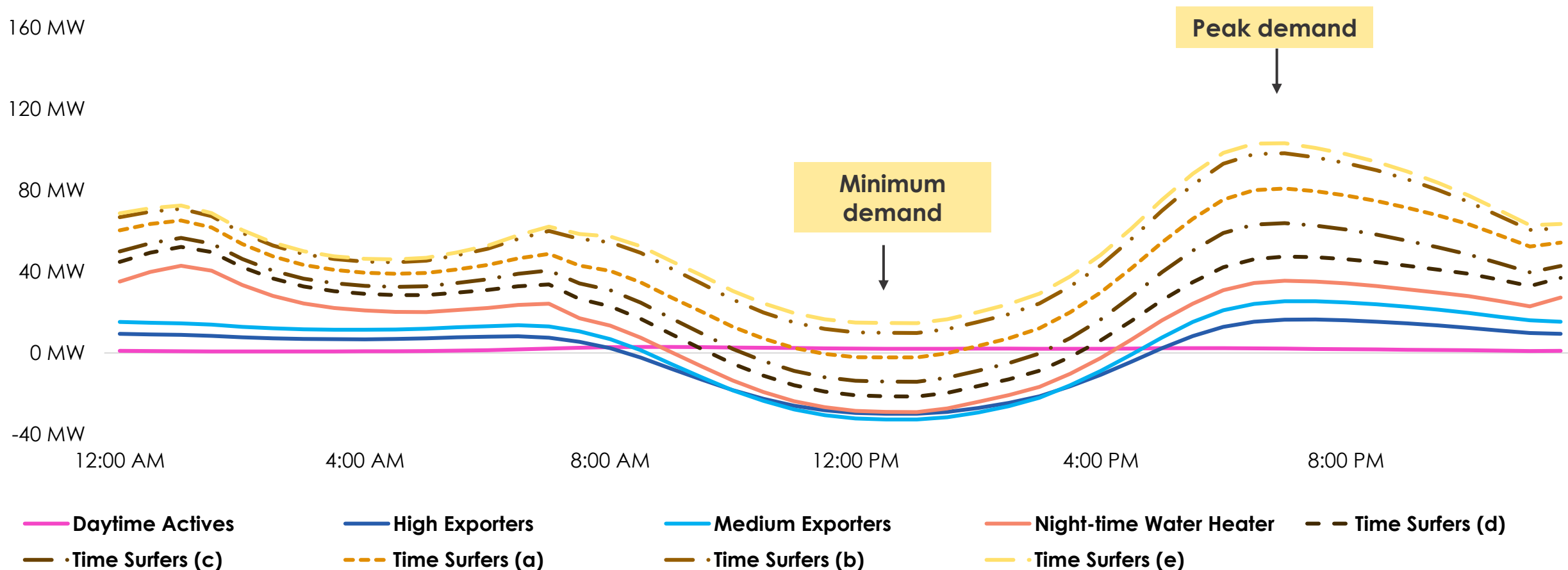
Time Surfers vs other segments



Segments' Contribution to Overall Demand

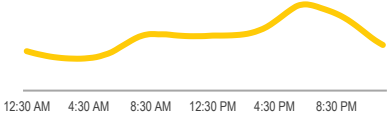
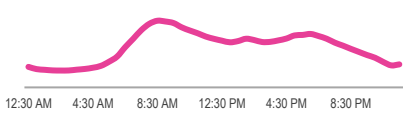
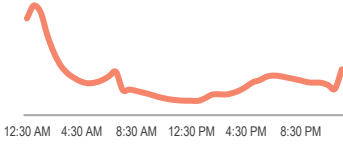
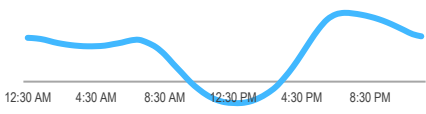
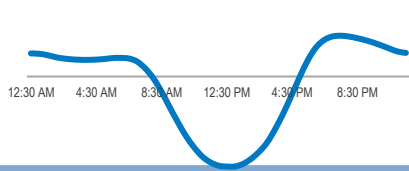
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The graph shows the relative impacts of each segment on overall demand. The segments are stacked on top of each other and the top line – *Time Surfers (e)* – shows total demand.



Our 5 Segments

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Time Surfers (Overall)			Day-Time Actives			Night-time Water Warmers			Medium Exporters			High Exporters		
65% of all customer base			4%			11%			5%			16%		
Low/No Solar Households									Solar Households					
														
Average 4,824 kWh / year			Average 2,918 kWh / year			Average 6,102 kWh / year			Average 4,267 kWh / year			Average -1,219 kWh / year		
Highly motivated by convenience. Skew to working families, higher incomes. Lower energy literacy less interested in changing behaviour.			Highest no. of singles or couples with no children. Tend to be newer properties. More pools and spas. Slightly more even split across metro and regional areas.			Consumption profile driven by AusNet-controlled hot-water load. Low no. of gas connections. Highest number of empty-nesters and over-65s. Concentrated in regional areas.			Highest no. of families and teens. Tend to own and live in bigger houses, with higher number of pools and spas. High reliance on main gas. There is a higher no. of workers			High no. of Empty Nesters and 65+. High reliance on main gas. Our most engaged customer group, who are doing most to save energy. These customers are also most literate on energy issues .		
18% renters		82% homeowners	9% renters		91% homeowners	10% renters		90% homeowners	3% renters		97% homeowners	2% renters		98% homeowners
91% Mains gas	6% bottled gas	5% no gas	66% Mains gas	16% bottled gas	19% no gas	36% Mains gas	26% bottled gas	43% no gas	82% Mains gas	12% bottled gas	10% no gas	84% Mains gas	10% bottled gas	12% no gas
74% Metro		26% Regional	60% Metro		40% Regional	34% Metro		66% Regional	70% Metro		30% Regional	68% Metro		32% Regional
16.5 years old connection			12 years old connection			19.5 years old connection			17.5 years old connection			15 years old connection		
Medium morning peak		High evening peak	High morning peak		Medium evening peak	High overnight peak		Medium evening peak	Medium day minimum demand		High evening peak	High day minimum demand		Medium evening peak

Our 5 Time Surfer Sub-Segments

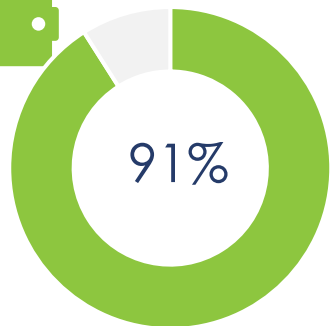
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Time Surfers (a) 17% of all customer base			Time Surfers (b) 17%			Time Surfers (c) 15%			Time Surfers (d) 11%			Time Surfers (e) 5%		
Average 4,791 kWh / year			Average 4,917 kWh / year			Average 3,834 kWh / year			Average 6,100 kWh / year			Average 5,195 kWh / year		
Over-represented in school-aged families and renters, tending to be more metro			Over-represented with children (incl. teens), higher incomes, but smaller dwellings (more units)			Working families with younger children			Families with younger children, many working but also more stay-at-home parents			Over-represented with singles/couples with no children, lower number of workers		
24% renters		76% homeowners	12% renters		88% homeowners	15% renters		85% homeowners	24% renters		76% homeowners	21% renters		79% homeowners
90% Mains gas	7% bottled gas	5% no gas	92% Mains gas	6% bottled gas	5% no gas	93% Mains gas	4% bottled gas	5% no gas	88% Mains gas	10% bottled gas	4% no gas	89% Mains gas	6% bottled gas	6% no gas
79% Metro		21% Regional	73% Metro		27% Regional	74% Metro		26% Regional	67% Metro		33% Regional	80% Metro		20% Regional
16 years old connection			17 years old connection			16.5 years old connection			17 years old connection			16 years old connection		
Steady usage during day		High evening peak	High morning peak		High evening peak	Low morning peak		High evening peak	Medium morning peak		Medium evening peak	Lower morning usage		Steady usage during day

03

Energy Efficiency

Why it's useful



are concerned about the rising cost of energy and associated living costs

Energy saving behaviours benefit everyone:



lower individual bills for households



lower peaks = lower network costs for everyone

The segmentation research identifies:

- ✓ Impact of cost-of-living on different segments
- ✓ Segments' behaviours and barriers/motivations to shift
- ✓ In which segments the biggest opportunities are

Energy-saving home features

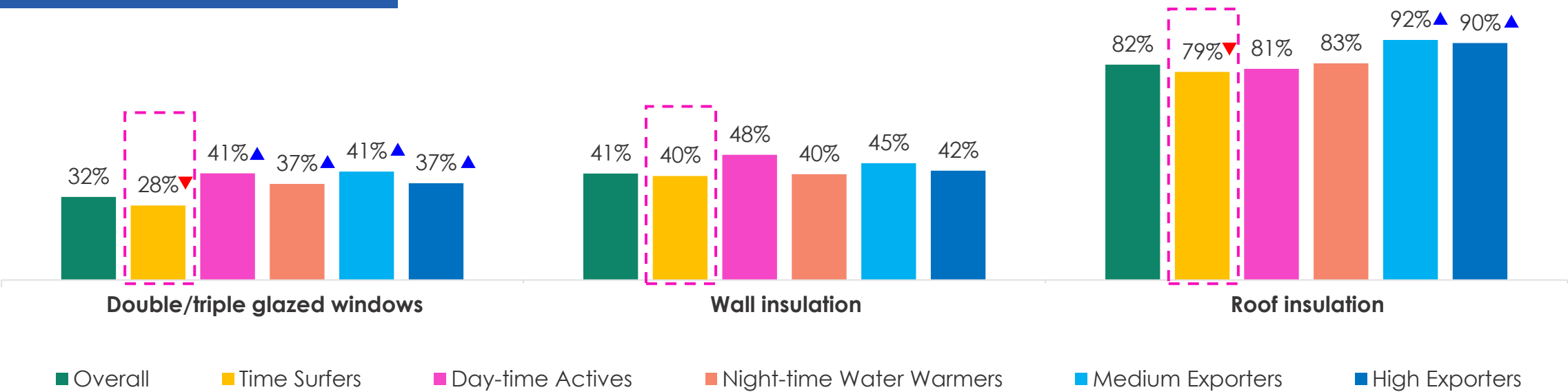
These 3 features (or lack of) materially impact heating and cooling requirements



Key insight

Time surfers are the least likely to have each energy saving feature.

% of homes with feature

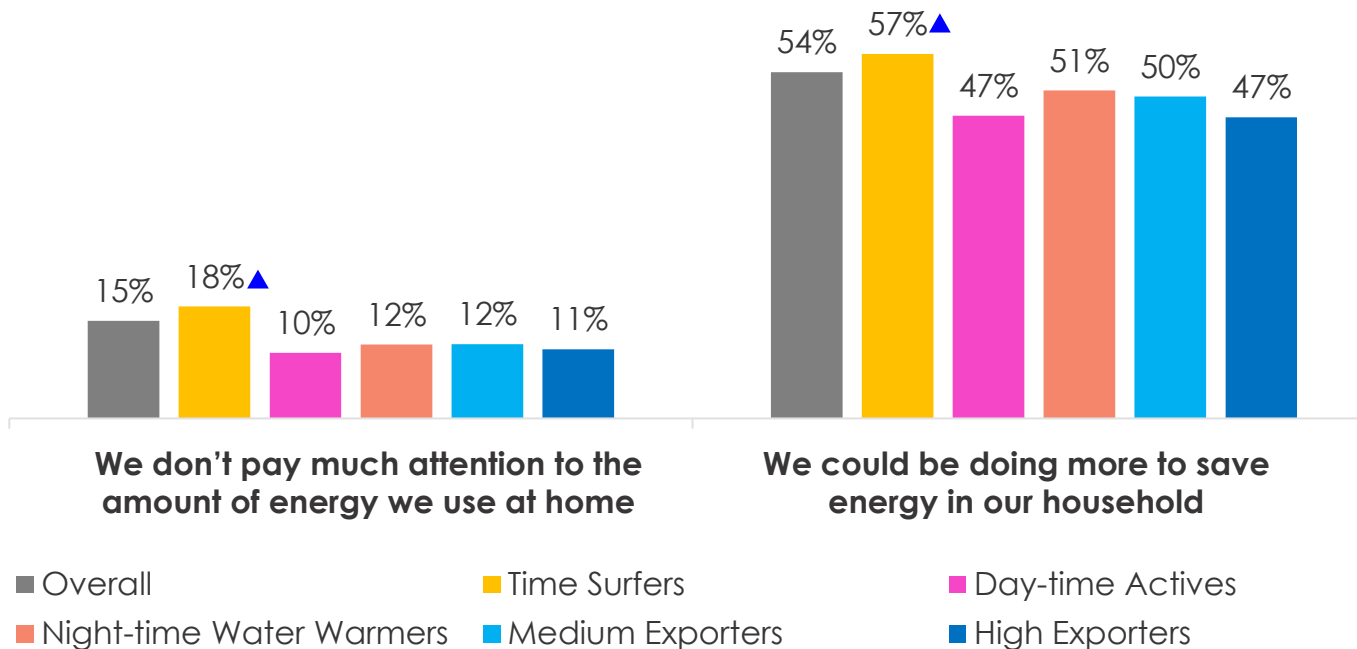


▼▲ Significantly higher/lower than overall

Energy-saving effort varies with segments

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% Agree + % Strongly agree



Key insight

Around **1 in 5 Time surfers** don't pay attention to the amount of energy they use at home (compared to ~ 1 in 10 in other segments)



Key insight

Half of all households agree they could be doing more to save energy

▲ Significantly higher/lower than overall

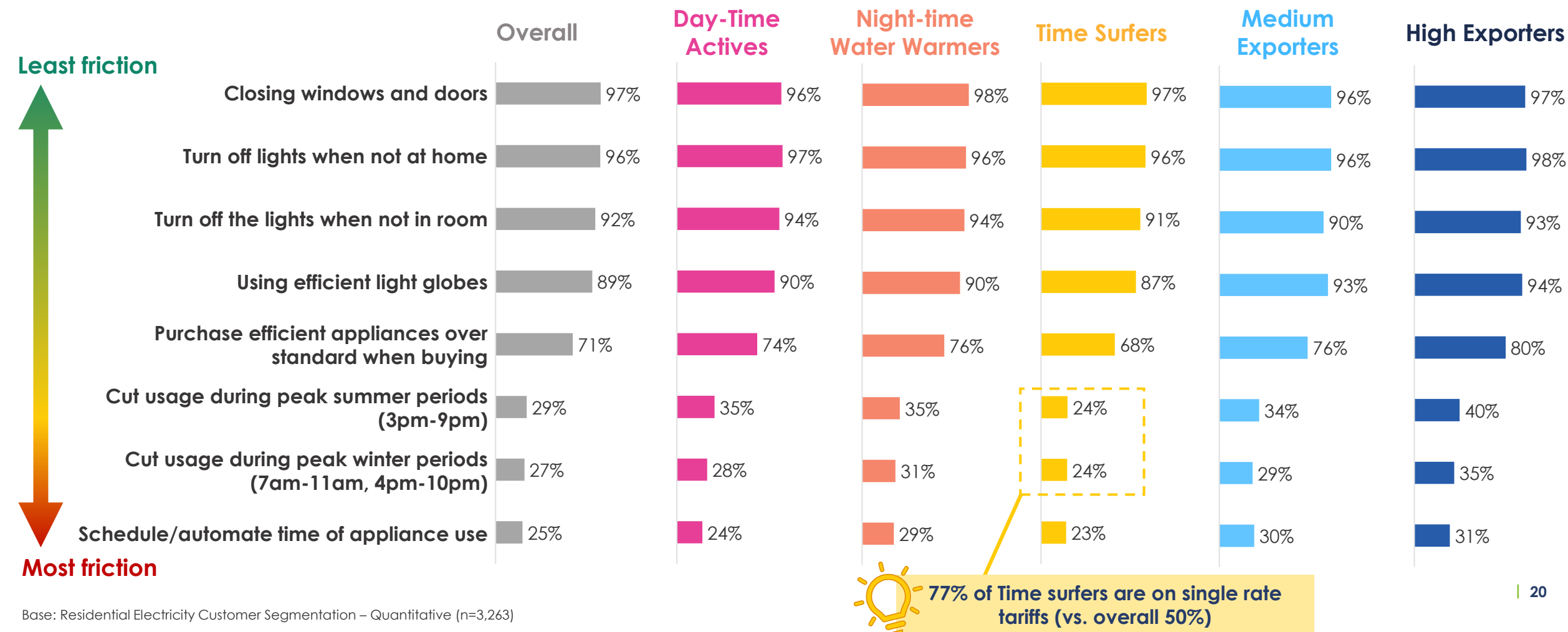
Base: Residential Electricity Customer Segmentation – Quantitative (n=3,263)

Adoption of energy-saving behaviours

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is broadly similar for the easiest-to-do, but gets larger with inconvenience.

High exporters have the highest and Time surfers have the lowest adoption rates.



Motivations to adopting energy-efficient actions

FROM SURVEY (PROMPTED) *(% ranked in their top 3)*

Saving money 79%

Increased cost of living 68%

Being environmentally-friendly 52%

Climate change 41%

Specific energy incentives 17%

FROM INTERVIEWS (UNPROMPTED) *Additional themes*



Sense that energy-efficient behaviours and investments “pay for themselves”



Habit (particularly those learned as children)



Key insight

Cost and reducing impact on the environment were the 2 key motivators that emerged from both the survey and qualitative research.



Barriers to adopting energy-efficient actions

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Key insight

Cost is both the biggest motivator and barrier to energy-saving actions

FROM SURVEY (PROMPTED) *(% ranked in their top 3)*

We can't afford to install solar / batteries 51%

We're already doing as much as we can to save energy 40%

We can't afford to install other energy-saving products 37%

We don't know what else we could do to save energy 25%

Any reduction we could make is too small to make a difference 16%

FROM INTERVIEWS (UNPROMPTED) *Additional themes*

- ✘ Households are busier than ever
- ✘ Hard to get whole household on board
- ✘ Sense that people deserve some creature comforts ... *particularly if they're giving up more expensive things!*
- ✘ Perception that newer (more efficient) appliances don't work as well)



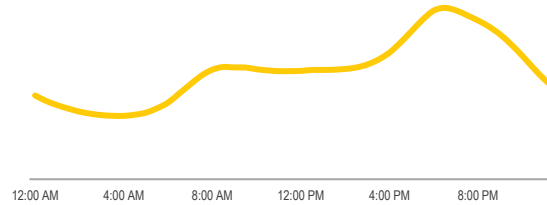
Key insight

Cost was a strong theme in the prompted survey, but **inconvenience and household friction** came out strongly in the interviews!

While there are opportunities for saving electricity (and cost) in all segments, **Time surfers** are the biggest opportunity

Time Surfers represent 2 in 3 households, contribute most to the evening peak and underperform against peers.

- x *Second-highest usage*
- x *Least likely to have energy-efficient features in their homes*
- x *More likely to be on single-rate tariffs*
- x *Fewest energy-saving behaviours*
- x *Highest % not paying attention to usage*
- x *Highest % who feel they could do more*



But their curve will be hard to move:

- Convenience-motivated
- Highest % of renters
- Lowest energy literacy
- Less open to automation

To reach them ... we need to make energy efficiency a “no brainer”

- ✓ Make automation more attractive
- ✓ Shift to cost-reflective tariffs
- ✓ Good incentives
- ✓ Engage whole family.



04 Electrification of gas and transport

Why it's useful

Understanding the impact of electrification of gas and transport on household energy usage is really important for our network planning.

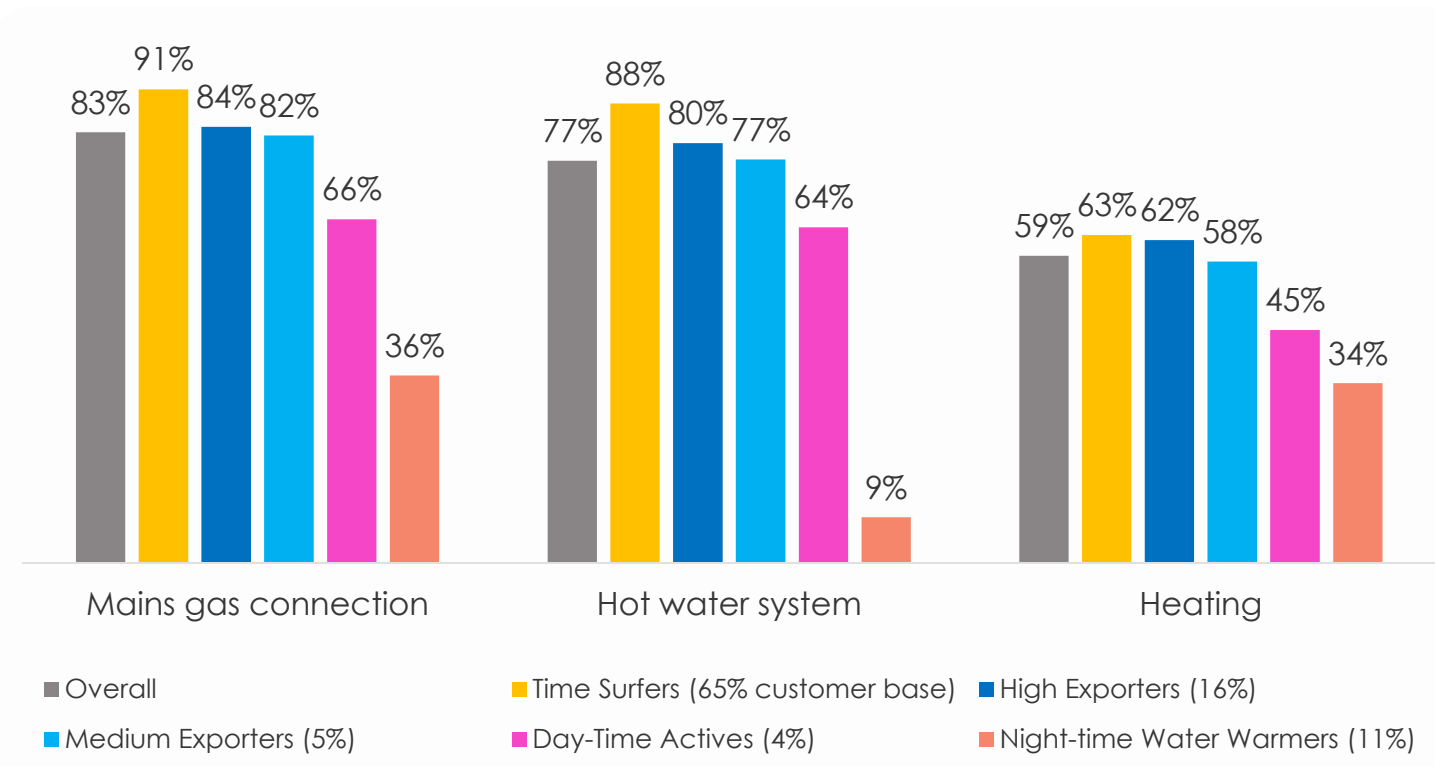


The segmentation research identifies:

- % of households reliant on gas
- gas appliances per age of home and location
- interest in EV ownership
- EV charging patterns

Insights | Prevalence of gas

83% of households have mains gas connected to their home and 9% have bottled gas.



Key insight

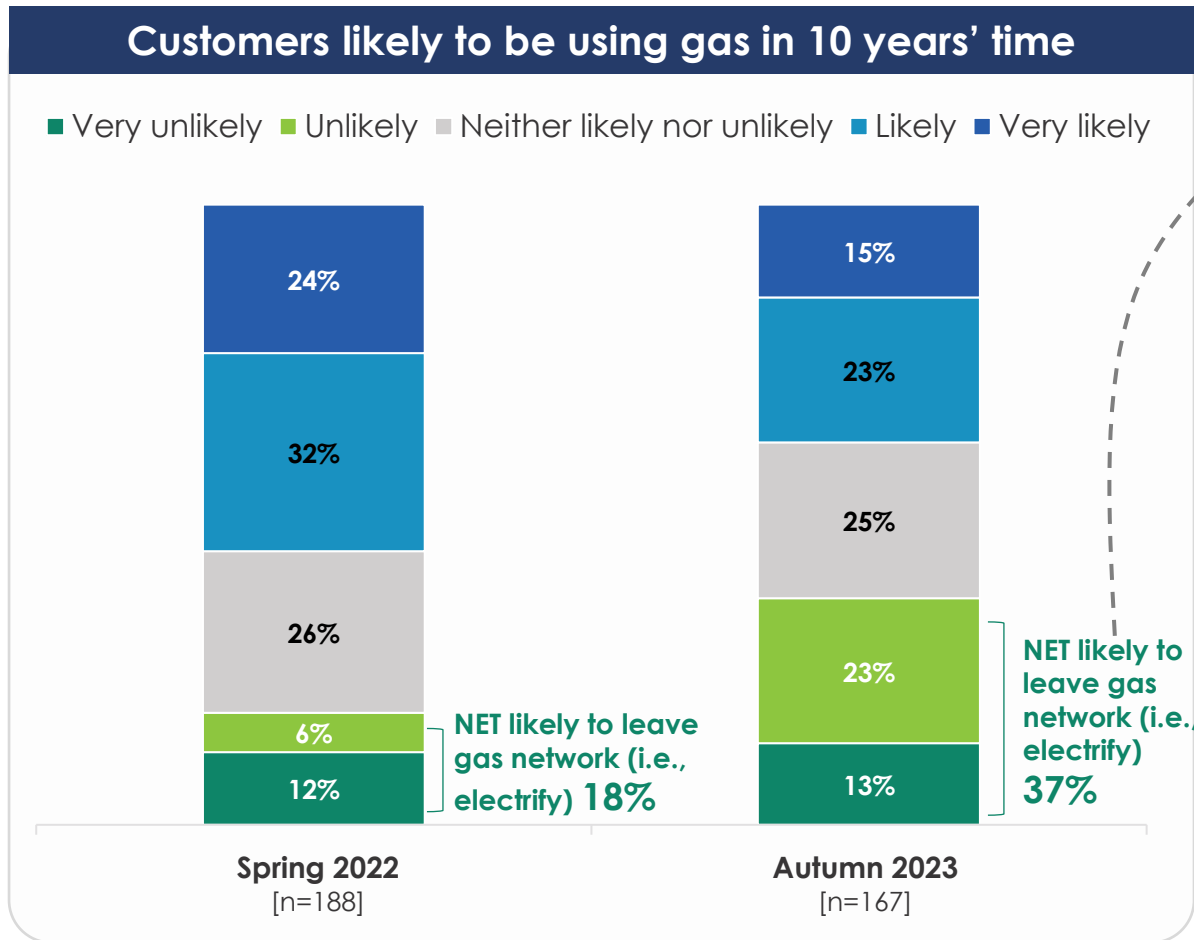
Almost all households in metro areas use gas today, with the highest rates among the least engaged customer segment (Time Surfers) and in oldest homes. Regional areas without mains gas are already mostly electrified (gas bottle rates are low).

Myth buster – are solar customers electrifying to get most out of solar investment?

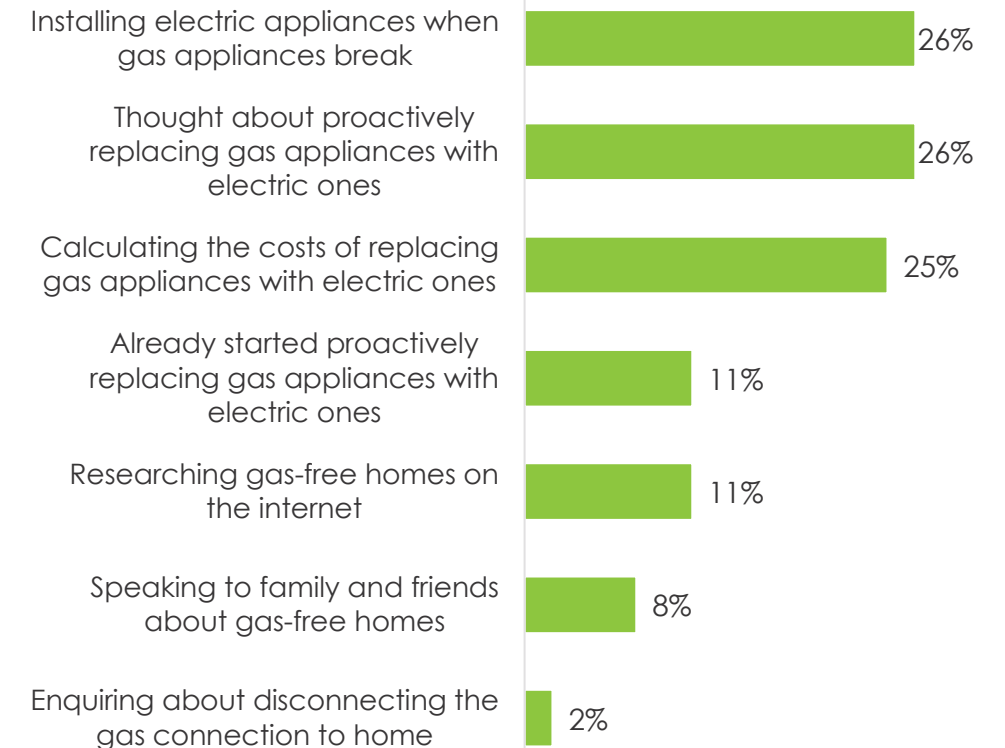
Customers with solar systems have not electrified their homes in large numbers to date. Exporting segments still have high rates of gas.

Electrification could accelerate soon

Our Energy Sentiments survey shows customer intention to leave the gas network has more than doubled in the last 6 months.



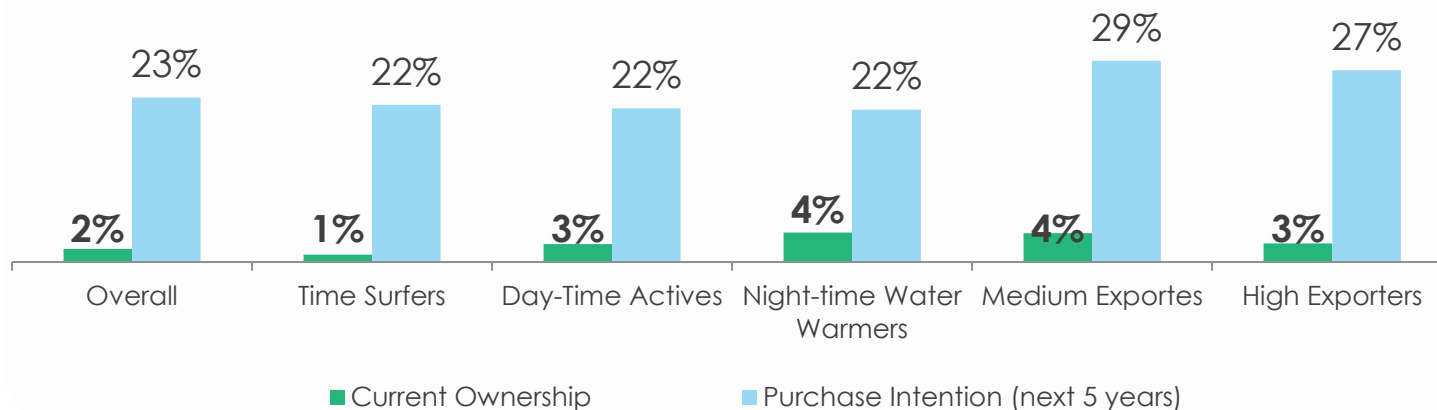
6 in 10 of those likely to leave gas network have taken steps toward electrification



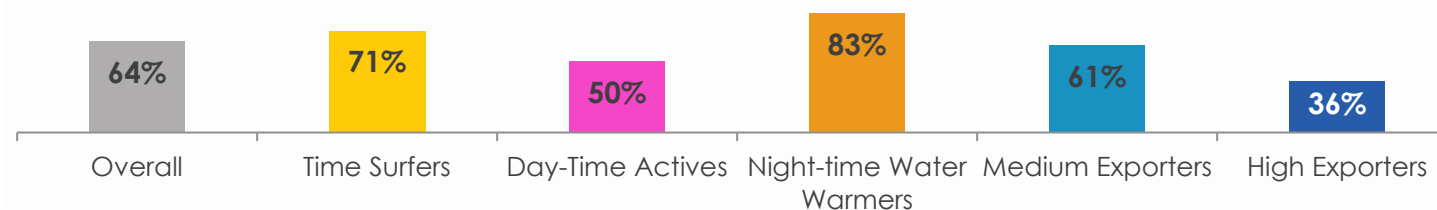
Insights | EV owners by segments

While the sample size is still small, EV owners are already providing some insights into customer behaviours and motivators.

Current EV penetration and intention to buy EVs, per segment*



Tendency to charge EVs at night (rather than at other times)*



*Results are indicative due to small sample size

Key insight



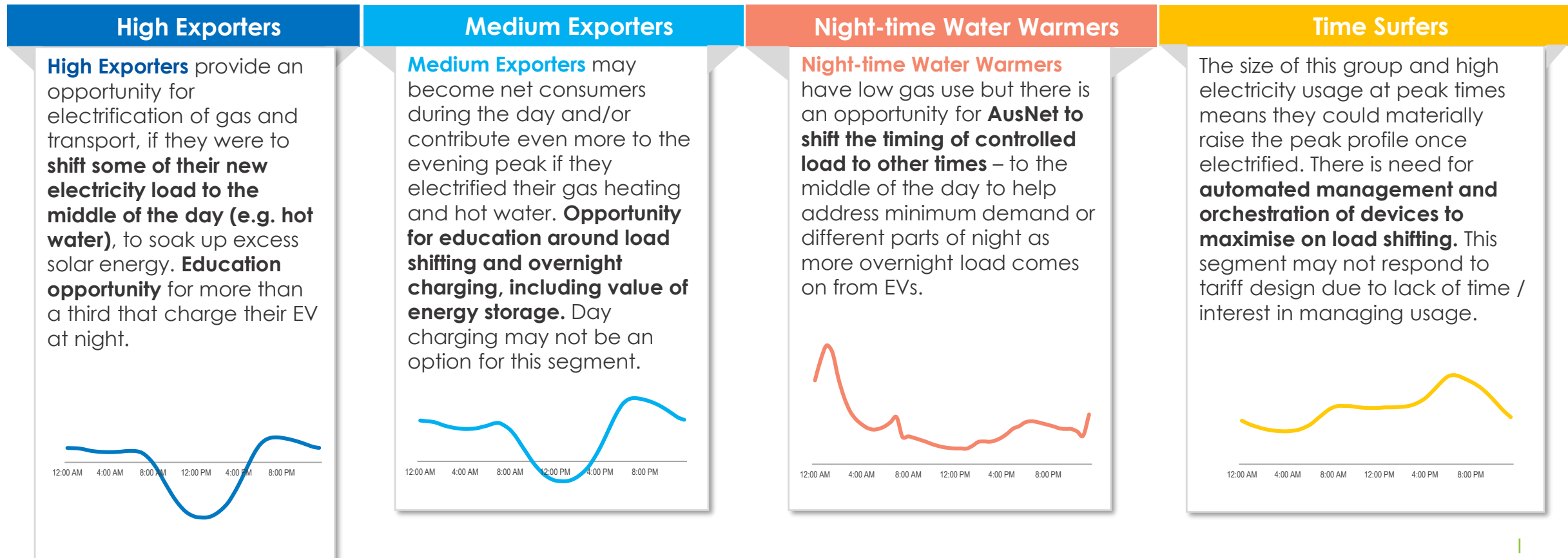
More than 20% of all households intend to purchase an EV in the next 5 years. The exporter segments are more likely to purchase an EV. Time Surfers are showing the least interest. Based on existing charging patterns, most customers are likely to charge overnight.

Myth buster – do solar customers charge their EV during the day?

High Exporters tend to charge less during the night (and presumably charge during the day), but Medium Exporters mostly charge during the night, likely due to less flexible routines.

Applying insights in practice | Demand forecasting

Understanding customer segments will help us better plan for network demand as the different segments electrify their homes and cars and implement measures that reduce impact on network costs and customer experience.



05 Solar exporters

Why it's useful

Customers who can export energy back into the grid are changing the way networks plan for and deliver electricity supply. It is also changing how network charges are recovered from customers.



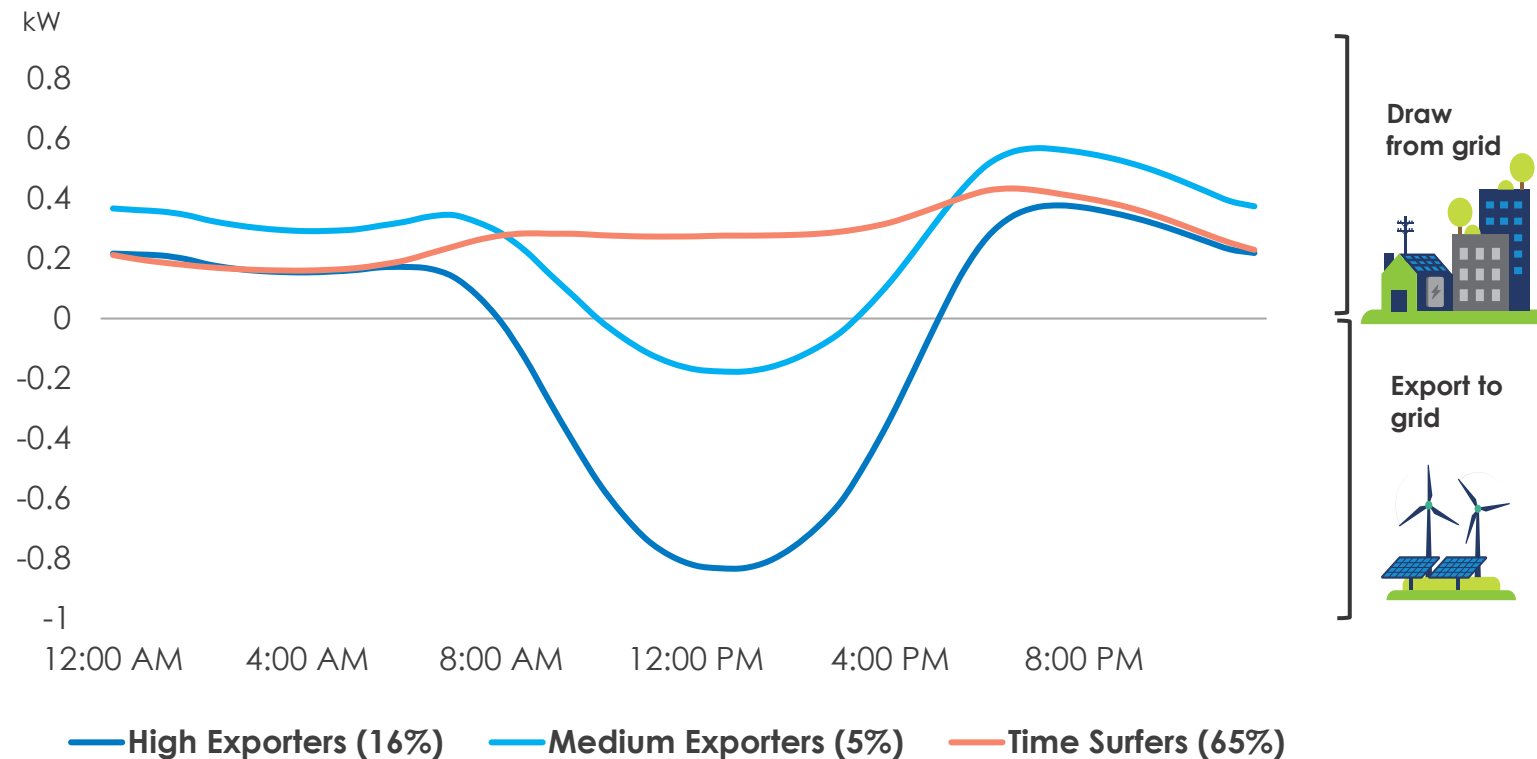
The segmentation research identifies:

- export patterns
- characteristics of exporting customers
- intention to install solar

Households exporting electricity back into the grid

“Exporters” are changing the way electricity is supplied to customers.

Average daily usage per half hour intervals

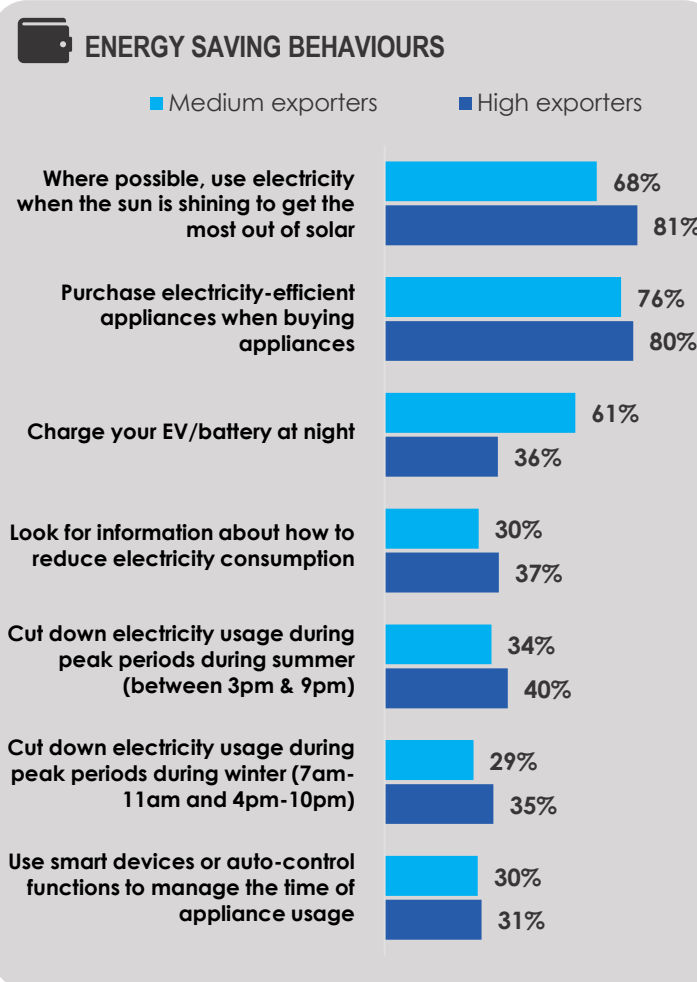
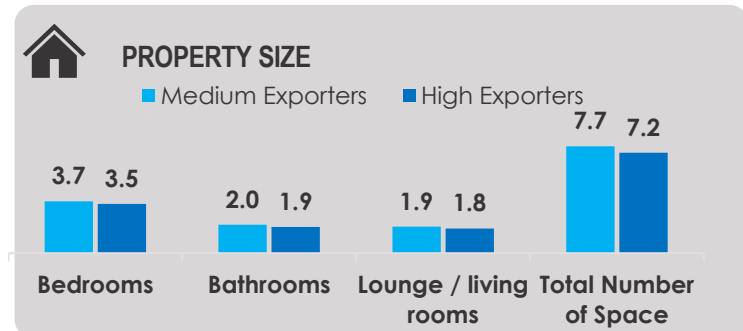
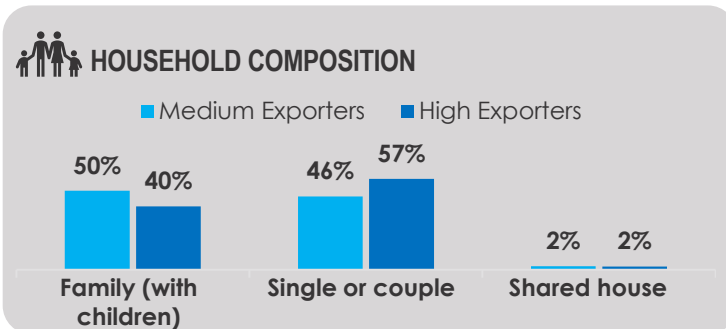
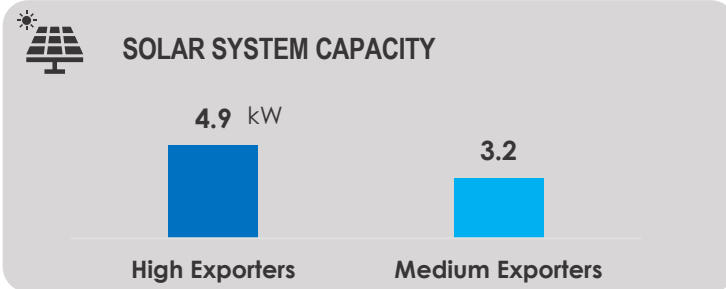


Key usage characteristics:

- Most customers with rooftop solar are feeding energy back into the grid during the day.
- Those with high exports are exporting more energy to the grid during the middle of the day than an average Time Surfer uses during the evening peak.
- Solar customers with high usage have lower exports but higher evening peak.

Insights | High vs Medium Exporters

Family size and house characteristics have a significant impact on overall export levels.



Key insight



Medium Exporters have larger houses and family households, which explains their higher usage and less flexibility to shift behaviours. They are less engaged on all energy saving behaviours than High Exporters. High Exporters are engaged in saving energy.

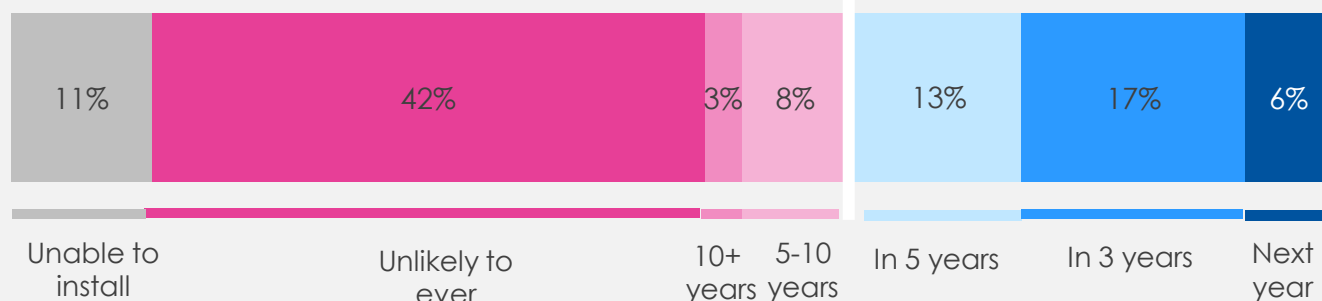
Myth buster – do high exporting customers spend less time at home during the day?

High Exporters are more likely to be at home during the day, despite their high daytime exports. This allows them to shift usage to during the day, but many still believe export is always valuable to the grid and therefore may not be doing everything they can.

Insights | Solar uptake expected to continue to rise

If the motivation to get solar is stronger than the barriers, over 50% of AusNet's customers could have solar in the next 5 years

Purchasing intention by customers without solar



Key insight

37% of customer who own a home are intending to purchase solar over the next 5 years. That could bring ownership of rooftop solar among AusNet customers to ~50% by 2028.

Motivators for getting solar

- ✓ Long term cost savings
- ✓ Renewable source of energy
- ✓ Independence from the grid
- ✓ Previous positive experience

Barriers to getting solar

- ✗ Upfront costs
- ✗ Unclear pay back value / period
- ✗ Time horizon for savings can be too long
- ✗ The right time to buy to get most out of technology
- ✗ Scepticism about renewables

Myth buster – are solar connections going to slow down?

While there are both motivators and barriers to getting solar, most AusNet households that can install rooftop solar intend to do so in the near and long term.

Applying insights in practice |

Tariff design

Without a change in network tariff design, High Exporters may continue to add cost to the network without a proportional change in network charges

Segment	Maximum demand	Minimum demand	Capacity used Max – min demand	Network charge*
High Exporters	0.4 kW	-0.8 kW	1.2 kW	\$342
Medium Exporters	0.6 kW	-0.2 kW	0.8 kW	\$617
Time Surfers	0.4 kW	0 kW	0.4 kW	\$652

* Indicative network charges based on time of use (TOU) tariffs



Key insight

Exporting customers are increasing the variations in demand and exports that distributors need to plan for and invest in. However, customer who have high exports typically pay a lot less in network charges. Without changes to tariff structures, as more customers become exporting customers, the disparity between exporting and non-exporting customers is likely to grow.

What about batteries?

Batteries will play a key role in increasing flexibility of demand and export, and reducing costs on the network, particularly for Medium Exporters that are less directly engaged.



Myth buster – are exporting customers considering batteries?

High and Medium Exporters are interested in batteries but are also somewhat sceptical. As they already have solar, they are more knowledgeable about the costs / benefits, waiting for the cost of batteries to fall before investing.

06

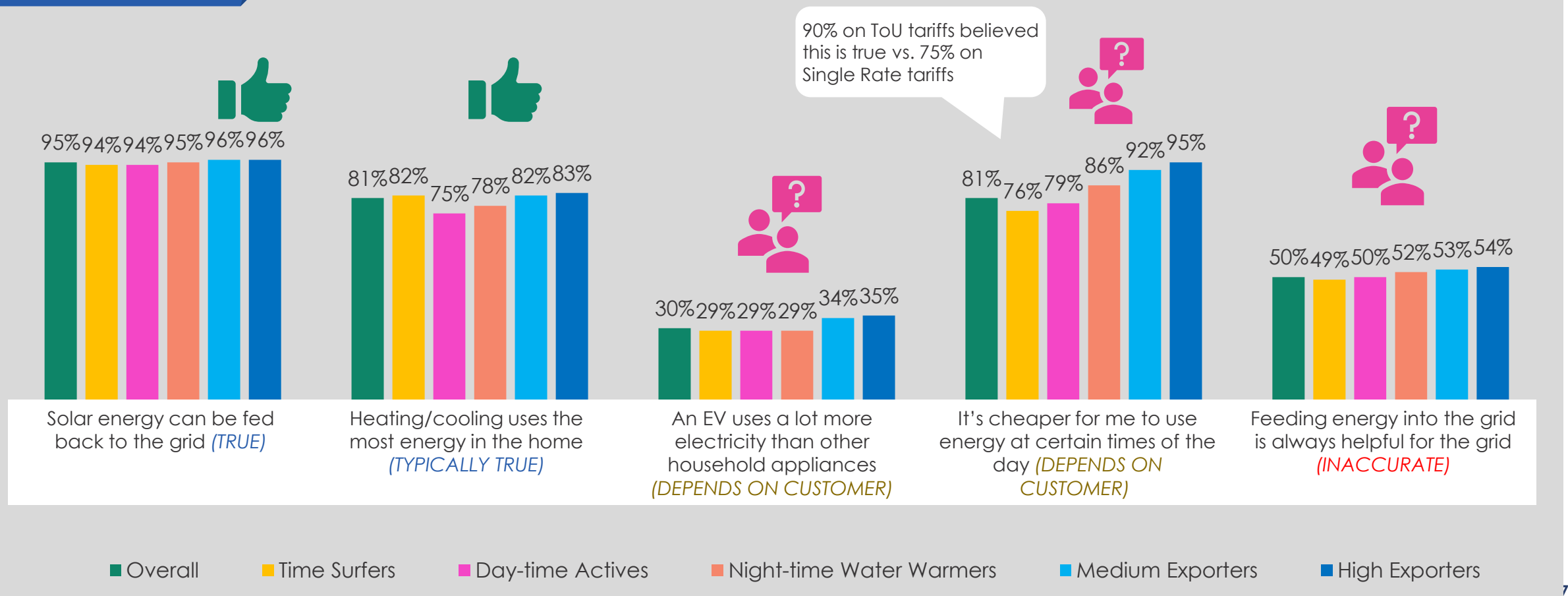
Communications & energy literacy

Insights | Literate only on basic energy issues

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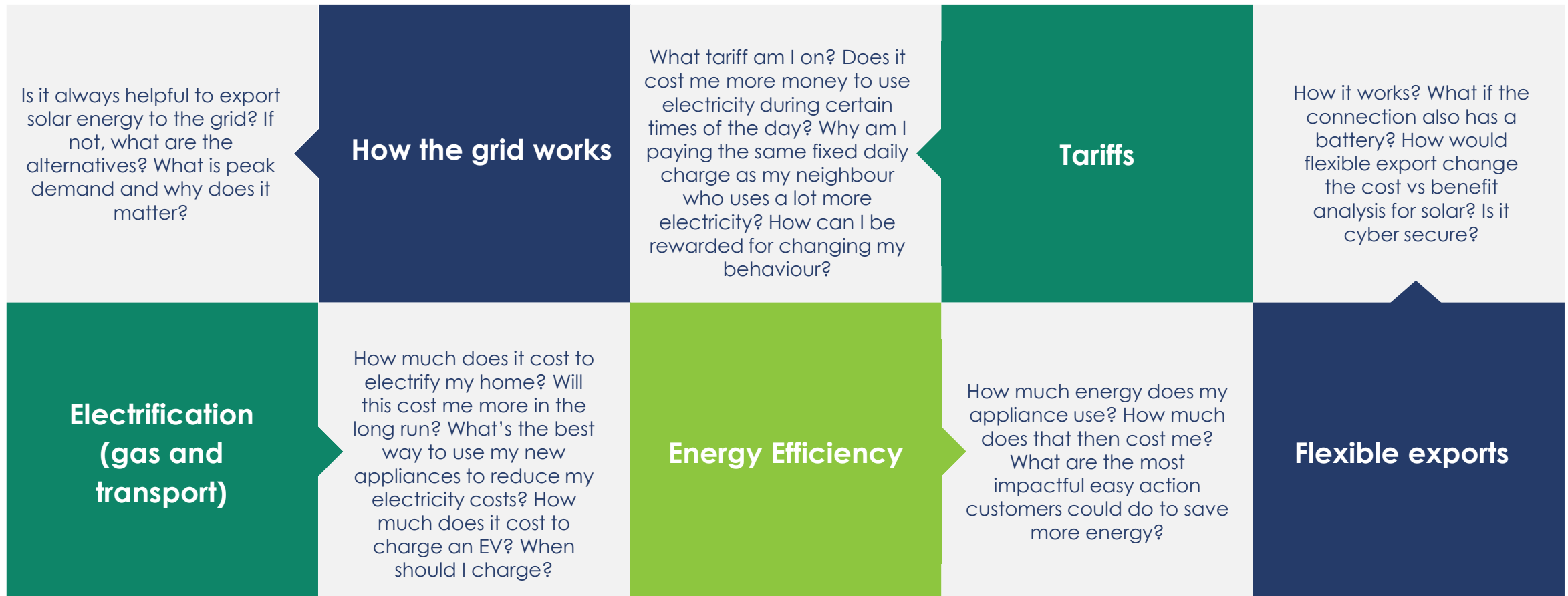
Most customers are familiar with conventional energy issues but their knowledge of the more advanced topics, including EV, tariffs, and how the grid works, is limited

ENERGY LITERACY (% responded 'true')



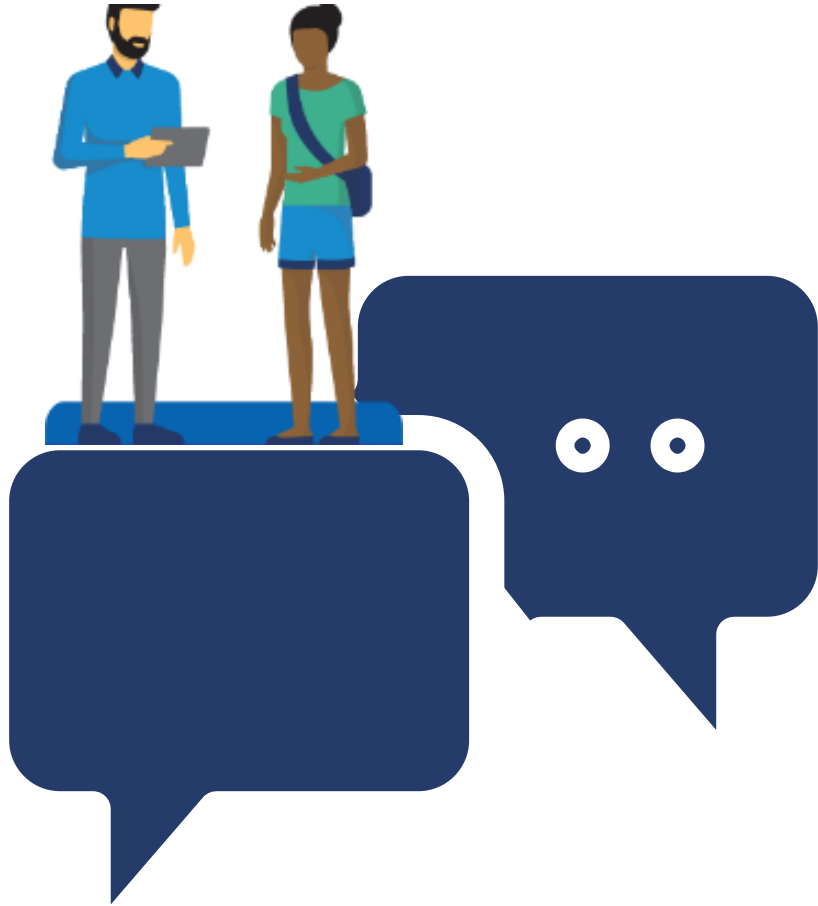
Applying insights | Improving energy literacy **AusNet**

Targeting engagement and education at certain segments for maximum impact will become critical to a successful and orderly clean energy transition. And the opportunities are endless!



07 Q&As

Q&A



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Thank You

