TasNetworks
Delivering your power

Distributed Energy Resources Customer Survey

Research Report

SEPTEMBER 2021

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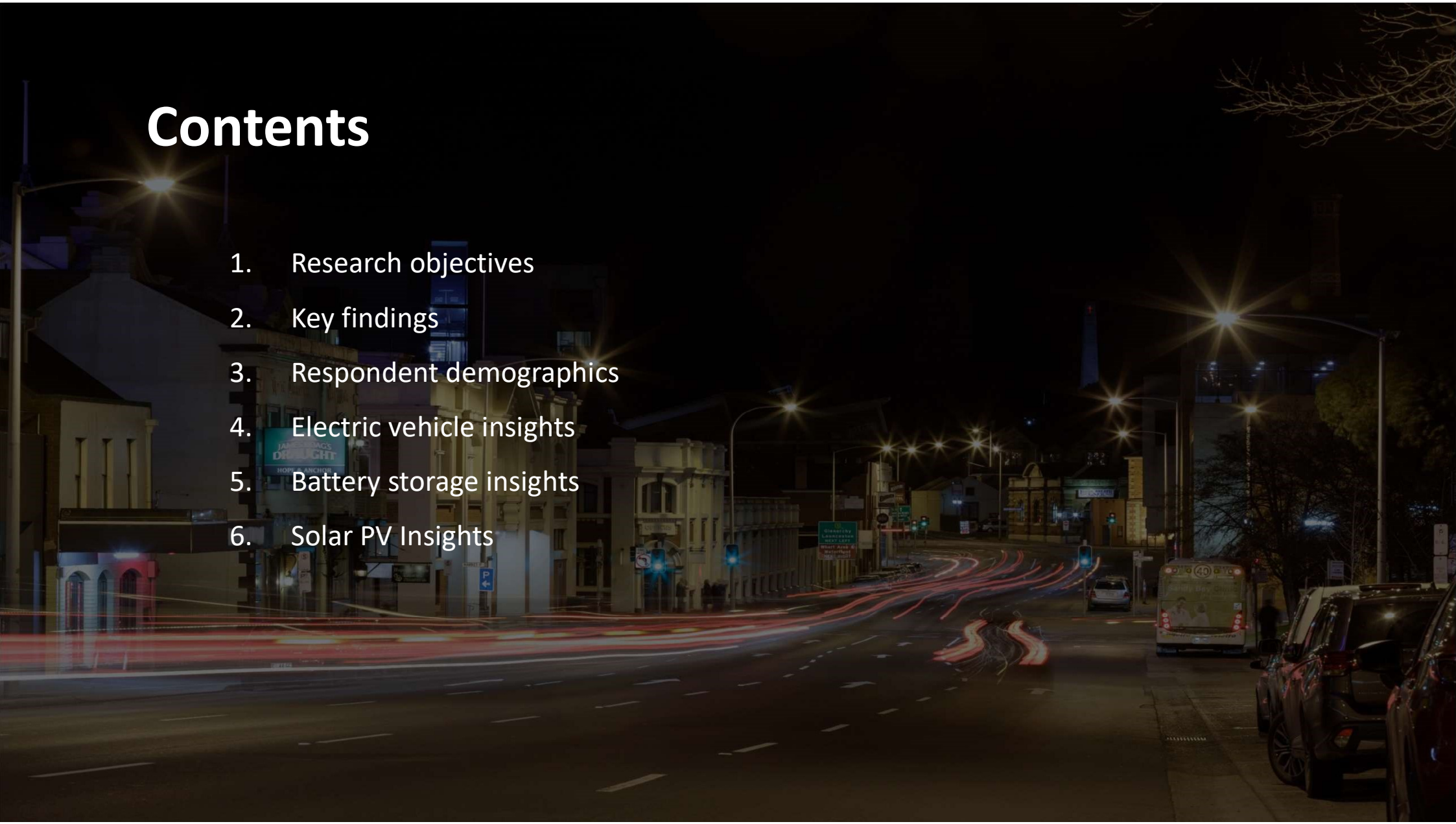

DER Survey Objectives

The purpose of the DER customer survey was:

1. To better understand how and when our customers use energy storage and generation technology such as;
    - solar PV (solar panels),
    - Batteries, and
    - electric vehicles
2. To inform decisions which shape our future network

Key Findings

Respondents

- The majority of respondents are located in Hobart and own their own home.
- Respondents tend to be in full time employment, earn higher incomes and are mature.
- Respondents have relatively high uptake of DER technology compared to the general population.

Electric Vehicle Owners

- Existing electric vehicle owners:
  - would be interested in powering their home from their vehicle if the technology was available;
  - have identified that they charge their vehicle whenever it is convenient – this is mostly overnight or on weekends;
  - have observed changes in their energy use – particularly customers who are currently on a time of use tariff.
- Respondents considering purchasing electric vehicles in the next 10 years:
  - have identified that they would charge their vehicles during off-peak times.
  - Plan on purchasing an EV, however cost is the main deterrent

Solar Owners

- Over half of all survey respondents who don't currently own solar PV would consider purchasing solar PV.
- Self consumption was the main investment driver for both solar and non solar owners.
- More than half of solar PV owners plan on installing a battery in the next ten years.

Battery Storage Owners

- The main driver for investment in a battery was to utilise the off peak rate and self consume during peak times.
- A high proportion of all non battery owners would not consider purchasing battery storage without solar PV, and most current battery owners don't use their battery on it own, but in conjunction with other DER technologies.
- Key deterrents for non battery owner investment in battery storage technology include: uncertainty around disposal, rate of return on investment and battery safety.

Respondent demographics versus the general Tasmanian population*

- The respondents tend to be in full time employment, earn higher incomes and are mature
- The majority of respondents were located in Hobart and owned their own home

Where * Tasmanian comparison data in the following slides is taken from the 2016 ABS Census data

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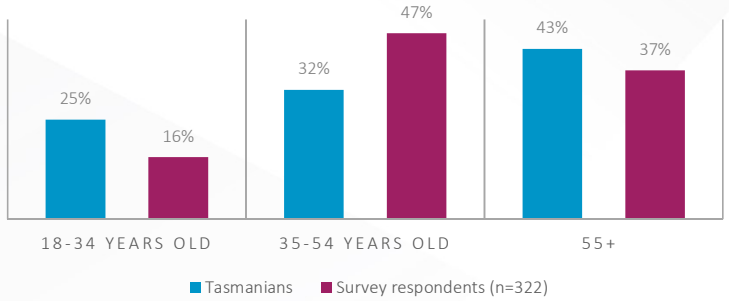
The respondents tend to be in full time employment, earn higher incomes and are mature

Household Income

Of the 322 **respondents 47%** earn more than $100k+ compared to the broader **Tasmanian population*** where **23%** of earn over $100k.

Age

The majority of **respondents** are between the age of 35-54.
The 18-34 years olds are under-represented when compared to the **Tasmanian population***.



Employment

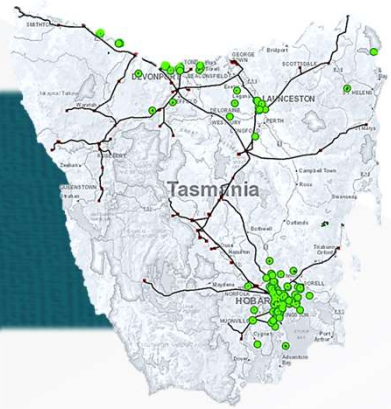
Of the **respondents**:

- 62% are either employed full or part-time
- 12% are self-employed
- 16% are retired
- 8% are either employed casually, unemployed, in unpaid work (e.g. carers), unable to work or studying

The majority of respondents were located in Hobart and owned their own home

Location - Region

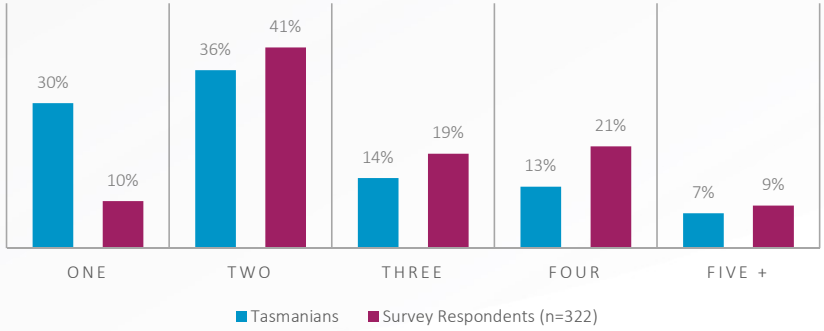
Over **78% of survey respondents** reside in the Hobart region – compared to **33% of Tasmanian residential customers***



Household Size

The **majority** of **respondents (81%)** live in a two, three or four person household – higher than the **Tasmanian population (63%)***

However **over half** of the **respondents** were either in one or two person household, this is lower than this cohort for the **Tasmanian population (66%)***



Home ownership

83% of respondents own their own home, with **45%** owning their home outright. Compared to **71%** of the **Tasmanian population*** owning their own home (**37%** outright).

12% of respondents rent (compared to **28%** of the **Tasmanian population***).

The type of housing is consistent with the broader Tasmanian population

	Respondents	Tasmanian population
Free standing detached	84%	88%
Semi-detached	8%	6%
Apartments (low and high rise)	5%	6%

Electric Vehicles

- Existing electric vehicle owners:
  - would be interested in powering their home from their vehicle if the technology was available;
  - have identified that they charge their vehicle whenever it is convenient – this is mostly overnight or on weekends;
  - have observed changes in their energy use – particularly customers who are currently on a time of use tariff.
- Respondents considering purchasing electric vehicles in the next 10 years:
  - have identified that they would charge their vehicles during off-peak times.
  - Plan on purchasing an EV, however cost is the main deterrent

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Electric Vehicle Owners - demographics

22% (n=71) of the survey respondents **own an electric vehicle**
of those respondents **69%** live in **Hobart**

66% of EV owners who responded are **55+** years of age.
Respondents who are **retired** are somewhat more likely to own an EV (41%).

Of EV owners

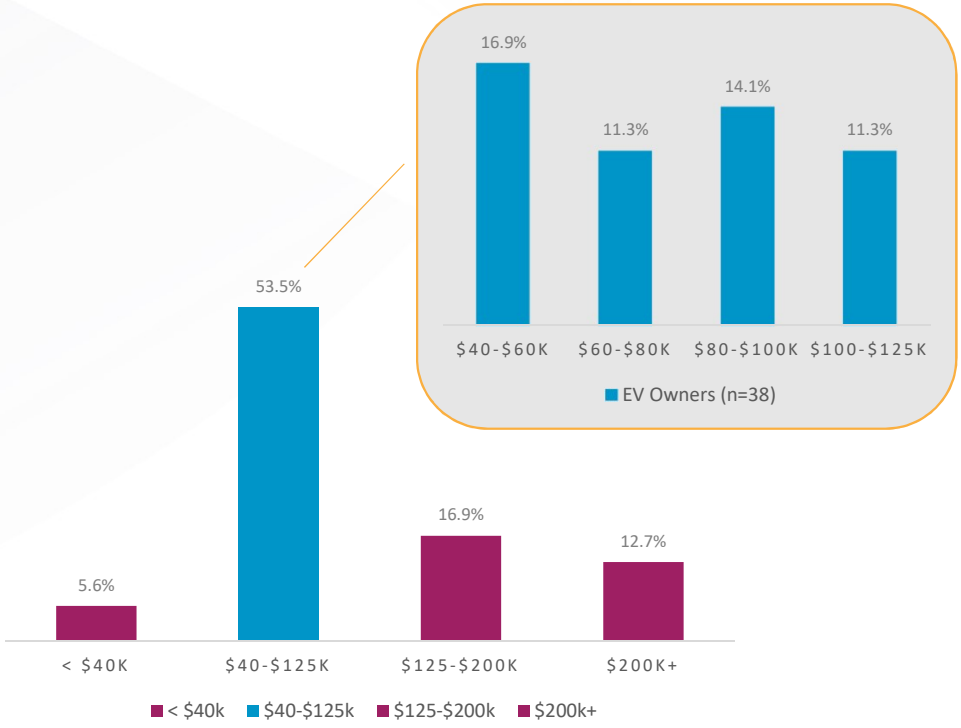
- **41%** are **employed** on a full or part time basis
- **28%** are **retired**
- **21%** are **self employed**

Of EV owners

- **89% own their own home** (68% own their home outright).
- **49%** have **two people** in their household.

53% earn between **$40k and $125k** per annum

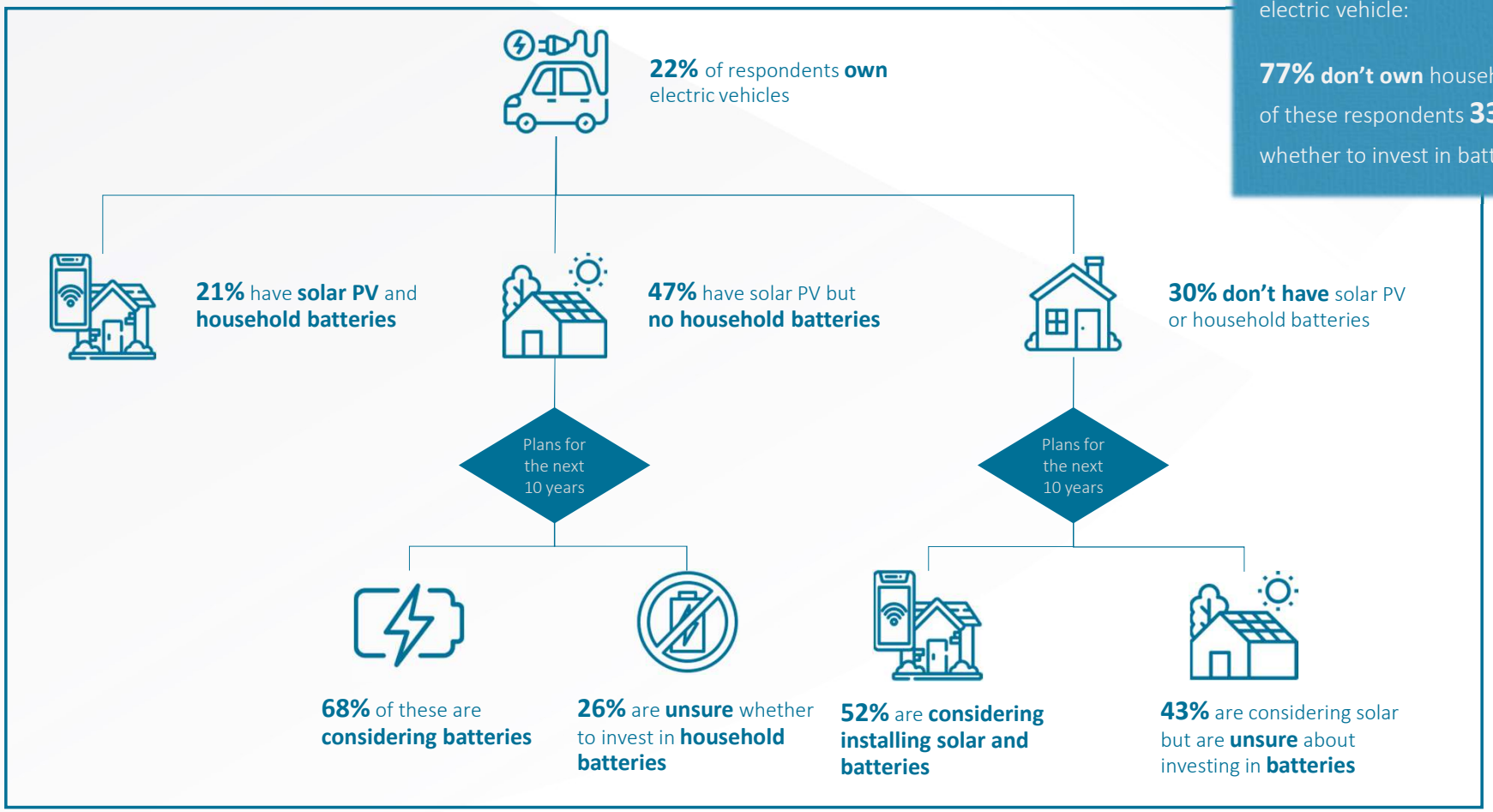
41% earn **above $100k**



Electric Vehicle Owners – and energy technology

Of the survey respondents who own an electric vehicle:

77% don't own household batteries, and of these respondents **33% are unsure** whether to invest in batteries



Electric Vehicles – customers' understanding of the technology

Owners

22% of the survey respondents own an electric vehicle

65% thought an electric vehicle was better for the environment

89% would consider using their car battery for household consumption if the technology became available.

72% were confident in their knowledge of electric vehicles when they purchased them

56% ranked **convenience** as being the most important factor in charging their vehicle, followed by cost (35%).
With EV owners **charging** their vehicle **overnight 54%** of the time and on weekends (49%)

Non-owners

78% of the survey respondents do not own an electric vehicle

69% of those who have plans to purchase an EV in the next 10 years consider EVs to be better for the environment.

20% who have plans to purchase an EV in the next 10 years believe they are less expensive to run and maintain.

62% are considering purchasing an electric vehicle in the next 10 years despite …

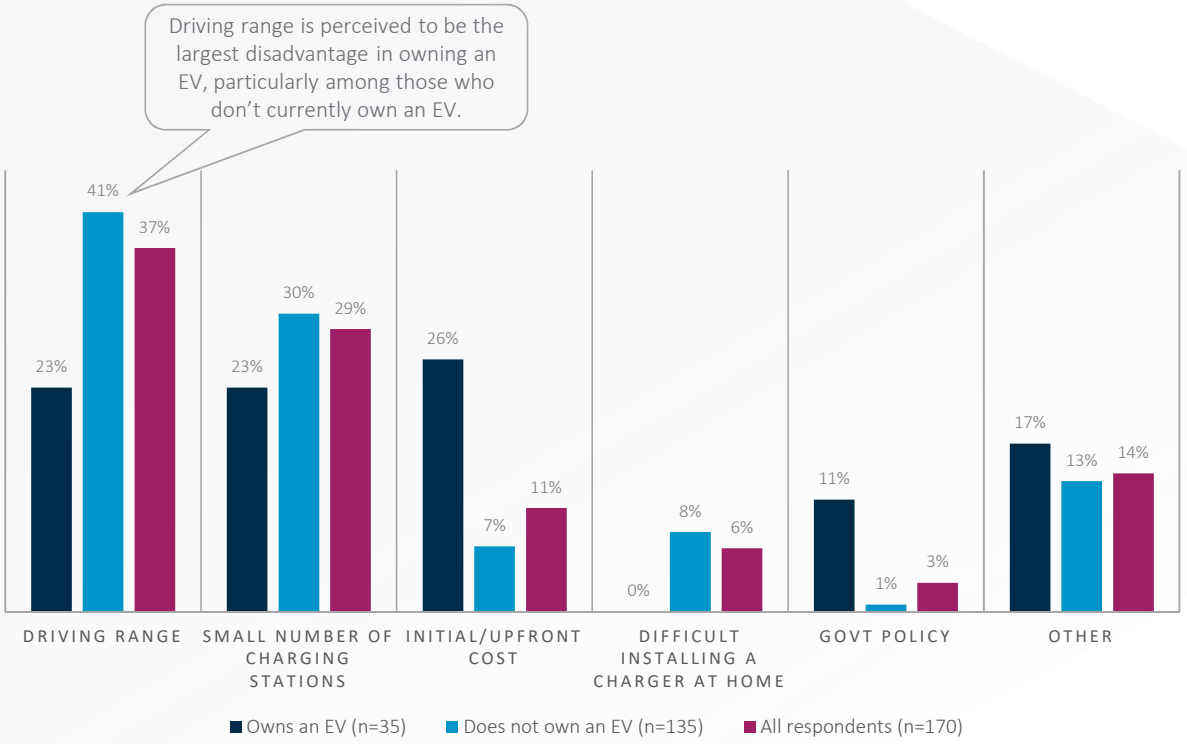
- **21%** of these respondents not having confidence in their knowledge to purchase an electric vehicle and …
- **42%** stating that their understanding of EVs is not as good as their understanding of internal combustion engine vehicles.

85% of the survey respondents who intend on purchasing an EV state that they would charge their vehicle at home. These respondents would charge their vehicles:

- between **9pm and 7am** on weekdays **74%** of the time
- on **weekends 37%** of the time, and
- between **10am and 4pm** on weekdays **23%** of the time.

Electric Vehicles – perceived disadvantages of owning EVs

All respondents



Perceived disadvantages for who are unsure or plan to purchase EVs.

25% of non-owners who have future purchase plans consider there is **technological uncertainty/limitations**, compared to 14% of non-owners who are unsure about purchasing an EV.

For customers who are unsure whether to purchase EVs, **14%** were concerned with the effects of **pollution during driving/manufacturing**, compared to 33% of those who have no intention to purchase an electric vehicle.

Electric vehicle disadvantages

As told by our customers

Technology is still **evolving**

"Technology is likely to develop a lot in the near future. Also most electric vehicles have designs that people don't want to buy (sedans, sports cars)."

"Currently very few models on sale in Tasmania."

"Not yet good for towing boats."

"Technology changes creating early obsolescence."

"Gaps in public policy on EVs in society in terms of facilities, incentives, possible EV taxes."

"Due to lack of government support (common in other developed countries), and at times open derision of EV's, they are relatively very expensive in Australia."

Lack of **government policies**

High **initial cost**

"High upfront cost compared to fossil fuel vehicles - needs to be comparable."

"They are outrageously expensive. I understand why and accepted this when I purchased, but it still hurts to pay the cost of two cars for a single EV."

"Lack of power tariffs that suit EV home charging."

"Not being allowed to use it as a source of energy for my home."

Perceived barriers from **TasNetworks**

Unsustainable and **dangerous**

"Electric pollution is as high as petrol."

"They are silent and cyclists and walkers have not much warning that they are approaching."

"We fail to measure the environmental impact of building and servicing the cars (including their batteries)."

Why customers are buying electric vehicles

As told by our customers

Looking to the **future**

"The way of the future."

"I feel the vehicle market is transitioning to electric."

Internal combustion engines will become **less common**

"ICE cars will become extinct. I have no choice. That's fine by me."

"Re-sale value of fuel vehicles will possibly be lower as electric vehicles become more common."

Cheaper overall costs

"Overall ownership costs, fuel, maintenance cheaper."

"Cost of ownership a bonus. Resale of Tesla vehicles is high."

Electric Vehicle Owners – use of tariffs and energy costs

The information on the next two slides refers only to those respondents (93% (n=66) of EV owners) where consumption data was available

44% of the survey respondents who own an electric vehicle use the residential **time of use consumption tariff (TAS93)**. This compares to 17% of TasNetworks customers being on a time of use consumption tariff.

78% respondents have an **average to very good understanding** of their tariffs, represented by:

- **79%** time of use consumption (TAS93)
- **76%** general flat rate tariff (TAS31)

94% of the survey respondents who own an electric vehicle **charge at home,** of those respondents:

- **54%** charge **Monday to Friday 9pm – 7am**
- **49%** charge **on weekends**

Respondents on the time of use tariff (TAS93) charge their vehicle on

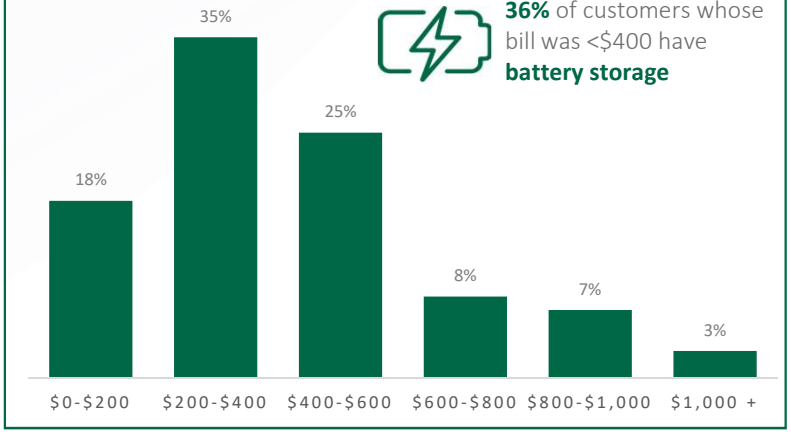
- **weekends 72% of the time** and
- during **weekday off-peak 59% of the time.**

Respondents on the general light and power tariff (TAS31) charge their vehicle during **weekends 48% of the time**

59% of the survey respondents have a **solar tariff** installed against their property

54% of electric vehicle customers' **average quarterly bill** is **less than $400**

36% of customers whose bill was <$400 have **battery storage**



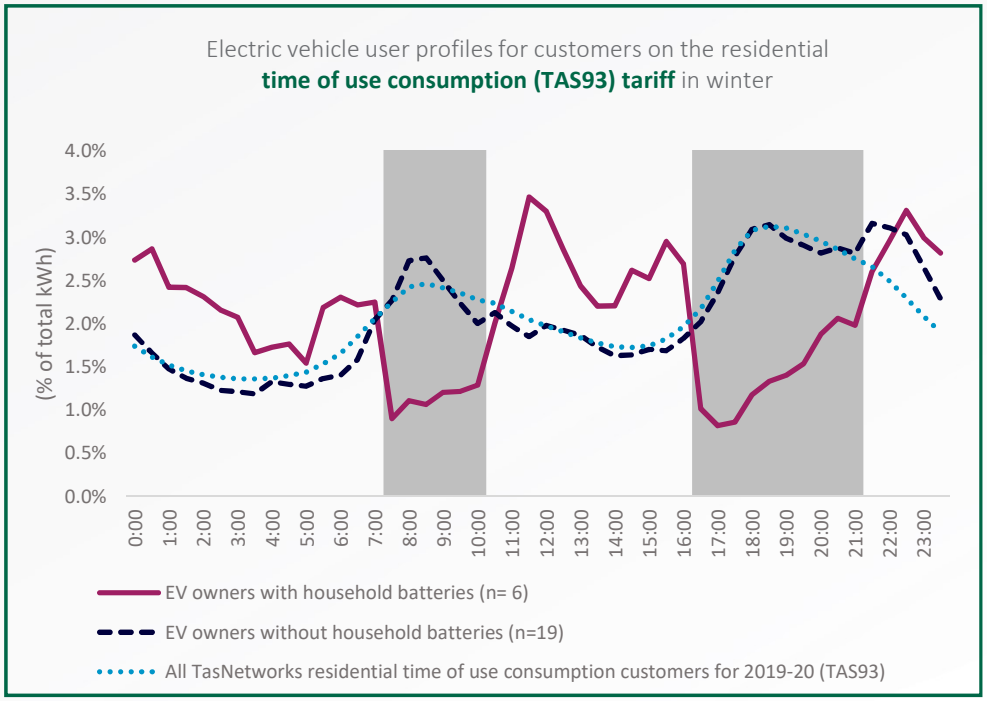
Electric Vehicle Owners – consumption profiles

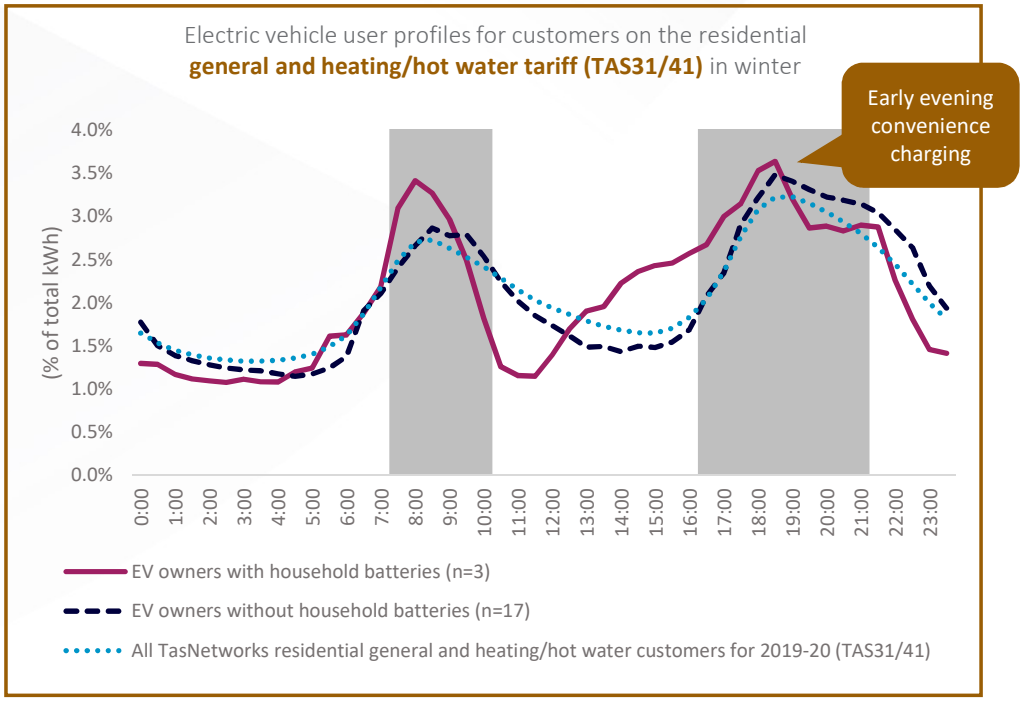
Customers on a **time of use** tariff

- with household batteries seem to respond to **off-peak** network charging windows.
- without household batteries may also be responding to the **off-peak** network charging windows with a spike in their profile after 9pm.

Customers on the **general** tariff and **heating/hot water** tariff

- with and without household batteries seem to charge when it is convenient.





EV users vary the way they use energy for their electric vehicles

Solar

- Over half of all survey respondents would consider purchasing solar PV
- Self consumption was the main investment driver for non solar owners who would consider buying solar PV
- More than half of solar PV owners plan on installing a battery in the next ten years

Solar PVs - demographics

Of the total survey respondents (n=322) **42%** own **solar PV**

- **69%** of these customers live in **Hobart**

51% of solar owners who responded are **55+** years of age. Customers in this age group are more likely to own solar than not own it.

Of solar PV owners who responded to the survey

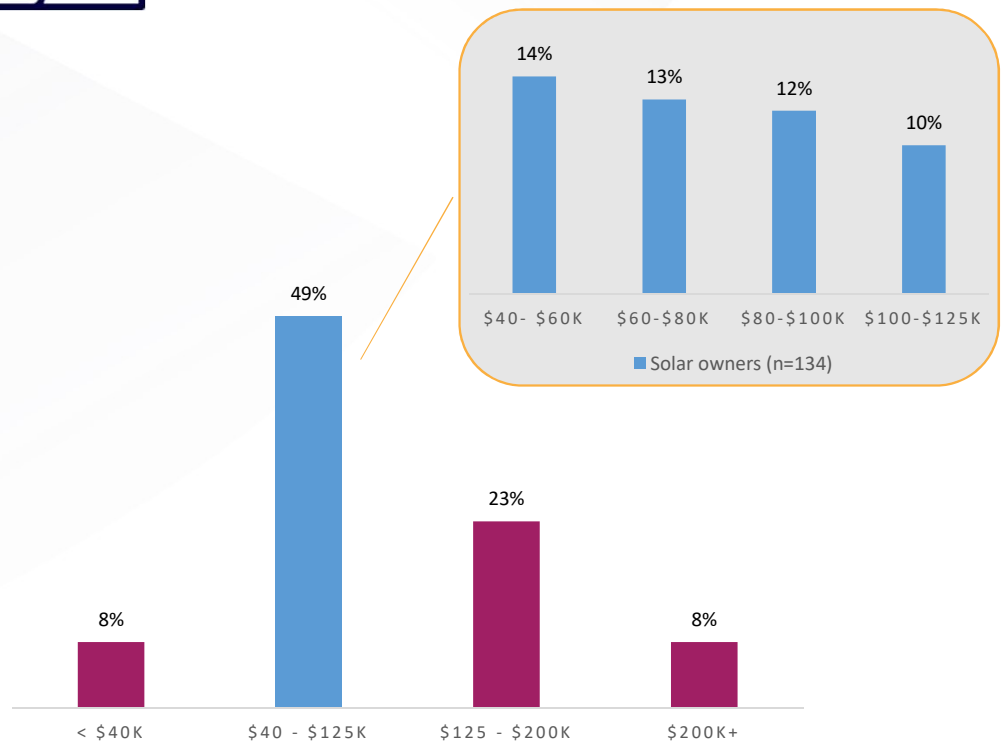
- **22%** are **retired**
- **55%** are **employed** on a full or part time basis
- **14%** are **self employed**

Of the solar PV owners

- **93% own their own home** (61% own their home outright)
- **50%** have **two or fewer people** in their household

71% are **middle** to **high income earners**

41% earn **above $100k**



Solar PVs – future state

Solar PV owners (n=134)

Intention to invest in supplementary technology

16% of current solar PV owners have a battery

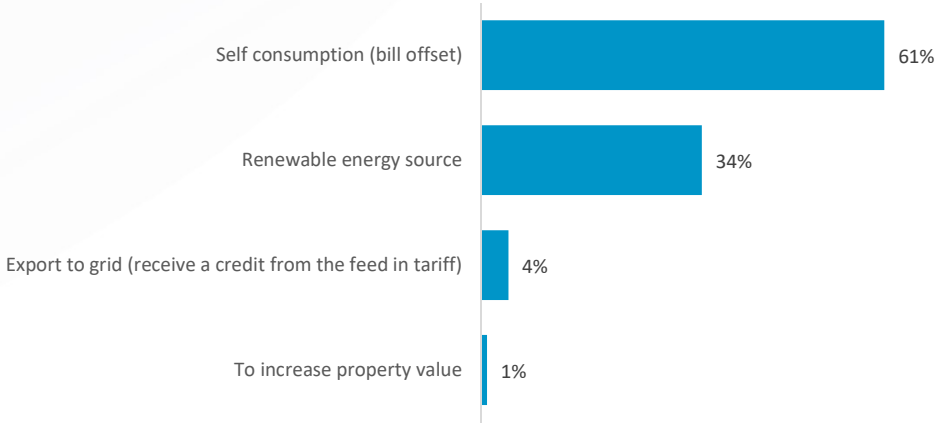
49% of solar PV owners plan on installing a battery in the next 10 years if they do not currently own one

85% of solar owners with the intention of purchasing battery storage in the next 10 years are motivated by the ability to utilise the off peak rate and self consume during peak time

Non solar PV owners (n=188)

65% of all respondents who do not own solar are considering purchasing solar PV in the next ten years

Drivers for non solar owners with planned installation



Solar disadvantages

As told by our customers

Low Feed-in Tariff

"Life and cost of replacing the battery as it expires and new technology replaces current technology."

"Feed-in tariff changes are disappointingly low, so much so that I'll probably look to invest in battery storage now."

"Uncertainty of tariff changes during lifetime of solar PV ownership."

"The feed in tariff has dropped dramatically making the investment less productive than it was. I'm annoyed!"

Initial and additional costs

"High cost of installation."

"Cost of solar battery."

"High initial costs can be an issue for low income families."

"Availability of affordable battery storage."

Physical location limitations

"They impact negatively on the appearance of a house."

"Aesthetics."

"Neighbouring trees will limit the amount of sun the panels get."

"Tree shading limiting energy generation and value for money."

"I cannot get permission to use solar panels as I rent my home."

Network impacts

"Effect on TasNetworks' grid stability."

"Threatens network stability and even viability. All solar power should be centrally generated and controlled."

"Negative impact on the grid in some locations."

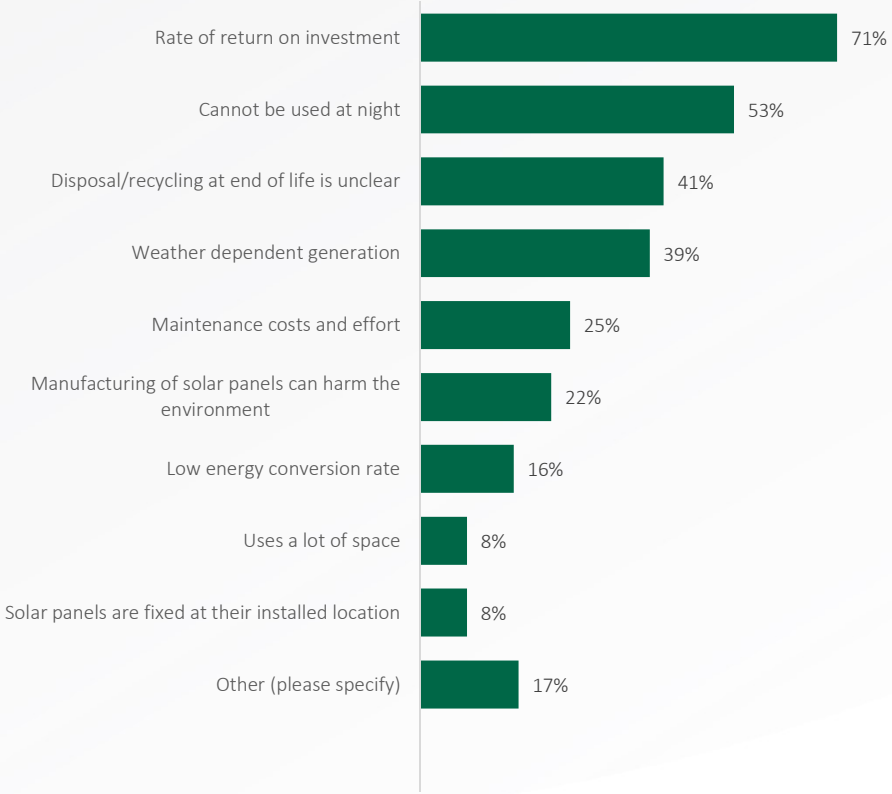
Manufacturing concerns

"Tasmania generates already 100% renewable energy (hydro, wind), my solar panels will need to be manufactured etc. so create additional carbon footprint."

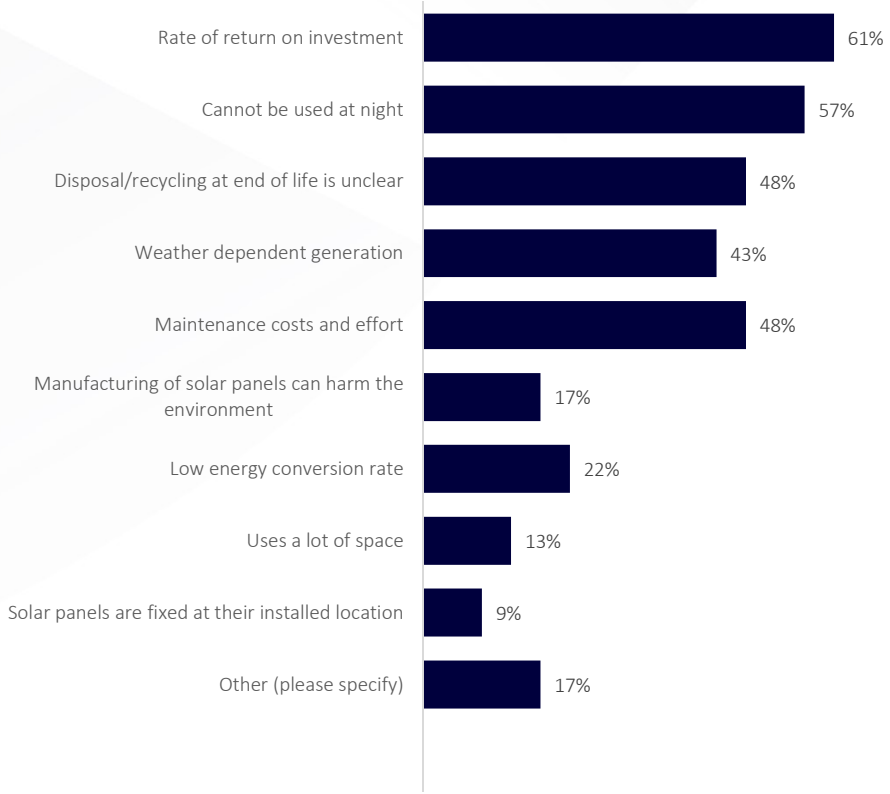
"Battery and storage technology still evolving. Fire risk and battery location/safety"

Solar Owners - customer sentiments

39% Of all respondents see **disadvantages of buying a solar PV**, which has a similar sentiment profile to the 40% of respondents who don't own solar PV



43% Of respondents who are considering purchasing batteries in the next 10 years have a slightly different perspective of some key **disadvantages of buying a solar PV**,



Batteries

- Over half of battery owners attributed their main driver for investment in a battery was to utilise the off peak rate and self consume during peak time
- A high proportion of all non battery owners would not consider purchasing battery storage without solar PV
- Key deterrents for non battery owner investment in battery storage technology includes: uncertainty around disposal, rate of return on investment and battery safety

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Battery Storage Owners - demographics

Of the total survey respondents (n=322), **8% own batteries**

- **44%** live in **Hobart**

44% of battery storage owners who responded are **55+ years** of age, however **52%** of battery owners are between the **ages 35** and **54**

Of battery storage owners

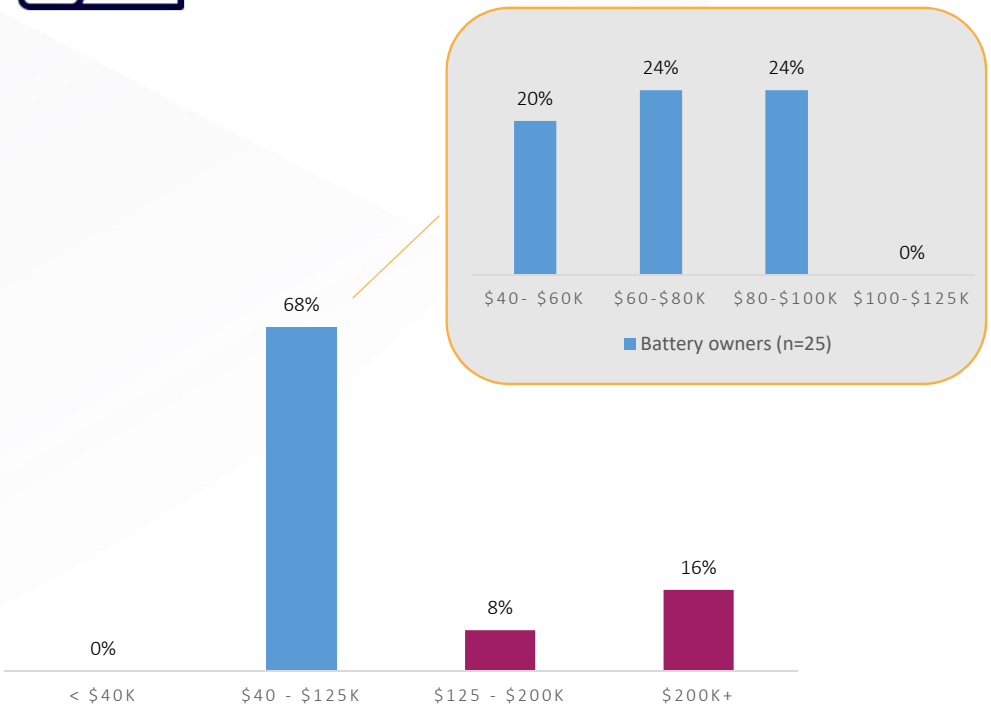
- **96% own their own home** (80% own their home outright)
- **40%** have **2 people** in their household

Of battery storage owners

- **20%** are **retired**
- **48%** are **employed** on a full or part time basis
- **20%** are **self employed**

68% are **earn between $40k and $100k**

24% earn **above $100k**



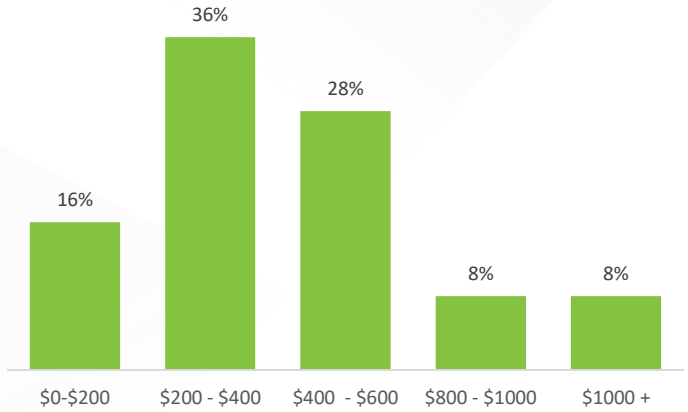
Battery Storage Owners – use of tariffs and energy costs

Batteries have tended to be a means by which energy consumers can shift their energy usage and respond to time of use price signals. They seem to be used in conjunction with other DER technologies.

Of the respondents who own batteries* (n=19), **32%** use the residential **time of use consumption tariff (TAS93).** **44%** are on general **flat rate tariffs (TAS31).**

75% of respondents who use the time of use consumption tariff (TAS93) have a **good to very good understanding** of their tariff compared to **64%** of respondents who use the general tariff (TAS31)

52% of battery storage owners' **average quarterly bill** is **less than $400**



Battery owners WITH solar (n=17) consumed 29% less annually on average than respondents with ONLY battery (n=2)

* Tariff information was unavailable for some respondents (n=6)

Battery Storage Owners – future state

Of the subgroup who currently don't own a battery (n=297), **47%** are **thinking of installing a battery** in the next 10 years. Of those, **54%** do not currently own solar.

17% of the subgroup (n=297) stated **no** to **installing a battery**

85% of solar owners who are thinking of installing a battery indicated their main driver is to **utilise the off peak rate and self consume during peak** – compared to 75% of non solar owners

For the subgroup that own batteries (n=25), **52%** were more likely to install batteries to **utilise the off peak rate**

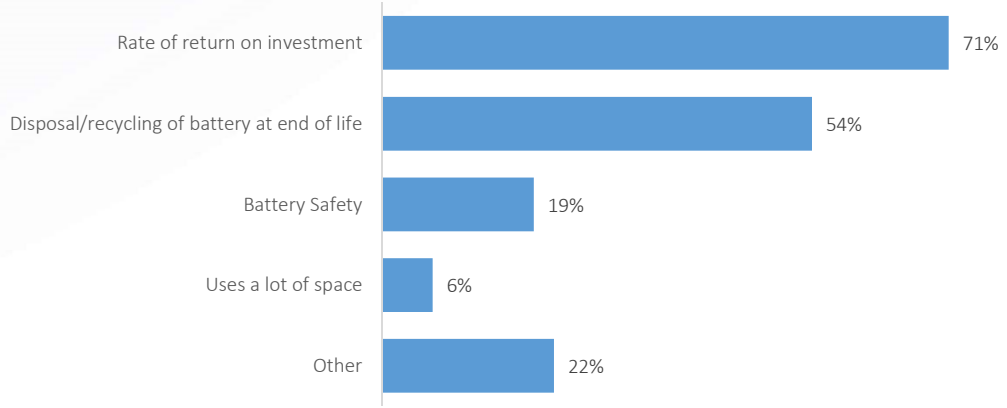
The subgroup who don't own batteries (n=297), **79%** were more likely to install batteries to **utilise the off peak rate**

Within the subgroup who currently do not own battery storage but plan to install a battery (n=140), only **59%** would purchase a battery **with solar PV.**

29% would consider purchasing a battery **without solar PV**

Disadvantages of battery installation

From the full sample of respondents (n=322) **49%** consider there to be **disadvantages in owning battery storage**, with 71% of those citing rate of return as being the main disadvantage



Battery storage disadvantages

As told by our customers

Too early to buy

"Life and cost of replacing the battery as it expires and new technology replaces current technology."

"Rapid increases in technology mean may be better to wait - prices down and capacity up."

"The price of batteries is too high at present and I prefer to wait for the technology to become cheaper. "

"Battery and storage technology still evolving. Fire risk and battery location/safety."

"Technology being superseded."

Tasmania as a renewable resource

"Tasmania already stores a lot of electrical energy with a very small carbon footprint (hydro dams). My personal battery duplicates this."

"Dubious value as a renewable energy source at single home level. I'd rather invest in more hydro!"

"Marginal environmental benefit having a home battery given our grid is largely renewable."

Manufacturing concerns

"Usage of rare metals - social justice and sustainability."

"Personal costs of lithium mining. Possible use of child slave labour."

"Low levels of lithium available globally."

"Mining resources used to make batteries."

"Environmental cost of mining for production of battery."

Electric vehicles and perceived barriers from TasNetworks

"If we purchase an electric vehicle, we might use that as the 'battery' instead."

"Expect to have an electric vehicle and would use that battery."

"Power companies like TasNetworks have not approved the use of the best home batteries, i.e. electric vehicles. Get your act together!"

Cost and battery life

"Rate of degradation."

"Cost to purchase the battery."

"Lifetime of battery."

"Limited battery lifespan."

"Battery life."

"Initial expense is prohibitive."

Reasons to install battery storage disadvantages

As told by our customers

Power stability

"We are 20k from the grid."

Sustainability

"Sustainable lifestyle. We are in a climate crisis."

Utilising existing solar panels

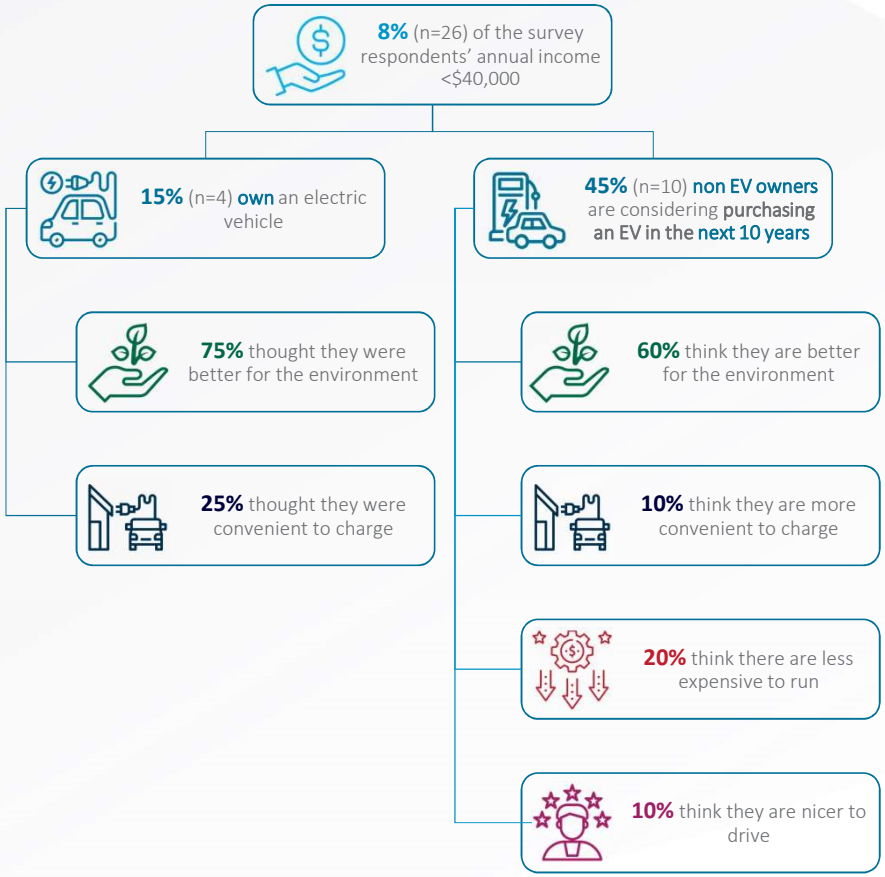
"Lack of incentive to export power to grid - better to self-consume."

"We bought an EV to re-direct our surplus solar energy to and power our mobility."

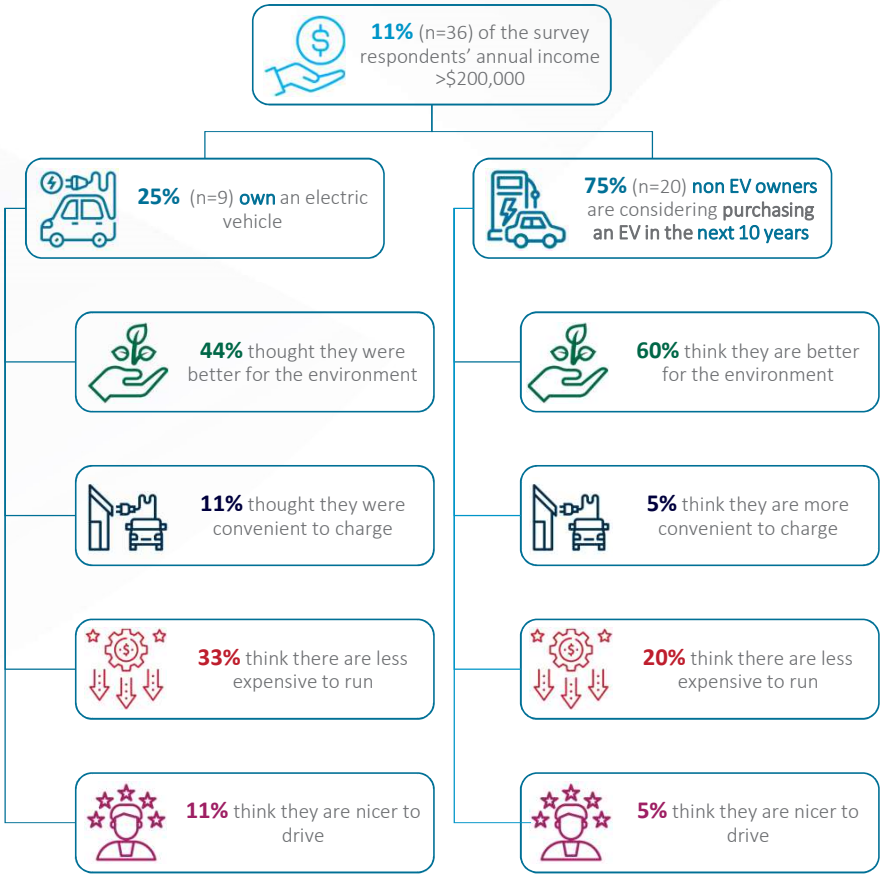
Appedix 1: Comparison by income bracket

Income comparisons – Electric Vehicles

Annual household income < $40,000



Annual household income >$200,000

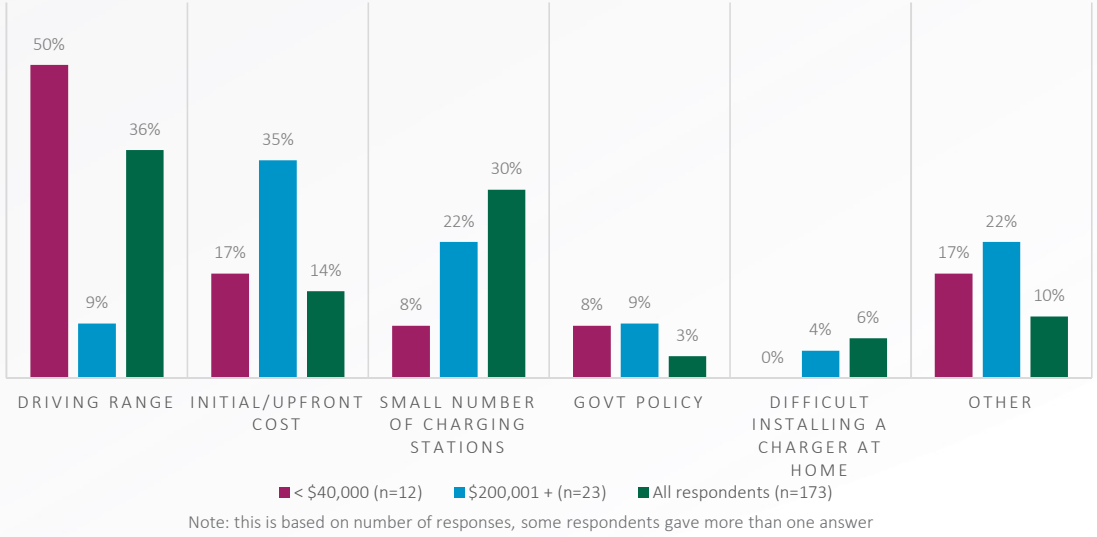


Income comparisons – Electric Vehicles

46% of respondents whose **household income is <$40,000** stated there were **disadvantages** to investing in electric vehicles, 23% didn't think there were disadvantages.

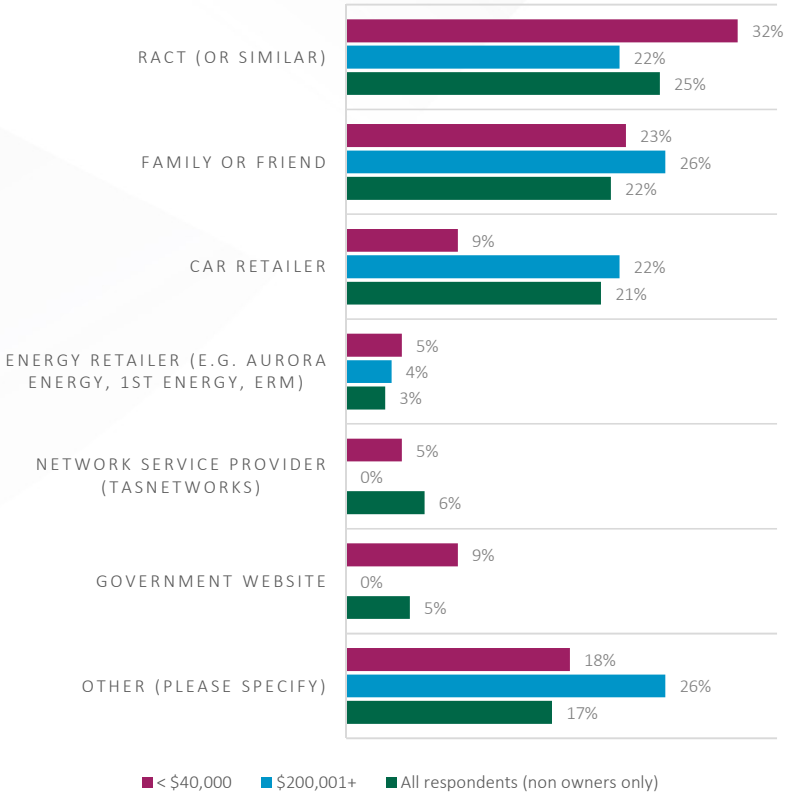
53% of respondents whose **household income is >$200,000** stated there were **disadvantages** to investing in electric vehicles, 36% didn't think there were disadvantages.

The following represents their main perceptions for disadvantages of electric vehicle ownership



Note: this is based on number of responses, some respondents gave more than one answer

For those respondents who **don't currently own an electric vehicle** they predominantly **source their information** from the **RACT (or similar) or family and friends.**



Appendix 2: Comparison of respondent demographics

Where * Tasmanian comparison data in the following slides is taken from the 2016 ABS Census data

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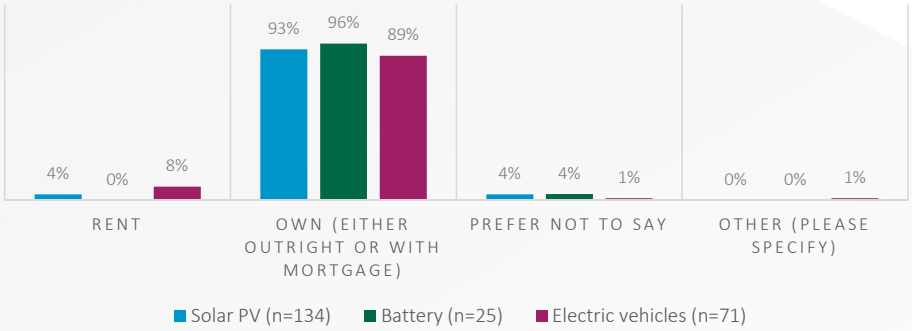
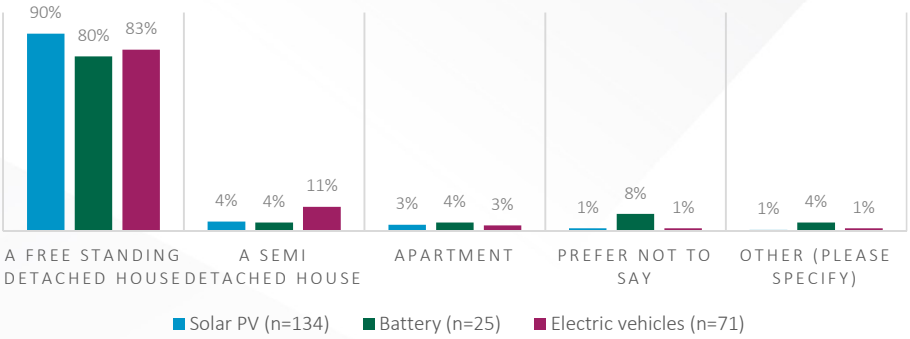
Snapshot of respondents who indicated ownership of some form of DER technology

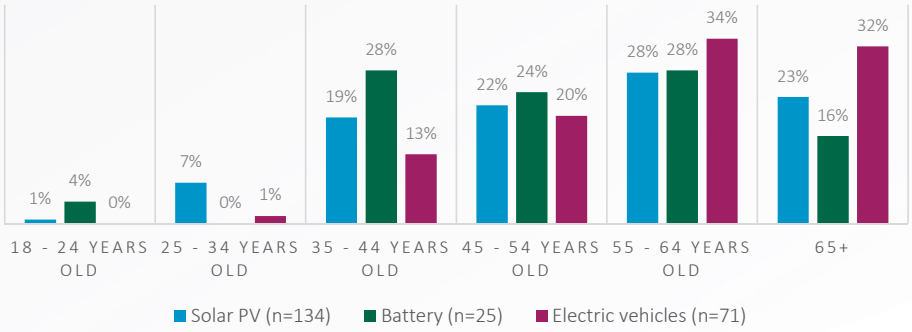
HOME OWNERSHIP



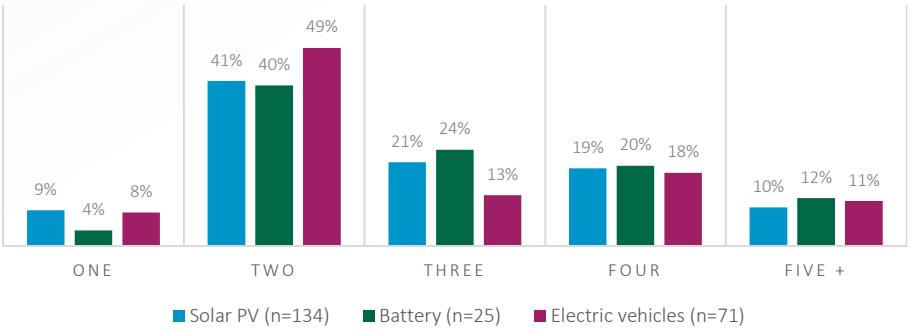
HOUSE TYPE



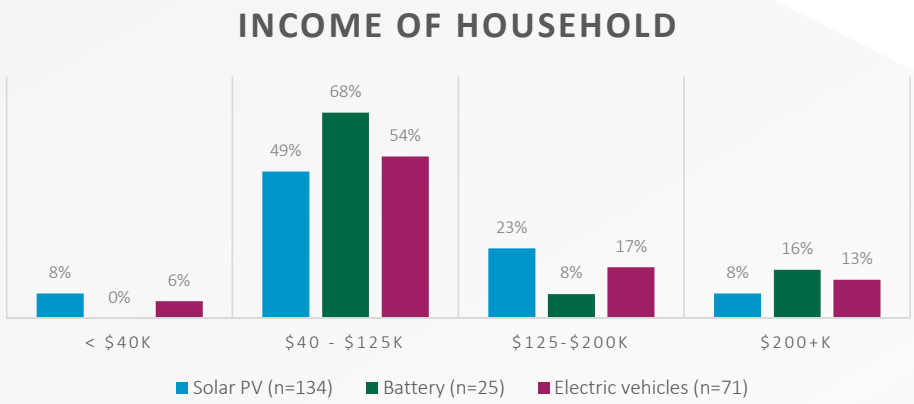
DER OWNERSHIP BY AGE GROUP

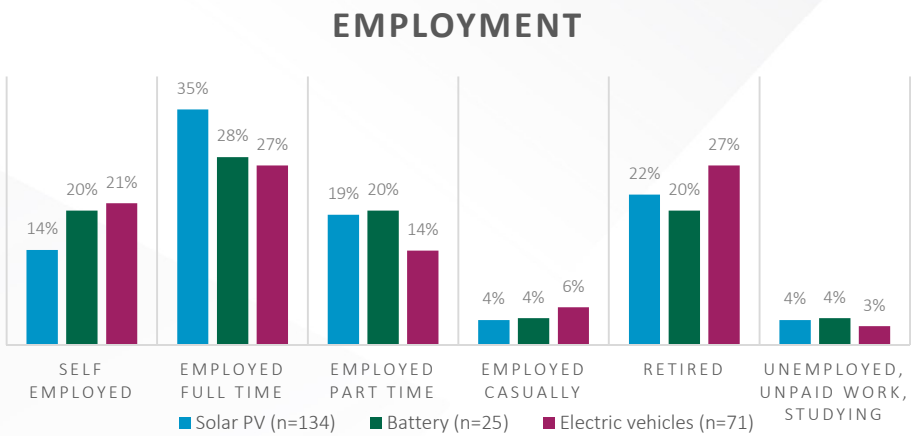


OF PEOPLE IN HOUSEHOLD



Snapshot of respondents who indicated ownership of some form of DER technology



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