AUSGRID'S COMMUNITY BATTERY CONCEPT

Customer Survey Report

Final Public Report

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NEWGATE RESEARCH

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EXECUTIVE SUMMARY

This report presents the findings from an online survey to understand the views of Ausgrid's customers regarding its Community Battery concept. The 20-minute survey was with a robust sample of n=956 customers across Ausgrid's distribution area in NSW, with a focus on solar PV and storage battery owners, plus a sample of customers considering getting a solar PV system in the next year or two.

Fieldwork occurred in July 2020 and involved reaching out to Ausgrid customers who had completed a 2016 survey, as well as customers who have registered their interest in community batteries. Participants were also recruited from online panel sample. Participants were incentivised via a prize pool.

EXISTING AWARENESS OF COMMUNITY BATTERIES

- **Unprompted awareness of any home battery alternatives is low**, with only 16% of those surveyed saying they were aware of options for customers with solar power systems to store the energy they generate, apart from having a battery system in their own home.
  - These results were consistent between those with and without solar or batteries. Notably, only 30% of those who had previously registered their interest in a community battery ('registrants') indicated being aware of any options in this regard, with most not connecting the dots with the community battery concept here.
  - By comparison, just 8% of those in the random mailout sample were aware of any options.

- **When prompted, the term 'Community Battery' was more familiar; almost half (43%) had heard of it** and most of these could describe it to some extent as a battery that a community shares to store excess solar power generated by households. There was limited understanding of how it would be funded or maintained.
  - While awareness has grown, even a quarter of prior Community Battery registrants weren't aware, highlighting the term's relative newness. 74% were aware vs 35% from the 2016 survey.

INTEREST IN COMMUNITY BATTERIES

- **Following a basic description of Ausgrid's Community Battery concept, there was a very high level of interest**, with just over half (53%) rating their interest level at 9 or 10 out of 10. Indeed 40% rated their interest at 10 out of 10.

- **Further, nearly half said they were highly likely to sign up to a Community Battery** if the opportunity arose in their area and it was affordable; 47% rated their likelihood as 9 or 10 on a scale where 10 meant 'definitely would' and 0 meant 'definitely would not'. Just 17% indicated a low likelihood of 0-6 out of 10.

IMPORTANT BENEFITS FROM A COMMUNITY PERSPECTIVE

- The key, **unprompted benefits** participants thought the Community Battery would offer fell into three main themes, which are well aligned with customers' reasons for investing in solar power:
  - **Saving money** on energy bills through the battery storage capabilities and sharing of solar energy ('access for all'), and avoiding the set-up costs of a home battery through shared costs;
  - **Environmental benefits** for the community (lowering of the community's carbon footprint) – also the second-most important reason for investing in solar; and
  - **Network benefits** such as grid stability and supply in an outage – those these were mentioned at much lower levels.

INTRODUCTION

Background & Methodology

BACKGROUND

Ausgrid is investigating the potential for locally based community batteries. Customer research was undertaken to measure knowledge and perceptions of community batteries, solar PV systems and home batteries.

RESEARCH METHODOLOGY: QUANTITATIVE SURVEY

Online survey: 20 minutes in length

- 1st – 26th July 2020

Representative sample

- Robust sample of n=956 customers aged 18+ who are key decision-makers for their home's energy supply, live in a detached or semi-detached house in the area serviced by Ausgrid (Sydney, the Central Coast and Hunter regions of NSW).
- Participants invited by email or mail, from a range of sources:
  - Ausgrid database (9,983 mailed, 1,703 emailed; 8% response rate):
    - Signed up online to register their interest in participating in the Community Battery project (n=293)
    - Completed the Ausgrid 2016 survey on solar (n=83)
    - Live in the candidate trial areas (n=225)
    - Live in randomly selected target segments (n=307)
  - Professional market research panel, CanvasU (n=48).
- Margin of error: +/- 3.2% (95% confidence level).
- Mailout sampling aimed to provide a good mix of location and solar PV/ battery ownership (and export scale) to ensure representation of a cross-section of relevant opinion.
- See appendix for a breakdown of sample characteristics.

Sample breakdown by key groups of interest

Group	Total pop.	Database size	Sample size (n)	
			Target	Achieved
Non-solar households *(Considering installing grid connect solar PV in next 12-24 months)*	701,411	2,365	100	128
Grid connect solar PV exporters – without batteries (n=640):				
Small (*<5kWh / day*)	51,483	2,230	200	135
Medium (*5-10kWh / day*)	31,333	2,939	300	149
Large (*>10kWh / day*)	37,427	2,907	300	125
Unknown / None	-	-	-	231
Battery owners	3,541	940	100	175
TOTAL	**825,105**	**11,381**	**1,000**	**956***

*The total sample also included n=13 participants who only have a non-grid connect solar PV system, making up the balance of the total sample

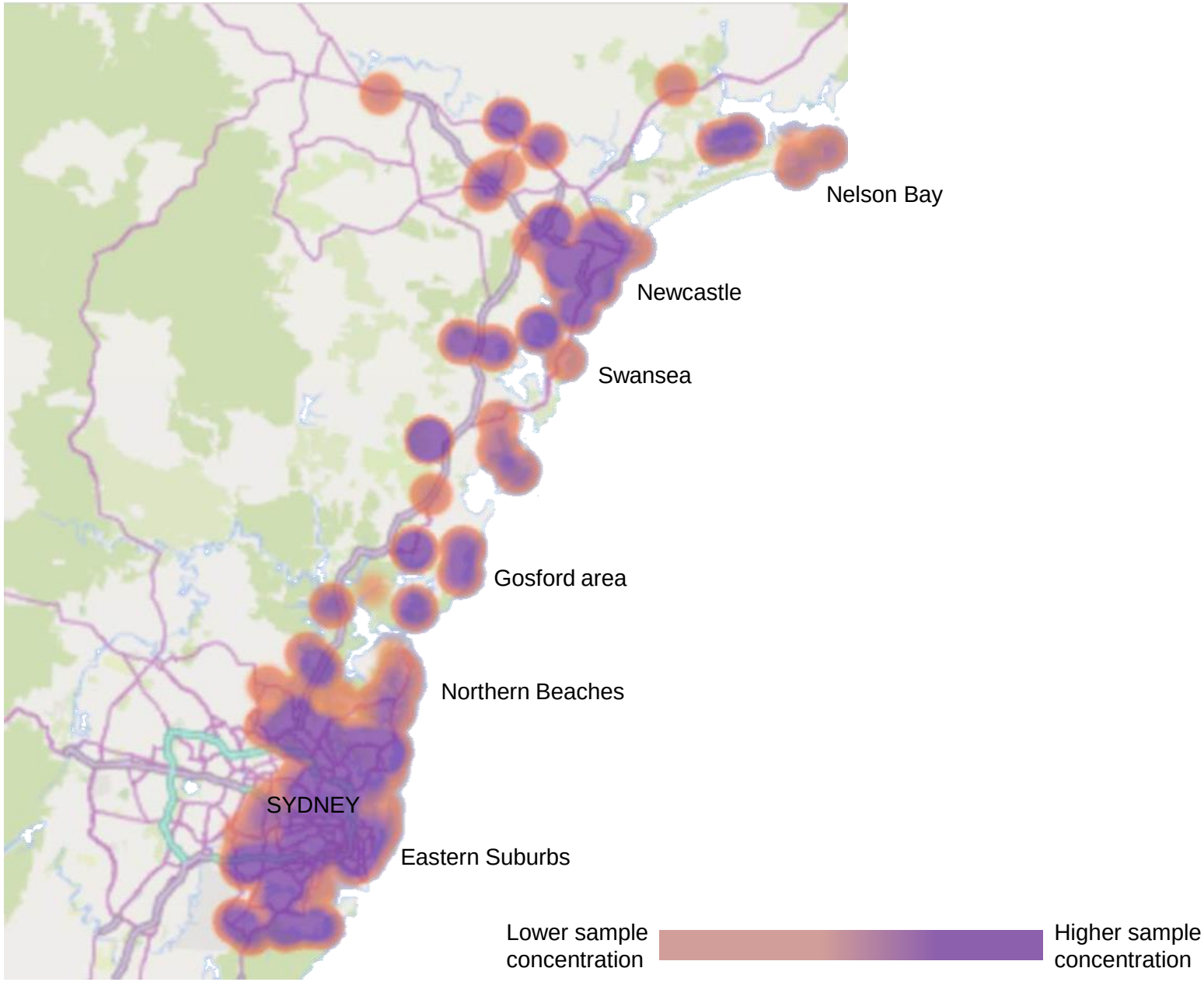
Notes to the reader

Survey questions and sample bases are shown at the bottom of each page.

Results may not always total 100% due to rounding or multiple-response questions.

To ensure data reliability, results are typically only shown when the sample sizes are at least n=30.

WHERE PARTICIPANTS CAME FROM



DETAILED RESULTS

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CUSTOMER CONTEXT

- Profiles by solar ownership and export level
- Solar PV and battery system specifications
- Intent to upgrade battery and cost perceptions
- Intent to install grid-connect solar and cost perceptions

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INTRODUCTION TO KEY PARTICIPANT TYPES

The following pages profile demographic and (where relevant) solar PV and battery system characteristics. Overall, the following skews emerge compared to population data, which must be borne in mind when considering the findings:

- **The sample is skewed towards males** (75% vs 25% female), compared to an almost even split in the population;
- **The sample skews older** (58% are aged 55 and over), compared to around one-third of adults being aged 55 years or over in the population.

While there are a lot of similarities between the groups of interest in the sample, a number of differences between the groups were recorded:

Non-solar customers ('solar considerers'): Compared with those who already have solar PV, those who don't yet have a system but are considering one in the next 12-24 months were more likely to:

- Have larger households (52% have 4+ people in their household, vs 35% of those who already have solar PV)
- Be a couple with children at home (64% vs 44%)
- Be aged under 44 (38% vs 16%)
- Have a mortgage (54% vs 42%)
- Live in a semi-detached house or terrace (13% vs 6%)
- Be female (35% vs 23%)

Those providing no export data are less engaged than those who knew their solar export levels, they were more likely to:

- Not track their solar output (22% vs 6%)
- Be female (32% vs 20%)
- Be Cautious or a Follower on the technology adoption spectrum (50% vs 33%)

Small exporters (<5kWh) are more likely to:

- To have an older solar PV system – over 7 years old, compared to 5 years for other exporters

Medium exporters (5-10kWh) had no standout demographic characteristics

Large exporters (>10kWh) are more likely to:

- Have a newer solar PV system – 82% had installed it in the last 4 years compared with 34% of small exporters and 62% of medium exporters)
- Have a high flat feed-in tariff of more than 15c/kWh (52% vs 25% of small exporters and 32% of medium exporters)

Battery owners: More likely to be retired (47% vs 35% of people who do not have a battery) and see themselves as an Innovator (25% vs 12%)

CHARACTERISTICS OF SYSTEMS REPRESENTED IN THE SAMPLE

The following pages profile the characteristics of the solar PV systems owned by participants in the survey:

	NO EXPORT DATA PROVIDED	SMALL EXPORTER (Exports <5kWh per day, no battery)	MEDIUM EXPORTER (Exports 5-10kWh per day, no battery)	LARGE EXPORTER (Exports >10kWh per day, no battery)	BATTERY ATTACHED TO SOLAR PV
AVERAGE SOLAR PV CAPACITY	5.7kW	4.1kW	5.1kW	8.0kW	7.7kW
AVERAGE SOLAR PV AGE	5.3 yrs	7.2 yrs	5.2 yrs	4.2 yrs	5.9 yrs
EXPORT FOR SUMMER PERIOD	-	7.9 kWh/day	13.0 kWh/day	19.9 kWh/day	12.5 kWh/day
EXPORT FOR LAST BILL PERIOD	-	2.8 kWh/day	7.8 kWh/day	17.4 kWh/day	6.5 kWh/day
% CUSTOMERS TRACKING SOLAR OUTPUT VIA APP/ PORTAL	38%	40%	56%	67%	67%
% ON RETAIL ToU* TARIFF	51%	58%	54%	50%	56%
% CLAIMING TO SAVE $500+ A YEAR ON ENERGY BILL	42%	39%	58%	76%	64%

Less likely to track production via an app or portal than those with a higher export level

Older, 7.2 vs 5.0 for other export levels

Newer, 4.2 vs 5.8 for other export levels

More likely to have an app/portal 67% vs 48% of non-battery owners, or 44% of smaller systems

*Time of Use

Level of engagement with system

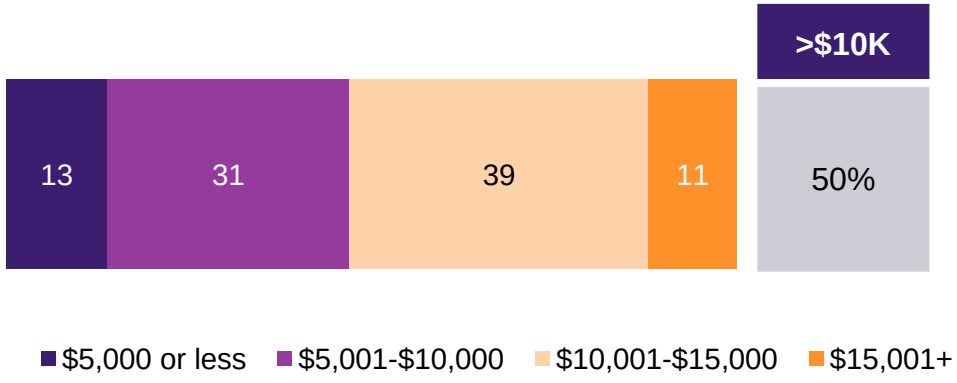
THE BATTERY SYSTEMS REPRESENTED IN THE SAMPLE

One in five solar customer participants had a battery attached to their system. The average battery age is 3.1 years and average capacity is 9.5kWh. The most common brand installed is Tesla, followed by Enphase and LG, and half paid more than $10K to have it installed.

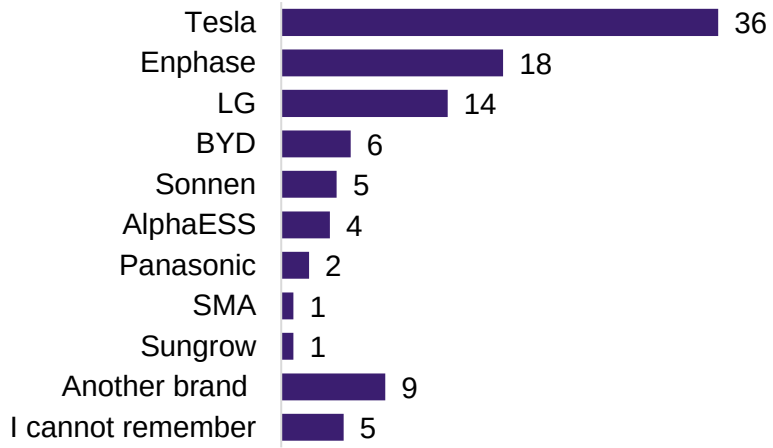
BATTERY OWNERS		n=175 (18% of sample)
SYSTEM SPECS	% WITH GRID-CONNECTED SOLAR PV SYSTEM	94%
	% WITH MORE THAN ONE BATTERY	26%
	AGE OF BATTERY (AVE. YRS) – All able to provide a date	3.1 (Range: 1-11)
	BATTERY STORAGE CAPACITY (AVE. kWh)	9.5 (1-40)
	% EXPORTING TO THE GRID	93%
	AVERAGE DAILY EXPORT (kWh) – LAST BILL	6.5 (0-37.6)

All providing data		n=134
BATTERY CAPACITY	Capacity <7kWh	41%
	Capacity 7-<14kWh	49%
	Capacity 14+kWh	13%

COST OF BATTERY INCLUDING INSTALLATION (%)



BRAND OF BATTERY INSTALLED (%)



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S11. BATTERY / S12. BATTERY CAPACITY / Q6. AGE OF BATTERY / Q7. BRAND OF BATTERY / Q8. COST OF BATTERY

Base: All battery owners (n=175)

INTENTIONS RE INSTALLING SOLAR PV AND BATTERY

Most participants without grid-connected solar PV said they were likely to get a grid-connected system installed in the next 2 years, while a quarter of current solar PV owning participants expect to upgrade their system in the same timeframe; around one in ten solar PV owning participants without a battery think they will get one; and around a quarter of battery owners think they will upgrade theirs in the near future.

SOLAR PV INTENTIONS

% OF THOSE WHO CURRENTLY DON'T HAVE GRID-CONNECTED SOLAR PV WHO ARE LIKELY* TO INSTALL IT IN NEAR FUTURE	
No solar PV system currently (n=128)	59%
Non-grid connected solar system only currently (n=13)	61%

% OF SOLAR PV OWNERS LIKELY* TO UPGRADE THEIR SYSTEM IN THE NEAR FUTURE	
Total solar PV owner sample size (n=805)	**24%**
Non-exporter/don't know export figure (n=231)	25%
Small Exporter (n=135)	29%
Medium Exporter (n=149)	26%
Large Exporter (n=125)	17%
Battery owner with solar (n=165)	29%

BATTERY INTENTIONS

% OF BATTERY NON-OWNERS WHO HAVE GRID-CONNECTED SOLAR PV WHO ARE LIKELY* TO INSTALL A BATTERY IN NEAR FUTURE	
Total sample size (n=781)	**14%**
Non-exporter/don't know export figure (n=231)	10%
Small Exporter, no battery currently (n=135)	11%
Medium Exporter, no battery currently (n=149)	13%
Large Exporter no battery (n=125)	12%

% OF BATTERY OWNERS WHO ARE LIKELY* TO UPGRADE/EXPAND THEIR BATTERY IN THE NEAR FUTURE	
Total solar PV owner sample size (n=175)	**27%**
Current battery capacity <7kWh	33%
Current battery capacity 7-<14kWh	29%
Current battery capacity 14+kWh	15%

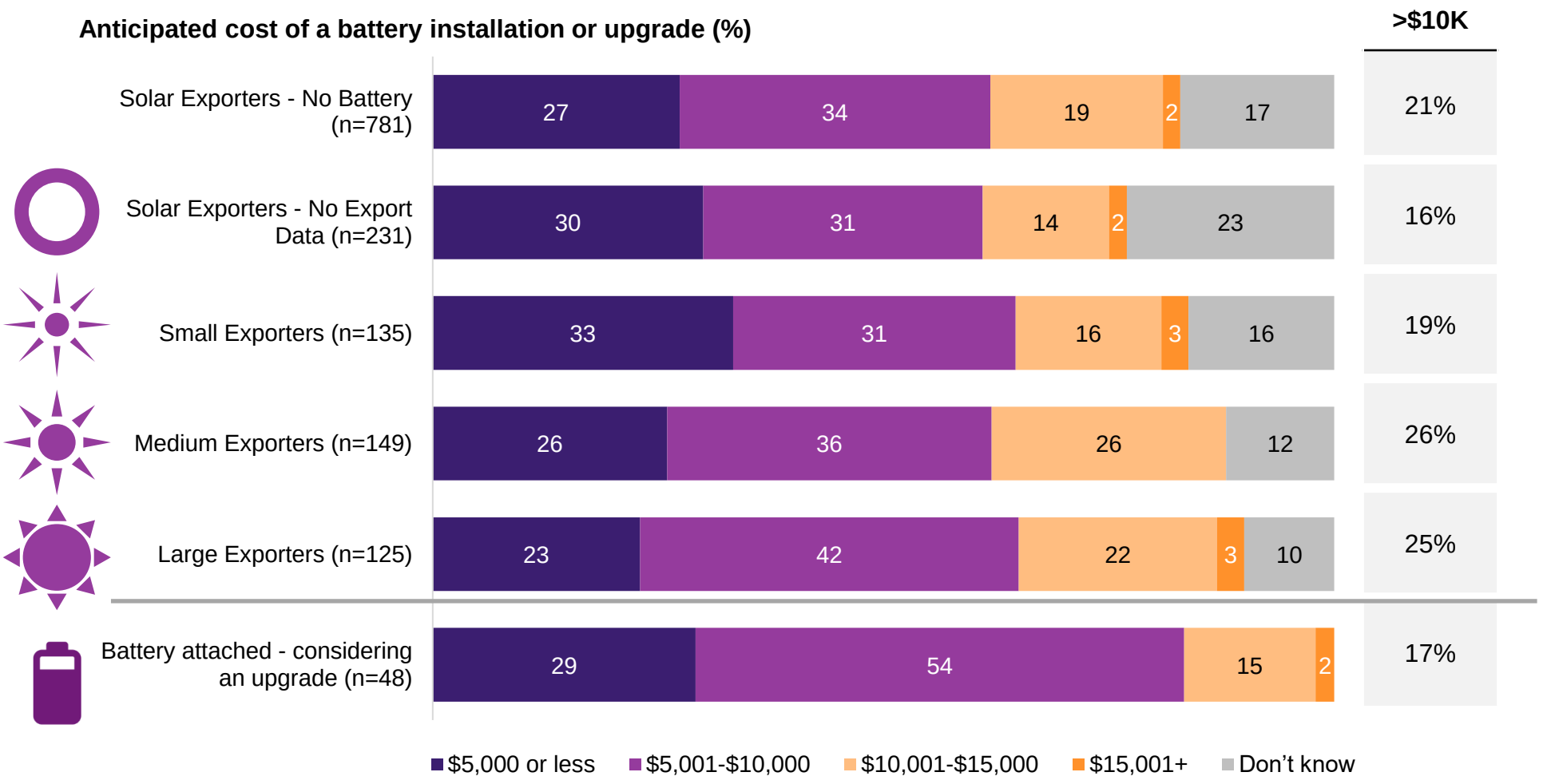
(n=x) refers to the sample size of each sub-group

*S13. What is the likelihood of your household installing a grid connect solar power system in the next 12-24 months? / Q5. How likely are you to upgrade or expand your solar PV system in the near future? / Q9. How likely are you to upgrade or expand your battery storage system in the near future? / Q21. What is the likelihood that you will buy a battery for your solar PV system in the next 12-24 months? Base: all participants (n=956). * = Either definitely or probably likely to.*

Near future = within the next 24 months/2 years

ANTICIPATED COST OF BATTERY INSTALL OR UPGRADE

Participants provide a range of values for what they would expect to pay for a battery install/upgrade and quite a few simply don't know. Around one-quarter expect to spend $5K or less, a third expect to pay between $5-$10k and almost a quarter think it will cost more



THE COMMUNITY BATTERY CONCEPT

- Awareness
- Interest

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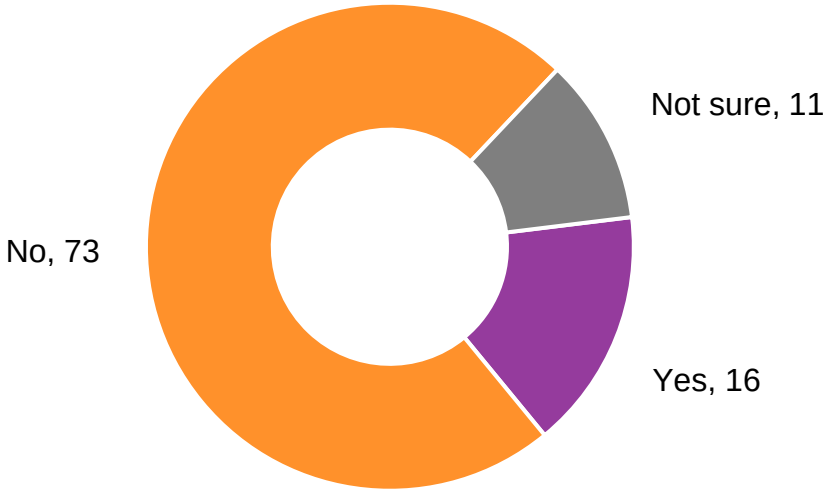
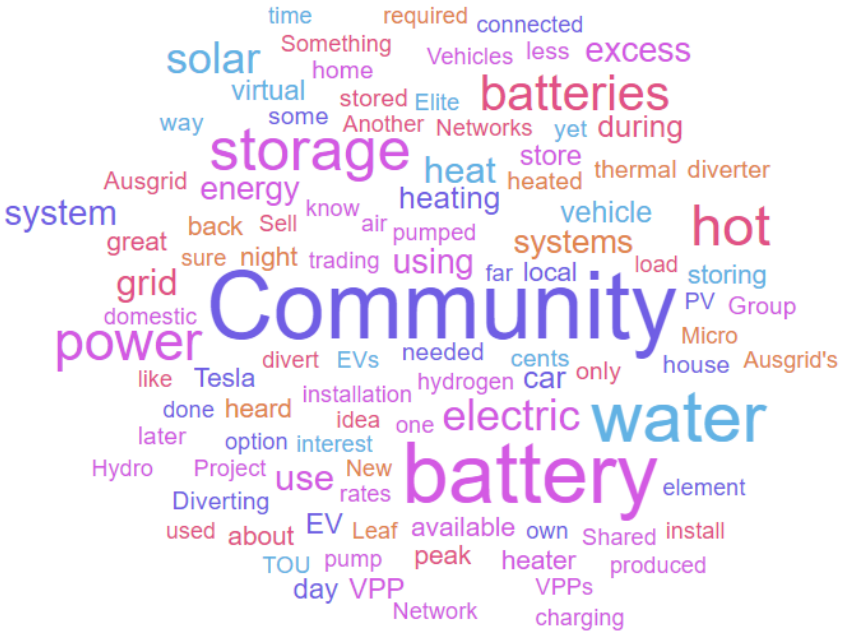
AWARENESS OF NON-HOME STORAGE OPTIONS

The large majority were unaware of any options for storing solar apart from a battery, with no differences in awareness levels between those with or without solar, by solar export level or battery ownership

Aware of non-home solar storage options? (%)





Key mentions:

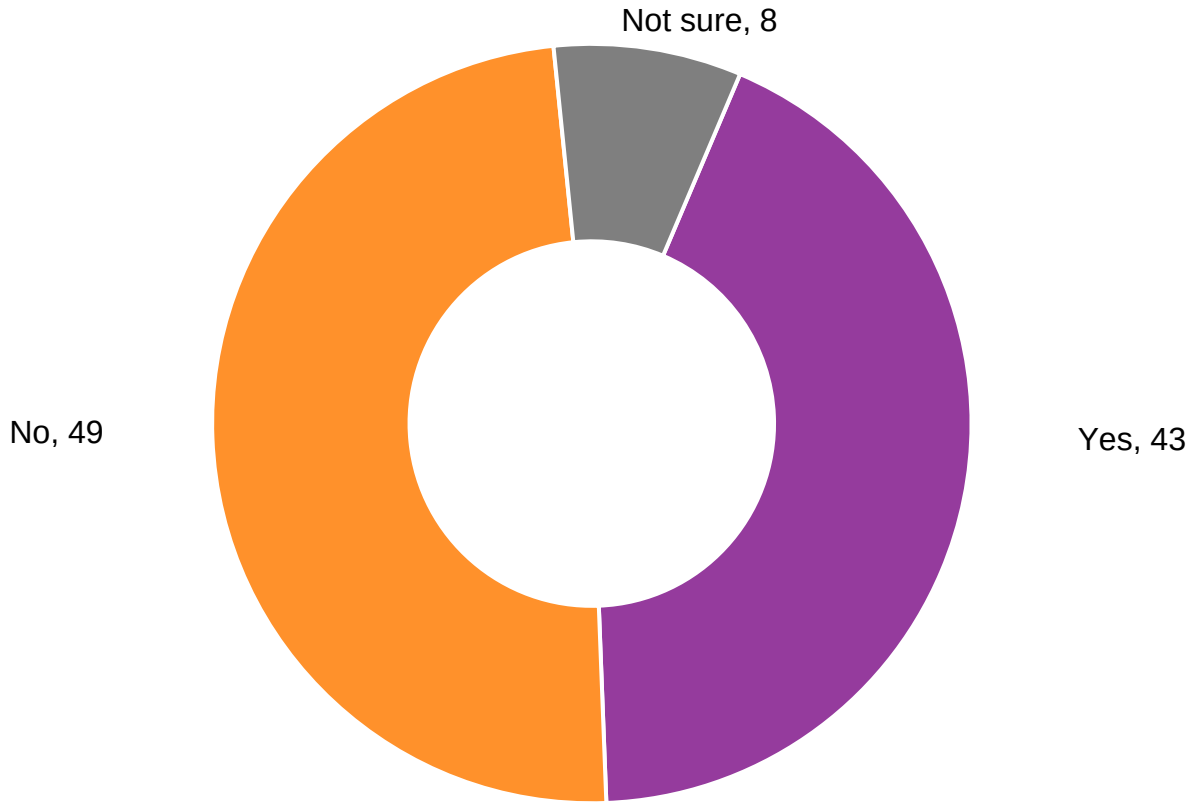
- Community batteries
- Electric vehicles
- Hot water / heat pumps
- Virtual power plants

Q26. Are you aware of any options for customers with solar power systems to store the energy they generate, apart from having a battery system in their own home? Base: All participants (n=956). / Q27. What options for storing solar power have you heard about? WRITE IN (NOT CODED). Base: Those aware of any options at Q26 (n=150).

AWARENESS OF TERM ‘COMMUNITY BATTERY’

People were more likely to be aware of the term than the concept, with awareness higher among those with larger PV systems and single batteries and early adopters

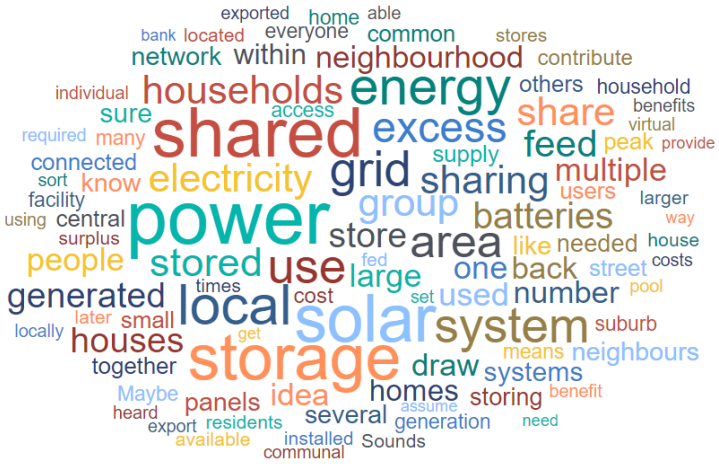
Aware of the term ‘Community Battery’? (%)



Q28. Are you aware of the term ‘Community Battery’?
Base: All participants (n=956).

UNDERSTANDING OF THE TERM ‘COMMUNITY BATTERY’

People were more likely to be aware of the term than the concept of an alternative to home battery storage, and many could explain to some extent what a ‘Community Battery’ is, although some assume it would be funded and maintained by local communities



*“It’s a battery which **stores the excessive energy created by the community, which can then feed back** to the community.”*

*“**Local storage device** which can be shared by customers in the Community Battery's area.”*

*“A **group of local people getting together to pay for large battery** and use the stored power when needed.”*

*“The **cost and the operation of the battery are shared** by the community.”*

*“My guess would be that excess kilowatts would be **stored and used by people within a specific area** who likewise have solar panels and feed into a grid.”*

*“Shared battery that **stores and discharges solar power** generated in a local area.”*

*“Maybe **a storage area somewhere in a street for multiple homes in that street to store their power** created by their solar systems.”*

*“Householders **exporting to a Community Battery instead of feeding back to retailer**.”*

*“Large Battery Storage that **multiple houses fitted with solar charge the Battery, then the stored energy can be used to power houses at night**.”*

*“A local battery storage unit which can **help load balance the local grid** especially with increasing installation of PV systems in that area and **increasing micro generation**.”*

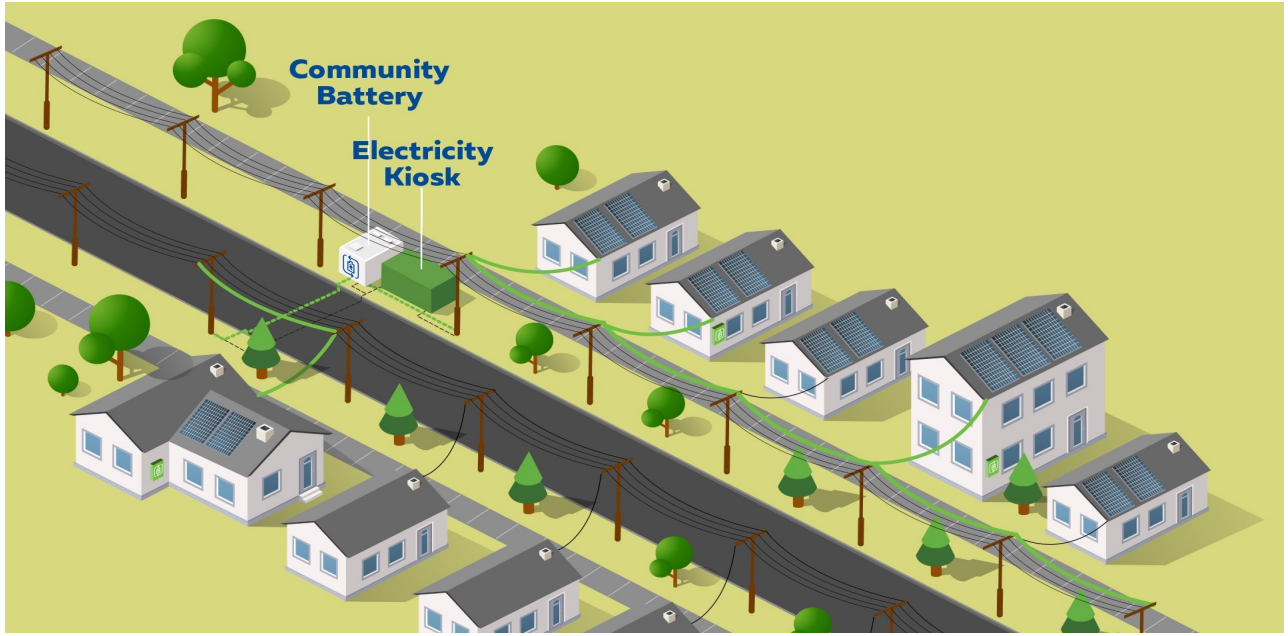
Q29. Even if you’ve not heard of it before, what do you think the term ‘Community Battery’ means? WRITE IN (NOT CODED).
Base: All participants (n=956).

THE CONCEPT – AS EXPLAINED TO SURVEY PARTICIPANTS

Introducing a Community Battery solution for household solar energy *

- A “Community Battery” is a resource that can be shared by customers who have a solar panel system and are connected to the same local electricity network.
- Customers connected to a Community Battery can use it to store their excess solar power and access it as needed later that day (or night), and potentially even sell it to other community members.
- A Community Battery would be placed in the local community, perhaps beside a footpath on a verge or in another appropriate area. They are typically the size of a small car or a distribution substation (DC) box.
- Community batteries have the potential to increase overall levels of solar energy in the electricity system, reducing peak demand and placing downward pressure on electricity costs. As such, they can help improve energy sustainability in local communities and the network in general.
- This would be a flexible electricity storage solution. The Community Battery would allow users to grow or shrink their share of the battery use as they need to.
- Can provide a fair and equitable solution for customers who are tenants and unable to install their own battery system.

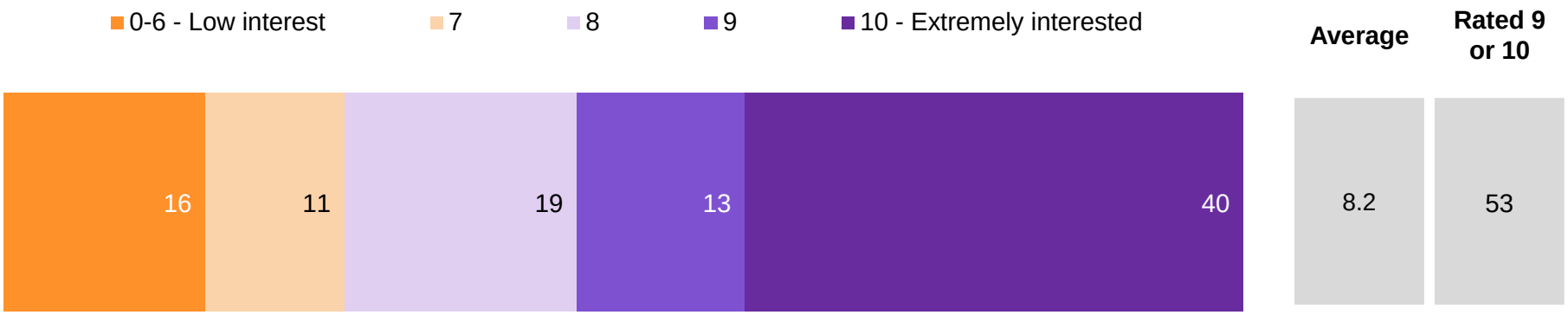
* (The description above is an evolving concept as part of the innovation trial and may be subject to change)



INTEREST IN THE IDEA OF A COMMUNITY BATTERY (PROMPTED)

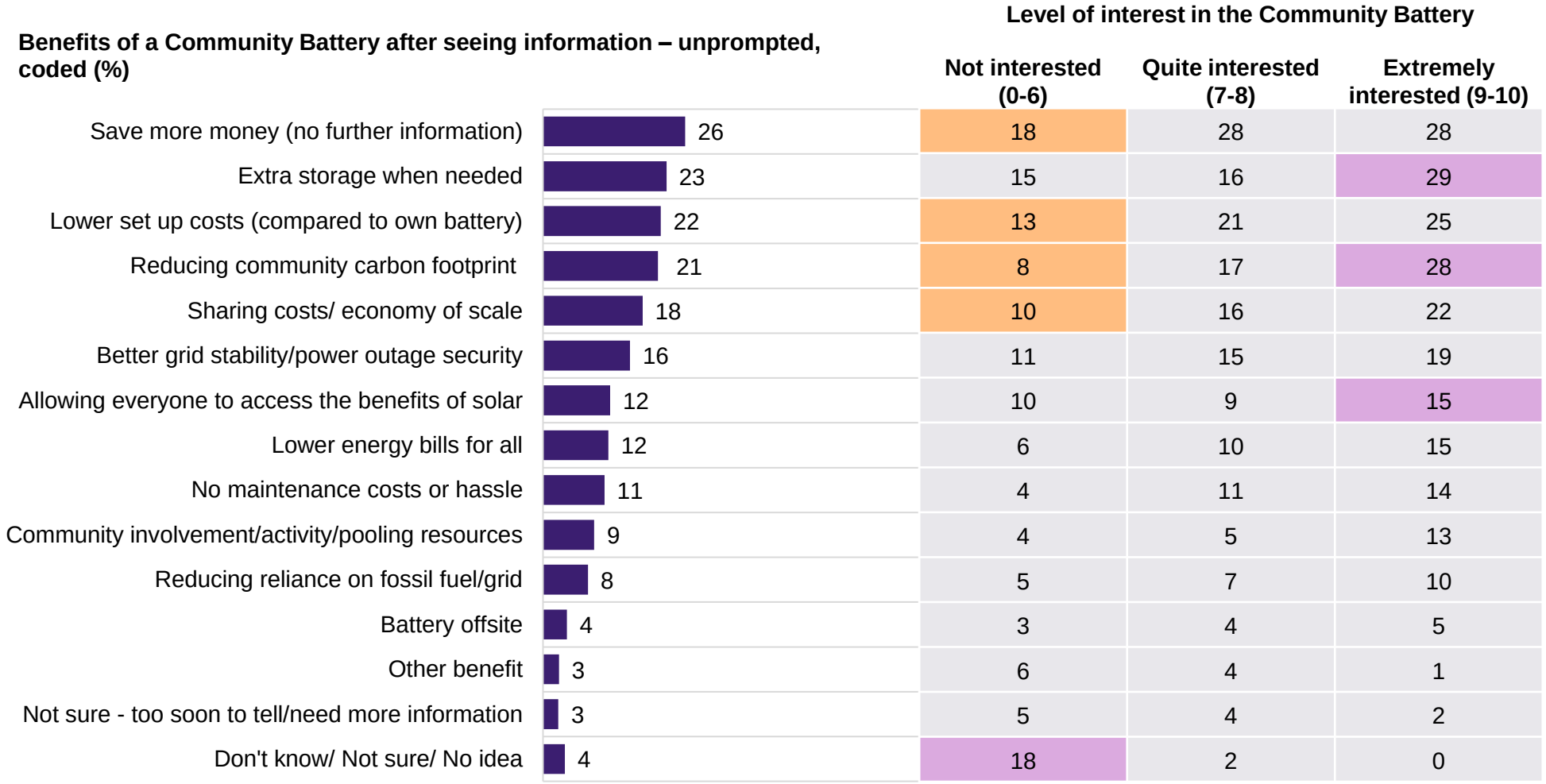
After seeing the concept, interest was very high (53% gave a 9 or 10 rating), particularly among those who registered for the Community Battery and among non-battery owners

Level of interest in Community Battery concept (%)



EXPECTED BENEFITS OF A COMMUNITY BATTERY

A range of benefits are anticipated (especially among those who were more interested): saving money, extra storage, lower set up costs, economies of scale, grid stability and environmental benefits



Q31. What do you think would be the main benefits of a 'Community Battery'? / Base: All participants (n=956). Those giving an interest rating of 0-6 (n=154), those giving a rating of 7-8 (n=283), those giving a rating of 9-10 (n=508)

PERCEIVED BENEFITS OF A COMMUNITY BATTERY BY GROUP

Those who had already registered their interested in a Community Battery were more likely to mention several of the benefits, perhaps reflecting their existing knowledge and past contemplation

Unprompted benefits (%)	TOTAL SAMPLE	NON-REGISTRANTS	REGISTERED FOR COMMUNITY BATTERY	NO EXPORT DATA	SMALL TO MEDIUM EXPORTER	LARGE EXPORTER	BATTERY OWNER	NON-SOLAR CONSIDERER
Sample: n=	*956*	*663*	*293*	*231*	*284*	*125*	*175*	*128*
Save more money (no further information)	**26**	26	27	26	28	25	25	30
Extra storage when needed	**23**	20	29	16	28	26	21	23
Lower set up costs (vs own battery)	**22**	19	27	20	26	26	12	21
Reducing community carbon footprint	**21**	18	27	19	22	25	17	26
Sharing costs/ economy of scale	**18**	15	26	15	18	16	15	27
Better grid stability/power outage security	**16**	14	21	13	15	19	20	14
Allowing everyone to access the benefits of solar	**12**	12	13	10	12	14	13	16
Lower energy bills for all	**12**	12	13	13	12	18	8	9
No maintenance costs or hassle	**11**	11	13	11	14	13	3	15
Community involvement/activity/pooling resources	**9**	8	13	7	7	11	10	15
Reducing reliance on fossil fuel/grid	**8**	8	10	9	7	10	9	7
The battery is off-site	**4**	4	5	3	7	5	2	5
Other benefit	**3**	3	2	4	3	1	3	5
Not sure - too soon to tell/need more information	**3**	3	2	4	2	-	2	1
Don't know/ Not sure/ No idea	**4**	3	-	3	2	-	3	2

Q31. What do you think would be the main benefits of a 'Community Battery'?

Base: All participants (n=956).

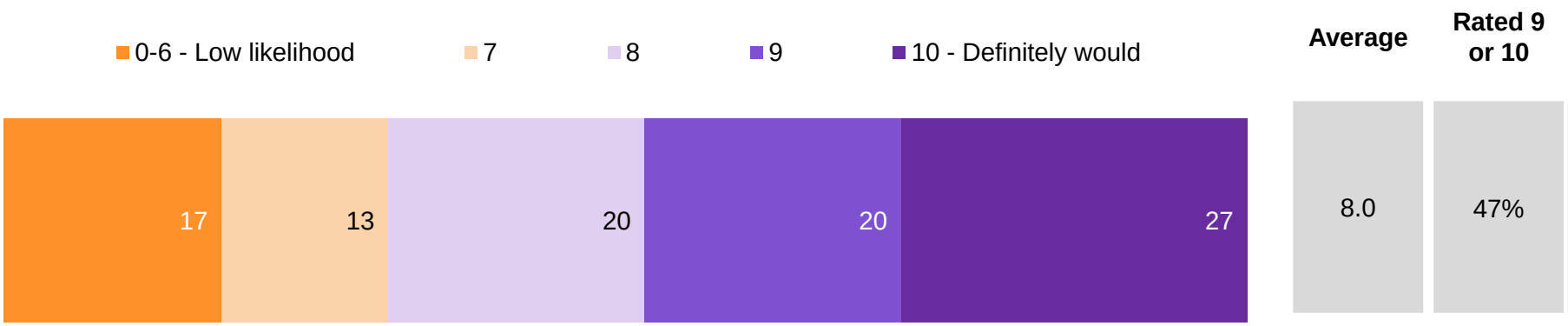
Significantly higher @ 95% confidence

Significantly lower @ 95% confidence

LIKELIHOOD OF SIGNING UP TO A COMMUNITY BATTERY

If a Community Battery were available and affordable, nearly half said they were highly likely to sign up (47% gave a 9 or 10 rating). In line with interest levels, those most likely had a higher household income, were younger families, early adopters (innovator) and non-battery owners

Stated likelihood of signing up to a Community Battery (%)

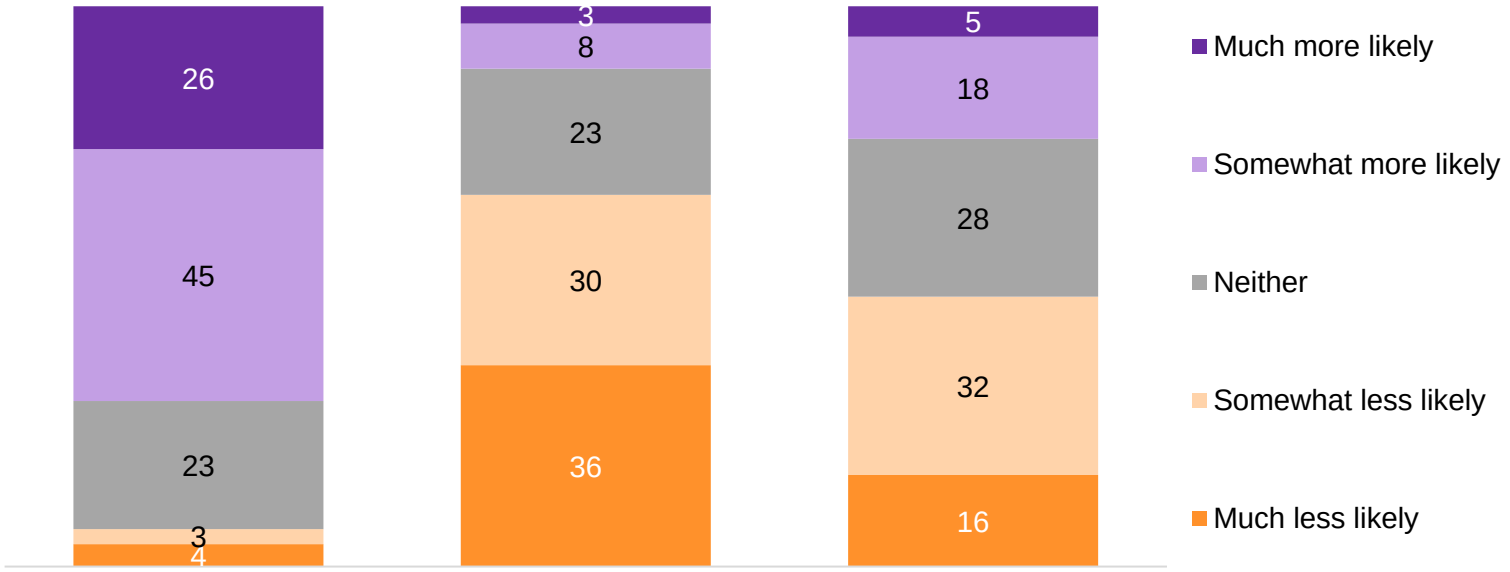


Q32. Based on this concept, if the opportunity arose in your local area and assuming it was affordable to you, how likely would you be to sign up and connect to a local 'Community Battery'? / Base: All participants (n=956). Sub-group base sizes lie between n=26 and n=805, with those giving a 0-6 at n=162 and a 9-10 at n=448). ***Full profiling is in the appendix****.*

EXPECTED BEHAVIOURS IF COMMUNITY BATTERY AVAILABLE

After seeing the information and messaging about the Community Battery, results suggest the availability of a local Community Battery could see a boost to solar connections (71% of non-solar customers became more likely to buy one), and a drop in likelihood to install or upgrade a home battery

Likelihood to take various actions if able to connect to a Community Battery (%)



	Likelihood to install grid-connect solar	Likelihood to install home battery	Likelihood to upgrade existing home battery
Much + somewhat more likely	71	11	24
Much + somewhat less likely	7	66	48

Q37. Would you be more or less likely to install a grid connect solar power system if you were able to connect to a 'Community Battery'? Base: Non-grid-connect solar customers (n=149). / Q38. And would you be more or less likely to install your own battery storage system at home if you were able to connect to a 'Community Battery'? / Base: Those without a battery system (n=781). / Q39. And would you be more or less likely to upgrade your own battery storage system if you were able to connect to a 'Community Battery'? / Base: Existing battery customers likely to upgrade their battery system (n=110).

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MOTIVATORS AND BARRIERS TO SOLAR PV INSTALLATION

- Among those who have a solar PV system (Q11, Q12, Q15, Q16, Q17)
- Among those who do not yet have solar PV system (Q23, Q24, Q25)

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SUMMARY OF MOTIVATORS AND BARRIERS TO SOLAR PV

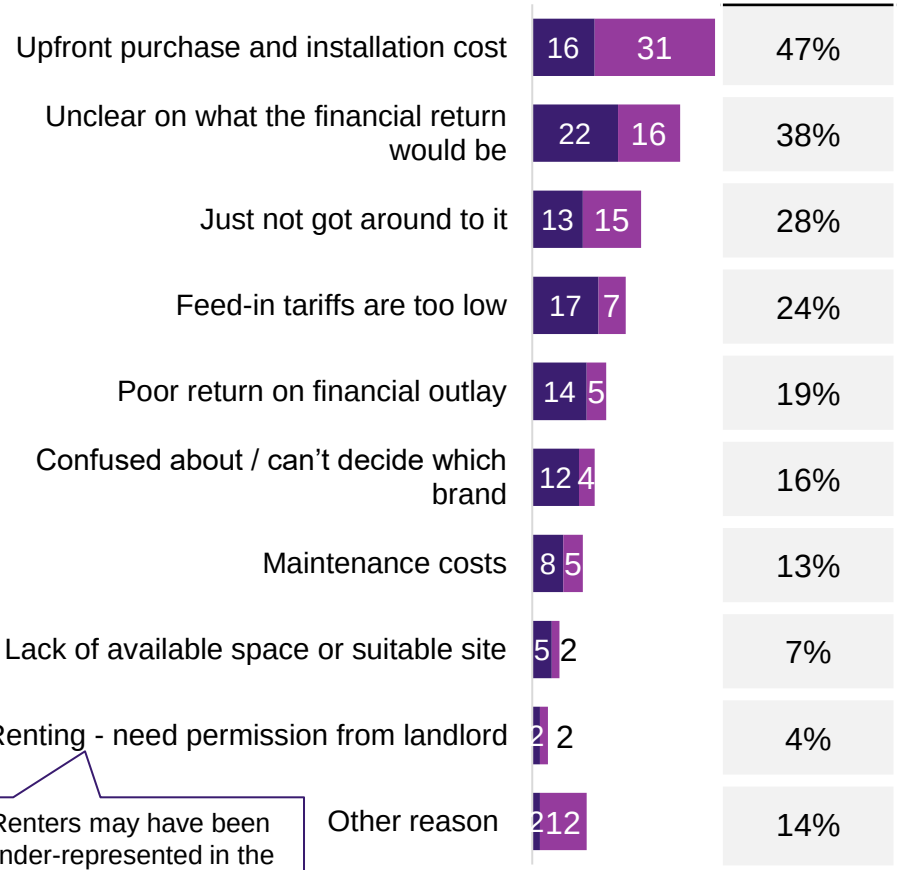
Key positives and key issues feedback

	KEY POSITIVES	KEY ISSUES
AMONG OWNERS	**The key prompted reasons for system installation:** • Saving money on electricity bill (71%) • Reducing carbon footprint (54%) • Benefiting from feed-in tariffs (40%) • Less reliance on energy utilities (34%)	**The key reasons for low performance of their solar PV system:** • Saving less money than expected (25%) • Lower output than expected (24%) • Lower feed-in tariffs than expected (18%) • Reliability issues e.g. needs to be replaced/fixed (11%)
AMONG NON-OWNERS	**The key prompted reasons driving interest in solar PV:** • Good savings on energy bill (70%) • Reliability (69%) • Good return on overall outlay (62%) • Little maintenance needed (52%)	**Key prompted reasons for not installing solar PV yet:** • Upfront purchase cost (47%) • Unclear what the financial return might be (38%) • Just not got around to it (28%) • Feed-in tariffs are too low (24%)

SOLAR PV PERCEPTIONS AMONG NON-SOLAR PV CUSTOMERS

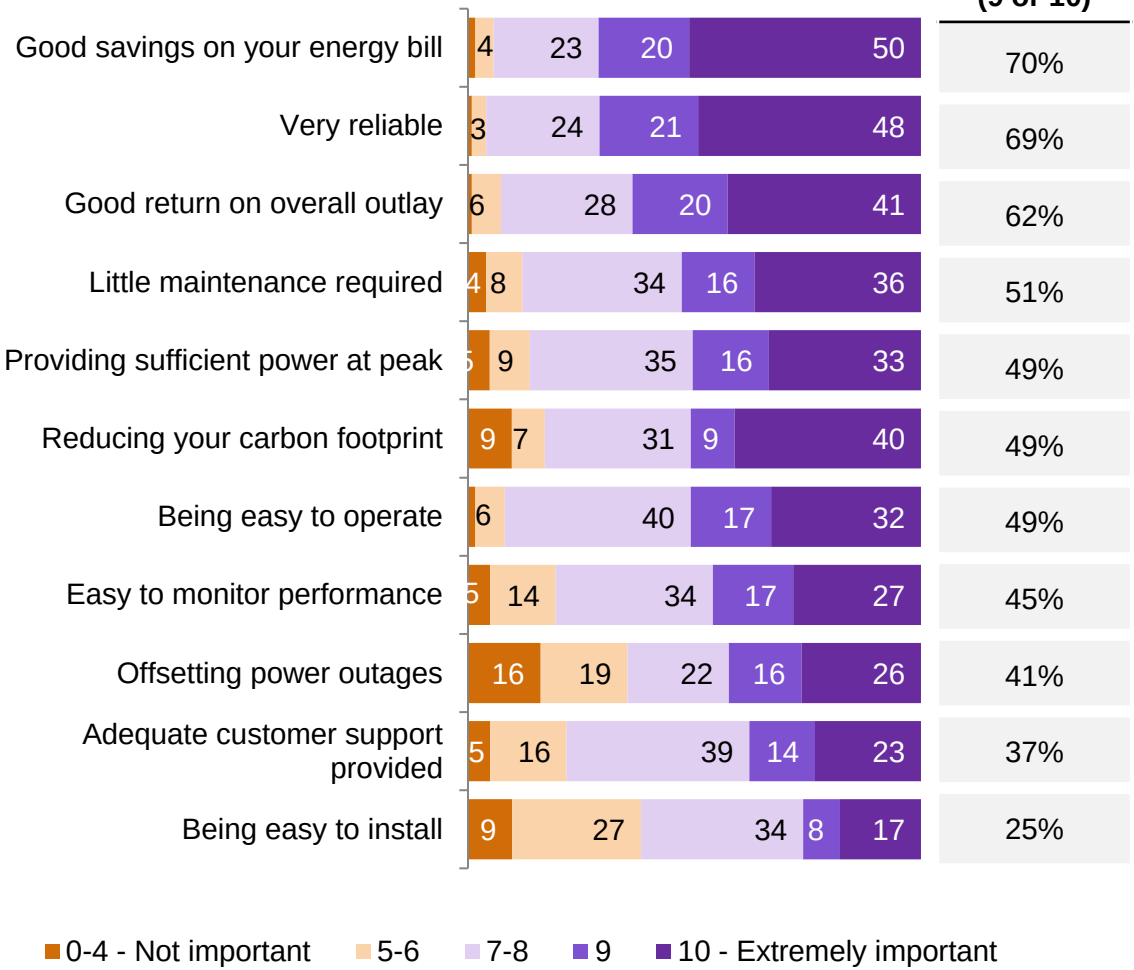
Perceptions of solar PV are largely cost driven, with upfront costs and financial return key issues, and these same reasons (along with reliability) being the key factors driving interest

Unprompted reasons for not installing solar PV yet (%)



Renters may have been under-represented in the databases provided for recruitment – the focus was on homeowners

Prompted reasons driving interest in solar PV (%)



Q23. Below is a list of possible reasons why people might not purchase a grid connected solar power system. Which, if any, of the following reasons explain why you have not purchased one? / Q24. And of those reasons you selected, which ONE would you say is the biggest or most important reason why you haven't purchased a grid connect solar power system? / Q25. How important are each of these aspects in driving your interest in investing in a grid connected solar power system? Base: All participants with no solar PV system currently (n=128)

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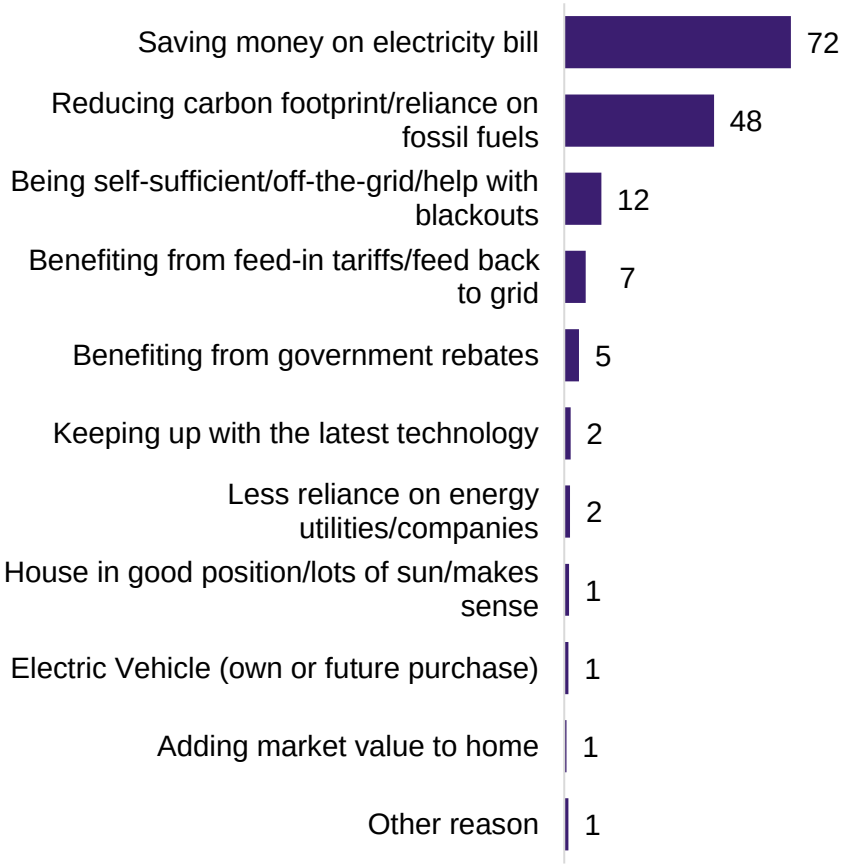
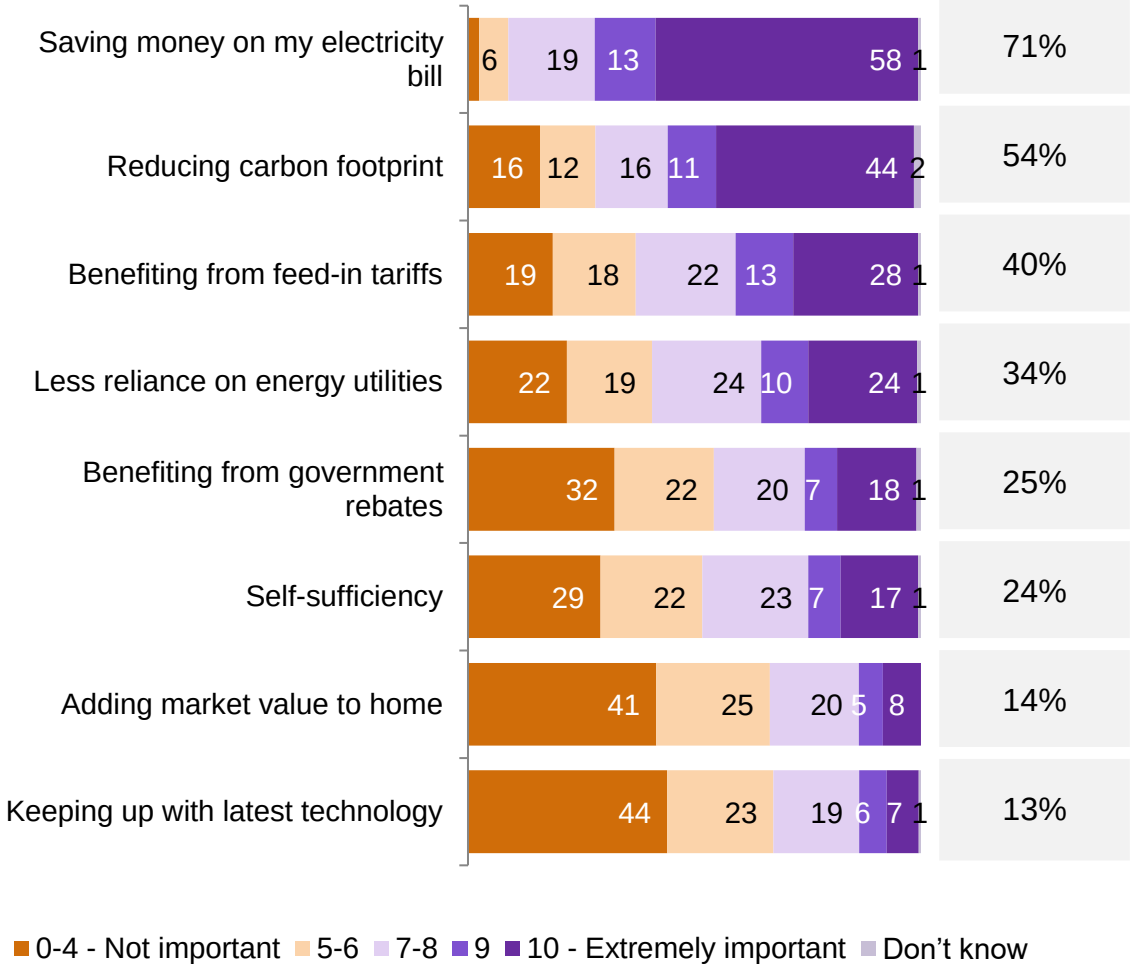
REASONS FOR SOLAR PV INSTALLATION (ALREADY HAVE)

Saving money on electricity bills is the main reason for solar PV installation by far, followed by reducing carbon footprint, self-sufficiency and getting feed-in tariffs, with **negligible differences by export level**

Top of mind reasons given by solar PV owners for installing their system (%)



Prompted reasons given by solar PV owners for installing their system (%)

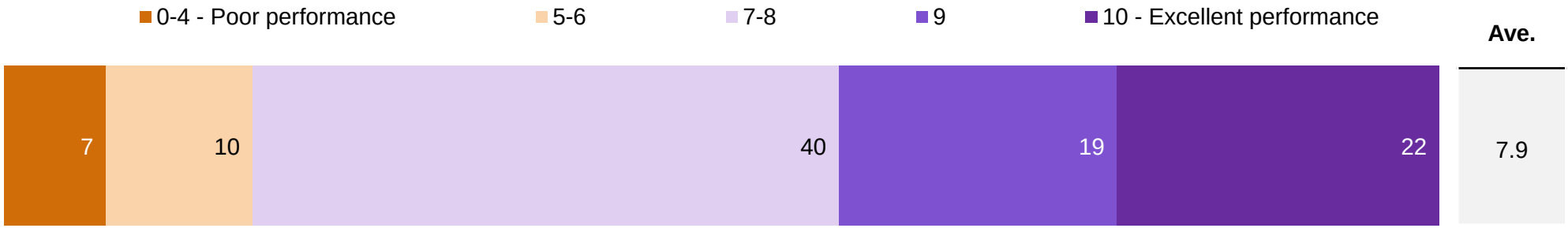


Q11. What are the main reasons you installed your solar PV system? / Q12. Below is a list of possible reasons for purchasing a solar power system. How important were each of these aspects in your decision to install your solar system? Base: All participants with grid-connected solar (n=805)

OWNER PERCEPTIONS OF SOLAR PV PERFORMANCE

Most were at least fairly happy with the performance of their system, with battery owners and large exporters the happiest. The main unprompted reasons for performance perceptions were saving less money or lower feed-in tariffs than expected, insufficient output and issues with siting or reliability

Perceptions of solar performance (%)



Key reasons for rating given – unprompted, coded (5%+)

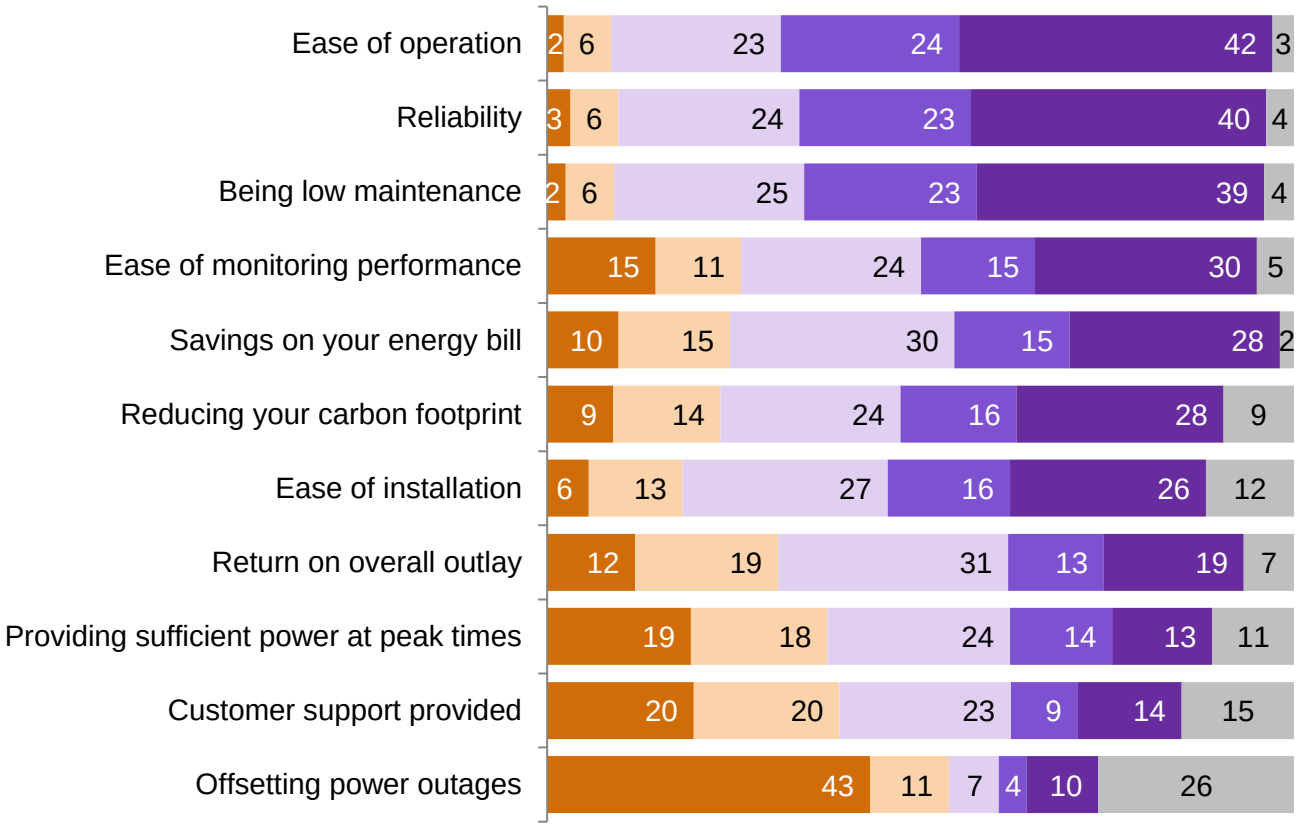
POOR RATINGS OF 0-6 (n=131)	FAIR RATINGS OF 7-8 (n=320)	HIGH RATINGS OF 9-10 (n=331)
• Saving less money than expected (25%) • Lower output than expected (24%) • Lower feed-in tariffs than expected (18%) • System too small, more panels needed (12%) • System needed to be replaced/fixed (11%) • Insufficient performance data (7%) • Siting/shading issues (6%)	• Is good/OK (no further information) (29%) • Lower output than expected (14%) • Saving money (on my bills) (14%) • Would prefer a battery to store power (12%) • System too small – more panels needed (10%) • Siting/shading issues (9%) • Provides sufficient power at peak times (8%) • Lower feed-in tariffs than expected (7%)	• Is good/OK (no further information) (50%) • Saving money (on my bills) (30%) • Reliable system (13%) • Provides sufficient power at peak times (10%) • Enables monitoring of performance (6%) • Reduces carbon footprint (6%)

Q15. Taking everything into account, how do you rate the performance of your solar power system? / Q16. Why did you give that rating?
Base: All participants with grid-connected solar (n=805). All profiling sub-groups lie between n=165 and n=605

OWNER PERFORMANCE EVALUATION OF SOLAR PV

Most PV owners rated their system as easy to operate, reliable and low maintenance, with larger exporters significantly more positive on several fronts. Opinions were more mixed on other factors, with many negative about their system's ability to offset power outages.

Performance evaluation of current solar PV system (%)



	High performance (9 or 10)				
	Overall	**Small exporter**	**Medium exporter**	**Large exporter**	**No data**
Ease of operation	**66%**	62%	69%	73%	56%
Reliability	**62%**	54%	68%	73%	52%
Being low maintenance	**62%**	61%	71%	62%	53%
Ease of monitoring performance	**45%**	32%	44%	54%	32%
Savings on your energy bill	**44%**	30%	42%	61%	38%
Reducing your carbon footprint	**43%**	31%	42%	55%	37%
Ease of installation	**43%**	36%	47%	48%	38%
Return on overall outlay	**32%**	30%	32%	42%	29%
Providing sufficient power at peak times	**27%**	16%	30%	22%	22%
Customer support provided	**23%**	11%	20%	30%	17%
Offsetting power outages	**13%**	3%	5%	10%	10%

Significantly higher @ 95% confidence

Significantly lower @ 95% confidence

Q17. And how would you rate the performance of your solar power system (and storage battery system, if you have one) on the following specific aspects?
Base: All participants with grid-connected solar (n=805). Small exporter (no battery) (n=135), Medium exporter (no battery) (n=149), Large exporter (no battery) (n=125), No export data (n=231)

DRIVERS OF SOLAR PV PERFORMANCE RATINGS

In line with stated reasons, the biggest factor driving performance perceptions among solar PV owners by far is bill savings – but less than half rated the performance of their system highly on this front. Also impacting perceptions and rated somewhat lower were ease of monitoring performance and return on outlay

	Excellent performance (9 or 10)	Impact on solar PV performance rating *	Commentary
Savings on your energy bill	44%	**47%**	**Key areas of focus in relation to solar PV performance**
Ease of monitoring performance	45%	**7%**	
Return on overall outlay	32%	**11%**	
Ease of operation	**66%**	**6%**	**The biggest positives around solar PV performance**
Reliability	**62%**	**12%**	
Reducing your carbon footprint	43%	4%	Secondary areas of focus in relation to solar PV performance
Ease of installation	43%	1%	
Providing sufficient power at peak times	27%	4%	
Customer support provided	23%	3%	
Offsetting power outages	13%	-	
Being low maintenance	**62%**	3%	Other positives around solar PV performance

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Q17.And how would you rate the performance of your solar power system (and storage battery system, if you have one) on the following specific aspects?/ Base: All participants with grid-connected solar (n=805)

**This variable is created from a regression analysis of Q17 (independent variables) by Q15. (PV Performance rating) (dependent variable) (R^2=0.66).*

MOTIVATORS AND BARRIERS TO BATTERY INSTALLATION

- Among those who have a battery system (Q13, Q14)
- Among those who do not yet have a battery (Q19, Q20)

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MOTIVATORS AND BARRIERS TO BATTERIES IN SUM

Key positives and key issues feedback

KEY POSITIVES AND MOTIVATORS AMONG BATTERY OWNERS

The key prompted reasons for installing a battery:

- Save money on electricity bill by storing energy for to use off-peak (61%)
- To be less reliant on energy companies (46%)
- Have a reliable power source in case of outages (41%)
- To be self-sufficient (41%)

KEY ISSUES AMONG BATTERY OWNERS

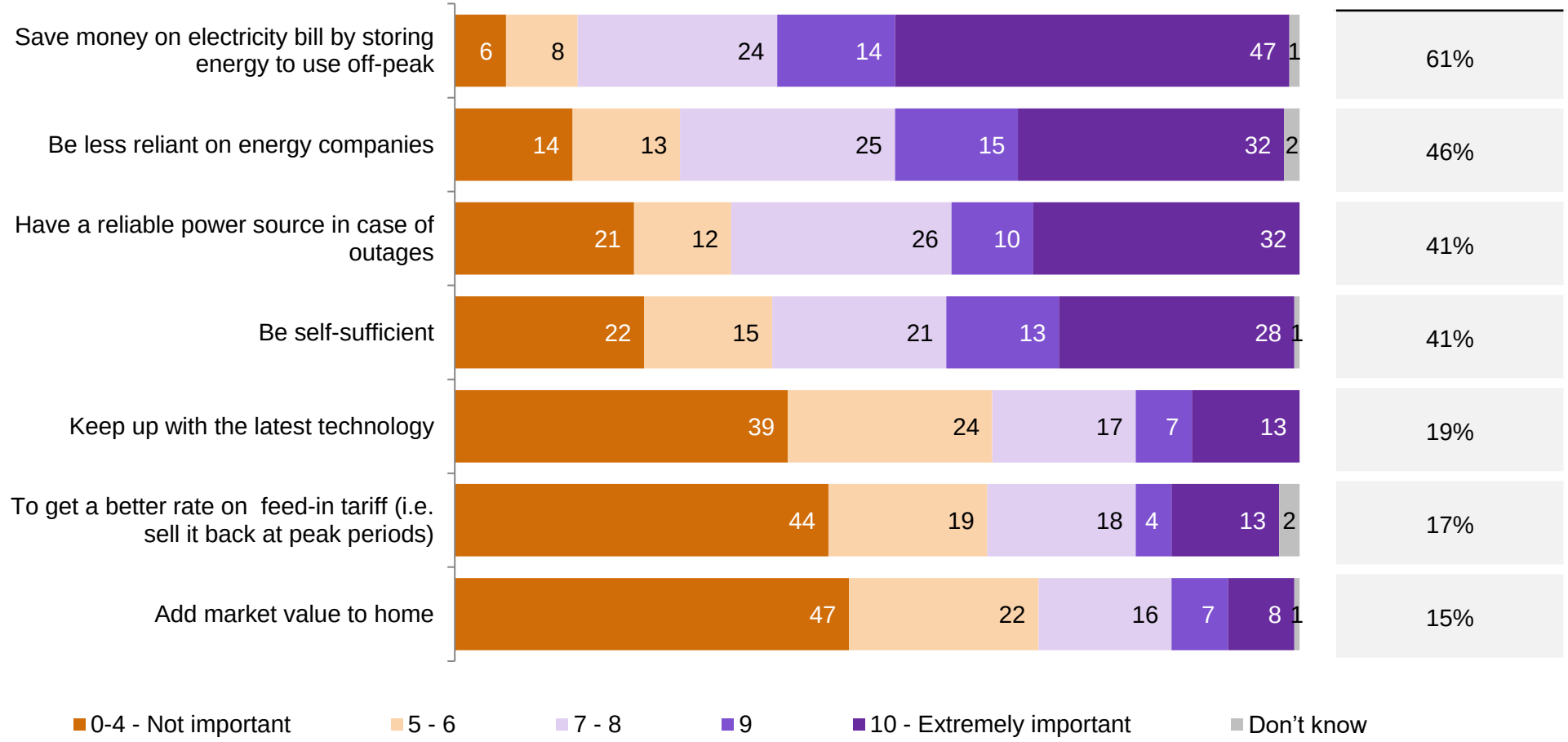
Key prompted reasons for not installing a battery system yet:

- Upfront purchase and installation cost (79%)
- Unclear on what the financial return would be (46%)
- Confused about/ unsure which battery to chose (21%)
- The current export levels are too low (17%)

REASONS FOR BATTERY INSTALLATION

Most battery owners installed their system to save money on their electricity bill. Being less reliant on energy companies and self-sufficiency were also important, as was having electricity during outages

Reasons for installing a battery – among battery owners (%)



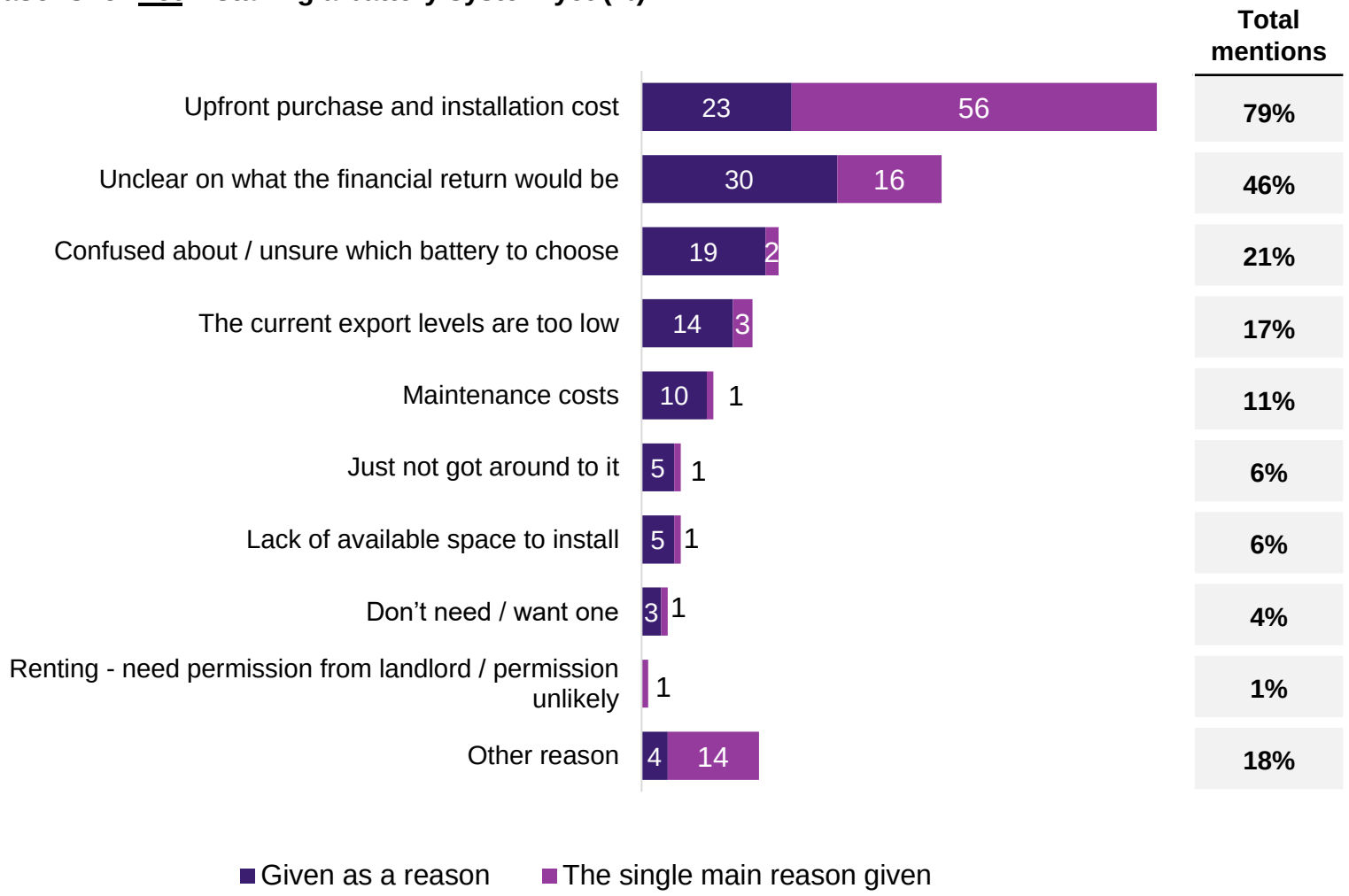
Highly Important (9 or 10)
61%
46%
41%
41%
19%
17%
15%

Q14. Below is a list of possible reasons for purchasing a battery storage system. How important were each of these aspects in your decision to install your battery system? / Base: All participants with a battery that they installed (n=165)

REASONS FOR NOT INSTALLING A BATTERY SYSTEM YET

The standout reason given for non-installation of a battery system was the upfront costs, followed by a lack of clarity on what the financial return might be, with no significant differences by solar export level

Reasons for <u>not</u> installing a battery system yet (%)



Q19. Below is a list of possible reasons why people might not purchase a battery storage system. Which, if any, of the following reasons explain why you have not installed a battery system? / Q20. And of those reasons you selected, which ONE would you say is the biggest or most important reason why you haven't purchased a battery storage system? / Base: All participants without a battery system currently (n=781)

INFORMATION NEEDS

- Comfort with potential battery providers
- Interest in Community Battery app features
- Information channel preferences
- Further information needs to address

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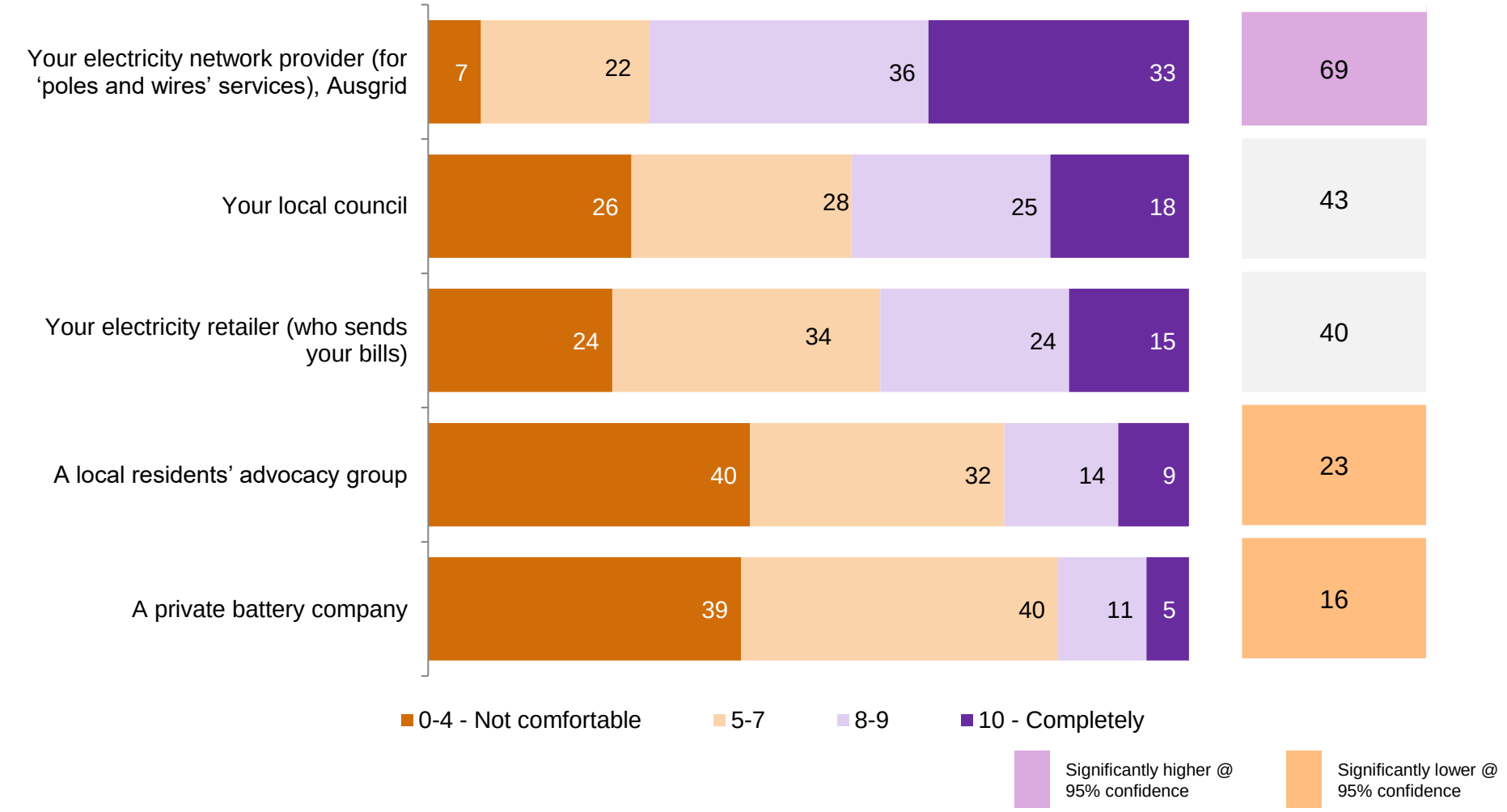
COMFORT WITH POTENTIAL BATTERY PROVIDERS

Comfort is greatest with Ausgrid providing a Community Battery, especially vs a private battery company or residents' advocacy group

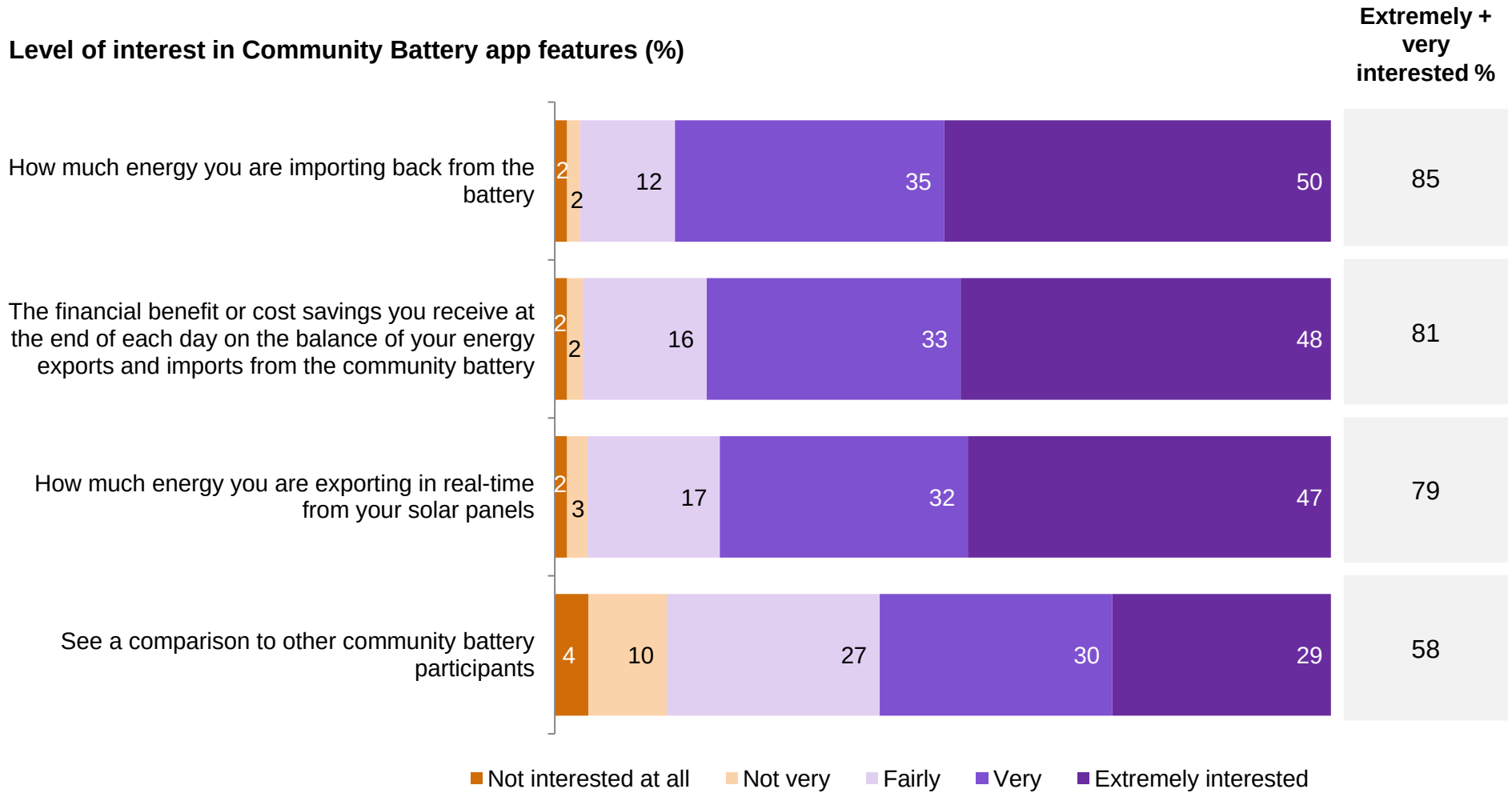
Level of comfort in organisations providing at Community Battery solution (%)



Q40. How comfortable would you feel with each of the following organisations providing a Community Battery solution? Using a scale from 0 to 10 where 0 means you would be not at all comfortable and 10 means you would be completely comfortable with such an organisation providing this service. Base: All participants (n=956).

INTEREST IN COMMUNITY BATTERY APP FEATURES

The app features tested all hold quite high levels of appeal, though customers were least interested in seeing a comparison to other participants

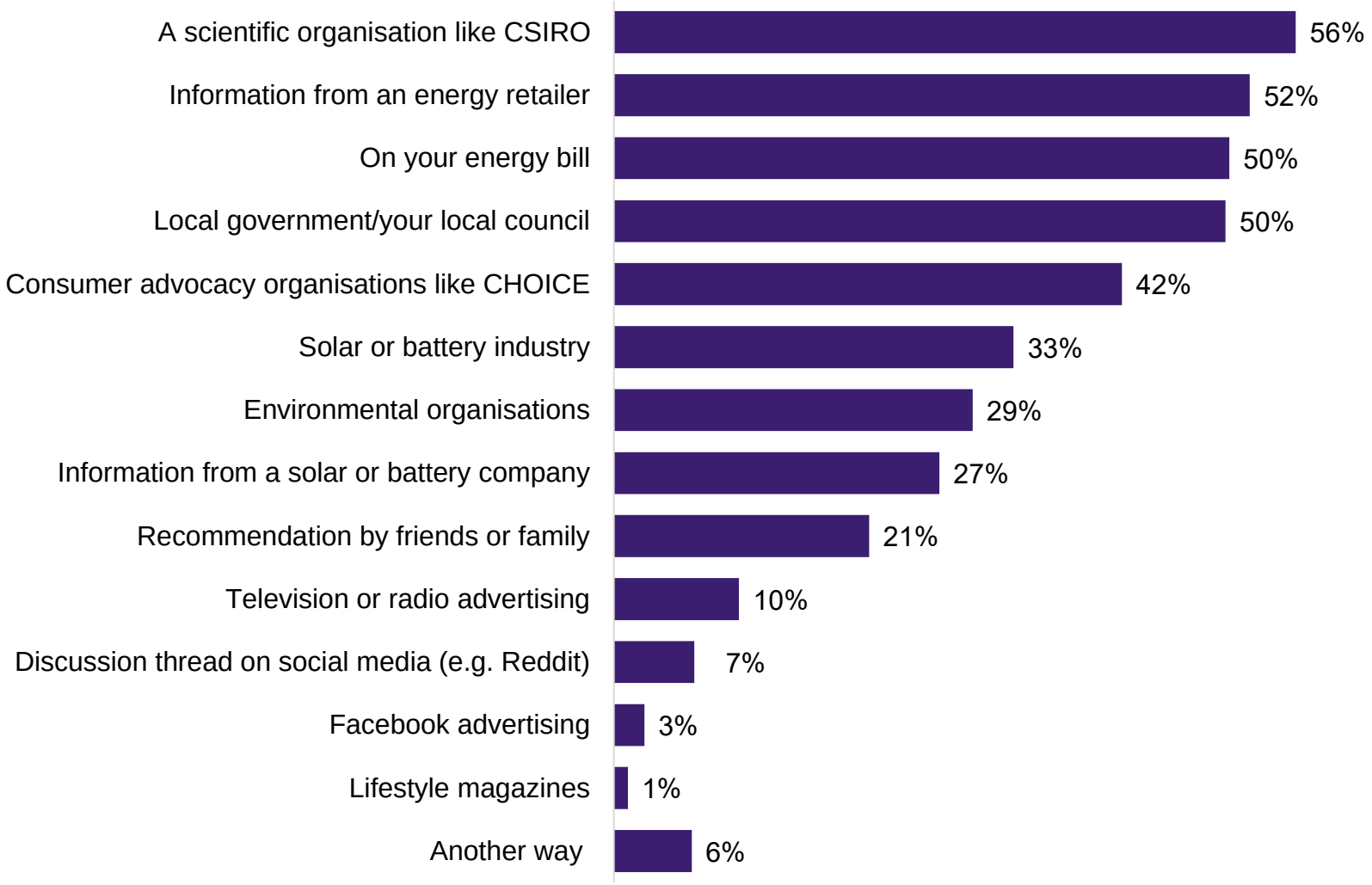


Q41. If you were participating in a Community Battery trial, how interested would you be in each of the following features that could be included in a mobile app or online tool to give you information about how the Community Battery is performing? / Base: All participants (n=956).

INFORMATION SOURCES

A range of information sources is welcomed, in particular scientific organisations, energy retailers, local government and consumer organisations

Preferred information sources about Community Batteries (%)

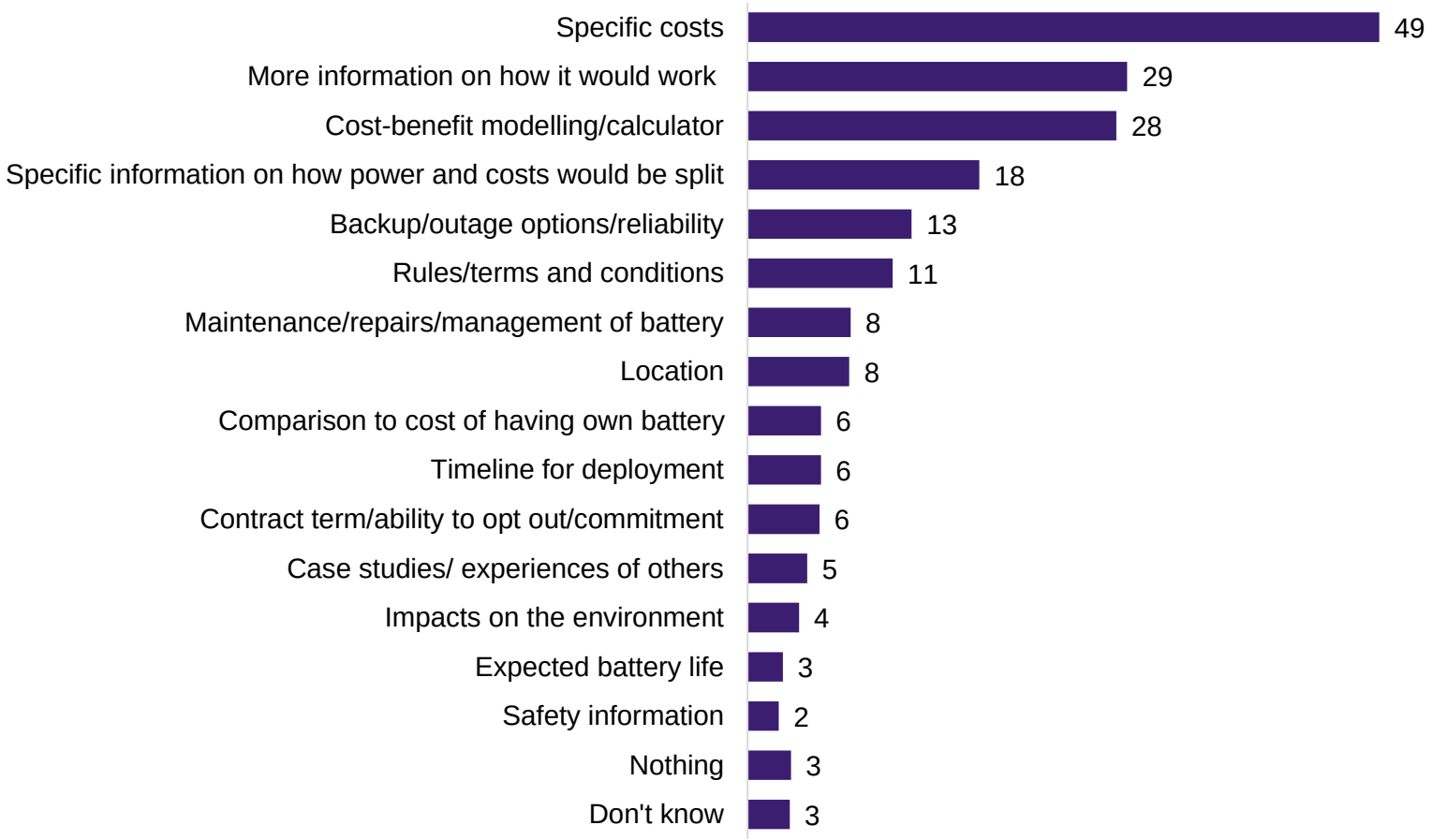


Q42. How would you most like to hear information about Community Batteries?
Base: All participants (n=956).

INFORMATION NEEDS AROUND THE COMMUNITY BATTERY

The standout information customers want to help with their decision-making around any Community Battery offering is what the specific costs would be, and to support that, a cost-benefit calculator, while many also wanted to know how it would actually work, with a host of other more specific details sought

What customers want to know about the Community Battery offering (Unprompted %)



Q43. What are the things you would like to know about the Community Battery offering to help with your decision-making around it? Unprompted, open-ended response, coded post fieldwork. Base: All participants (n=956).

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7 National Circuit
Barton ACT 2600

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Perth WA 6000

Melbourne
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Level 10, 120 Collins Street
Melbourne VIC 3000

Brisbane
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Level 14, 110 Eagle Street
Brisbane QLD 4000

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APPENDIX

1. Full demographic profiling slides
2. Q30 – Interest in the Community Battery – Profiling
3. Q32 – Likelihood to sign-up to Battery – Profiling

NEWGATE RESEARCH

1 SAMPLE COMPOSITION

Significantly higher than other groups @ 95% confidence

Significantly lower than other groups @ 95% confidence

VARIOUS CHARACTERISTICS		TOTAL	NON-SOLAR	NO EXPORT DATA	SMALL EXPORTER	MEDIUM EXPORTER	LARGE EXPORTER	BATTERY OWNER
SAMPLE SIZE: (n=x and % of total sample)		***956 (100%)***	***128 (13%)***	***231 (24%)***	***135 (14%)***	***149 (16%)***	***125 (13%)***	***175 (18%)***
GENDER	Male	**75%**	62%	76%	84%	76%	81%	81%
	Female	**25%**	38%	24%	16%	24%	19%	19%
PARTICIPANT AGE	18 - 44	**19%**	38%	15%	13%	21%	22%	13%
	45-54	**21%**	23%	22%	24%	23%	20%	16%
	55-64	**22%**	18%	26%	20%	19%	18%	28%
	65+	**36%**	17%	35%	41%	36%	37%	43%
EMPLOYMENT STATUS	Employed	**50%**	67%	48%	46%	55%	48%	42%
	Self employed	**10%**	9%	8%	13%	11%	10%	11%
	Retired	**37%**	16%	39%	41%	36%	38%	47%
	Other employment situation	**6%**	13%	5%	6%	3%	7%	5%
HOUSE TYPE	Detached house	**93%**	88%	93%	96%	92%	93%	95%
	Semi-detached house/terrace	**7%**	13%	7%	4%	8%	7%	5%
ENERGY RETAILERS	EnergyAustralia	**31%**	34%	33%	30%	26%	30%	31%
	AGL Energy	**27%**	20%	26%	22%	32%	31%	29%
	Origin Energy	**14%**	13%	13%	12%	14%	22%	11%
	Powershop Australia	**9%**	10%	4%	17%	8%	8%	10%
	Red Energy	**8%**	6%	11%	10%	7%	4%	9%
	Other retailer	**5%**	4%	5%	4%	6%	3%	7%

S3. HOUSE TYPE/ S4. HOME OWNERSHIP STATUS/ S15. AGE/ D1. HOUSEHOLD SIZE/ D2. HOUSEHOLD TYPE/ D6. HOUSEHOLD INCOME

Base: All participants (n=956)

SAMPLE COMPOSITION CONT'D

Significantly higher than other groups @ 95% confidence

Significantly lower than other groups @ 95% confidence

VARIOUS CHARACTERISTICS		TOTAL	NON-SOLAR	NO EXPORT DATA	SMALL EXPORTER	MEDIUM EXPORTER	LARGE EXPORTER	BATTERY OWNER
SAMPLE SIZE: (n=x and % of total sample)		***956 (100%)***	***128 (13%)***	***231 (24%)***	***135 (14%)***	***149 (16%)***	***125 (13%)***	***175 (18%)***
NUMBER OF PEOPLE IN HOUSEHOLD	1	**5%**	5%	6%	6%	4%	6%	5%
	2	**39%**	28%	38%	46%	40%	41%	41%
	3	**18%**	15%	19%	19%	17%	12%	18%
	4+	**38%**	52%	36%	30%	39%	42%	35%
HOUSEHOLD TYPE (>1)	COUPLE ONLY	**7%**	8%	7%	9%	10%	6%	4%
	SINGLE PARENT	**2%**	2%	3%	3%	1%	1%	2%
	COUPLE WITH CHILDREN	**47%**	64%	47%	40%	49%	49%	39%
	EMPTY NESTERS	**33%**	18%	31%	39%	39%	39%	41%
	OTHER GROUP HOUSEHOLD	**10%**	7%	8%	9%	5%	5%	13%
HOUSEHOLD INCOME	Less than $60,000	**15%**	14%	19%	13%	13%	14%	13%
	$60,000 - $120,000	**24%**	16%	24%	32%	23%	22%	27%
	$120,000+	**36%**	52%	28%	33%	37%	38%	33%
	Prefer not to say	**25%**	17%	29%	21%	26%	26%	26%
HOME OWNERSHIP	Own outright	**55%**	42%	52%	62%	55%	58%	59%
	Own with mortgage	**43%**	54%	45%	36%	44%	42%	38%
	Rent	**1%**	4%		1%			2%
	Other	**1%**		2%		1%		

THE SOLAR PV SYSTEMS REPRESENTED IN THE SAMPLE

The non-% figures given are averages, with the range in brackets		NO DATA	SMALL EXPORTER	MEDIUM EXPORTER	LARGE EXPORTER	BATTERY ATTACHED
SAMPLE SIZE: SOLAR OWNERS		***231 (24%)***	***135 (14%)***	***149 (16%)***	***125 (13%)***	***175 (18%)***
SYSTEM SPECS	AGE OF SOLAR PV SYSTEM (YRS) – All providing a date	5.3	7.2	5.2	4.2	5.9
	SOLAR PV CAPACITY (kWh)	5.7 (1.5-23)	4.1 (1-16)	5.1 (1-10)	8.0 (3.8-35)	7.7 (1-100)
	% OF CUSTOMERS WHO TRACK THEIR SOLAR PRODUCTION VIA APP/PORTAL	38%	40%	56%	67%	67%
EXPORTS	AVERAGE DAILY EXPORT (MID-POINT) – SUMMER (kWh)	Low base	7.9 (0.1-28)	13.0 (5-30)	19.9 (5-50)	12.5 (0.1 – 50)
	AVERAGE DAILY EXPORT – WINTER (kWh)	Low base	4.0 (0-27)	7.8 (0-28)	11 (0-35)	5.3 (0-30)
	AVERAGE DAILY EXPORT – LAST BILL (kWh)	None provided	2.8 (0-5)	7.6 (5-10)	17.4 (10-120)	6.5 (0-37.6)
$	% ON FLAT FEED-IN TARIFF	30%	39%	42%	49%	33%
	FLAT FEED-IN TARIFF (cents)	12.9 (0-32)	11.7 (0.1-31.3)	13.1 (0.1-33)	15.8 (0.1-105)	14.3 (0-105)
	% ON RETAIL TIME OF USE TARIFF	53%	58%	54%	50%	56%
	VARIABLE FEED-IN TARIFF PEAK (cents)	31 (0-60.7)	37.9 (4.6-58.6)	28.2 (4.2-62.7)	27.1 (4.5-60)	32.8 (0.3-64)
	VARIABLE FEED-IN TARIFF OFF-PEAK (cents)	10.9 (0-19.2)	12.8 (0.7-23.1)	11.4 (1.1-29.5)	11.1 (1.2-19)	12.9 (1.3-22)
	LAST ENERGY BILL – AVG. DAILY CHARGE ($)	271.9 (1-903.1)	329.9 (1-2,216)	266.8 (1-1,141)	176.3 (1-774)	238.1 (1-1,677)
	% CLAIIMING TO HAVE SAVED $500+ FROM THEIR ANNUAL ENERGY BILL WITH SOLAR	42%	39%	58%	76%	64%

S6. ENERGY BILL/ S9. SOLAR CAPACITY/ S10A/B. ENERGY EXPORTED/ Q1. AGE/ Q2. TARIFF/ Q3. FEED-IN TARIFF/ S11. BATTERY/ Q4. TRACK SOLAR/ Q18 BILL REDUCTION

Base: All with solar PV installed who provided export and capacity data (n=630)

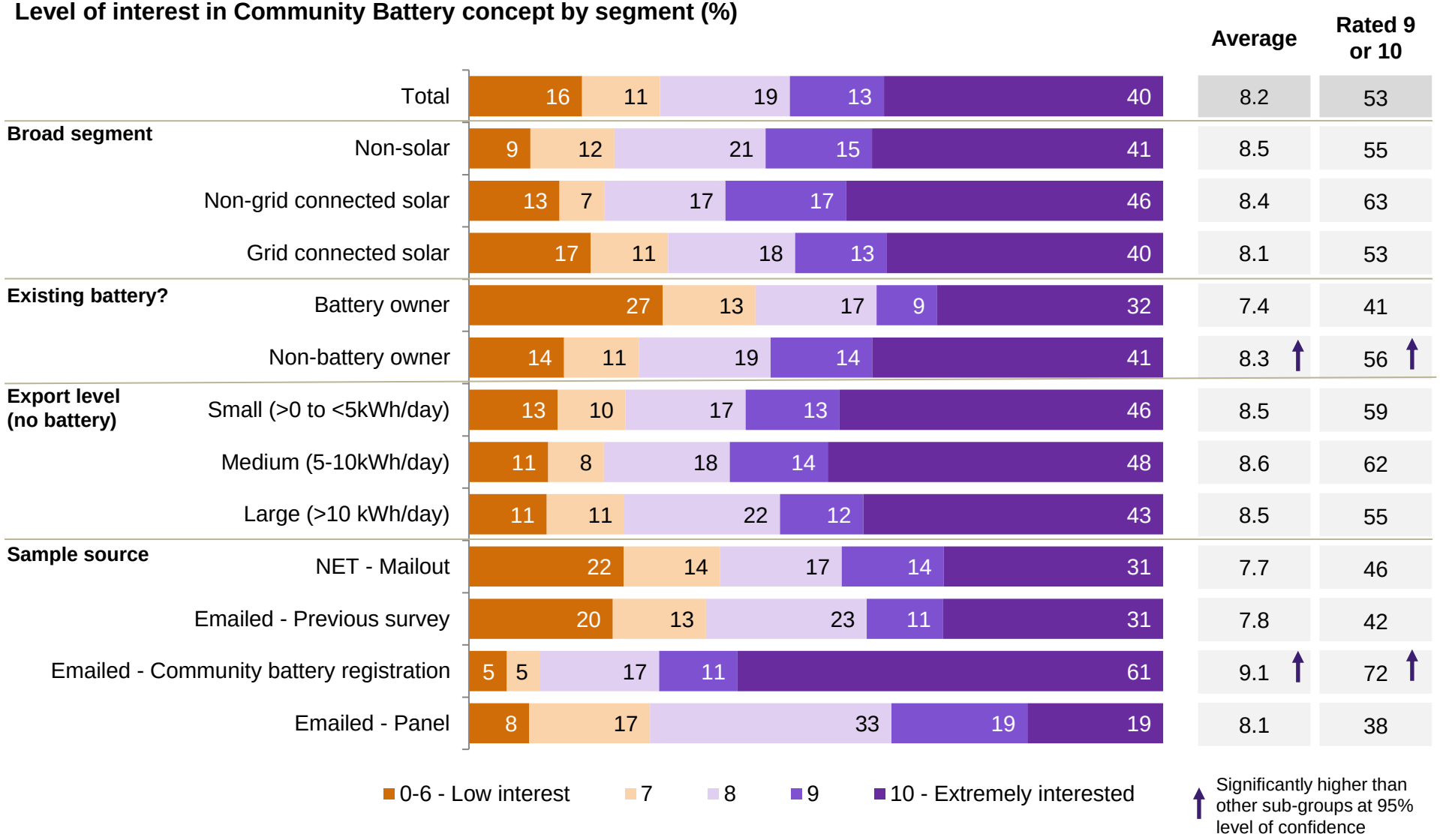
Significantly higher than other groups @ 95% Level of confidence

Significantly lower than other groups @ 95% Level of confidence

2 INTEREST IN THE IDEA OF A COMMUNITY BATTERY (PROMPTED)

After seeing the concept, interest was high across all key segments within the survey, particularly among those who registered for the Community Battery and among non-battery owners

Level of interest in Community Battery concept by segment (%)

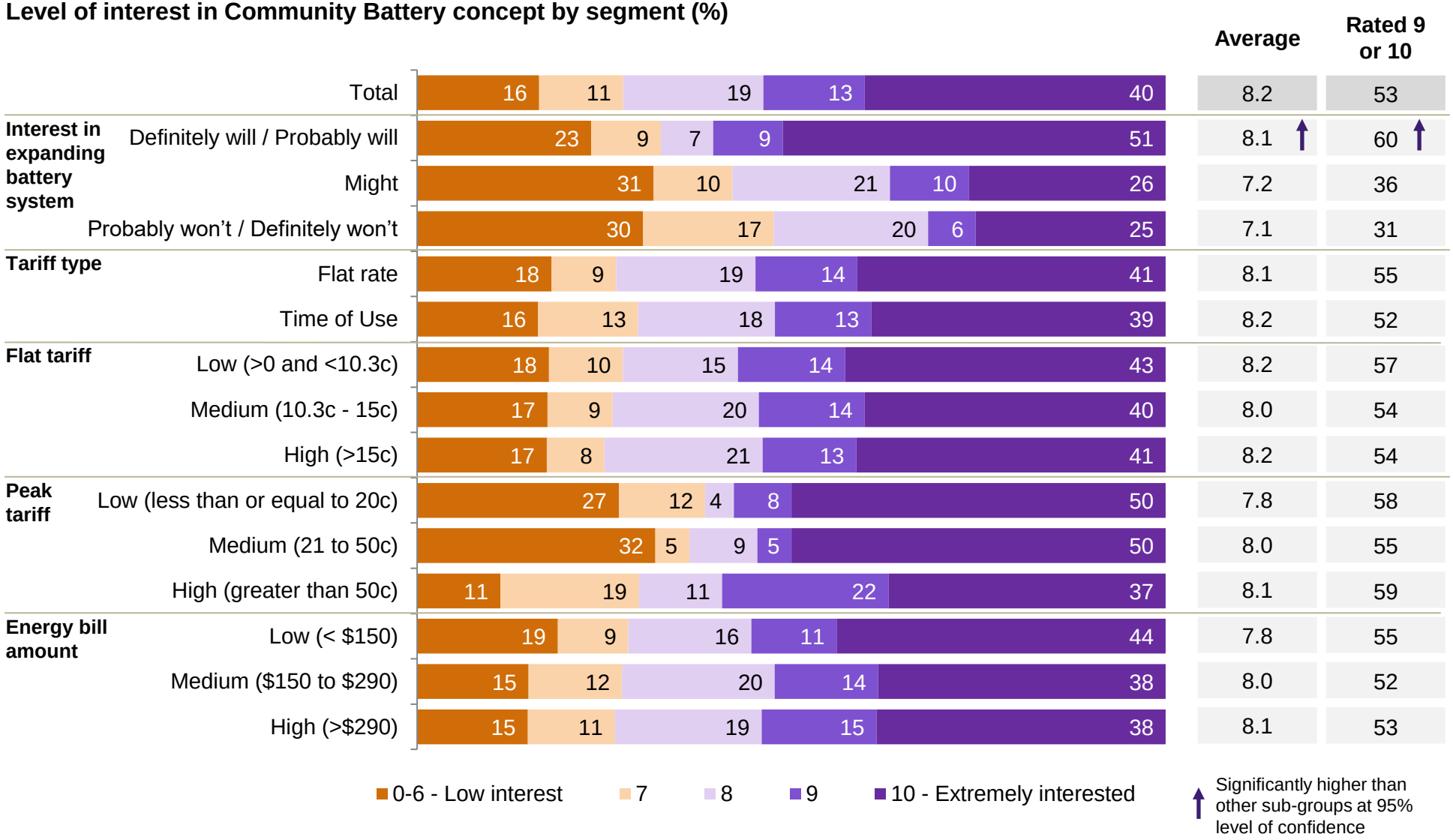


Q30. Based on what you have just read about Community Batteries, how interested are you in this idea? Scale: 0 = not at all, 10 = extremely interested. / Base: All participants (n=956). Sub-group base sizes lie between n=48 and n=805

INTEREST IN THE IDEA (PROMPTED) CONT'D

Across all key segments within the survey, a high level of interest was recorded in the concept, particularly those who either probably or definitely would expand their battery system

Level of interest in Community Battery concept by segment (%)

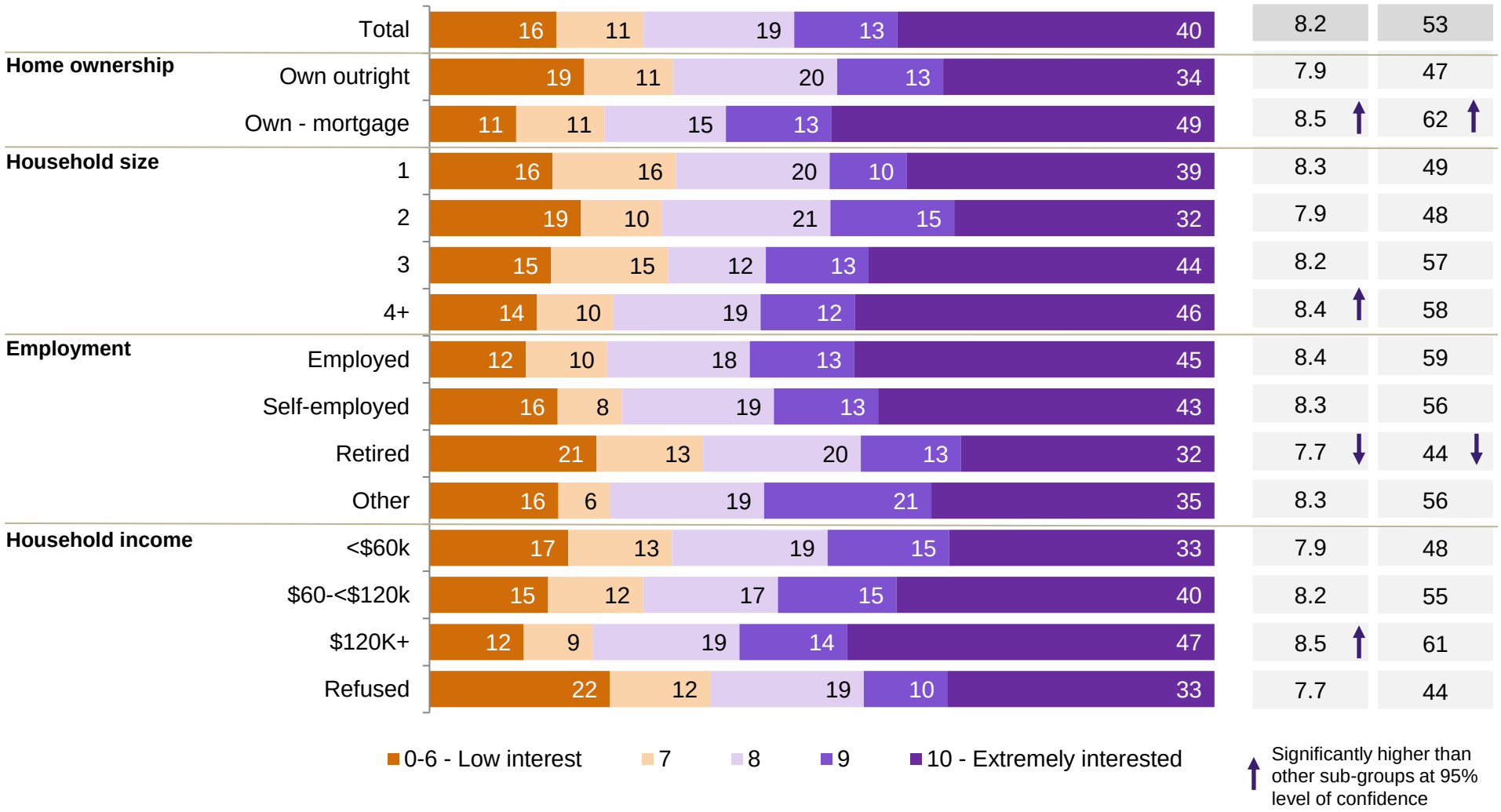


Q30. Based on what you have just read about Community Batteries, how interested are you in this idea? Scale: 0 = not at all, 10 = extremely interested. / Base: All participants (n=956). Sub-group base sizes lie between n=27 and n=352

INTEREST IN THE IDEA (PROMPTED) CONT'D

Those own their house with a mortgage, have a larger household size, are higher income earners and not retired are more likely to be interested in the Community Battery concept

Level of interest in Community Battery concept by segment (%)

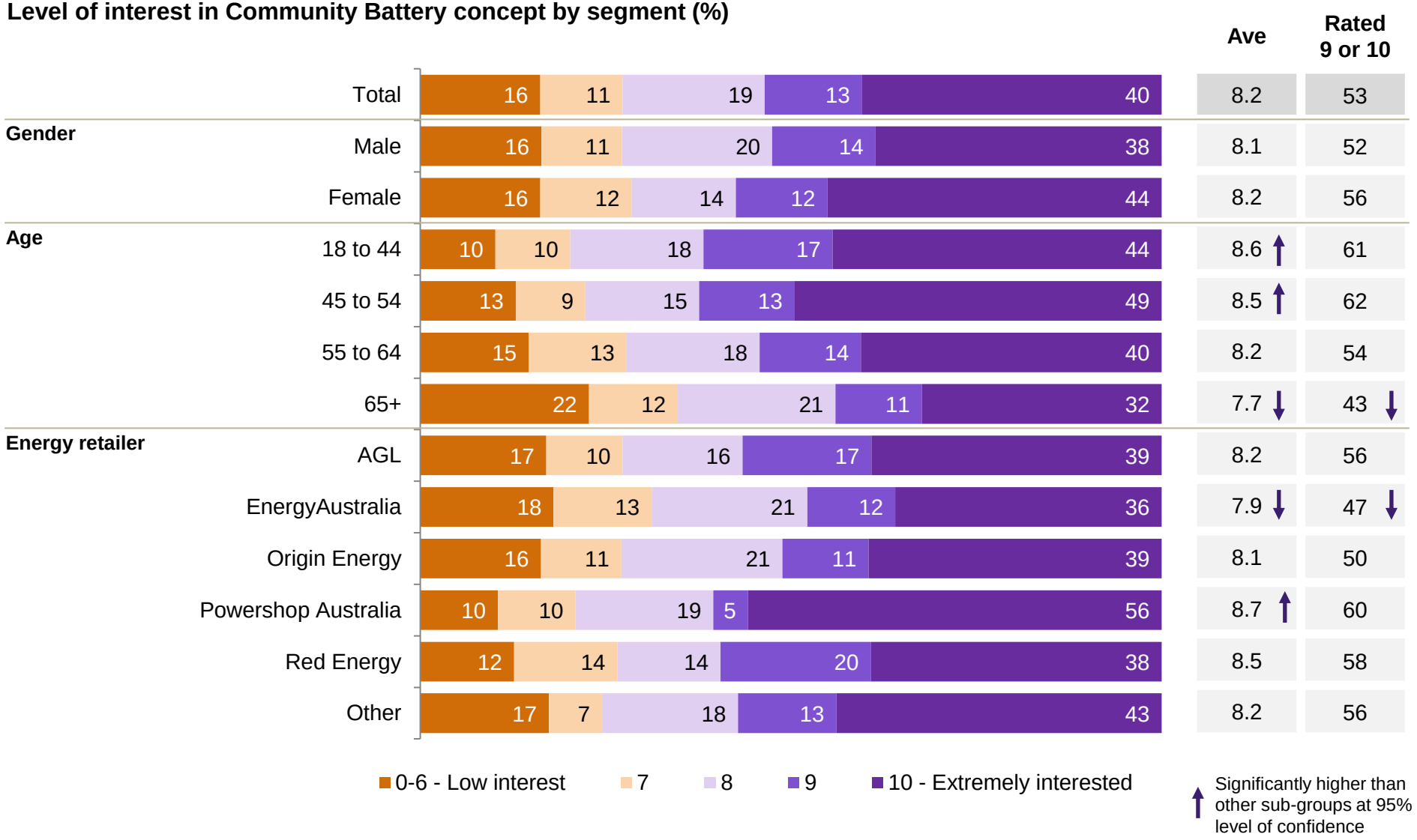


Q30. Based on what you have just read about Community Batteries, how interested are you in this idea? Scale: 0 = not at all, 10 = extremely interested. / Base: All participants (n=956). Sub-group base sizes lie between n=61 and n=518

INTEREST IN THE IDEA (PROMPTED) CONT'D

Younger participants (18-54) were also more likely to be interested

Level of interest in Community Battery concept by segment (%)

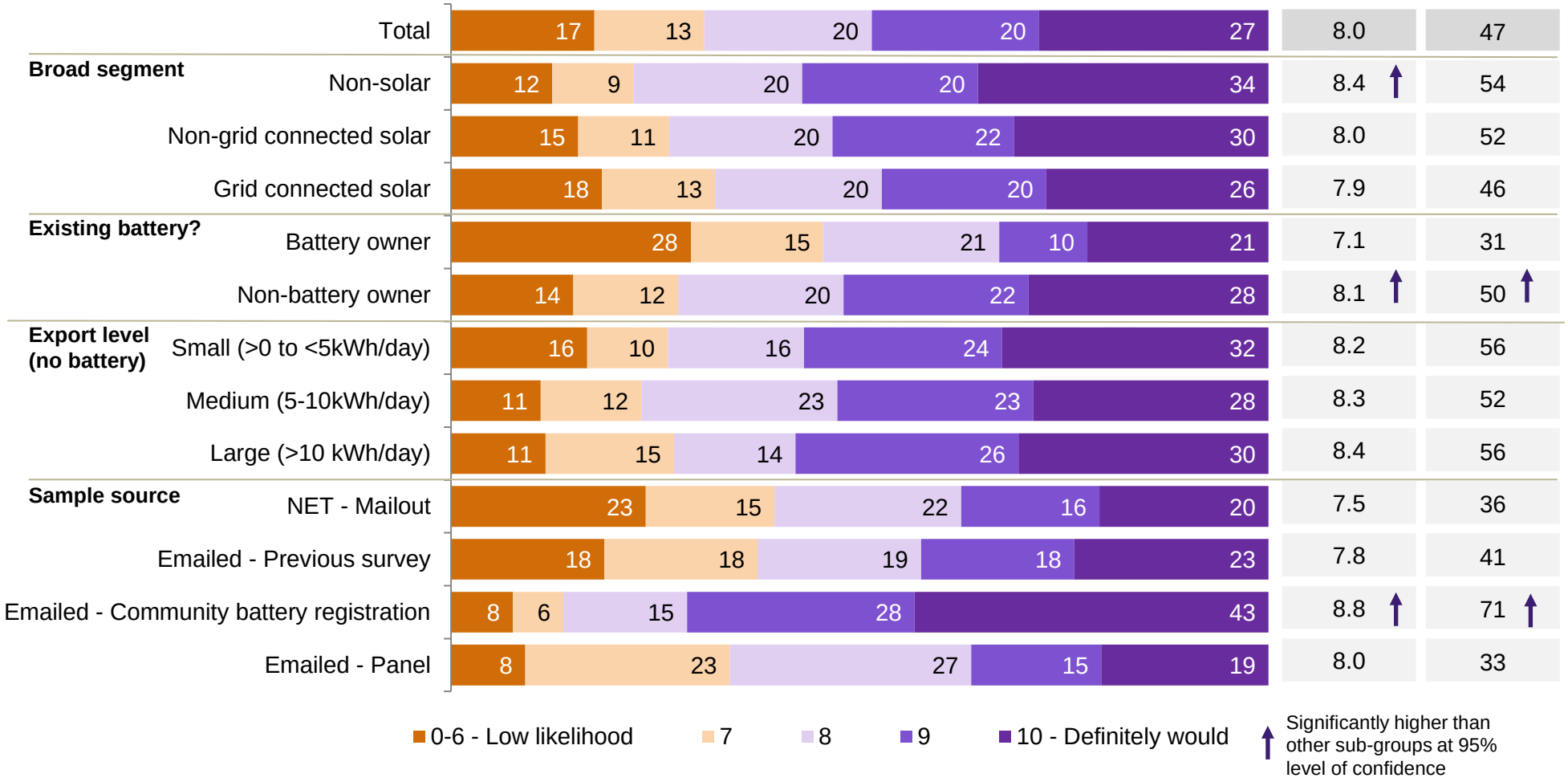


Q30. Based on what you have just read about Community Batteries, how interested are you in this idea? Scale: 0 = not at all, 10 = extremely interested. / Base: All participants (n=956). Sub-group base sizes lie between n=79 and n=710

3 LIKELIHOOD TO SIGN UP IF AVAILABLE (PRE-MESSAGES)

The large majority thought they would sign up if the opportunity arose in their area and it was affordable to them, especially pre-registered participants, non-battery owners and large exporters

Likelihood to sign up & connect to Community Battery if available by segment (%)



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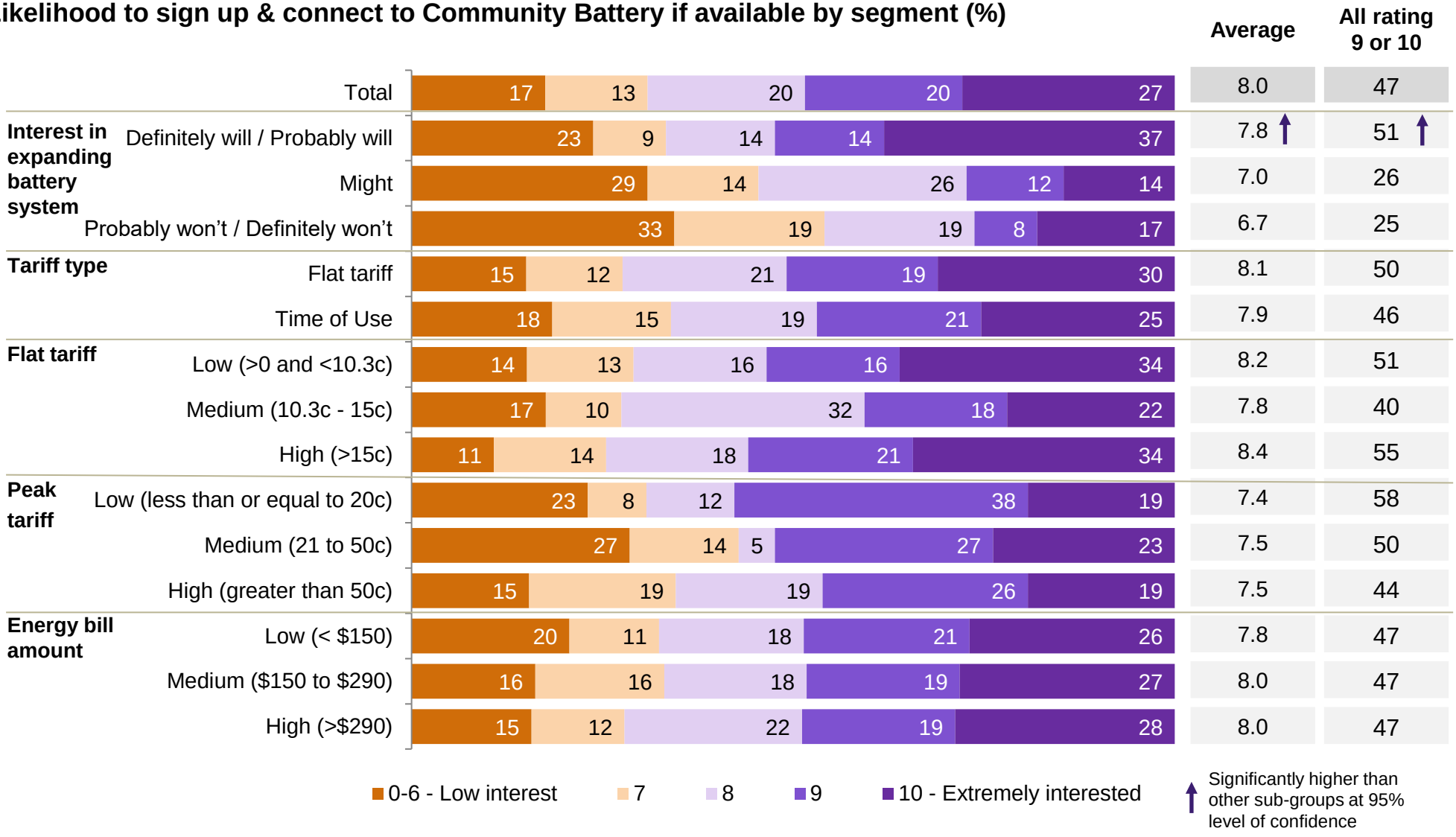
Q32. Based on this concept, if the opportunity arose in your local area and assuming it was affordable to you, how likely would you be to sign up and connect to a local 'Community Battery'? Scale: 0 = definitely would not, 10 = definitely would. / Base: All participants (n=956). Sub-group base sizes lie between n=48 and n=805

LIKELIHOOD TO SIGN UP IF AVAILABLE (PRE-MESSAGES) CONT'D

There was minimal difference in likelihood to sign up to a Community Battery between those with different tariff types and energy bill amounts, and levels were higher among those looking to expand their battery

Likelihood to sign up & connect to Community Battery if available by segment (%)

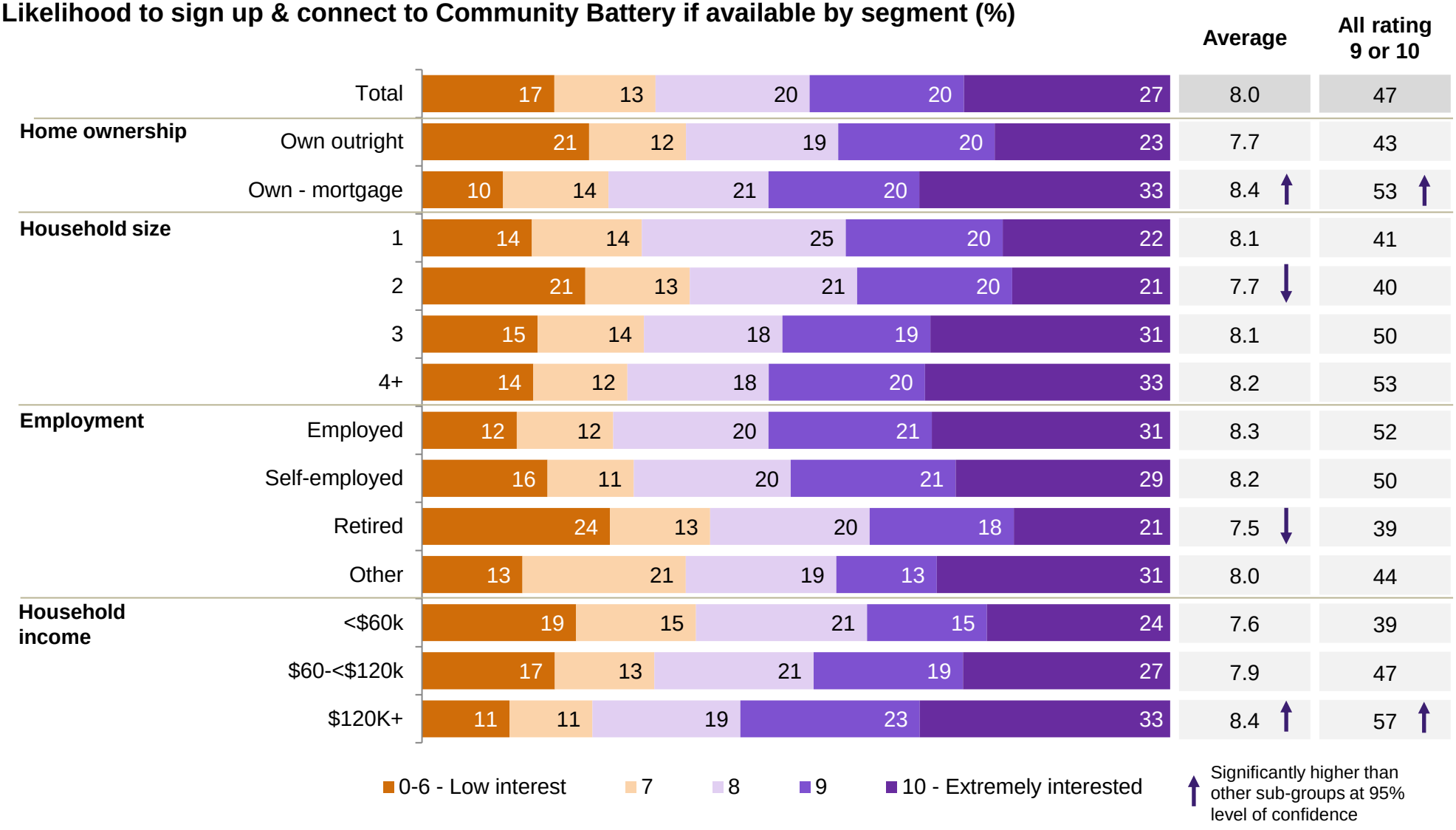


Q32. Based on this concept, if the opportunity arose in your local area and assuming it was affordable to you, how likely would you be to sign up and connect to a local 'Community Battery'? Scale: 0 = definitely would not, 10 = definitely would. / Base: All participants (n=956). Sub-group base sizes lie between n=27 and n=352

LIKELIHOOD TO SIGN UP IF AVAILABLE (PRE-MESSAGES) CONT'D

While the majority of participants thought they were likely to sign up, this was higher among those who had a mortgage on their property, workers and those earning a higher income

Likelihood to sign up & connect to Community Battery if available by segment (%)

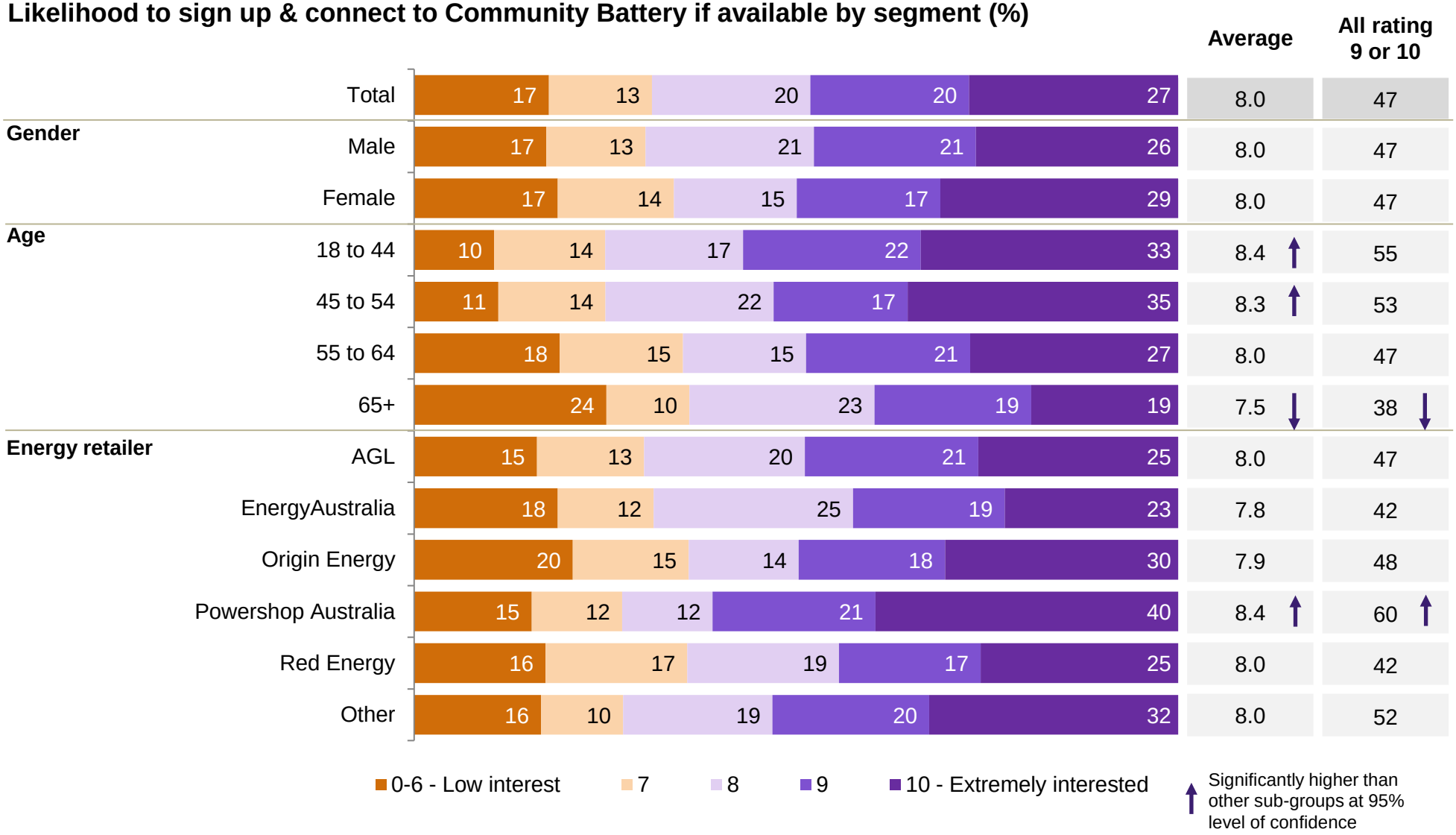


Q32. Based on this concept, if the opportunity arose in your local area and assuming it was affordable to you, how likely would you be to sign up and connect to a local 'Community Battery'? Scale: 0 = definitely would not, 10 = definitely would. / Base: All participants (n=956). Sub-group base sizes lie between n=61 and n=518

LIKELIHOOD TO SIGN UP IF AVAILABLE (PRE-MESSAGES) CONT'D

The large majority also thought they would sign up if the opportunity arose in their area and it was affordable to them and especially younger participants

Likelihood to sign up & connect to Community Battery if available by segment (%)



Q32. Based on this concept, if the opportunity arose in your local area and assuming it was affordable to you, how likely would you be to sign up and connect to a local 'Community Battery'? Scale: 0 = definitely would not, 10 = definitely would. / Base: All participants (n=956). Sub-group base sizes lie between n=79 and n=710