Perception of policies aimed at motivating consumers to adopt electric vehicles, electrify gas appliances, and install battery storage

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Better Consumption Lab, Deakin University

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Executive summary

Survey approach

+ 1,250 Victorian homeowners were surveyed to evaluate the influence of different policies on the adoption of EVs, home EV chargers, home batteries, and the electrification of gas appliances for space heating, water heating, and cooking.
+ Four policies were examined as part of this evaluation:
  - ↓ Purchase cost: zero emission technologies 10% cheaper to buy.
  - ↓ Operating cost: zero emission technologies 10% cheaper to run.
  - ↑ Infrastructure: zero emission technologies easier to install/use.
  - Mandates: sale of non-zero emission technologies banned by 2040.
+ A range of core insights were identified:

New and familiar technologies were perceived differently

+ When examined collectively, new technologies (EVs, home EV chargers, batteries) were perceived positively but less favourably than familiar technologies (reverse cycle air conditioners for heating, electric water heating, induction cooktops, electric ovens).
+ Business as usual (BAU) adoption intentions – which capture the choices that respondents would make if they needed to purchase or replace a product over the next 5 years in the absence of any new policies – were higher for familiar technologies (63% - 83%) than new technologies (21% – 48%). Additional policies may therefore be required to accelerate the adoption of new (vs. familiar) technologies.

↓ Operating cost favourably influenced new technology adoption and was both popular and seen as fair

+ Among the new technologies, ↓ Operating cost tended to increase total adoption intentions above BAU by the greatest margin (14% - 23%), followed by ↑ Infrastructure (9% - 11%).
+ 67% of respondents perceived ↓ Operating cost somewhat or very positively, with only 13% perceiving it somewhat or very negatively.
+ ↓ Operating cost was perceived as somewhat or very fair by 50% of respondents, with 25% perceiving it as somewhat or very unfair.
+ ↓ Operating cost was popular, with the greatest proportion of respondents (36%) ranking it as their most preferred policy scenario.

Mandates favourably influenced familiar technology adoption but were neither popular nor seen as fair

+ Among the familiar technologies, Mandates tended to generate the greatest total increases in adoption intentions above BAU (5 – 12%), followed by ↓ Operating cost (3 – 9%).
+ Mandates were viewed somewhat or very positively by 40% of respondents, while 49% perceived them somewhat or very negatively.
+ While 29% of respondents perceived Mandates as being somewhat or very fair, 55% viewed them as somewhat or very unfair.
+ Mandates were unpopular, with 66% of respondents indicating that it was their least preferred of the four policy scenarios.

Executive summary (cont.)

Adopter category and environmental worry influenced adoption intentions across all technologies

+ Business as usual (BAU) adoption intentions were consistently higher among early adopter categories and those with greater levels of environmental worry.
+ This pattern, which was observed across all technologies, highlights the importance of finding ways to increase adoption intentions among harder to reach segments, such as later adopter categories and those with low levels of environmental worry.

↓ Operating cost was perceived positively by harder to reach segments, whereas Mandates were not

+ ↓ Operating cost was perceived positively by:
  - All adopter categories (except laggards).
  - All levels of environmental worry (except those who were not at all worried about the environment).
+ Mandates were only perceived positively by:
  - Innovators and early adopters (among the adopter categories).
  - Respondents who were very worried about the environment (among the various levels of environmental worry).
+ These findings are noteworthy given the previous insight linking adopter category and environmental worry with adoption intentions.

Better educated, politically progressive, younger men are the bullseye segment for adopting these new technologies

+ Being male, younger (18-39), better educated, or politically progressive predicted BAU adoption intentions across most new technologies.
+ Fewer demographic variables predicted the familiar technologies, suggesting that these technologies are relatively equally accepted across most demographic groups.

Introduction

Motivating the adoption of zero emission technologies

+ For Australia to achieve net zero emissions, Australian consumers will need to adopt or convert to a range of zero emission technologies (DCCEEW, 2023; Wood et al., 2023).
+ Driving mass adoption of zero emission technologies across multiple product categories and within the relatively limited time available to mitigate the worst effects of climate change will likely require additional policy responses beyond those that are currently in place (Climate Council, 2022; Mortimore et al., 2022; Tidemann et al., 2022; Wood et al., 2023).
+ Drawing on national and international exemplars, there are a range of additional technology-agnostic policy responses that could be introduced (Newton et al., 2023).
+ While there are multiple lenses through which to evaluate such policies, an effective policy response would ideally:
  – Motivate the adoption of multiple zero emission technologies.
  – Be evaluated positively by consumers.
  – Be perceived as fair by consumers.

Aim

+ The aim of this research is to evaluate potential, technology-agnostic policies for motivating consumer adoption of zero emission technologies by considering their:
  – Influence on consumers' adoption intentions.
  – Perceived support among consumers.
  – Perceived fairness among consumers.

Focal technologies

+ This report examines the following zero emission consumer technologies:
  – Electric vehicles (EVs).
  – Home EV chargers.
  – Home batteries (sometimes referred to as a solar battery).
  – Electric space heating.
  – Electric water heating.
  – Electric cooktops.
  – Electric ovens.

Survey approach

Who

- We collected 1,250 survey responses from individuals who met all the following criteria:
  - Aged 18 years or older.
  - Currently residing in Victoria.
  - Living in a freestanding house or townhouse/duplex.
  - Owned their home outright or with a mortgage.
  - Joint or main decision maker in choosing energy products/services for their household.
  - Passed a comprehension check that assessed their understanding of the policy scenario they had been assigned to evaluate.
- A full breakdown of the sociodemographic profile of our sample can be found in Appendix 1.

How

- Respondents were recruited from an online survey panel provider from December 2023 – January 2024.
- Institutional ethics approval for the research was obtained before recruited started.

What

- For each of the focal technologies, respondents recorded their:
  - Current adoption profile. That is, what products (example: hybrid car) they have purchased/used in the category (example: car) associated with each focal technology (example: EV).
  - Business as usual (BAU) adoption intentions. That is, over the next 5 years, what they would purchase if they were going to buy/replace products from the category associated with each focal technology.
- Respondents then gave their perceptions of Australia's energy system.
- Next, respondents were randomly presented with one of four policy scenarios developed from a literature review of potential policy responses (Newton et al., 2023).
- After reading the policy scenario, respondents:
  - Provided their opinion and perceived fairness of the policy.
  - Recorded their policy adoption intentions. That is, assuming the policy was enacted, what they would purchase over the next 5 years if they were going to buy/replace products from the category associated with each focal technology.
- Respondents were then shown all policy scenarios and asked to rank them in order of preference.
- The survey concluded after respondents gave their opinion of each focal technology and completed a series of psychographic and demographic questions.

Approach: Policy scenarios

Scenario 1: ↓ Purchase cost

10% cheaper to purchase

Imagine the government launched a new plan to help Australia meet its climate goals. This plan would involve a 10% subsidy on the purchase price of the following technologies:

+ Electric cars.
+ Electric appliances replacing gas appliances.
+ Household batteries.

The plan would therefore make these technologies 10% cheaper for people to purchase.

Scenario 2: ↓ Operating cost

10% cheaper to run

Imagine the government launched a new plan to help Australia meet its climate goals. This plan would involve changing how electricity prices are charged so that the annual costs of using the following technologies would drop by 10%:

+ Electric cars.
+ Electric appliances replacing gas appliances.
+ Household batteries.

The plan would therefore make these technologies cheaper for people to run over time.

Scenario 3: ↑ Infrastructure

Easier to install/use

Imagine the government launched a new plan to help Australia meet its climate goals. This plan would:

+ Increase the number of public chargers for electric cars so more are available to everyone.
+ Train more people to install home-based electric car chargers and batteries.
+ Train more people to convert gas appliances to electric appliances.

The plan would therefore make it easier for people to install and use these technologies.

Scenario 4: Mandates

Ban sales

Imagine the government launched a new plan to help Australia meet its climate goals. This plan would, between 2035 and 2040, ban the sale of:

+ New petrol/diesel cars.
+ New gas appliances.

The plan would therefore mean that people could only buy electric cars and electric appliances after 2040.

Findings

Our findings are organised as follows:

+ Perceptions of current energy system
  - Fairness
  - Responsibility for ensuring fairness
+ Policy perceptions
  - Opinion
  - Fairness
  - Ranked preferences
+ Technology
  - Overall opinions
  - EV
  - Home EV charger
  - Home battery
  - Electric space heating
  - Electric water heating
  - Electric cooktop
  - Electric oven

Appendices

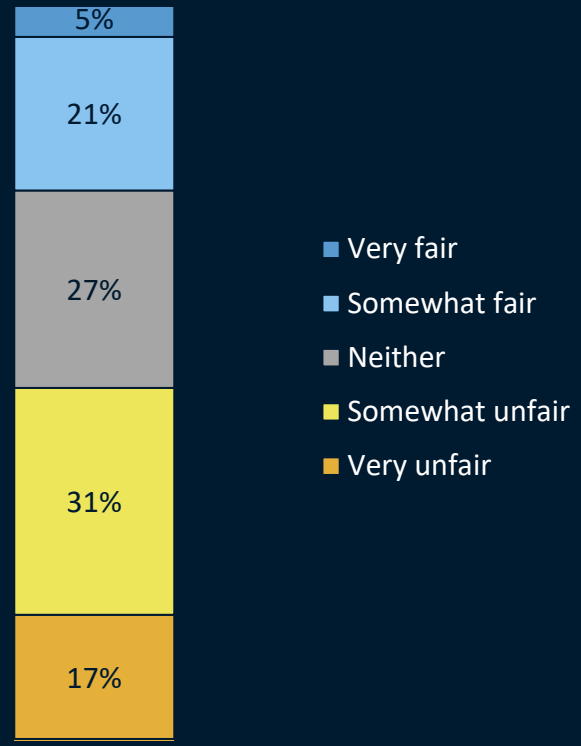
+ Demographic profile of the study sample
+ Psychographic segmentation profiles
+ Adoption rates by Distributed Network Service Provider

Perceptions of Australia's energy system: Fairness

More respondents believed that Australia's energy system was unfair than fair

+ Almost half (48%) of respondents perceived that Australia's energy system is somewhat or very unfair.
+ In contrast, approximately one-quarter (26%) of respondents believed that Australia's energy system is somewhat or very fair.

Perceived fairness of Australia's energy system



Perceptions of Australia's energy system: Fairness (segmentation)

Psychographic segmentation: Adopter category

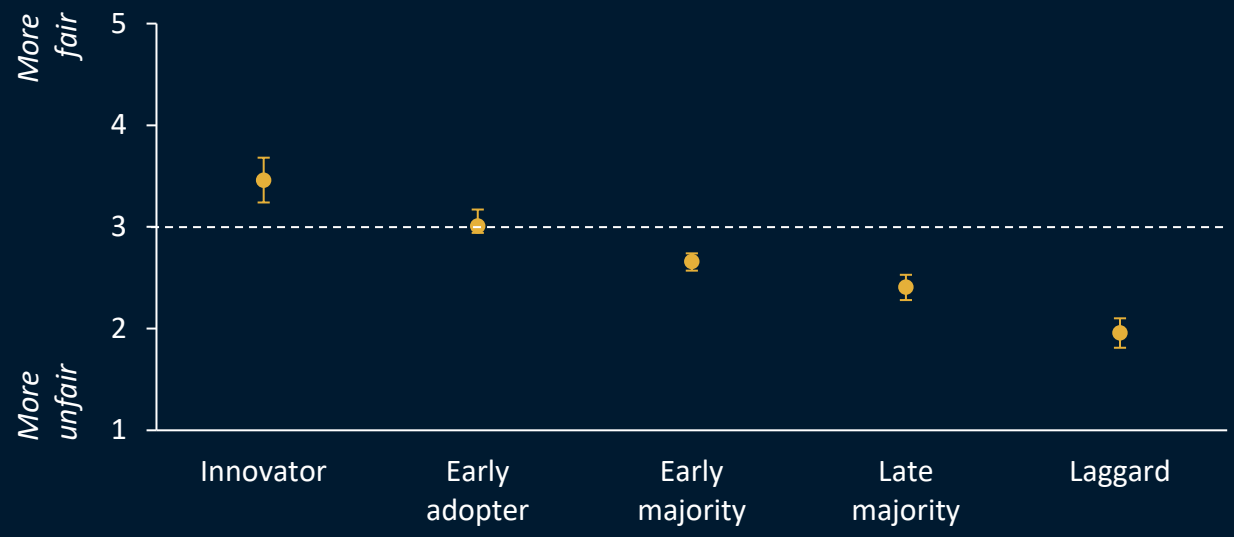
Innovators were the only adopter category to perceive Australia's energy system as fair

+ While innovators perceived Australia's energy system to be fair, the early majority, late majority, and laggards perceived it to be unfair.

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Perceived fairness of Australia's energy system across the adopter categories

Average; 95% confidence intervals



Perceptions of Australia's energy system: Fairness (segmentation)

Psychographic segmentation: Environmental worry

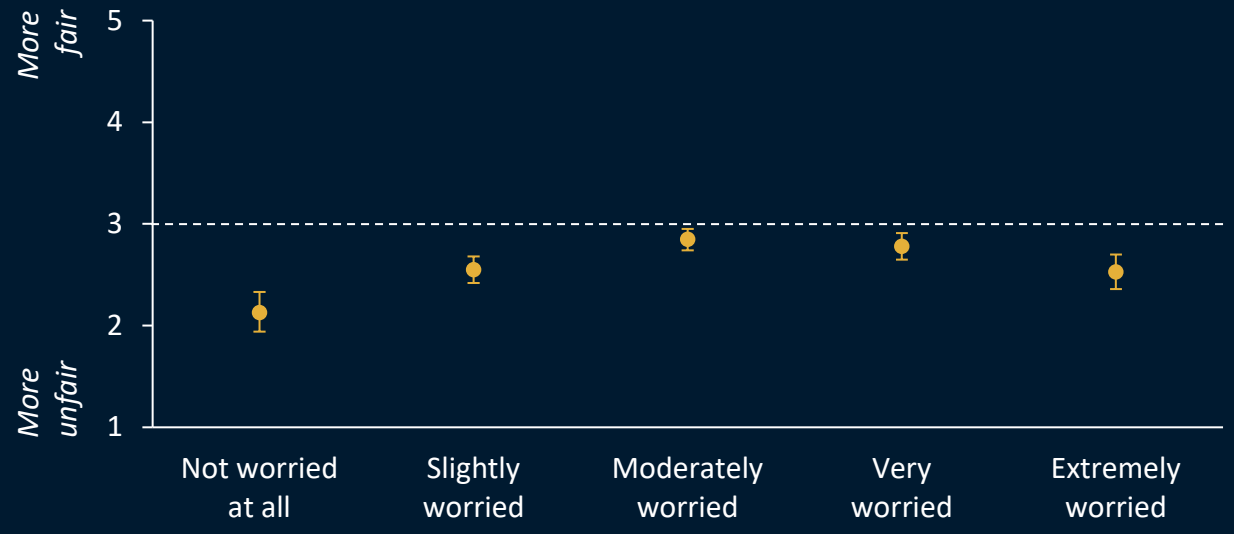
There was an inverted U-shaped relationship between environmental worry and perceived fairness of Australia's energy system

+ Australia's energy system was perceived as unfair by respondents at all levels of environmental worry.
+ Those who were moderately worried about the environment perceived the energy system to be significantly less unfair than those who were not worried at all, slightly worried, or extremely worried about the environment.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Perceived fairness of Australia's energy system at different levels of environmental worry

Average; 95% confidence intervals



Perceptions of Australia's energy system: Fairness (segmentation)

Demographic segmentation

Financial wellbeing and age predicted the perceived fairness of Australia's energy system

+ Younger respondents (18-39) perceived Australia's energy system to be fairer than those aged 40-59, who in turn perceived it to be fairer than those aged 60+.
+ Those who reported being financially comfortable or financially stretched perceived Australia's energy system to be fairer than those who reported being financially stressed.

Demographic predictors of perceived fairness of Australia's energy system

	Fairness
Male [Ref: Female]	-
Age (18-39) [Ref: Age (40-59)]	Small ↑
Age (60+) [Ref: Age (40-59)]	Small ↓
Regional [Ref: Metro]	-
Postgraduate [Ref: High school]	-
Undergraduate [Ref: High school]	-
TAFE/Diploma [Ref: High school]	-
Financially comfortable [Ref: Financially stressed]	Medium ↑
Financially stretched [Ref: Financially stressed]	Small ↑
CALD [Ref: Non-CALD]	-
Politically conservative [Ref: Centrist]	-
Politically progressive [Ref: Centrist]	-

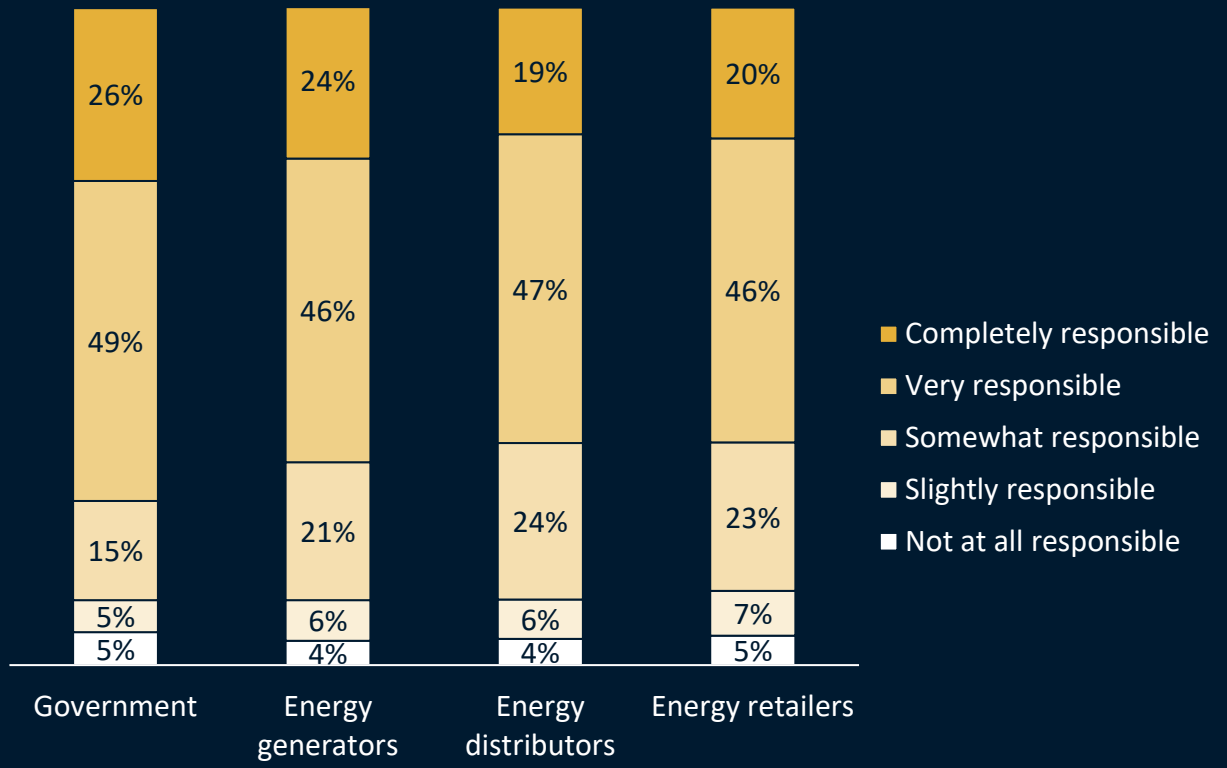
Small ↑ and Small ↓ denote a small but significant positive and negative, respectively, influence (standardised β = 0.10-0.29) relative to the reference (ref) group
Medium ↑ denotes a significant medium positive influence (standardised β = 0.30-0.49) relative to the reference (ref) group

Perceptions of Australia's energy system: Responsibility for ensuring fairness

Government and industry were seen as being responsible for ensuring the fairness of Australia's energy system

+ Three-quarters (75%) of respondents believed that government was very or completely responsible for ensuring the fairness of Australia's energy system.
+ Energy stakeholders were also deemed responsible, with the proportion of respondents believing that those stakeholders were very or completely responsible for ensuring the fairness of Australia's energy system ranging from:
  - 70% (energy generators).
  - 66% (energy distributors).
  - 66% (energy retailers).

Perceived responsibility for ensuring the fairness of Australia's energy system



Perceptions of Australia's energy system

Key takeaways

+ Only 26% of respondents thought Australia's energy system was somewhat or very fair, with 48% instead perceiving it as somewhat or very unfair.
+ Perceptions of fairness varied by adopter category, with innovators the only adopter category to perceive Australia's energy system as fair.
+ Respondents at all levels of environmental worry perceived Australia's energy system as unfair, although those with intermediate levels of worry perceived it as significantly less unfair than those with high or low levels of environmental worry.
+ Financial wellbeing and age influenced perceptions of the fairness of Australia's energy system, with younger respondents and those who were more financially comfortable perceiving it to be fairer than those who were not.
+ Government and industry stakeholders were collectively held responsible for ensuring the fairness of Australia's energy system, with two-thirds or more of respondents believing that Government, energy generators, energy distributers, and energy retailers were very or completely responsible for maintaining fairness.

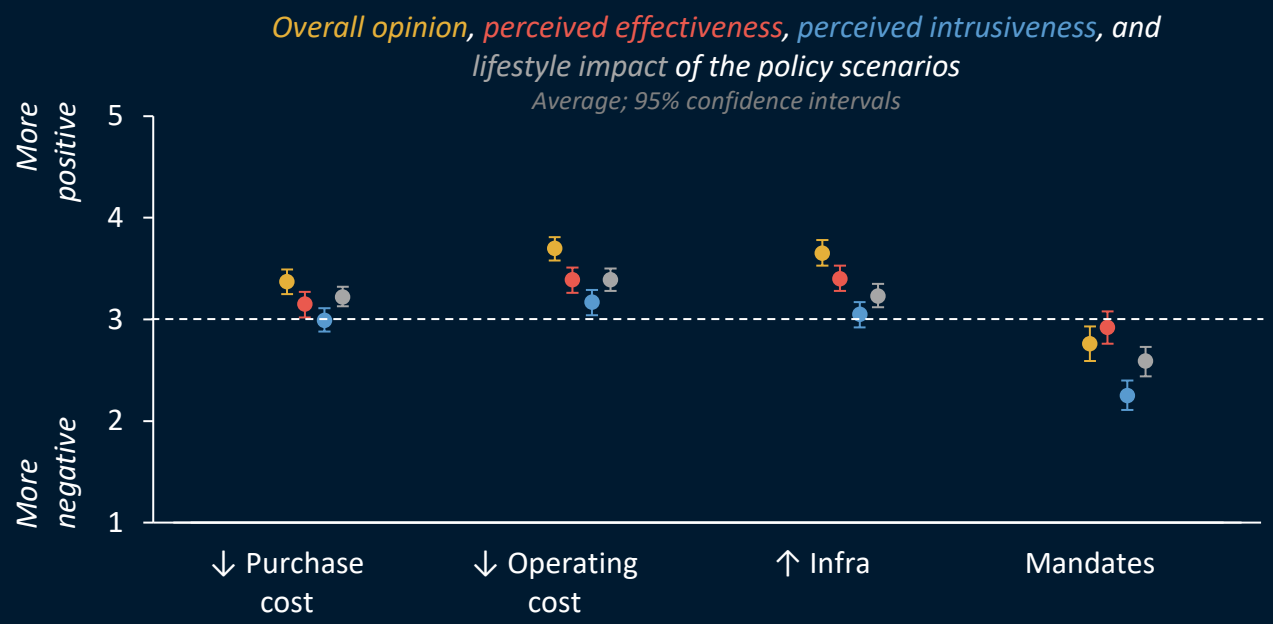
Policy perceptions: Opinion

↓ Operating cost and ↑ Infrastructure yielded the most favourable overall opinions

+ Four opinion dimensions were evaluated: overall opinion, perceived effectiveness, perceived intrusiveness, and lifestyle impact.
+ ↑ Infrastructure and ↓ Operating cost elicited the most favourable overall opinions relative to the other two policy scenarios, while Mandates yielded the least.
+ The specific pattern of significant differences across each opinion dimension is reported on the slides that follow.

There was high consistency in how the opinion dimensions were evaluated by respondents

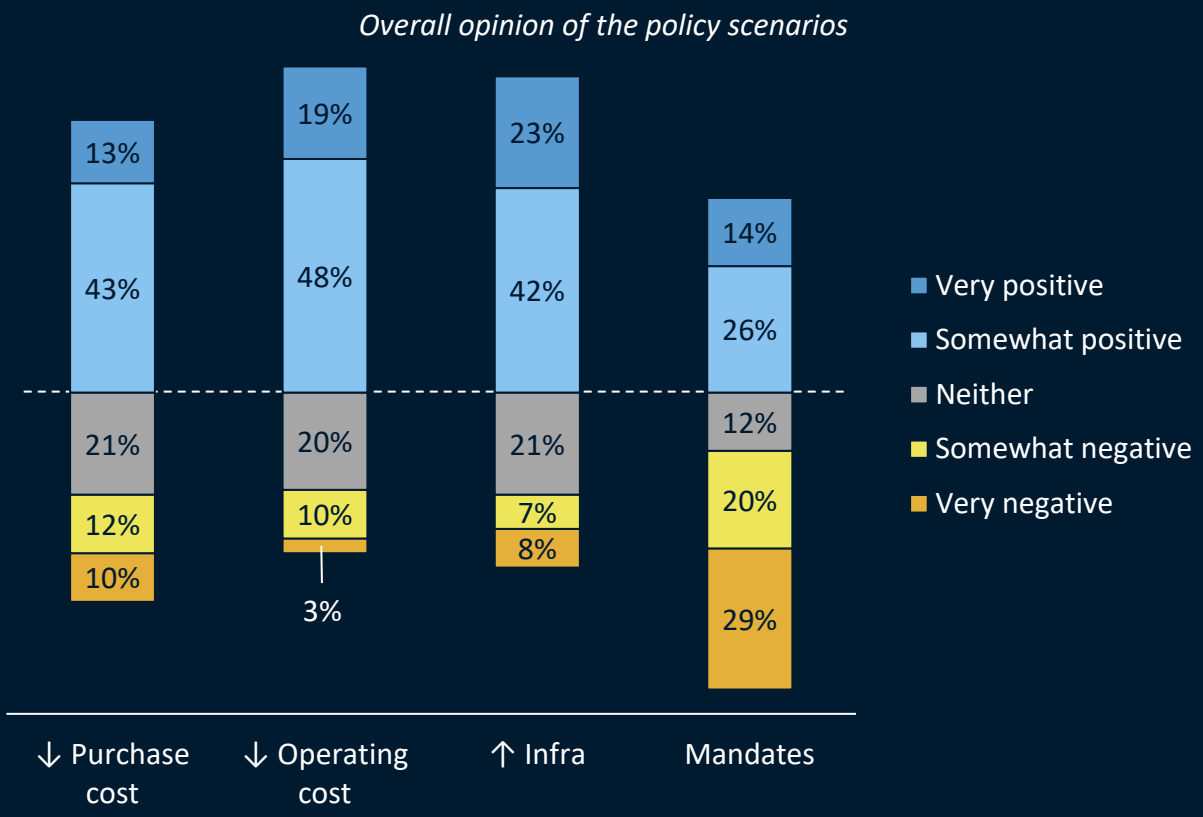
+ Principal components analysis indicated that responses across the opinion dimensions loaded onto a single component. Put differently, those who reported favourable opinions on one dimension tended to report favourable opinions on the other dimensions also.
+ There are multiple (non-competing) explanations for this finding:
  - Respondents may have evaluated the scenarios holistically, such that favourable opinions on one dimension informed how the other dimensions were evaluated.
  - The scenarios elicited relatively consistent opinions across the various opinion dimensions.



Policy perceptions: Opinion (overall)

↓ Operating cost and ↑ Infrastructure generated positive overall opinions

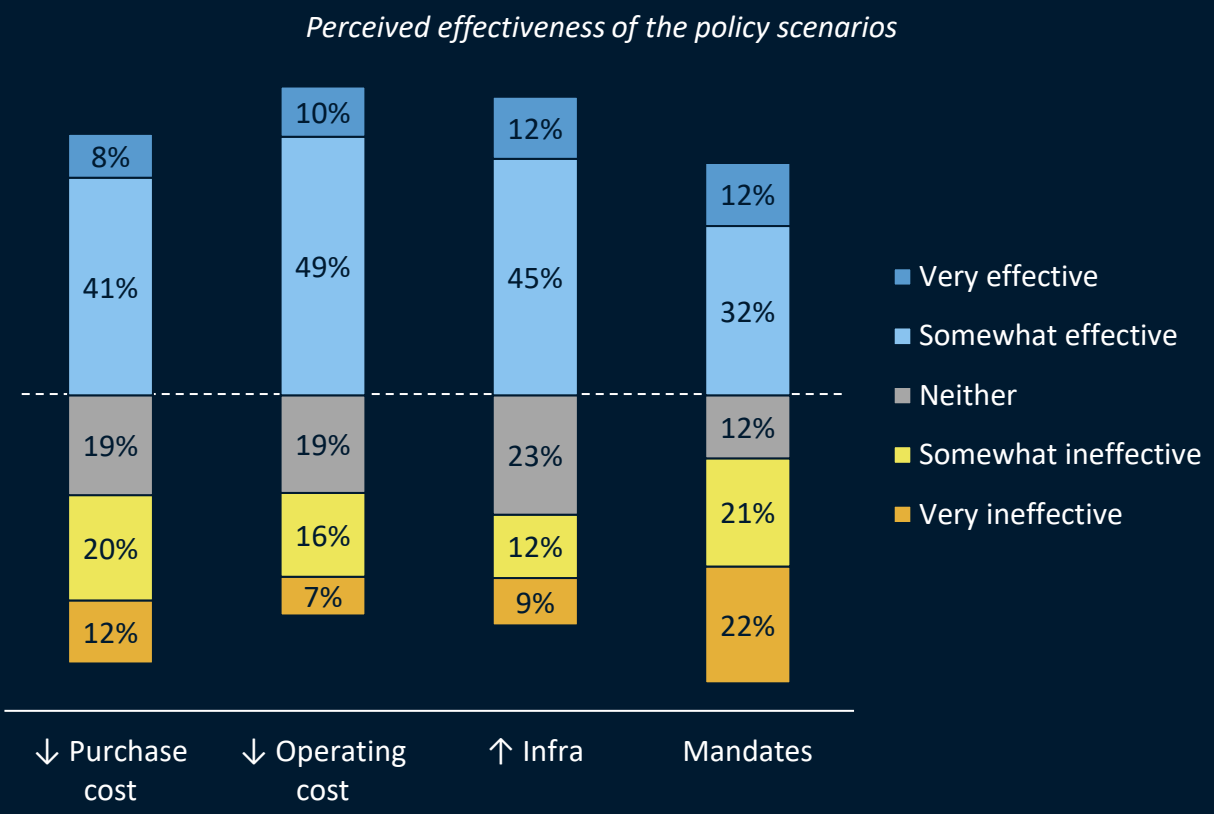
+ ↓ Operating cost and ↑ Infrastructure were seen as somewhat or very positive by two-thirds (67% and 65%, respectively) of respondents.
+ Both policy options were evaluated significantly more favourably than:
  - ↓ Purchase cost (seen as somewhat or very positive by 56%).
  - Mandates (seen as somewhat or very positive by 40%).
+ Mandates were perceived significantly less favourably than all other policy scenarios.



Policy perceptions: Opinion (effectiveness)

↑ Infrastructure was seen as more effective than ↓ Purchase costs and Mandates

+ Approximately half (57%) of respondents assigned to the ↑ Infrastructure policy scenario perceived it as being somewhat or very effective.
+ ↑ Infrastructure was perceived as being significantly more effective than ↓ Purchase cost.
+ ↑ Infrastructure and ↓ Operating cost were also perceived to be significantly more effective than Mandates.

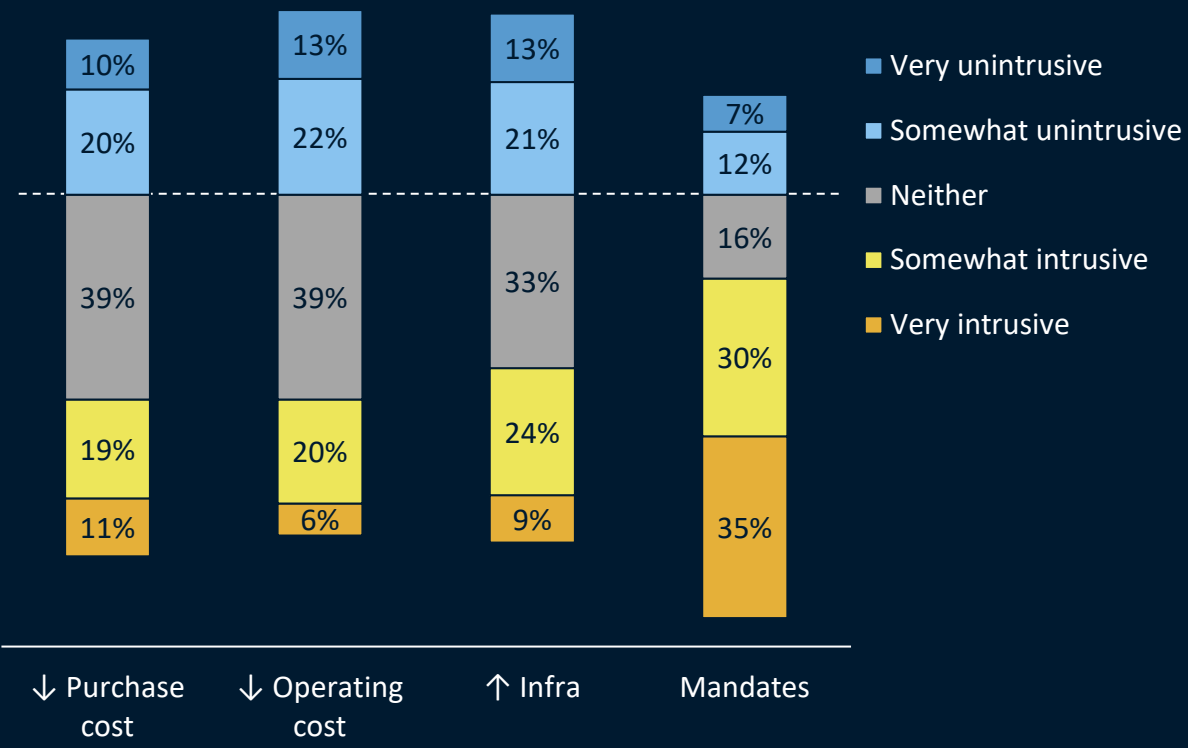


Policy perceptions: Opinion (intrusiveness)

Mandates were seen as being most intrusive

+ Two-thirds (65%) of respondents believed that Mandates would be somewhat or very intrusive.
+ Mandates were seen as being significantly more intrusive than the other three policy options, which were rated as being somewhat or very intrusive by the following proportion of respondents:
  - 33% (↑ Infrastructure).
  - 30% (↓ Purchase cost).
  - 26% (↓ Operating cost).

Perceived intrusiveness of the policy scenarios

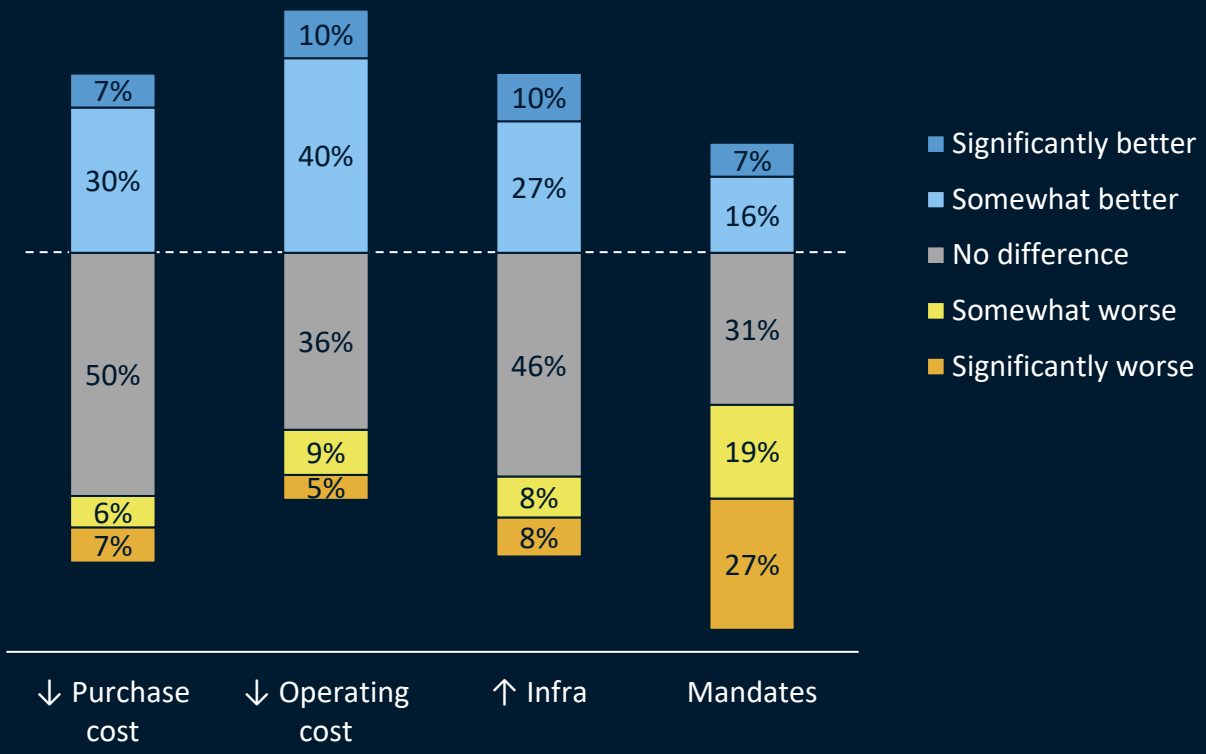


Policy perceptions: Opinion (lifestyle impact)

Mandates were seen as having the greatest lifestyle impact

+ Almost half (46%) of respondents believed that Mandates would leave them somewhat or significantly worse off.
+ The lifestyle impact of Mandates was rated as being significantly worse than the other three policy scenarios, which were seen as resulting in somewhat or significantly worse outcomes by the following (smaller) proportion of respondents:
  - 16% (↑ Infrastructure).
  - 14% (↓ Operating cost).
  - 13% (↓ Purchase cost).

Perceived lifestyle impact of the policy scenarios



Policy perceptions: Opinion (segmentation)

Psychographic segmentation: Adopter category

↓ Operating cost and ↑ Infrastructure resulted in net positive opinions for most adopter categories

+ Excluding laggards, all other adopter categories reported net positive opinions with respect to two policy scenarios: ↓ Operating cost and ↑ Infrastructure.

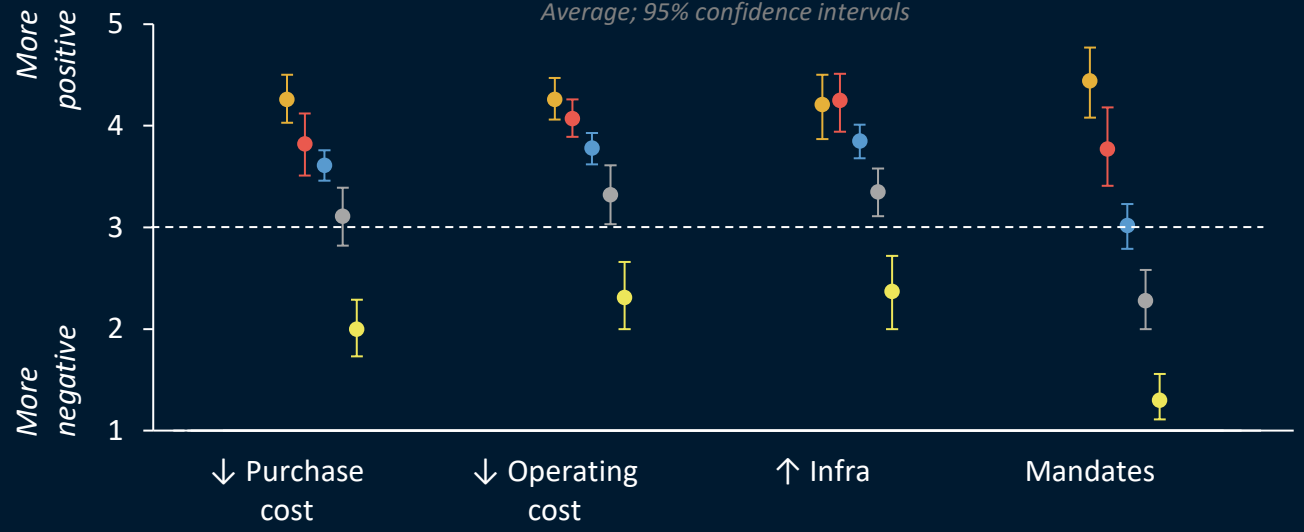
Mandates caused the greatest variability in opinion within and across the adopter categories

+ Innovators and early adopters reported significantly more favourable opinions of Mandates than all other adopter categories. Moreover, their opinion of Mandates did not significantly differ to that of the other policy scenarios.
+ The early majority, late majority, and laggards rated Mandates significantly lower than all other policy scenarios.

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Overall opinion of innovators, early adopters, early majority, late majority, and laggards towards the policy scenarios

Average; 95% confidence intervals



Policy perceptions: Opinion (segmentation)

Psychographic segmentation: Environmental worry

↓ Operating cost was the only policy to be favourably evaluated across most levels of environmental worry

+ Respondents who reported being extremely, very, moderately, or slightly worried about the environment reported, on average, positive opinions about ↓ Operating cost.
+ Respondents who were not at all worried about the environment also evaluated ↓ Operating cost significantly more positively than all other scenarios (except ↑ Infrastructure).

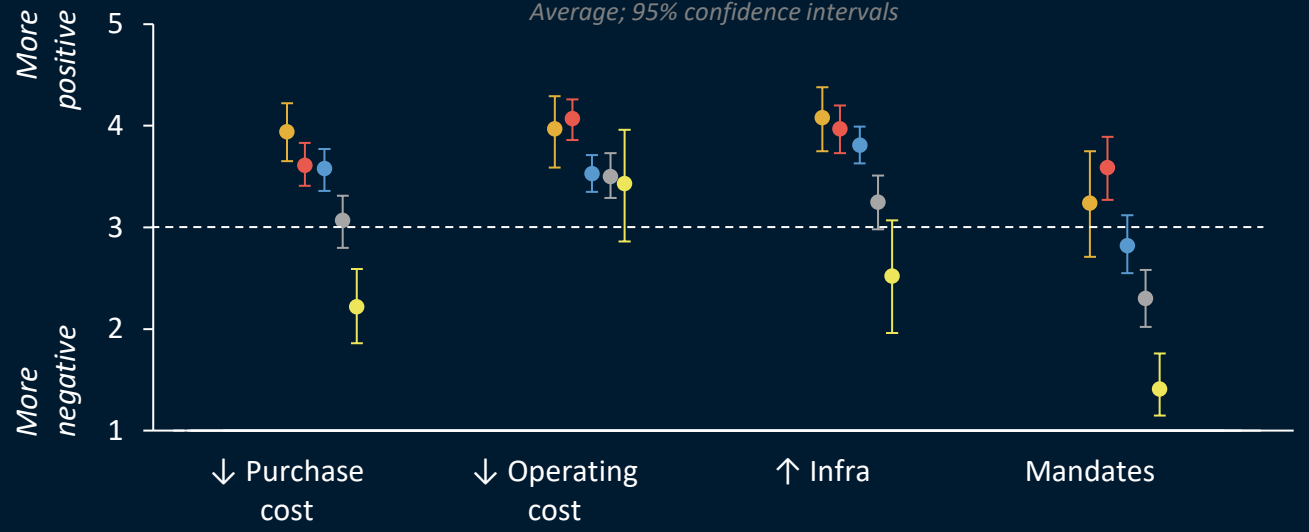
Higher levels of environmental worry were associated with positive evaluations of three scenarios

+ Respondents who reported being extremely, very, or moderately worried about the environment had favourable opinions of three policies: ↓ Purchase cost, ↓ Operating cost , and ↑ Infrastructure.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Overall opinion of respondents who were extremely, very, moderately, slightly, and not at all worried about the environment

Average; 95% confidence intervals



Policy perceptions: Opinion (segmentation)

Demographic segmentation

Most scenarios were positively evaluated by those with higher education, more financial comfort, and politically progressive views

+ Relative to high school graduates, those with a(n):
  - Postgraduate education positively viewed ↓ Purchase cost.
  - Undergraduate education positively viewed ↓ Operating cost and ↑ Infrastructure.
  - TAFE/Diploma education positively viewed ↓ Operating cost.
+ Relative to those who were financially stressed, those who were:
  - Financially comfortable positively viewed all scenarios (except Mandates).
  - Financially stressed positively viewed ↓ Purchase cost and ↑ Infrastructure.
+ Relative to centrists, political progressives viewed all scenarios positively (except ↓ Purchase cost).

Demographic predictors of having a positive opinion toward each policy scenario

	↓ Purchase cost	↓ Operating cost	↑ Infra	Mandates
Male [Ref: Female]	-	-	-	-
Age (18-39) [Ref: Age (40-59)]	-	-	Small ↑	-
Age (60+) [Ref: Age (40-59)]	-	-	-	-
Regional [Ref: Metro]	-	-	-	Small ↓
Postgraduate [Ref: High school]	Small ↑	-	-	-
Undergraduate [Ref: High school]	-	Small ↑	Small ↑	-
TAFE/Diploma [Ref: High school]	-	Small ↑	-	-
Financially comfortable [Ref: Financially stressed]	Small ↑	Small ↑	Small ↑	-
Financially stretched [Ref: Financially stressed]	Small ↑	-	Small ↑	-
CALD [Ref: Non-CALD]	-	-	-	-
Politically conservative [Ref: Centrist]	-	-	-	-
Politically progressive [Ref: Centrist]	-	Small ↑	Small ↑	Medium ↑

Small ↑ and Small ↓ denote a small but significant positive and negative, respectively, influence (standardised β = 0.10-0.29) relative to the reference (ref) group
Medium ↑ denotes a significant medium positive influence (standardised β = 0.30-0.49) relative to the reference (ref) group

Policy perceptions: Fairness

Mandates were seen as significantly less fair than the other policy scenarios

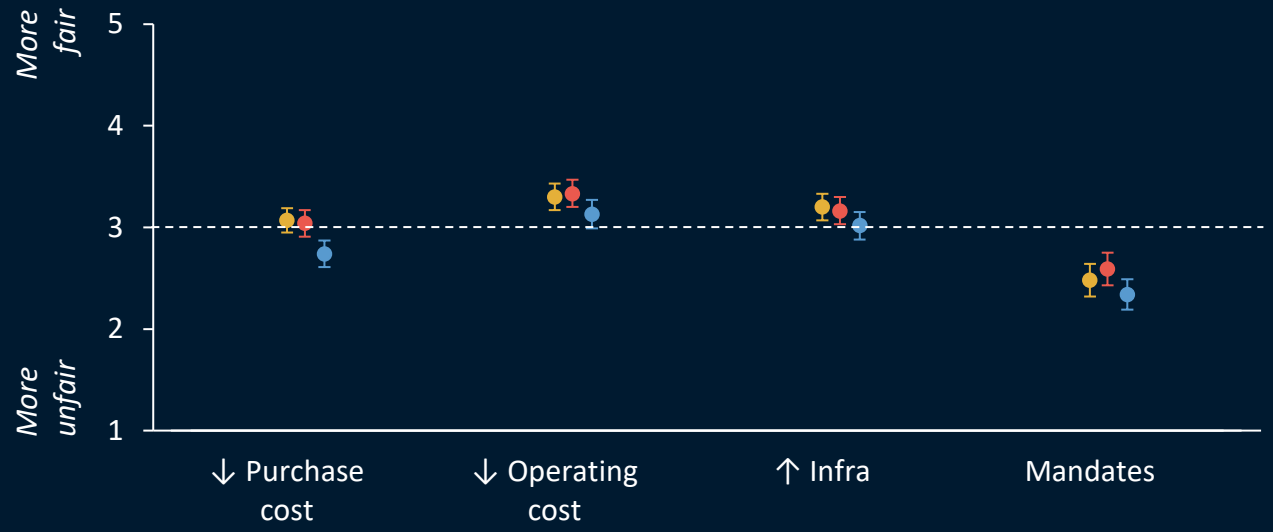
+ Three dimensions of fairness were examined: overall fairness, perceived equality, and perceived equity.
+ On each dimension, Mandates were seen as significantly less fair than the other policy scenarios.
+ The specific pattern of significant differences for each dimension of fairness across the tested policy scenarios are reported on the slides that follow.

As with the opinion dimensions, there was high consistency in how respondents evaluated the dimensions of fairness

+ Once again, principal components analysis indicated that responses to the various fairness dimensions loaded onto a single component. Thus, those who reported that a policy scenario was fair on one dimension tended to report that it was fair on the other dimensions also.

Overall fairness, perceived equality, and perceived equity of the policy scenarios

Average; 95% confidence intervals

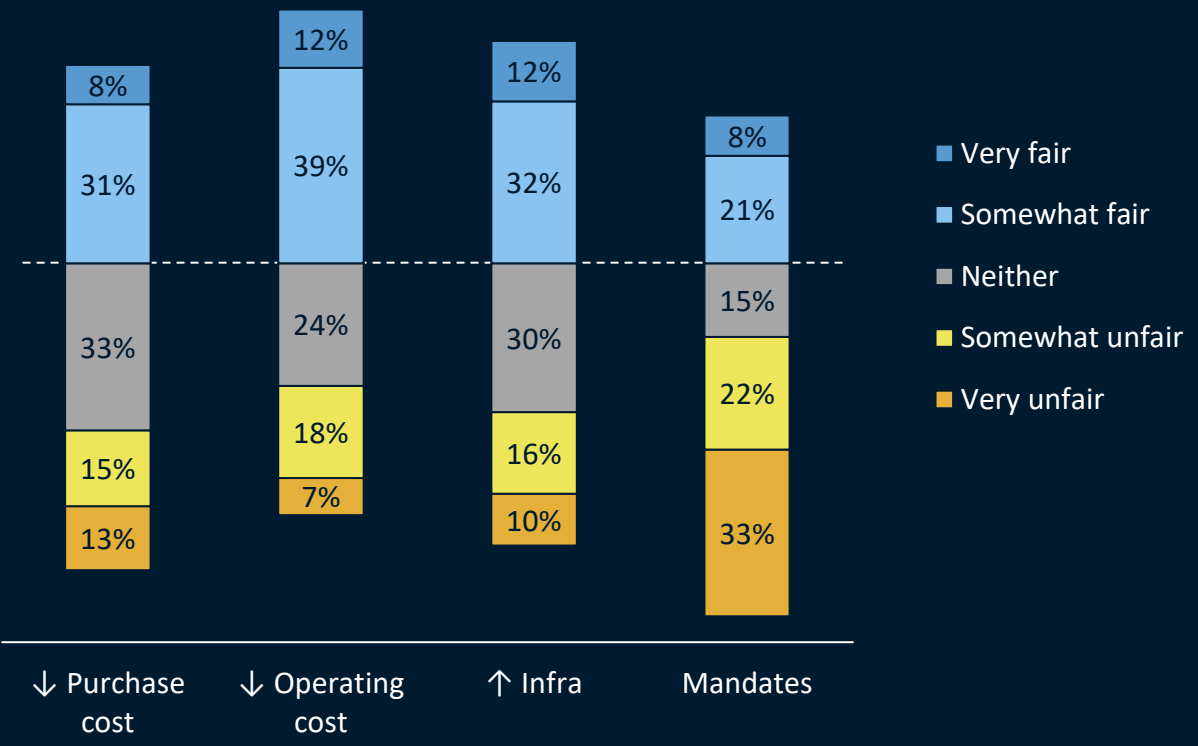


Policy perceptions: Fairness (overall)

Mandates were perceived as being more unfair overall

+ More than half (55%) of respondents perceived Mandates as being somewhat or very unfair.
+ Mandates were seen as being significantly more unfair than the other three policy scenarios, which were deemed somewhat or very unfair by the following (smaller) proportions:
  - 28% (↓ Purchase cost).
  - 26% (↑ Infrastructure).
  - 25% (↓ Operating cost).

Perceived overall fairness of the policy scenarios



Policy perceptions: Fairness (perceived equality)

Perceived equality

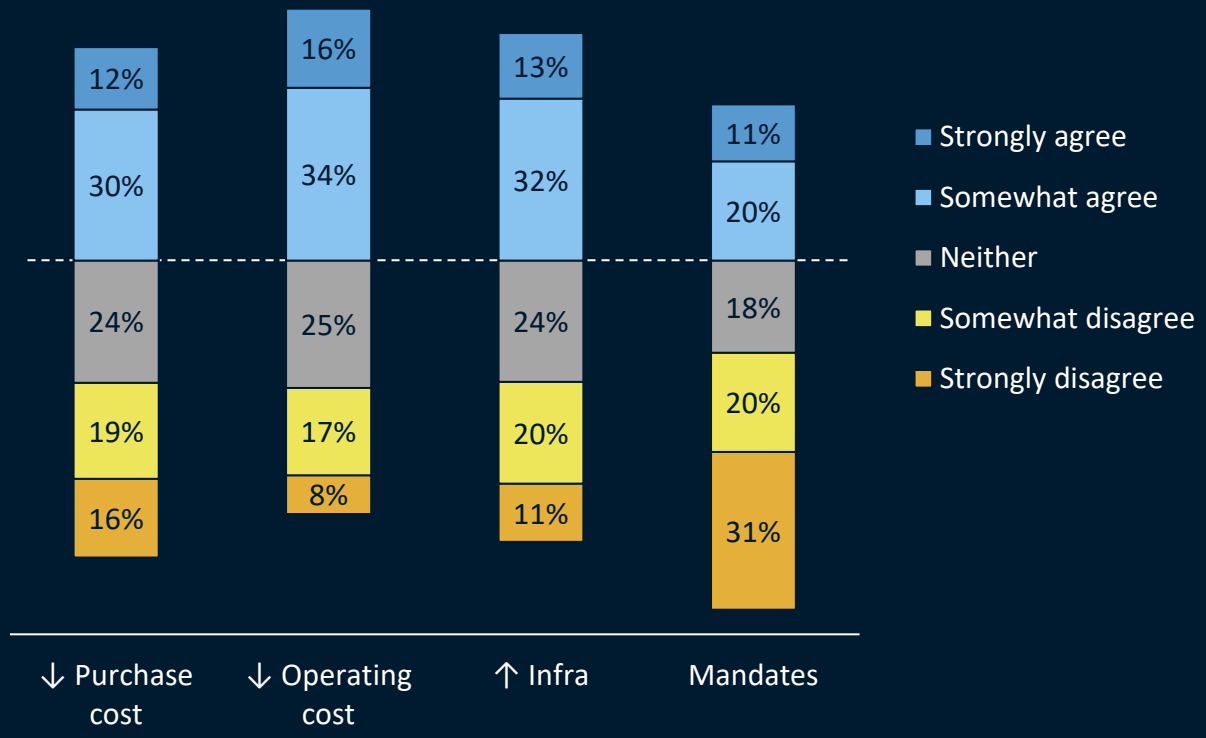
+ Before completing this question, respondents were presented with the following definition:

  Equality is about treating everyone equally, no matter their background.

Mandates were seen as generating less equality

+ Only one-third (31%) of respondents somewhat or strongly agreed that Mandates would result in equality, which was significantly lower than for ↓ Operating cost (50%), ↑ Infrastructure (45%), and ↓ Purchase cost (42%).
+ ↓ Operating cost was also seen as significantly more likely to result in equality than ↓ Purchase cost.

Perceived equality of the policy scenarios



Policy perceptions: Fairness (perceived equity)

Perceived equity

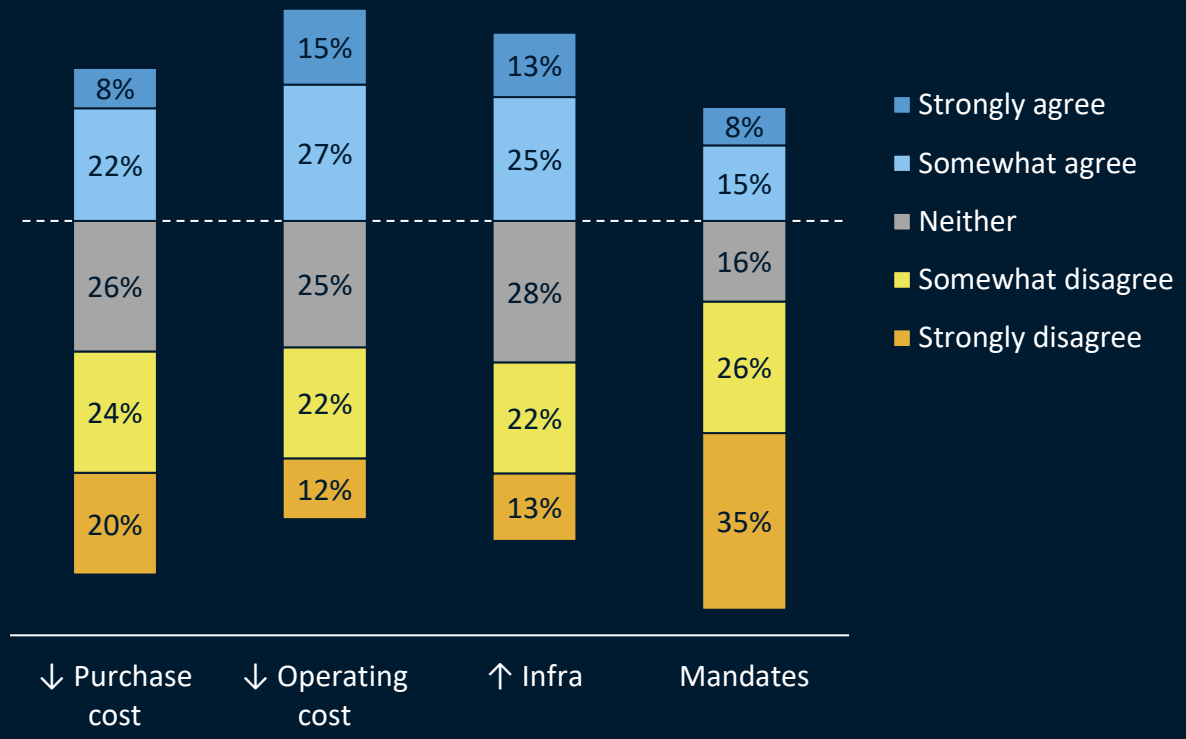
+ Before completing this question, respondents were presented with the following definition:

  Equity is about taking people's backgrounds into account, such as how much money they earn and where they live.

↓ Operating cost and ↑ Infrastructure were seen as resulting in more equity

+ 42% and 38% somewhat or strongly agreed that ↓ Operating cost and ↑ Infrastructure, respectively, were equitable. Moreover, these scenarios were seen as significantly more equitable than both ↓ Purchase cost and Mandates.
+ Mandates were seen as significantly less equitable relative to the other policy scenarios.

Perceived equity of the policy scenarios



Policy perceptions: Fairness (segmentation)

Psychographic segmentation: Adopter category

Innovators and early adopters reported statistically indistinguishable fairness perceptions across three of the policies

+ The overall fairness perceptions of innovators and early adopters for all policy scenarios (except Mandates) were statistically indistinguishable.

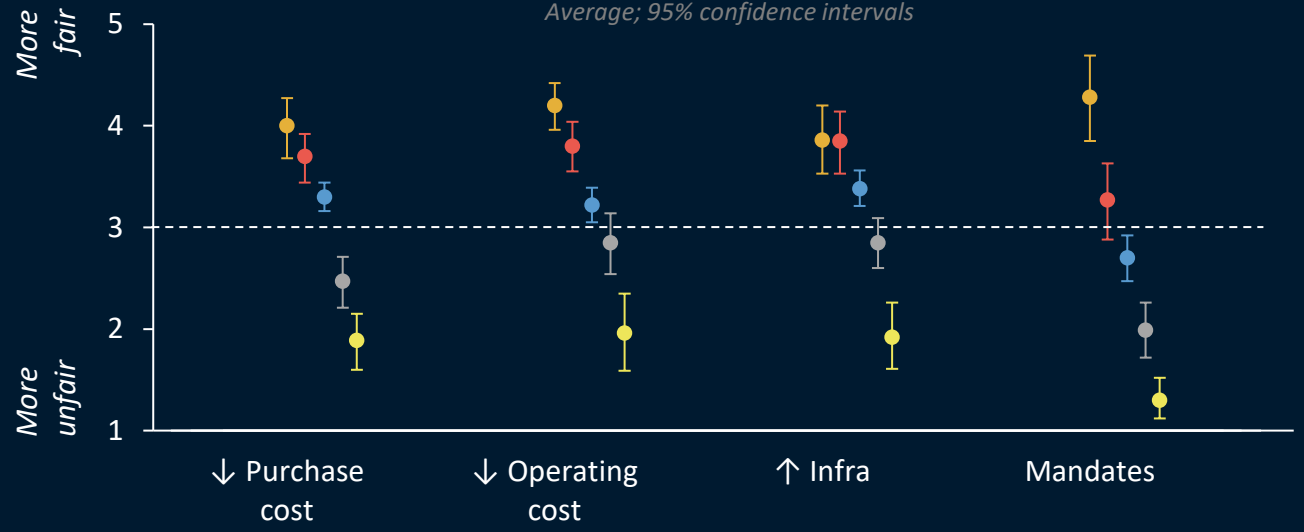
Innovators, early adopters, and the early majority perceived three of the policies as fair overall

+ Three policies – ↓ Purchase cost, ↓ Operating cost, and ↑ Infrastructure – were seen as being fair by innovators, early adopters, and the early majority.
+ Mandates were perceived as unfair by the early majority, late majority, and laggards.

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Overall fairness of the policy scenarios, as perceived by innovators, early adopters, early majority, late majority, and laggards

Average; 95% confidence intervals



Policy perceptions: Fairness (segmentation)

Psychographic segmentation: Environmental worry

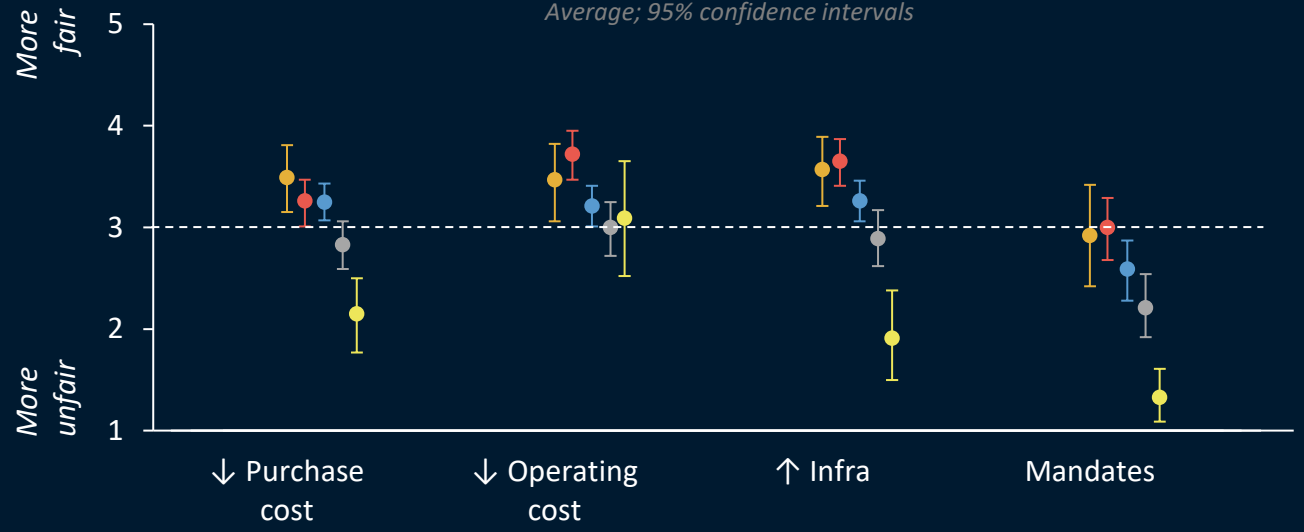
Three policies were perceived as fair overall by those with higher levels of environmental concern

+ Respondents who reported being moderately, very, or extremely worried about the environment perceived three policy scenarios as fair overall: ↓ Purchase cost, ↓ Operating cost, and ↑ Infrastructure.
+ Of these three policies, two (↓ Purchase cost, ↑ Infrastructure) were perceived as unfair by those who reported being not at all worried about the environment.
+ Those who reported being not at all worried about the environment perceived ↓ Operating cost as being significantly fairer than the other three policy scenarios.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Overall fairness of the policy scenarios, as perceived by respondents who were extremely, very, moderately, slightly, and not at all worried about the environment

Average; 95% confidence intervals



Policy perceptions: Fairness (segmentation)

Demographic segmentation

Most scenarios were seen as fair overall by those who were more educated, financially comfortable, and politically progressive

+ Relative to high school graduates, those with a(n):
  - Postgraduate education saw ↓ Purchase cost and ↑ Infrastructure as fair.
  - Undergraduate education saw ↓ Purchase cost, ↓ Operating cost, and ↑ Infrastructure as fair.
+ Relative to those who were financially stressed, those who were financially comfortable saw all scenarios (except Mandates) as fair overall.
+ Relative to centrists, political progressives saw all scenarios as fair overall.

Progressives perceived fairness overall in Mandates, while regionals did not

+ Regional respondents saw Mandates as more unfair overall than urban respondents.
+ Relative to centrists, political progressives saw mandates as fair overall.

Demographic predictors of perceiving each policy scenario as fair overall

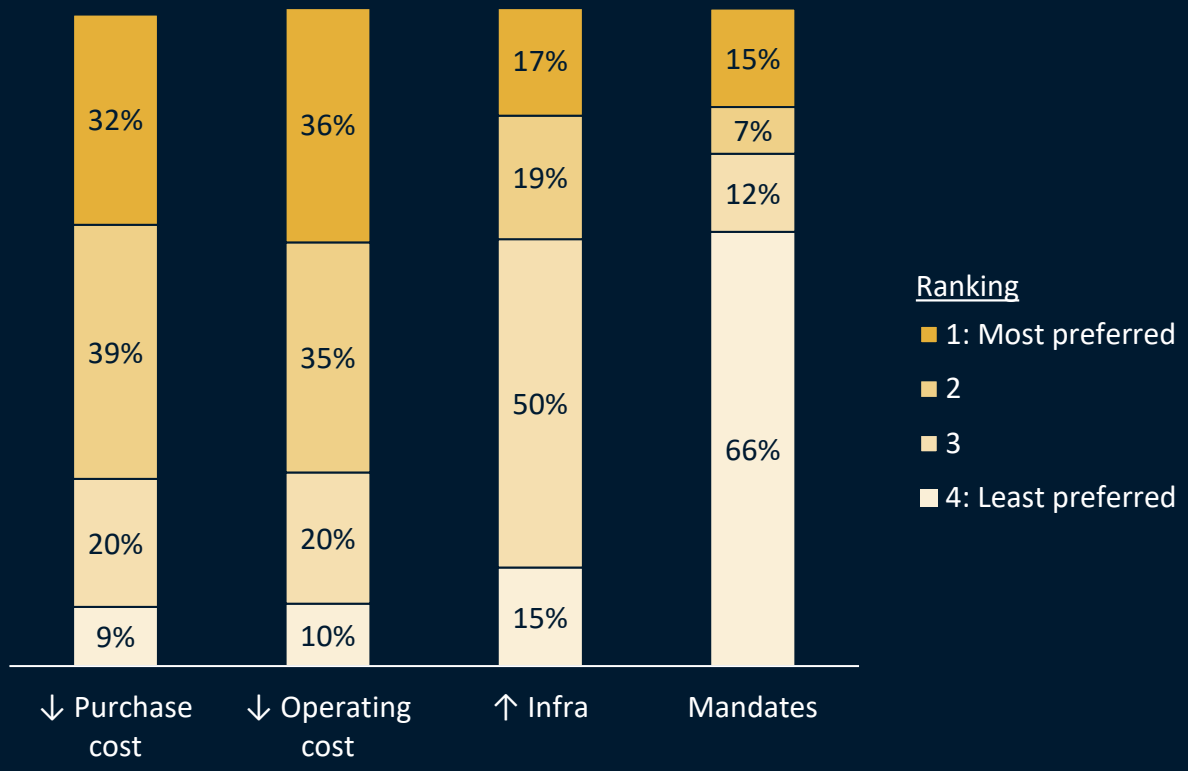
	↓ Purchase cost	↓ Operating cost	↑ Infra	Mandates
Male [Ref: Female]	-	-	-	-
Age (18-39) [Ref: Age (40-59)]	-	-	Small ↑	-
Age (60+) [Ref: Age (40-59)]	-	-	-	-
Regional [Ref: Metro]	-	-	-	Small ↓
Postgraduate [Ref: High school]	Small ↑	-	Small ↑	-
Undergraduate [Ref: High school]	Small ↑	Small ↑	Small ↑	-
TAFE/Diploma [Ref: High school]	-	-	-	-
Financially comfortable [Ref: Financially stressed]	Small ↑	Small ↑	Small ↑	-
Financially stretched [Ref: Financially stressed]	-	-	-	-
CALD [Ref: Non-CALD]	-	Small ↑	-	-
Politically conservative [Ref: Centrist]	-	-	-	-
Politically progressive [Ref: Centrist]	Small ↑	Small ↑	Small ↑	Medium ↑

Small ↑ and Small ↓ denote a small but significant positive and negative, respectively, influence (standardised β = 0.10-0.29) relative to the reference (ref) group
Medium ↑ denotes a significant medium positive influence (standardised β = 0.30-0.49) relative to the reference (ref) group

Policy perceptions: Ranked preferences

When they could see all policy options, ↓ Operating cost and ↓ Purchase cost were most preferred

+ After evaluating the policy scenario they had been randomly presented with, respondents were shown all policy options and asked to rank them in order of preference, from 1 (most preferred) to 4 (least preferred).
+ The policy options ranked as most preferred were ↓ Operating cost (36%) and ↓ Purchase cost (32%).
+ The least preferred policy option – by a considerable margin – was Mandates (66%).



Policy perceptions

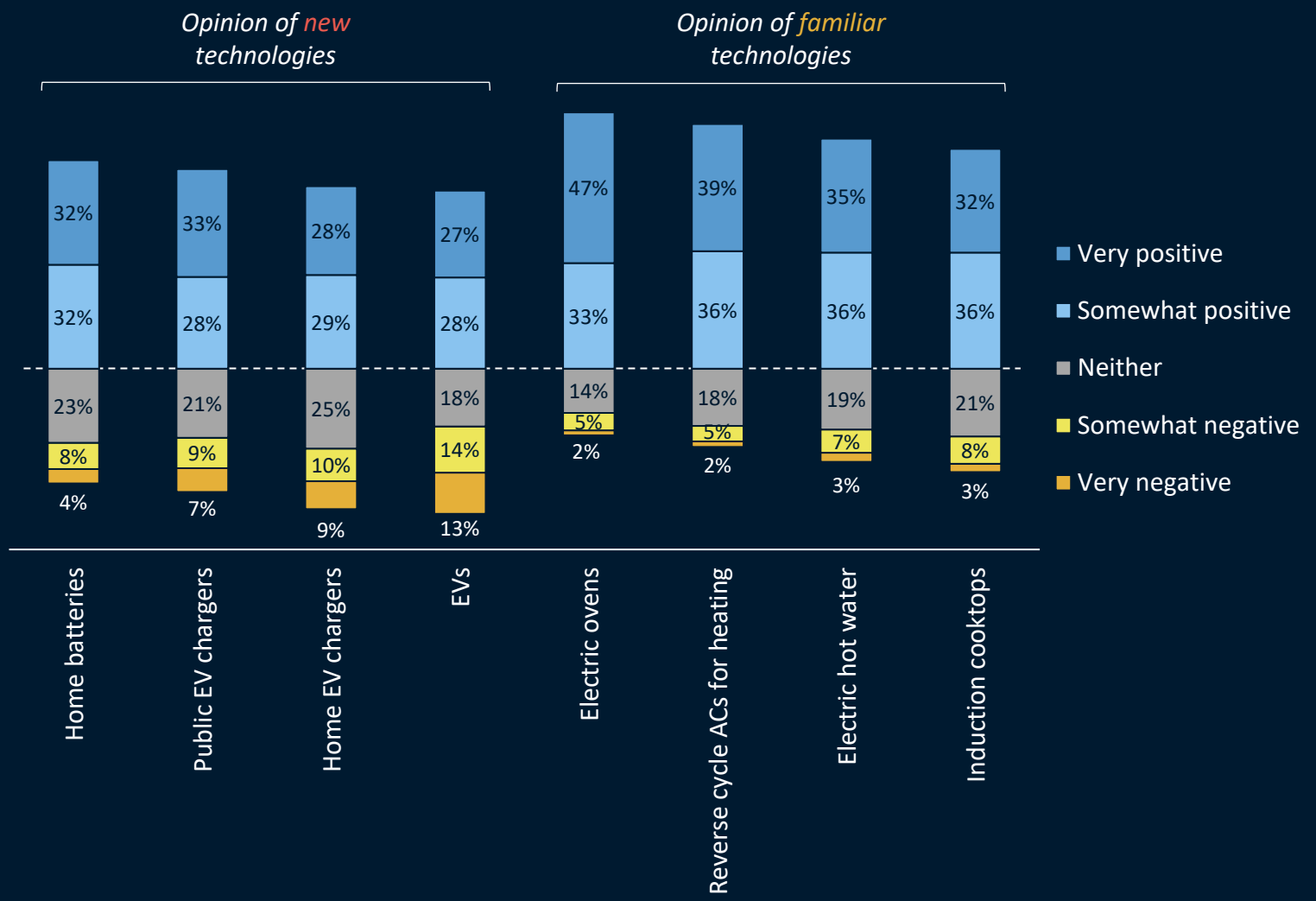
Key takeaways

+ ↓ Operating cost and ↑ Infrastructure generated the most favourable overall opinions and resulted in the greatest levels of perceived equity.
+ Mandates generated the least favourable overall opinions and were deemed the most intrusive, most disruptive to current lifestyles, and most unfair overall.
+ ↓ Operating cost generated positive overall opinions for all adopter categories (except laggards) and all levels of environmental worry (except those who were not at all worried about the environment).
+ ↓ Purchase cost, ↓ Operating cost, and ↑ Infrastructure were deemed fair overall by innovators, early adopters, and the early majority as well as by those who were moderately, very, or extremely worried about the environment. Mandates, by contrast, were perceived as unfair overall by the early majority, late majority, and laggards as well as by those who were moderately, slightly, or not at all worried about the environment.
+ ↓ Purchase cost, ↓ Operating cost, and ↑ Infrastructure tended to be evaluated overall more positively – and seen as fairer overall – by those with more education, greater levels of financial comfort, and with more politically progressive views.
+ When respondents were given the opportunity to rank all policy scenarios, ↓ Operating cost and ↓ Perceived cost were most preferred, while Mandates were least preferred.

Technology: Overall opinion

New technologies were evaluated differently to familiar technologies

+ Respondents were asked to report their opinion of the focal electric technologies. Factor analysis suggested that these technology-specific opinions could be clustered into two groups:
  - New technologies, which include home batteries, public/home EV chargers, and EVs.
  - Familiar technologies, which include electric ovens, reverse cycle air conditioners for heating, electric water heating, and induction cooktops.
+ Technology-specific opinions were consequently combined and averaged to form two new measures:
  - Opinion of new technologies.
  - Opinion of familiar technologies.
+ Opinion of familiar technologies was significantly more favourable than opinion of new technologies.
+ Segmentation-based analyses of these two opinion-based measures are reported on the slides that follow.



Technology: Overall opinion (segmentation)

Psychographic segmentation: Adopter category

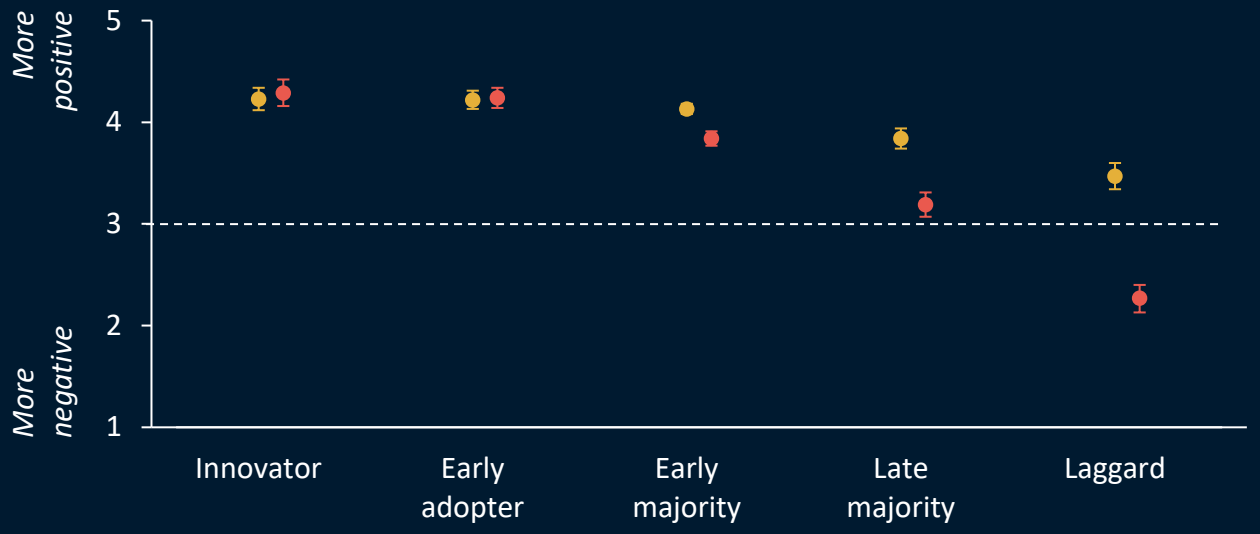
Adopter category was associated with opinion of familiar and new technologies

+ Familiar technologies were evaluated positively by all adopter categories, noting that:
  - Innovators, early adopters, and the early majority held an equivalently favourable opinion of familiar technologies.
  - The late majority and laggards had a statistically less favourable opinion of familiar technologies relative to the other categories.
+ New technologies were evaluated more variably across the adopter categories:
  - Innovators and early adopters had the most favourable opinion of new technologies, and this opinion was as equally favourable as their opinion towards familiar technologies.
  - For the other adopter categories, their opinion of new technologies was less favourable than their opinion of familiar technologies.
  - Laggards had a negative opinion of new technologies.

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Opinion of familiar and new technologies across the adopter categories

Average; 95% confidence intervals



Technology: Overall opinion (segmentation)

Psychographic segmentation: Environmental worry

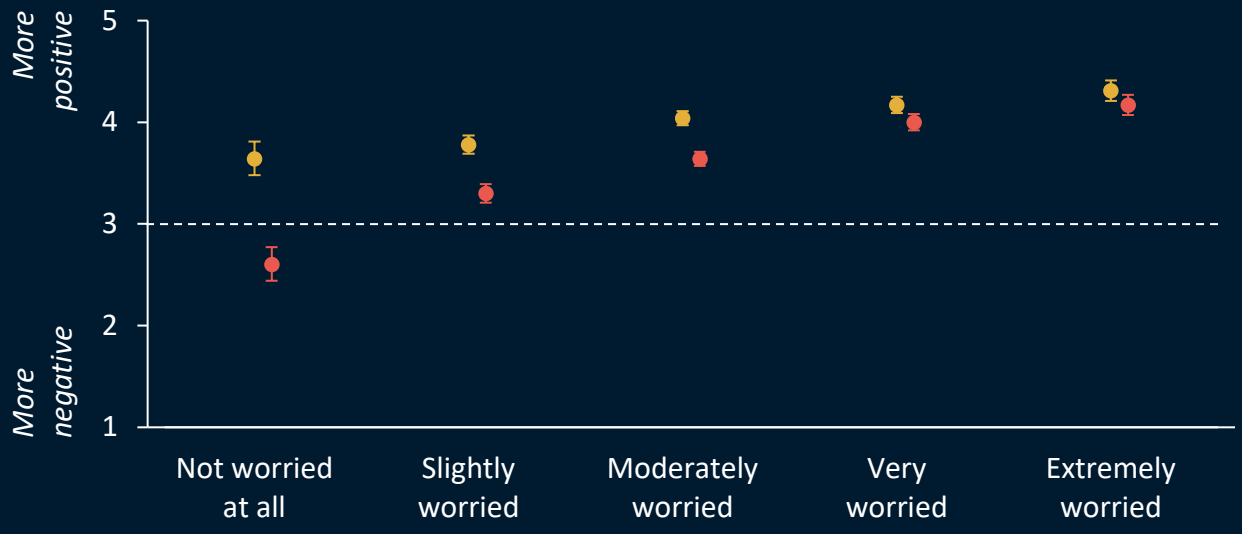
Opinion of new technologies increased with environmental worry

+ Opinion of familiar technologies was favourable for all levels of environmental worry, although opinion tended to become more favourable as levels of worry increased.
+ Opinion of new technologies showed greater variability:
  - Those who were very or extremely worried about the environment reported a similarly favourable opinion of new technologies.
  - For all other levels, opinion of new technologies became more significantly favourable as level of environmental worry increased.
  - Respondents who were not worried at all about the environment reported a negative opinion towards new technologies.
+ Opinion of new technologies was significantly less favourable than opinion of familiar technologies across all levels of environmental worry (excluding those who were very or extremely worried about the environment).

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Opinion of familiar and new technologies at different levels of environmental worry

Average; 95% confidence intervals



Technology: Overall opinion (segmentation)

Demographic segmentation

Education, political identity, and financial wellbeing predicted opinion of familiar and new technologies

+ Younger respondents (18-39) reported a more favourable opinion of new technologies than those aged 40-59.
+ Relative to high school graduates, having a(n):
  – Postgraduate education was associated with a more favourable opinion of new technologies.
  – Undergraduate education was associated with a more favourable opinion of familiar and new technologies.
+ Relative to those who reported being financially stressed, being:
  – Financially comfortable was associated with a more favourable opinion of familiar and new technologies.
  – Financially stretched was associated with a more favourable opinion of familiar and new technologies.
+ Politically progressive individuals reported a more favourable opinion of familiar and new technologies than political centrists.

Demographic predictors of having a positive opinion towards familiar and new technologies

	Familiar tech	New tech
Male [Ref: Female]	-	-
Age (18-39) [Ref: Age (40-59)]	-	Small ↑
Age (60+) [Ref: Age (40-59)]	-	-
Regional [Ref: Metro]	-	-
Postgraduate [Ref: High school]	-	Small ↑
Undergraduate [Ref: High school]	Small ↑	Small ↑
TAFE/Diploma [Ref: High school]	-	-
Financially comfortable [Ref: Financially stressed]	Small ↑	Small ↑
Financially stretched [Ref: Financially stressed]	Small ↑	Small ↑
CALD [Ref: Non-CALD]	-	-
Politically conservative [Ref: Centrist]	-	-
Politically progressive [Ref: Centrist]	Small ↑	Small ↑

Small ↑ denotes a small but significant positive influence (standardised β = 0.10-0.29) relative to the reference (ref) group

Technology: Overall opinion (subset analysis)

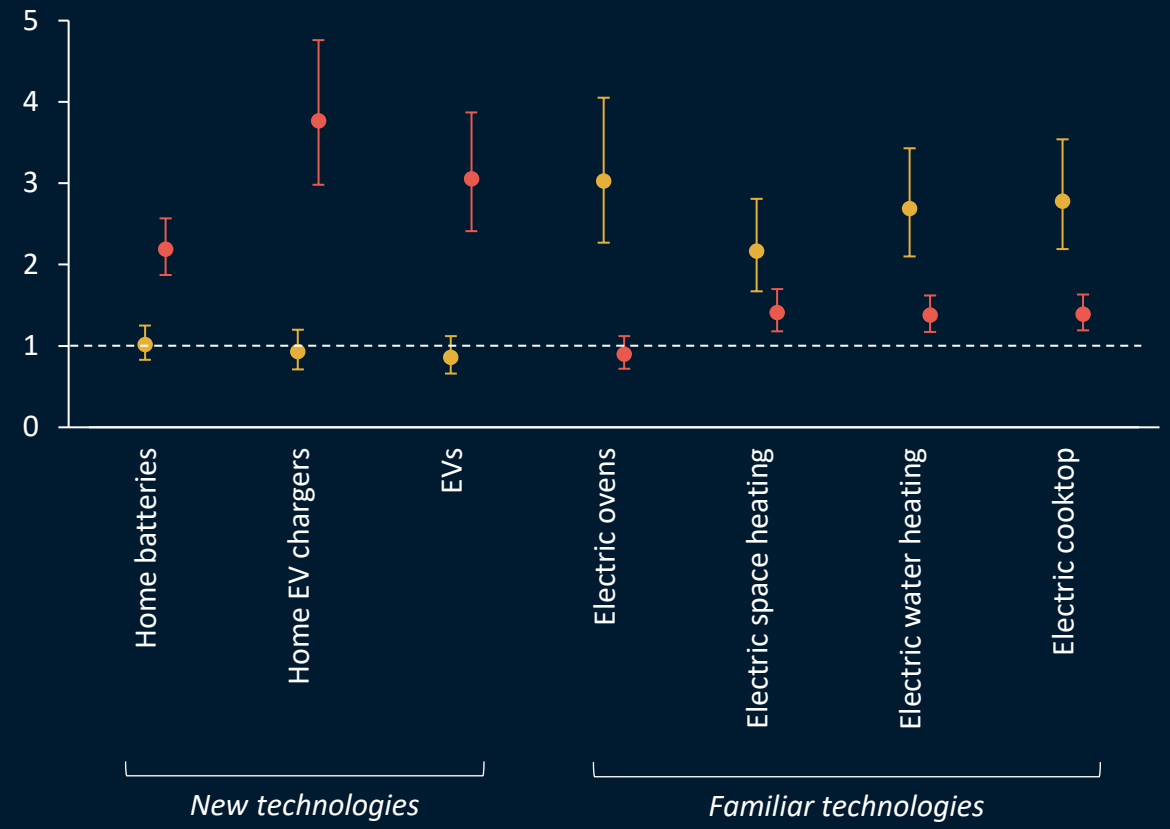
Opinion of new technologies was associated with adoption intentions for new *and* familiar technologies

+ New and familiar technology opinions were differentially predictive of business as usual (BAU) adoption intentions, which capture the extent to which respondents would adopt each technology over the next 5 years assuming no additional policies beyond those already in place:
  - Adoption intentions for new technologies like home batteries and EVs were only predicted by opinion of new technologies; opinion of familiar technologies had no influence.
  - Adoption intentions for familiar technologies like electric cooktops and electric space heating were usually predicted by opinion of both familiar and new technologies. However, opinion of familiar technologies were usually more predictive than opinion of new technologies.

Note: This subset analysis excludes current adopters for each technology to determine whether opinion of familiar and new technologies predicts intended switching behaviour.

Opinion of familiar and new technologies as predictors of intended BAU adoption

Odds ratio; 95% confidence intervals



Technology: Overall opinion

Key takeaways

+ While all technologies were evaluated positively, familiar technologies (reverse cycle air conditioners for heating, electric water heating, induction cooktops, electric ovens) were evaluated more favourably than new technologies (EVs, home EV chargers, home batteries).
+ Business as usual (BAU) intention to adopt familiar technologies was generally predicted by opinion of both familiar and new technologies, although opinion of familiar technologies was usually more predictive. Conversely, BAU intention to adopt new technologies was only predicted by opinion of new technologies. Different approaches to how familiar and new technologies are promoted to consumers may therefore be required.
+ All adopter categories had a positive opinion of familiar technologies, whereas opinion of new technologies was evaluated more variably across the adopter categories. Moreover, with the later adopter categories (early majority, late majority, laggard), opinion of new technologies was significantly lower than opinion of familiar technologies.
+ A similar dynamic existed for environmental worry: opinion of familiar technologies was significantly more favourable at lower levels of environmental worry than opinion of new technologies.
+ Education, political identity, and financial wellbeing predicted opinion of familiar and new technologies. In addition, younger age (30-49) and having a postgraduate degree predicted opinion of new technologies.

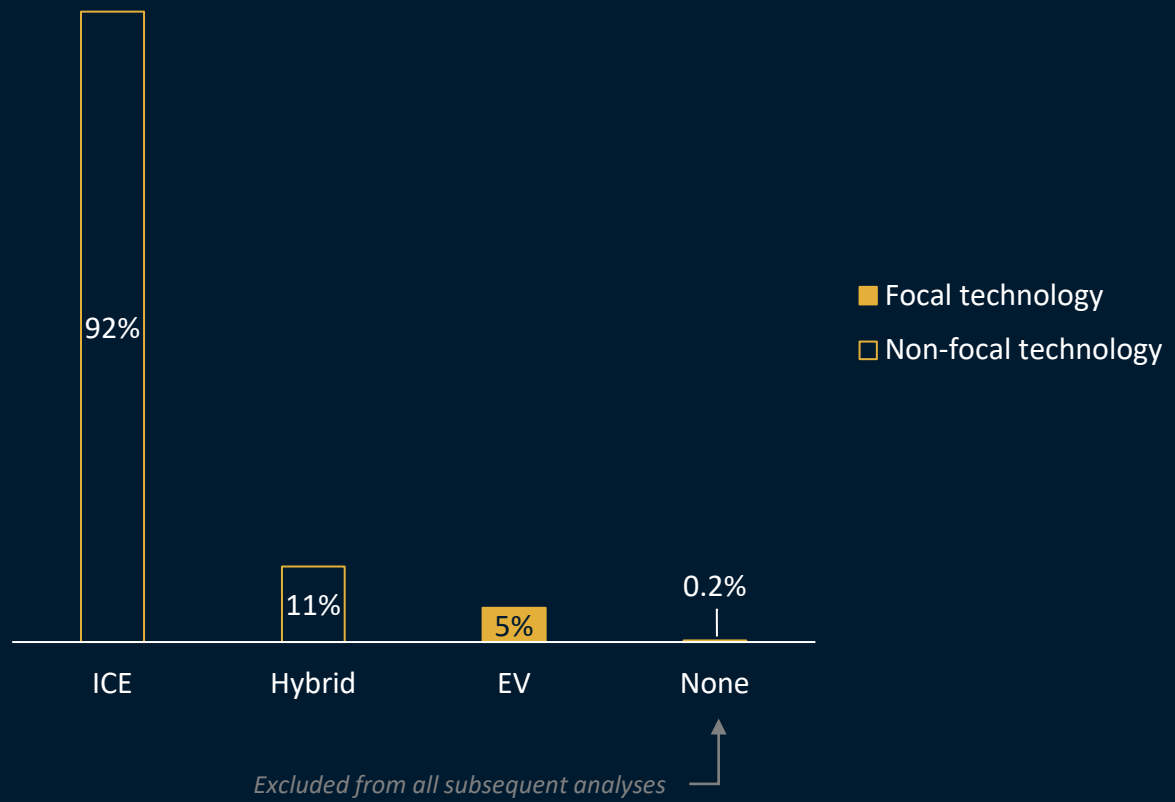
Technology: EV

Car ownership was dominated by internal combustion engine vehicles

+ Most respondents (92%) reported owning at least one internal combustion engine (ICE) vehicle, with only 5% reporting owning an EV.

Type of car currently owned by respondents

Total percentage exceeds 100% because respondents may own multiple types of cars



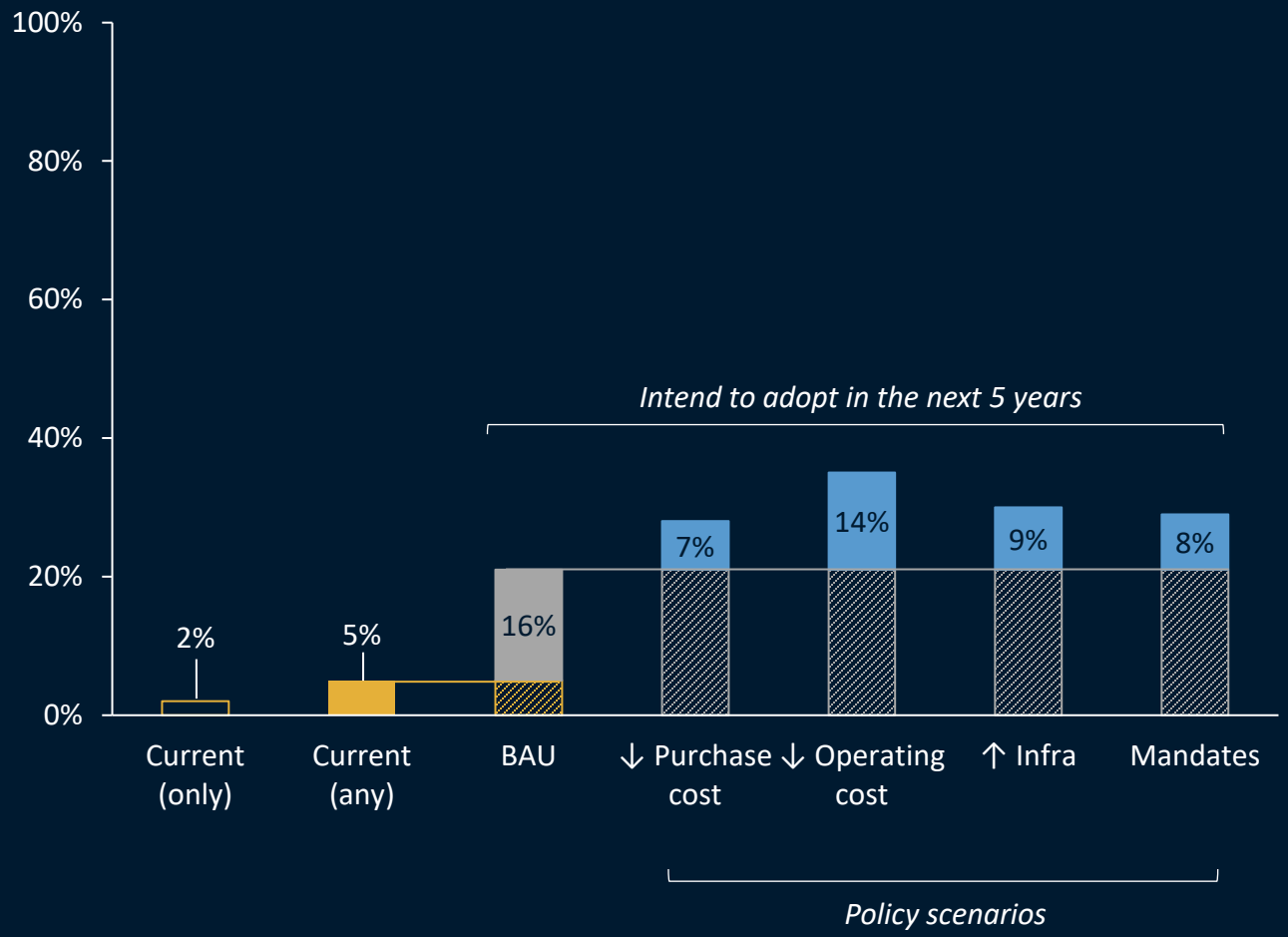
Technology: EV (policy impact)

Moderate BAU EV adoption intentions were identified

+ 5% of respondents reported owning an EV, although for many of these respondents, their broader vehicle ownership also included non-EVs. Indeed, only 2% of respondents reported exclusively owning EVs.
+ Under business as usual (BAU), which assumes no additional policy measures beyond those already in place, an additional 16% of respondents reported intending to adopt an EV in the next 5 years. However, for at least some of these respondents, such adoption would likely see adopted EV(s) sitting alongside currently owned internal combustion engine vehicles (rather than resulting in a transition to exclusive EV ownership).

Policy scenarios would result in additional adoption gains

+ The policy scenarios increased reported adoption intentions over the next 5 years by a further 7 – 14% above BAU, depending on the policy in question.
+ No significant differences in policy effectiveness were observed with respect to motivating additional adoption intentions.



Technology: EV (segmentation)

Psychographic segmentation: Adopter category

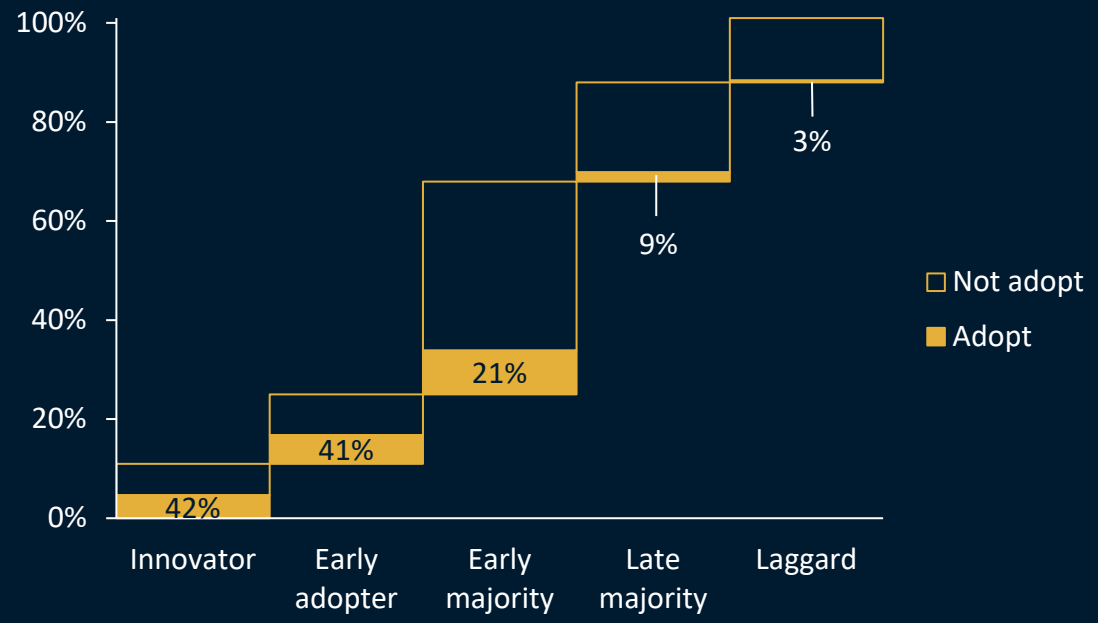
Innovators and early adopters had the highest EV adoption intentions

- Business as usual (BAU) adoption intentions significantly varied by adopter category:
  - 42% of innovators and 41% of early adopters reported a BAU intention to adopt an EV in the next 5 years.
  - These reported rates of adoption were significantly higher than for two of the other adopter categories: late majority (9%) and laggard (3%).

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Intended BAU adoption of an EV within each adopter category

Each adopter category is represented proportional to its percentage share of the total sample



Technology: EV (segmentation)

Psychographic segmentation: Environmental worry

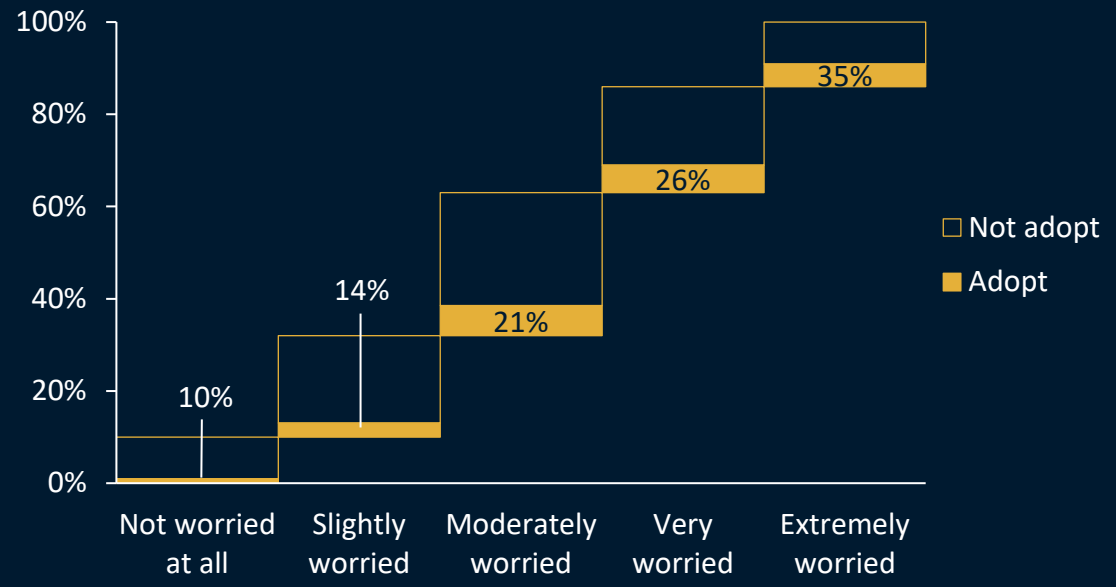
EV adoption intentions were greatest among those who were very or extremely worried about the environment

+ Business as usual (BAU) adoption intentions significantly varied as a function of worry about the environment:
  - Respondents who were very (26%) or extremely (35%) worried about the environment reported the highest adoption intentions.
  - These adoption intentions were significantly greater than those reported by respondents who were not at all (10%) or slightly (14%) worried about the environment.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Intended BAU adoption of an EV at varying levels of environmental worry

Each environmental worry level is represented proportional to its percentage share of the total sample



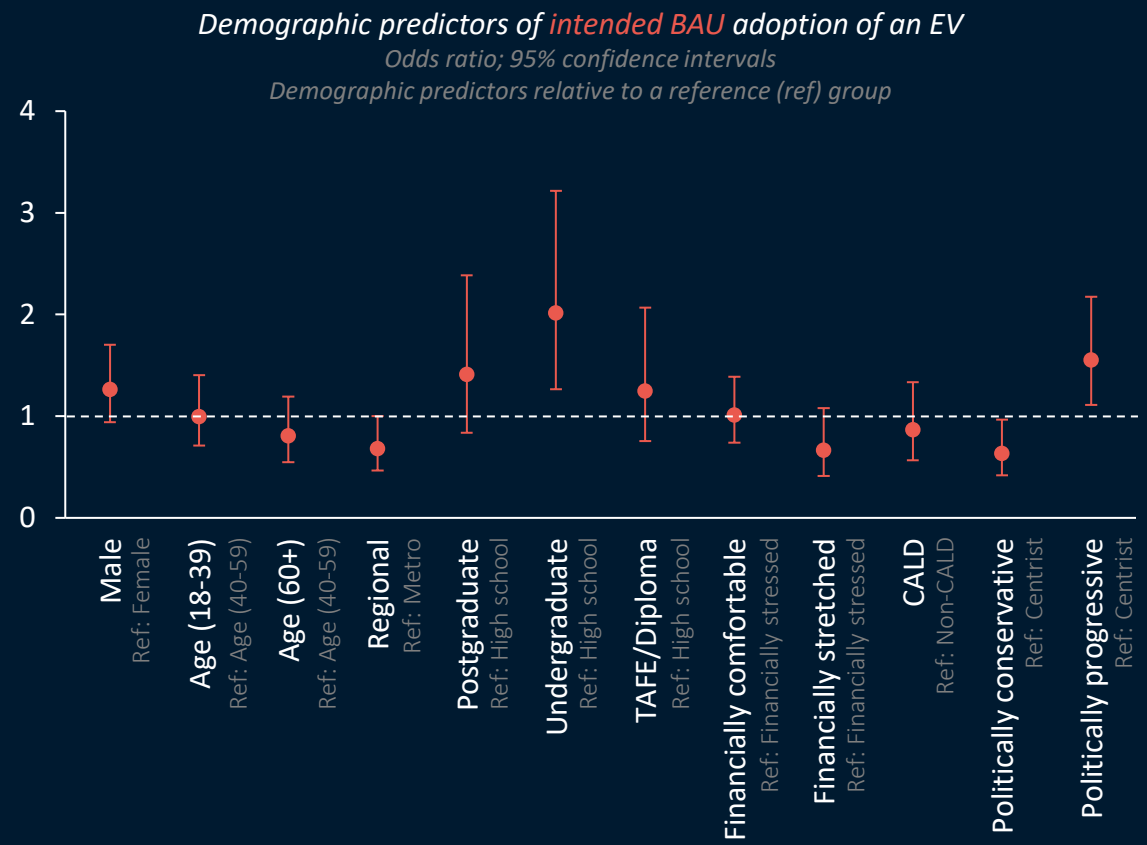
Technology: EV (segmentation)

Demographic segmentation

Educated political progressives were more – and regional conservatives less – likely to report EV adoption intentions.

- \+ Regional respondents were 0.7x less like to report EV adoption intentions than their metro counterparts.
- \+ Relative to high school graduates, those with an undergraduate education were 2.0x more likely to report intended EV adoption.
- \+ Relative to political centrists, those whose political views were:
  - – Conservative were 0.6x less likely to report intended EV adoption.
  - – Progressive were 1.5x more likely to report intended EV adoption.
- \+ All other demographic predictors were not significant.

Note: demographic segmentation analysis was not conducted for current adoption due to the relatively low rates of EV adoption observed among respondents.



Technology: EV

Key takeaways

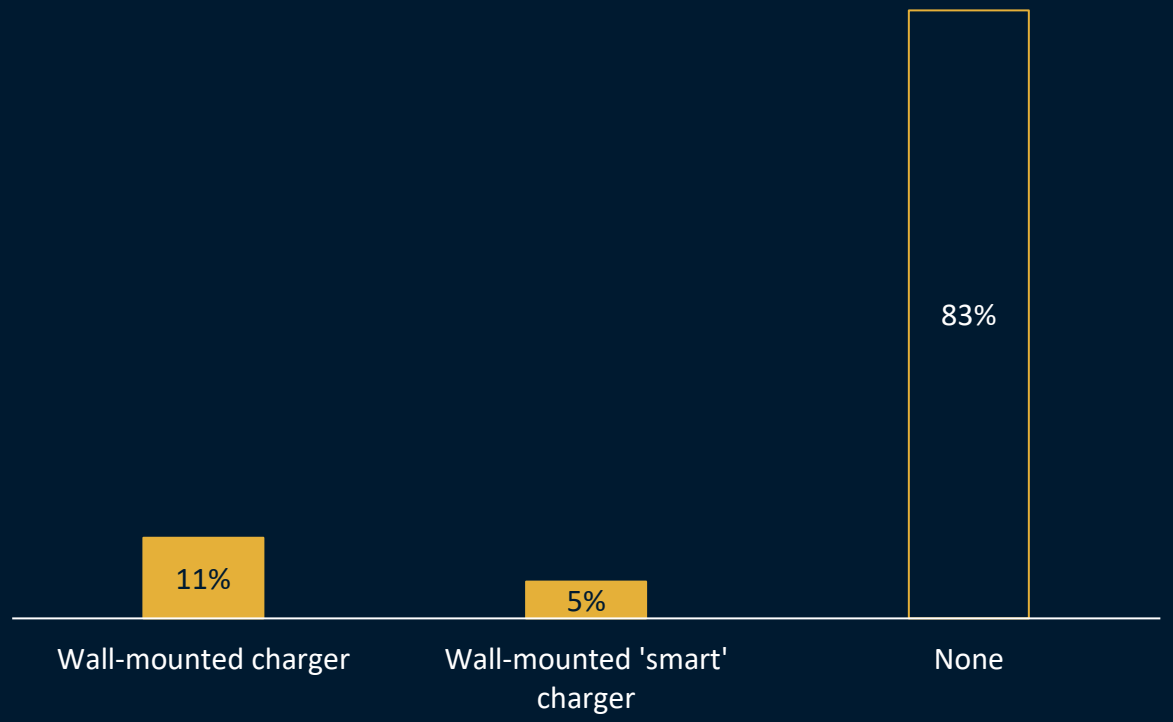
+ Current rates of EV adoption are low, although 21% of respondents reported that if they were going to purchase or replace a car in the next 5 years, an EV would be their choice (assuming current policies).
+ While each of the policy scenarios would further increase rates of EV adoption, the highest rate of intended adoption was associated with ↓ Operating cost, with 35% of respondents indicating that if this policy was enacted, an EV would be their choice for purchasing or replacing a car in the next 5 years.
+ Innovators and early adopters were significantly more likely to report business as usual (BAU) adoption intentions than the late majority or laggards. Notably, the largest adopter category – the early majority – reported intermediate adoption intentions. Accelerating these rates of intended adoption, particularly among the more risk averse later adopter categories, will likely require de-risking the use of EVs in the mind of consumers.
+ EVs were perceptually associated with environmental outcomes for a sizeable proportion of respondents, with higher levels of environmental worry being associated with greater BAU EV adoption intentions.
+ Reflecting the politically contested nature of EVs within Australia, respondents with conservative political views were 0.6x less likely to report BAU EV adoption intentions for an EV, whereas those with progressive political views were 1.5x more likely to report such adoption intentions.
+ Encouraging EV adoption in regional communities will likely be challenging, with regional respondents 0.7x less likely to report BAU EV adoption intentions relative to their metro counterparts.

Technology: Home EV charger

Most respondents do not currently have an EV charger

+ In total, 83% of respondents reported not having an electric car charger.
+ Given that only 5% of respondents reported currently owning an EV, the proportion reporting some form of wall-mounted EV charger (16%) was higher than might otherwise be expected. This may point to potential confusion among some respondents about what constitutes an EV charger.

Type of home EV chargers currently owned by respondents



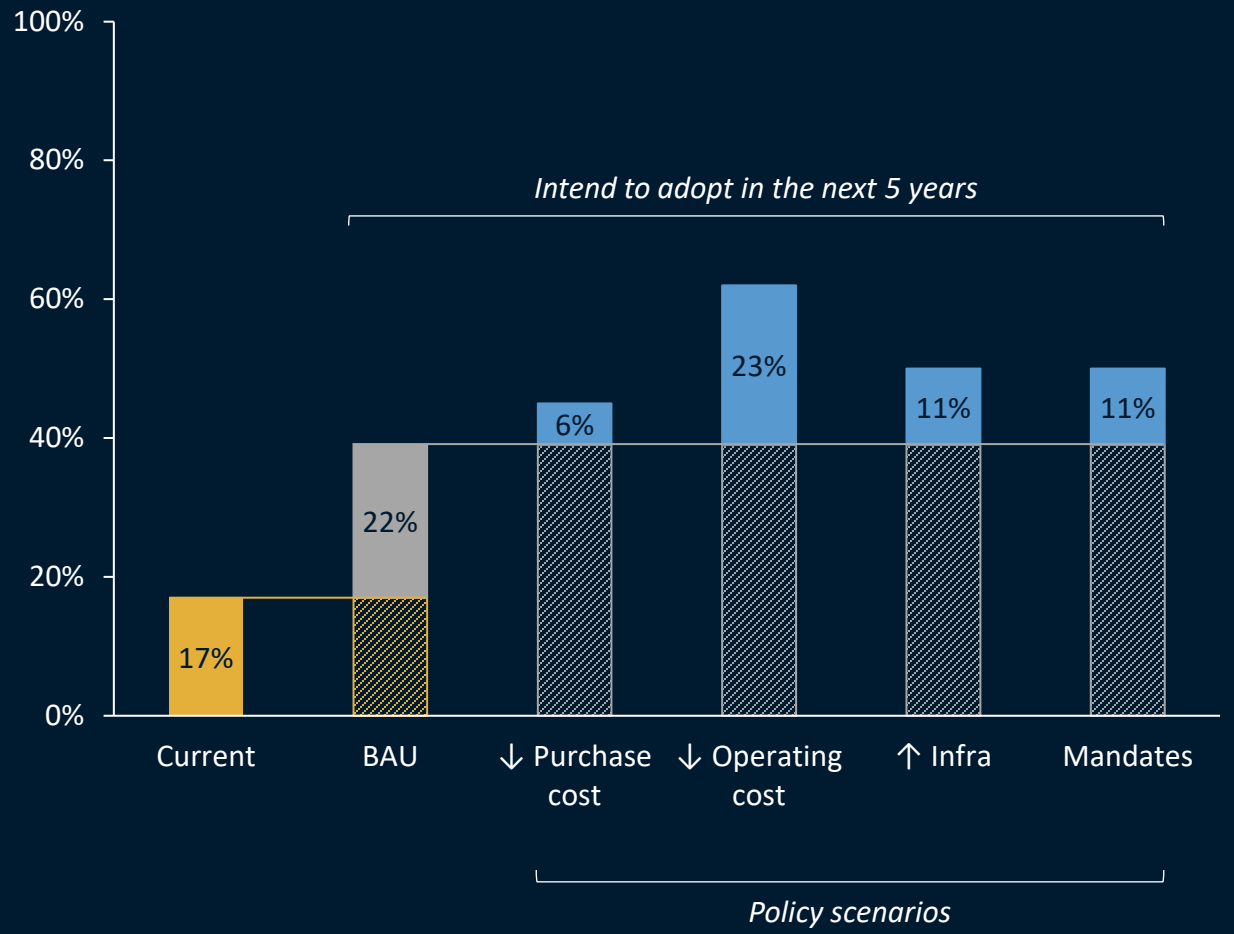
Technology: Home EV charger (policy impact)

BAU intention to adopt a home EV charger was moderate

+ Under business as usual (BAU), where no additional policy measures are introduced, an additional 22% of respondents would adopt a home EV charger in the next 5 years over and above the 17% of respondents who have already done so.

↓ Operating cost had the greatest influence on adoption intentions

+ All policy scenarios increased adoption intentions over the next 5 years by 6% - 23% above BAU, depending on the policy in question.
+ Significant differences were found across the policy scenarios:
  - ↓ Operating cost led to greater gains in adoption intentions.
  - ↓ Purchase cost led to lower gains in adoption intentions.



Technology: Home EV charger (segmentation)

Psychographic segmentation: Adopter category

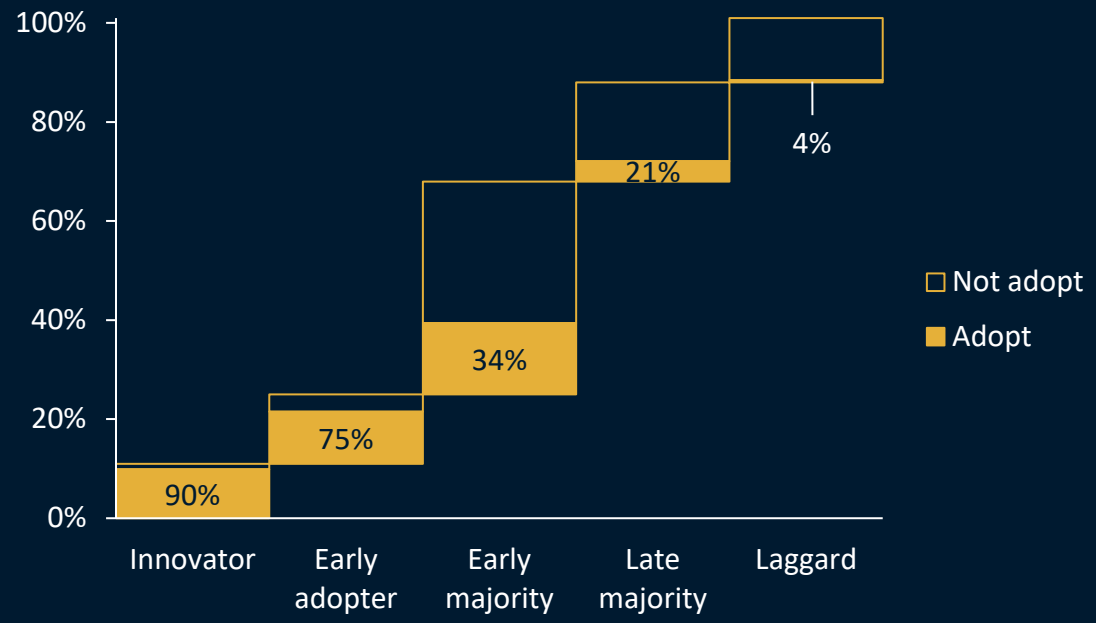
Innovators and early adopters were most interested in adopting a home EV charger

- Business as usual (BAU) adoption intentions significantly varied by adopter category:
  - 90% of innovators and 75% of early adopters reported intending to adopt a home EV charger in the next 5 years.
  - These rates of intended adoption were significantly higher than for the other three adopter groups, which were 34% (early majority), 21% (late majority), and 4% (laggard).

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Intended BAU adoption of a home EV charger within each adopter category

Each adopter category is represented proportional to its percentage share of the total sample



Technology: Home EV charger

Psychographic segmentation: Environmental worry

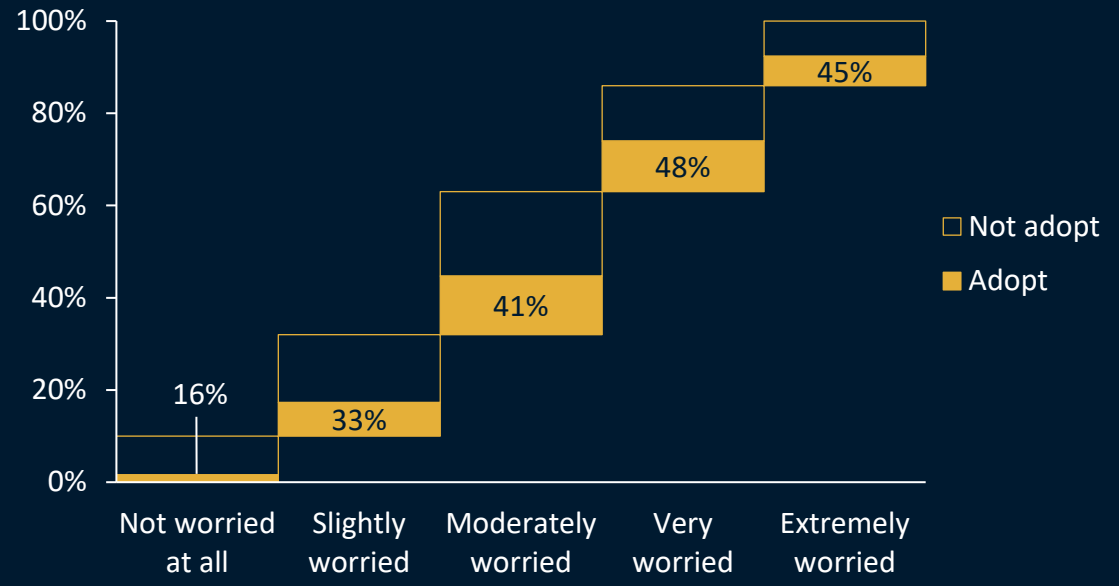
Respondents who were very or extremely worried about the environment reported greater adoption intentions

+ Business as usual (BAU) adoption intentions significantly varied across levels of environmental worry:
  - 45% and 48% of the respondents who were extremely worried and very worried, respectively, reported being likely to adopt a home EV charger in the next 5 years.
  - These reported adoption rates were significantly higher than for those who were not at all (16%) or slightly (33%) worried about the environment.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Intended BAU adoption of a home EV charger at varying levels of environmental worry

Each environmental worry level is represented proportional to its percentage share of the total sample



Technology: Home EV charger

Demographic segmentation

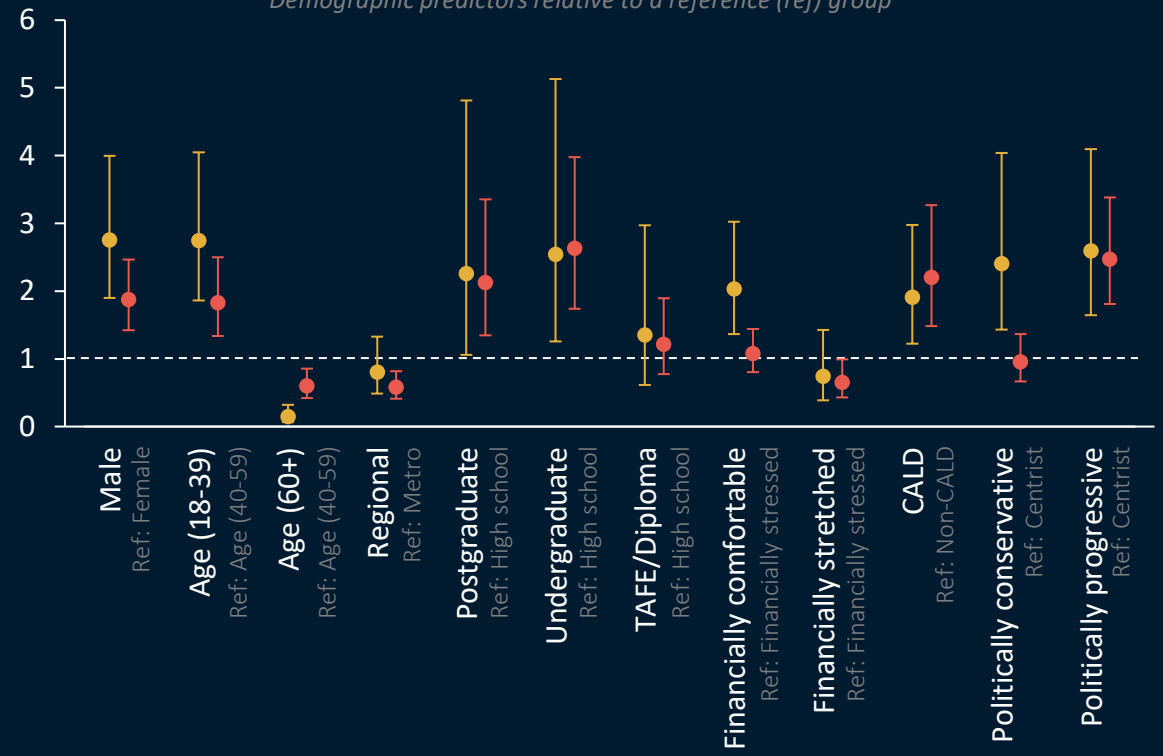
Young, educated, politically progressive males were more likely to report current and intended EV charger adoption

+ Men were 2.8x and 1.9x more likely than women to report current and intended adoption, respectively.
+ Relative to those aged 40-59 years:
  – Younger respondents (18-39) were 2.7x and 1.8x more likely to report current and intended adoption, respectively.
  – Older respondents (60+) were 0.1x and 0.6x less likely to report current and intended adoption, respectively.
+ Regional respondents were 0.6x less likely to report intended adoption than their metro counterparts.
+ Relative to high school graduates, those with a(n):
  – Postgraduate education were 2.3x and 2.1x more likely to report current and intended adoption, respectively.
  – Undergraduate education were 2.5x and 2.6x more likely to report current and intended adoption, respectively.
+ The financially comfortable were 2.0x more likely to report current adoption – and the financially stretched 0.7x less likely to report intended adoption – than the financially stressed.
+ Culturally and linguistically diverse (CALD) respondents were 1.9x and 2.2x more likely to report current and intended adoption, respectively.

Demographic predictors of current and intended BAU adoption of a home EV charger

Odds ratio; 95% confidence intervals

Demographic predictors relative to a reference (ref) group



+ Relative to political centrists, those whose political views were:
  – Conservative were 2.4x more likely to report current adoption.
  – Progressive were 2.6x and 2.5x more likely to report current and intended adoption, respectively.

Technology: Home EV charger

Key takeaways

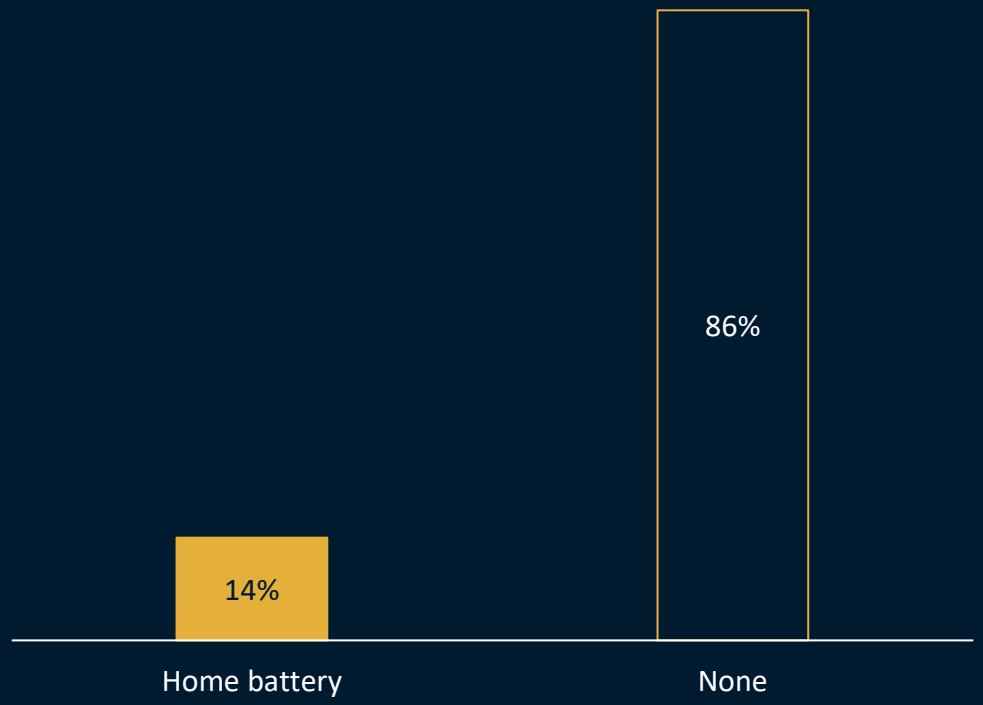
+ Current and intended home EV charger adoption rates tended to track higher than the equivalent adoption rates for EVs, which may reflect confusion about what a home EV charger is or a desire among respondents to 'future proof' their dwellings so that they can better support the next generation of vehicles.
+ 17% of respondents report having currently adopted some form of home EV charger, and this proportion would increase to 39% within the next 5 years under business as usual (BAU) conditions.
+ All policy scenarios further increased respondents' adoption intentions, with the greatest increase to adoption intentions (to 62% overall) being observed for ↓ Operating cost.
+ Very high rates of BAU adoption intention were reported by innovators and early adopters (90% and 75%, respectively), although these rates tailed off quickly among the later adopter categories, with adoption intentions ranging from 34% (early majority) to as low as 4% (laggard). This may point to the more bullish perceptions of innovators and early adopters with respect to future rates of EV adoption (and with it, a desire to prepare their dwellings for this eventuality).
+ As with EVs, increasing levels of environmental worry were associated with higher BAU adoption intentions for home EV chargers.
+ Young, educated, politically progressive males were more likely to report current and intended EV charger adoption
+ Respondents who were male, younger, more educated, culturally or linguistically diverse (CALD), and politically progressive were more likely to report current and intended home EV charger adoption. This profile could consequently inform the targeting of future promotional activities aimed at accelerating the rollout of this technology. By contrast, current and intended adoption was lower among older respondents.

Technology: Home battery

Few respondents had a home battery

+ Only 14% of respondents reported currently owning a home battery (which was also referred to as a ‘solar battery’ in the survey).

Current home battery adoption reported by respondents



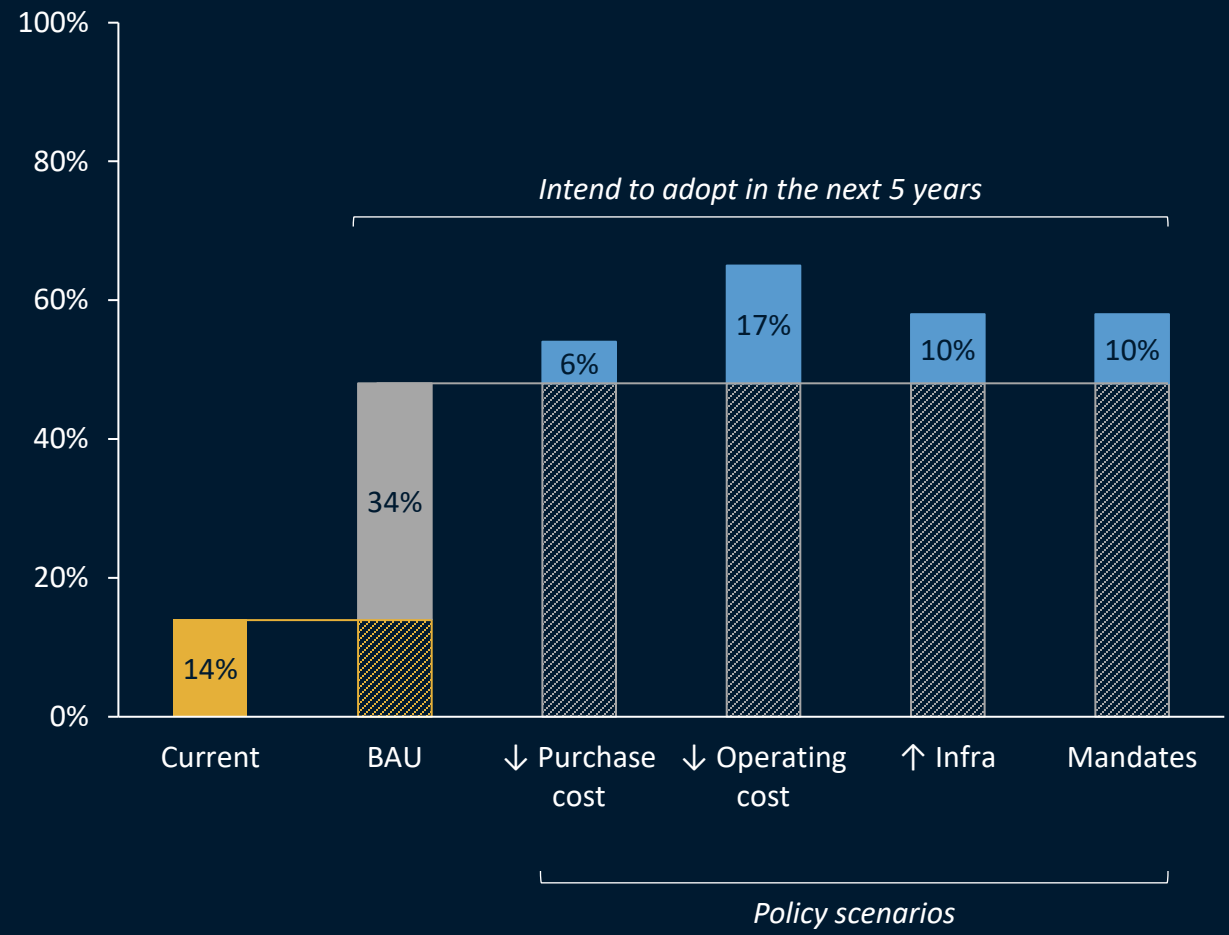
Technology: Home battery (policy impact)

There was strong BAU interest in adopting a battery

+ The business as usual (BAU) scenario, which involved no additional policy measures beyond those already in place, saw an additional 34% of respondents intending to adopt a home battery in the next 5 years over and above the 14% who reported already owning a home battery.

↓ Operating cost is more likely to drive additional battery adoption

+ The various policy scenarios increased intended adoption over the next 5 years by a further 6-17% above BAU adoption, depending on the policy in question.
+ Significant differences were found across the policy scenarios:
  - ↓ Operating cost led to greater gains in adoption intentions (an additional 17% above BAU).
  - ↓ Purchase cost led to lower gains in adoption intentions (an additional 6% above BAU).



Technology: Home battery (segmentation)

Psychographic segmentation: Adopter category

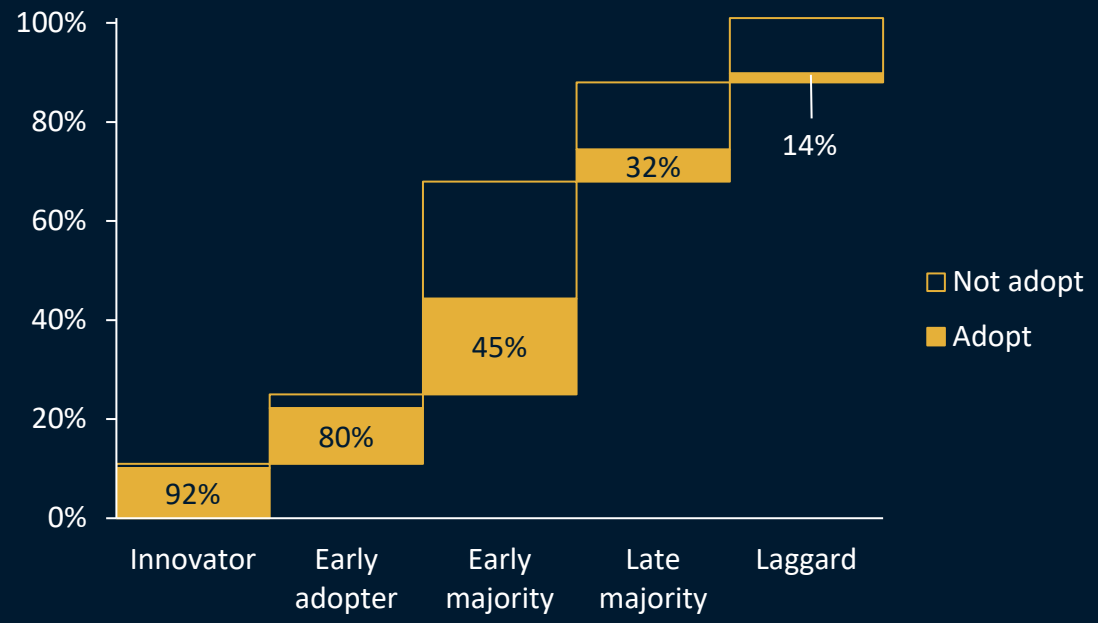
Innovators and early adopters led the interest in adopting a home battery

+ Business as usual (BAU) adoption intentions significantly varied by adopter category:
  - 92% of innovators and 80% of early adopters reported intending to adopt a home battery in the next 5 years.
  - These rates of intended BAU adoption were significantly greater than those reported by the early majority (45%), late majority (32%), and laggard (14%) adopter categories.

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Intended BAU adoption of a home battery within each adopter category

Each adopter category is represented proportional to its percentage share of the total sample



Technology: Home battery (segmentation)

Psychographic segmentation: Environmental worry

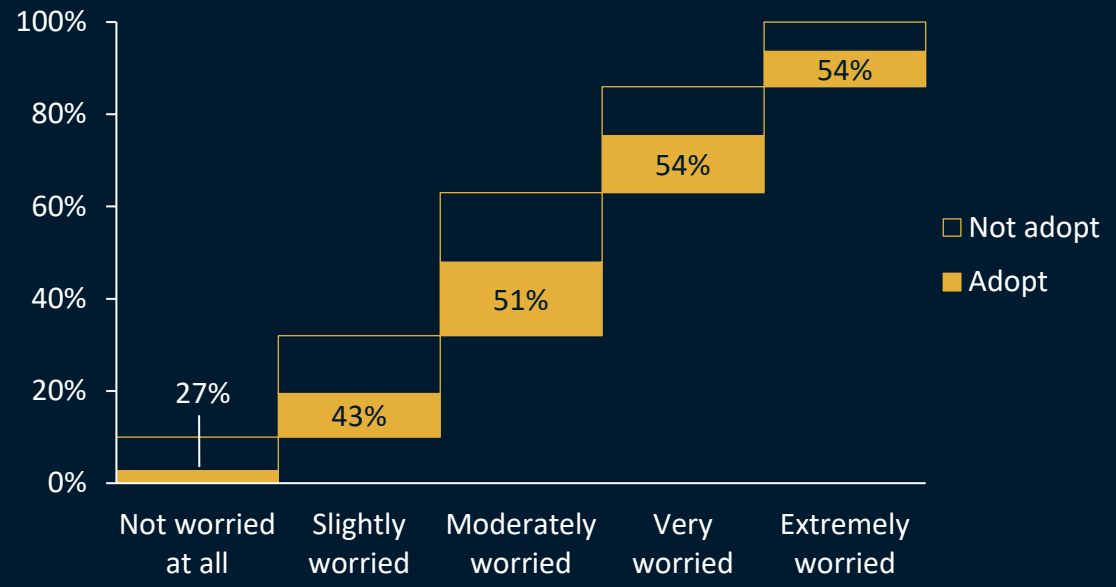
Intended battery adoption increased with levels of environmental worry

+ The highest levels of business as usual (BAU) intentions for adopting a home battery were reported by those who were very (54%) or extremely (54%) worried about the environment.
+ BAU adoption intentions significantly varied by environmental worry:
  – Adoption intentions were significantly higher among those who reported being very worried about the environment (54%) versus those who reported being not worried at all (27%).

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Intended BAU adoption of a home battery at varying levels of environmental worry

Each environmental worry level is represented proportional to its percentage share of the total sample



Technology: Home battery (segmentation)

Demographic segmentation

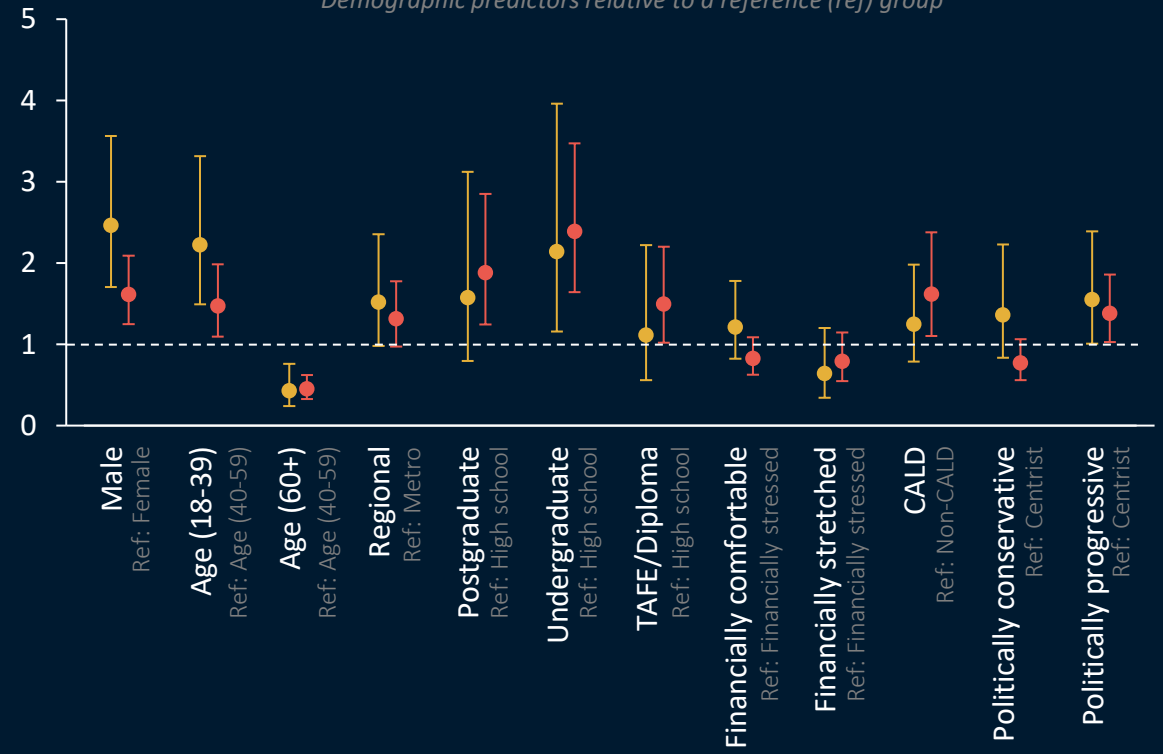
Younger, educated, politically progressive males tended to report higher current and intended home battery adoption

- Men were 2.5x and 1.6x more likely than women to report current and intended battery adoption, respectively.
- Relative to those aged 40-59 years:
  - Younger respondents (18-39) were 2.2x and 1.5x more likely to report current and intended battery adoption, respectively.
  - Older respondents (60+) were 0.4x and 0.5x less likely to report current and intended battery adoption, respectively.
- Relative to high school graduates, those with a(n):
  - Postgraduate education were 1.8x more likely to report intended battery adoption.
  - Undergraduate education were 2.1x and 2.4x more likely to report current and intended battery adoption, respectively.
  - TAFE/Diploma education were 1.5x more likely to report intended battery adoption.
- Culturally and linguistically diverse (CALD) respondents were 1.6x more likely to report intended battery adoption than non-CALD respondents.
- Relative to centrists, political progressives were 1.5x and 1.4x more likely to report current and intended battery adoption, respectively.

Demographic predictors of current and intended BAU adoption of a home battery

Odds ratio; 95% confidence intervals

Demographic predictors relative to a reference (ref) group



Technology: Home battery

Key takeaways

+ While the current battery adoption rate was low (14%), adoption intentions under business as usual (BAU) were high, with an additional 34% of respondents reporting an intention to purchase a battery over the next 5 years.
+ Adoption of home batteries might be increased through any of the four policy scenarios, although ↓ Operating cost had the greatest influence, increasing adoption intentions by a further 17% of respondents above BAU.
+ BAU adoption intentions were highest amongst innovators (92%) and early adopters (80%), although reported intentions among the largest adopter category – the early majority – were still relatively high (45%).
+ While BAU adoption intentions significantly varied by environmental worry, relatively similar intentions were reported by those who were moderately (51%), very (54%), or extremely (54%) worried about the environment, suggesting that environmental considerations may be a less important driver of adoption than for other zero emission technologies, such as EVs.
+ Younger, more educated, and politically progressive men were most likely to report current and intended home battery adoption, while older respondents were less likely to report current and intended adoption.

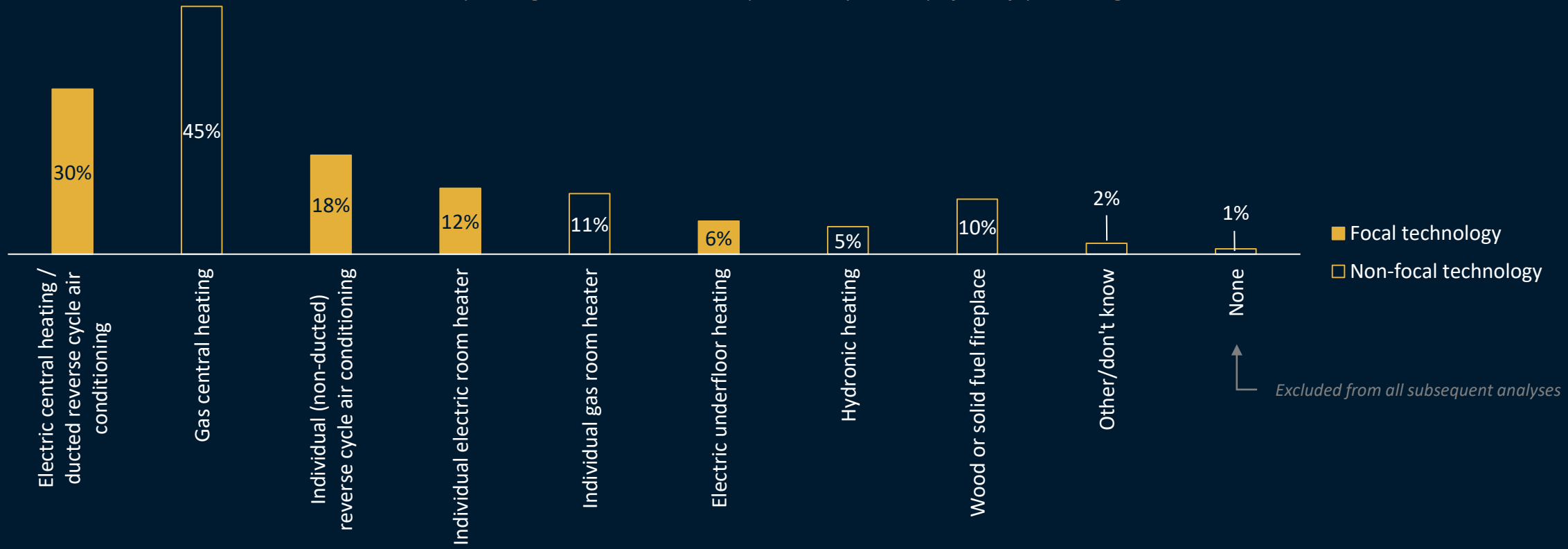
Technology: Electric space heating

Current ownership profile was varied

+ The most common forms of space heating reported by respondents were gas central heating (45%) and electric central heating / ducted reverse cycle air conditioning (30%).

Forms of space heating currently used by respondents

Total percentage exceeds 100% because respondents may use multiple forms of space heating



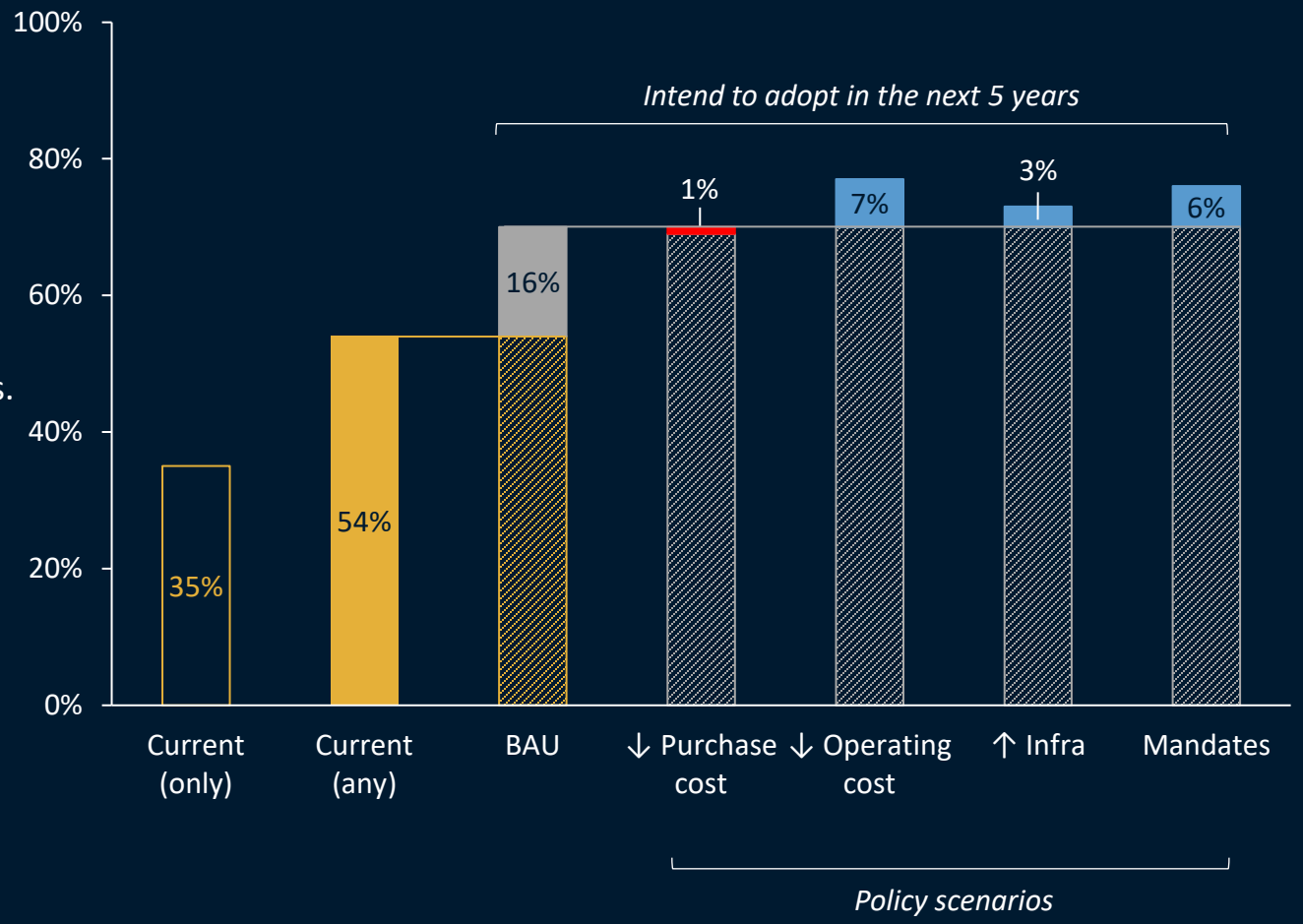
Technology: Electric space heating (policy impact)

BAU interest in adopting electric space heating was moderate

+ 54% of respondents reported that their current space heating setup included an electric space heater, although only 35% indicated that their current space heating setup relied exclusively on electric sources of heating.
+ The business as usual (BAU) scenario, which involved no additional policy measures beyond those already in place, saw an additional 16% of respondents intending to adopt an electric heater in the next 5 years.

The influence of the policies was modest at best

+ The impact of the policy scenarios varied, ranging from a 1% *decrease* in adoption intentions (relative to BAU) to a 7% *increase* above BAU.
+ Significant differences were not found across the policy scenarios.



Technology: Electric space heating (segmentation)

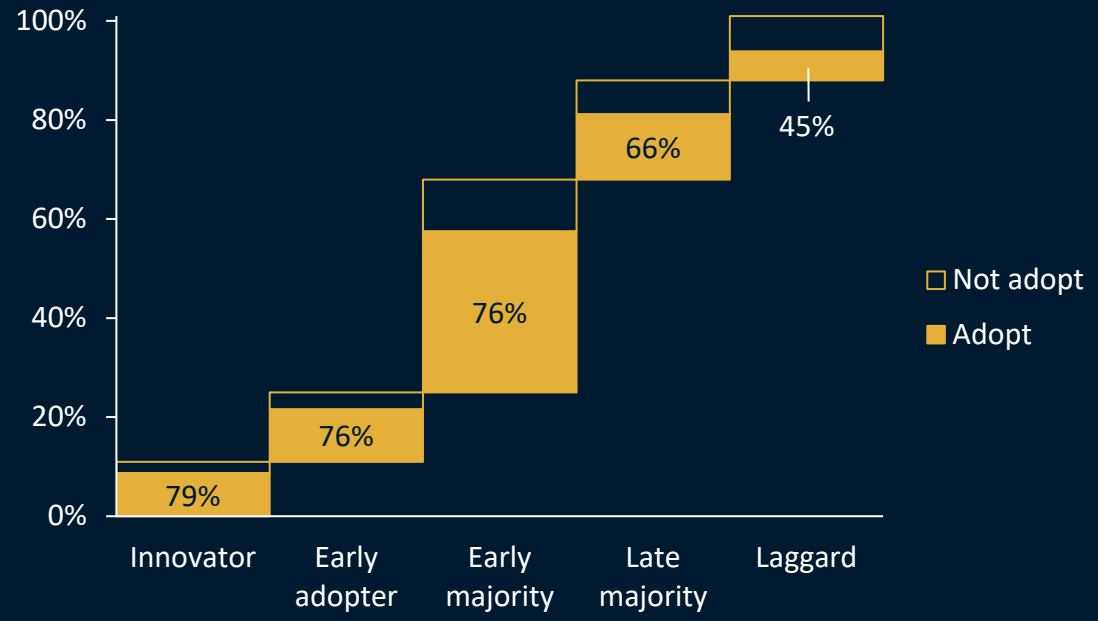
Psychographic segmentation: Adopter category

More than three-quarters of innovators, early adopters, and the early majority intended to adopt electric space heating

+ Adoption intentions significantly varied by adopter category:
  – Innovators (79%) and the early majority (76%) collectively reported significantly higher business as usual (BAU) adoption intentions than those in the laggard category (45%).

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Intended BAU adoption of electric space heating within each adopter category
Each adopter category is represented proportional to its percentage share of the total sample



Technology: Electric space heating (segmentation)

Psychographic segmentation: Environmental worry

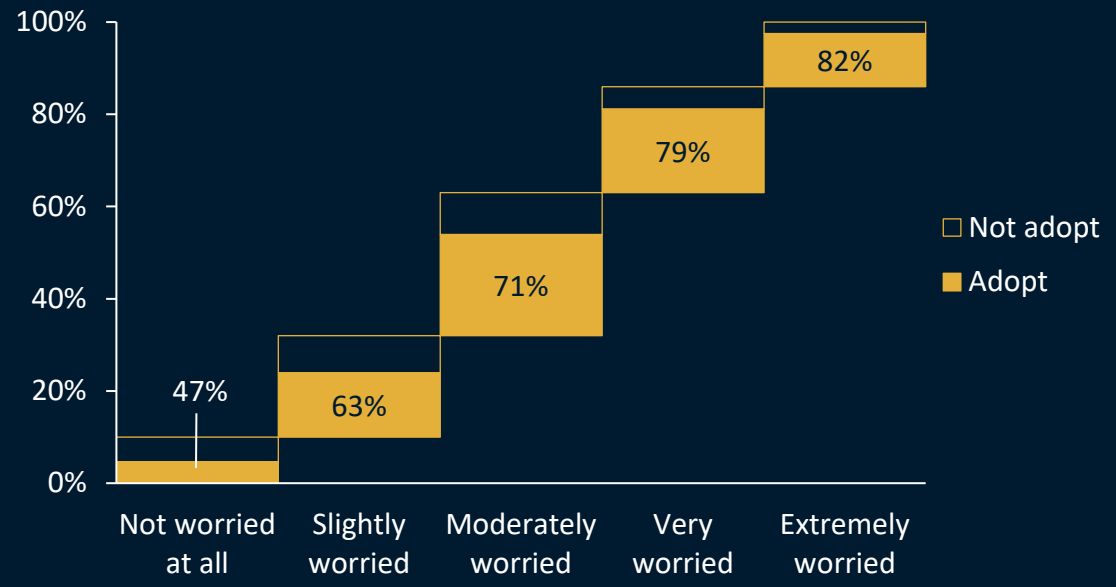
Adoption intentions increased with levels of environmental worry

+ Adoption intentions significantly varied by worry about the environment:
  - The highest business as usual (BAU) adoption intentions were reported by those who were very (79%) or extremely (82%) worried about the environment.
  - These levels of adoption intention were significantly greater than those reported by respondents who were not at all (47%) or slightly (63%) worried about the environment.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Intended BAU adoption of electric space heating at varying levels of environmental worry

Each environmental worry level is represented proportional to its percentage share of the total sample



Technology: Electric space heating (segmentation)

Demographic segmentation

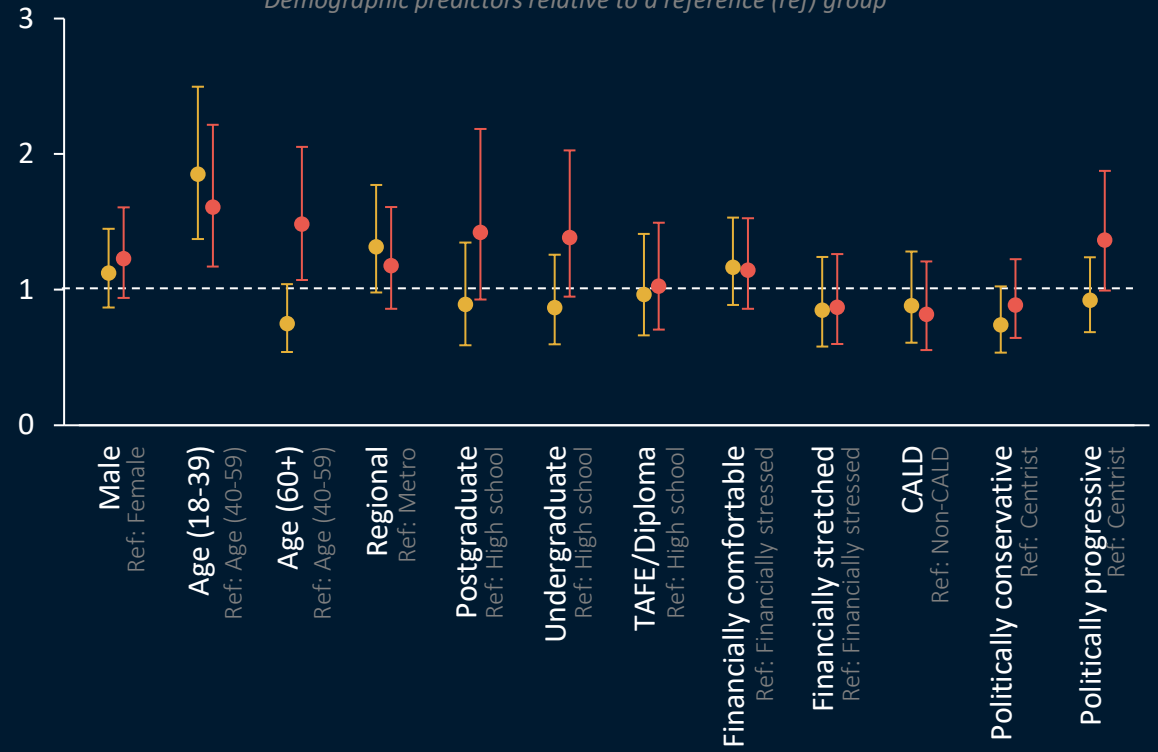
Age was the only demographic variable to predict electric space heating adoption

+ Relative to those aged 40-59 years:
  - Younger respondents (18-39) were 1.9x and 1.6x more likely to report current and intended space heater adoption, respectively.
  - Older respondents (60+) were 1.5x more likely to report intended space heater adoption.
+ All other demographic predictors were not significant.

Demographic predictors of current and intended BAU adoption of electric space heating

Odds ratio; 95% confidence intervals

Demographic predictors relative to a reference (ref) group



Technology: Electric space heating

Key takeaways

+ Electric space heating is already relatively common, with 54% of respondents reporting at least some form of electric space heating. Under business as usual (BAU), an additional 16% of respondents would choose electric sources of space heating if purchasing or replacing space heating in the next 5 years.
+ Adoption of electric space heating might be marginally increased through three of the four policy scenarios, with the highest increases observed for ↓ Operating Cost (additional 7% of respondents) and Mandates (additional 6% of respondents).
+ While adopter category was significantly associated with BAU adoption intentions, the variation in adoption intentions across the innovator (79%), early adopter (76%), and early majority (76%) categories was relatively minor and highlights the familiarity that many consumers have with this technology.
+ Environmental worry was associated with BAU adoption intentions, with those who were extremely (82%) or very (79%) worried about the environment reporting significantly greater adoption intentions than those who were not at all (47%) or slightly (63%) worried.
+ Younger (18-39) and older (60+) respondents were more likely than middle aged (40-59) respondents to report BAU adoption intentions. No other demographic variables predicted adoption, perhaps because of the familiarity that most consumer segments already have with electric space heating.

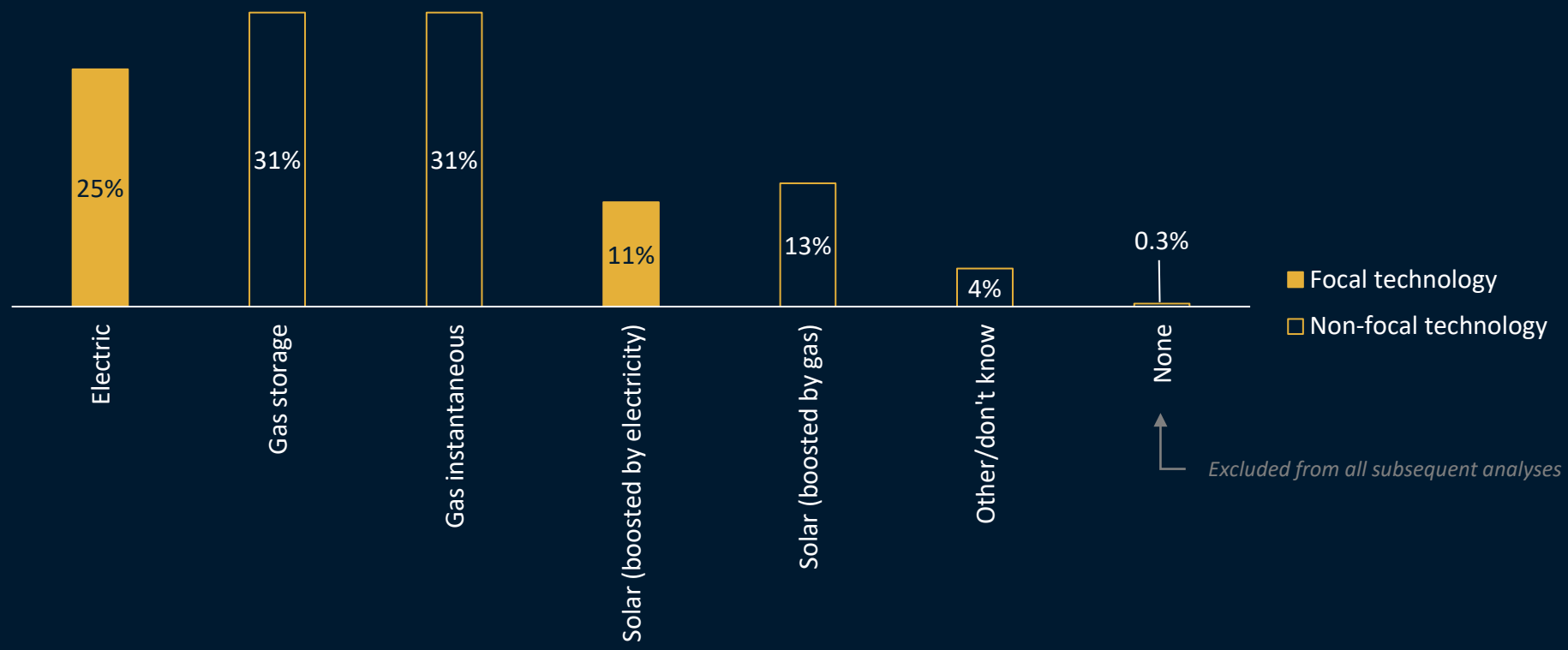
Technology: Electric water heating

Current ownership profile was varied

+ The most common forms of water heating reported by respondents were gas storage (31%) and gas instantaneous (31%).

Forms of water heating currently used by respondents

Total percentage exceeds 100% because respondents may use multiple forms of water heating



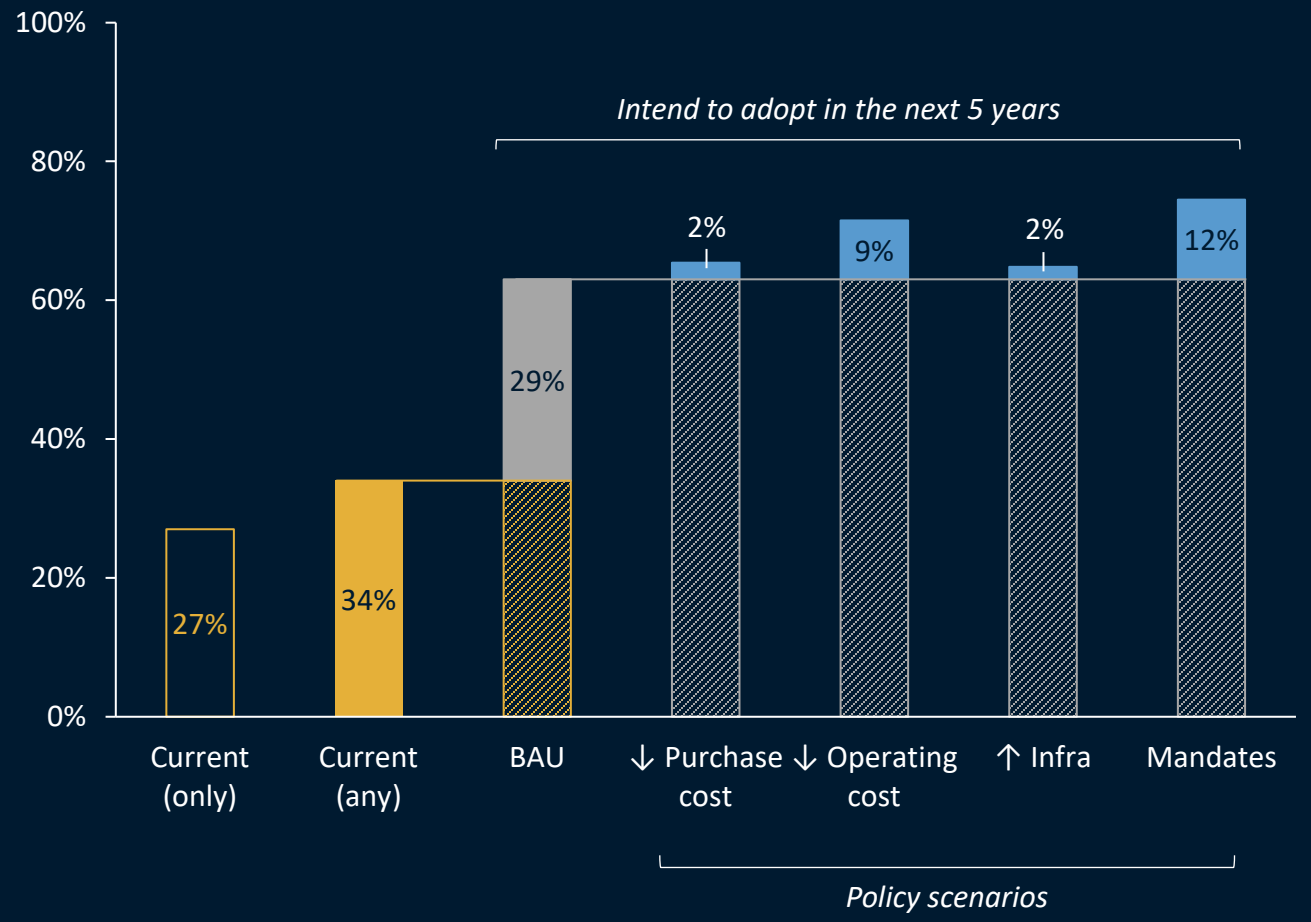
Technology: Electric water heating (policy impact)

Interest in adopting electric water heating was strong

+ 34% of respondents reported that their current water heating setup included an electric water heater, with 27% currently relying exclusively on an electric water heater.
+ The business as usual (BAU) scenario, which involved no additional policy measures beyond those already in place, saw an additional 29% of respondents intending to adopt an electric water heater in the next 5 years.

Mandates would be most effective at driving further adoption of electric water heating

+ The policy scenarios increased adoption intentions over the next 5 years by a further 2-12% above BAU, depending on the policy in question.
+ Significant differences were found across the policy scenarios, with Mandates leading to significantly greater gains in adoption intentions.



Technology: Electric water heating (segmentation)

Psychographic segmentation: Adopter category

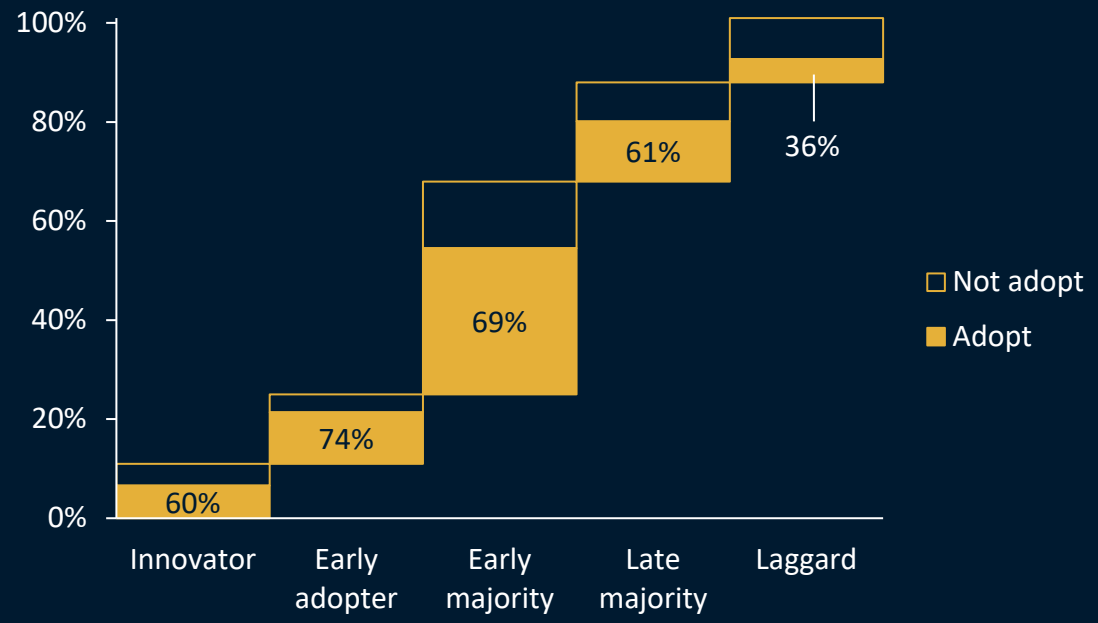
Adoption interest was led by early adopters and the early majority

+ Business as usual (BAU) adoption intentions significantly varied by adopter category:
  - 74% of early adopters and 69% of the early majority reported intending to adopt electric water heating in the next 5 years.
  - These adoption intentions were significantly greater than those reported by respondents in the laggard category (36%).

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Intended BAU adoption of electric water heating within each adopter category

Each adopter category is represented proportional to its percentage share of the total sample



Technology: Electric water heating (segmentation)

Psychographic segmentation: Environmental worry

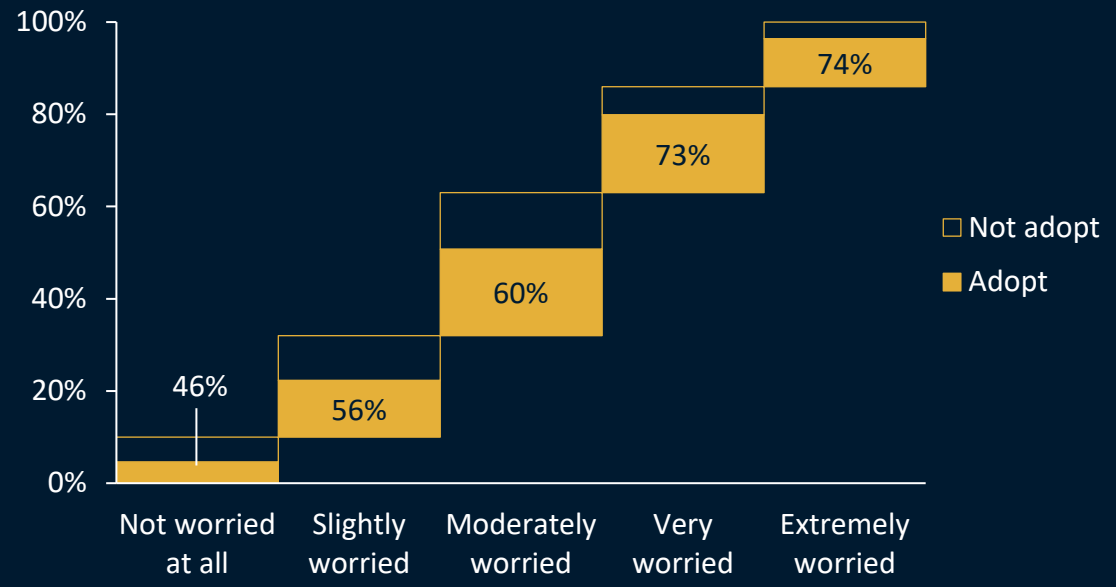
As environmental worry increased, so too did interest in adopting electric water heating

+ Business as usual (BAU) adoption intentions significantly varied with worry about the environment:
  - Interest in adopting electric water heating was greatest among respondents who were very (73%) or extremely (74%) worried about the environment.
  - These levels of adoption were significantly greater than for those who were not at all (46%) or slightly (56%) worried about the environment.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Intended BAU adoption of electric water heating at varying levels of environmental worry

Each environmental worry level is represented proportional to its percentage share of the total sample



Technology: Electric water heating (segmentation)

Demographic segmentation

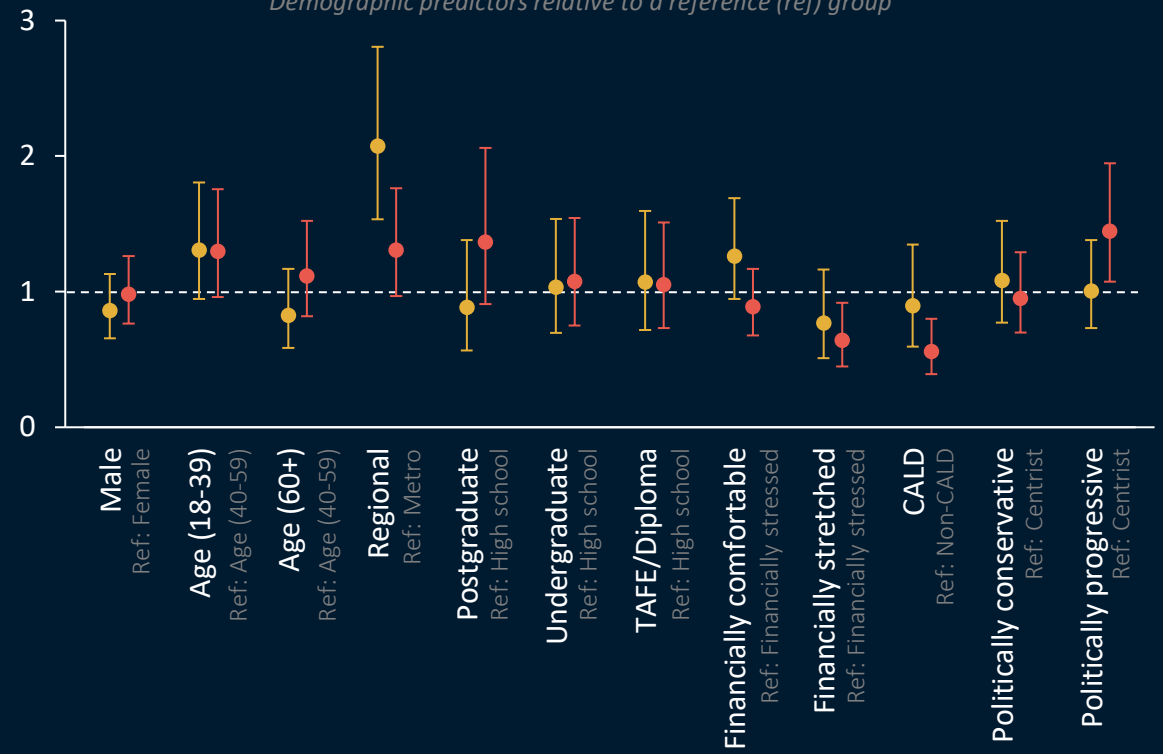
Being politically progressive increased – and financially stretched or CALD decreased – intention to adopt

+ Relative to their metro counterparts, regional respondents were 2.1x more likely to report current water heater adoption.
+ Financially stretched respondents were 0.6x less likely to report intended adoption than those who reported being financially stressed.
+ Culturally and linguistically diverse (CALD) respondents were 0.6x less likely to report intended adoption than their non-CALD counterparts.
+ Relative to politically centrist respondents, those who were politically progressive were 1.5x more likely to report intended adoption.
+ All other demographic predictors were not significant.

Demographic predictors of current and intended BAU adoption of electric water heating

Odds ratio; 95% confidence intervals

Demographic predictors relative to a reference (ref) group



Technology: Electric water heating

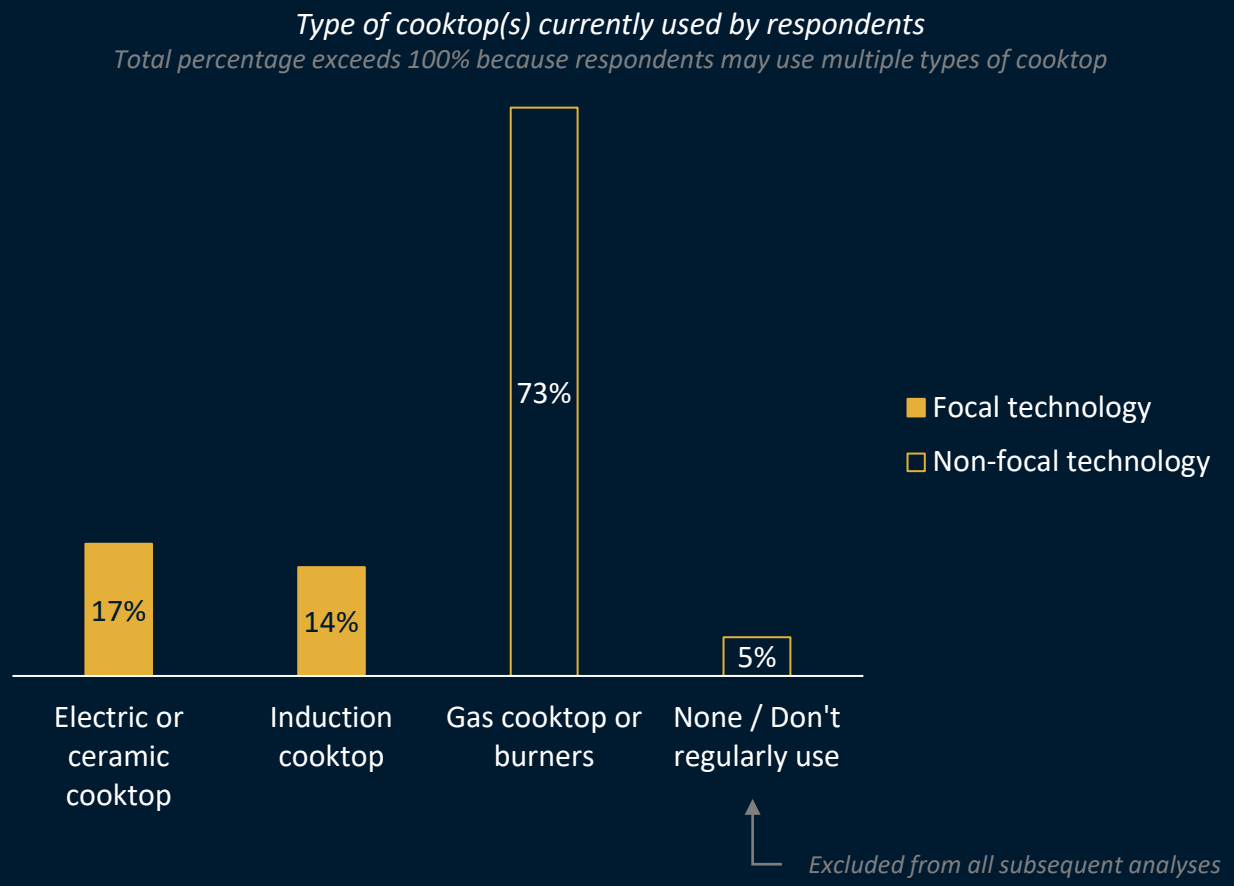
Key takeaways

+ 34% of respondents already reported having adopted some form of electric water heating, with a further 29% indicating that they would do so in the next 5 years if they needed to purchase or replace a water heating appliance under a business as usual (BAU) scenario.
+ All policy scenarios would further increase adoption intentions for electric water heating appliances, although the gains associated with some policy scenarios – like ↓ Purchase cost and ↑ Infrastructure – were modest (both 2%). The biggest gain was found with Mandates, which would see a further 12% of respondents intend to adopt electric water heating appliances above BAU over the next 5 years.
+ BAU adoption intentions significantly varied by adopter category, with early adopters (74%) and the early majority (69%) reporting higher adoption intentions than laggards (36%). Intriguingly, while the difference was not statistically significant, innovators reported lower BAU adoption intentions than all but one of the other adopter categories, potentially indicating that the water heating category is not an especially exciting one for innovators.
+ Once again, BAU adoption intentions varied by environmental worry, with those who were extremely (74%) or very (73%) worried about the environment reporting greater adoption intentions than those who were not at all (46%) or slightly (56%) worried.
+ Being politically progressive increased BAU adoption intentions by 1.5x, while being financially stretched or CALD decreased them by 0.6x for both.

Technology: Electric cooktop

Use of gas cooktops/burners predominated

+ The majority (73%) of respondents reported mainly using a gas cooktop or burners for cooking at home (excluding BBQs and outdoor cooking).



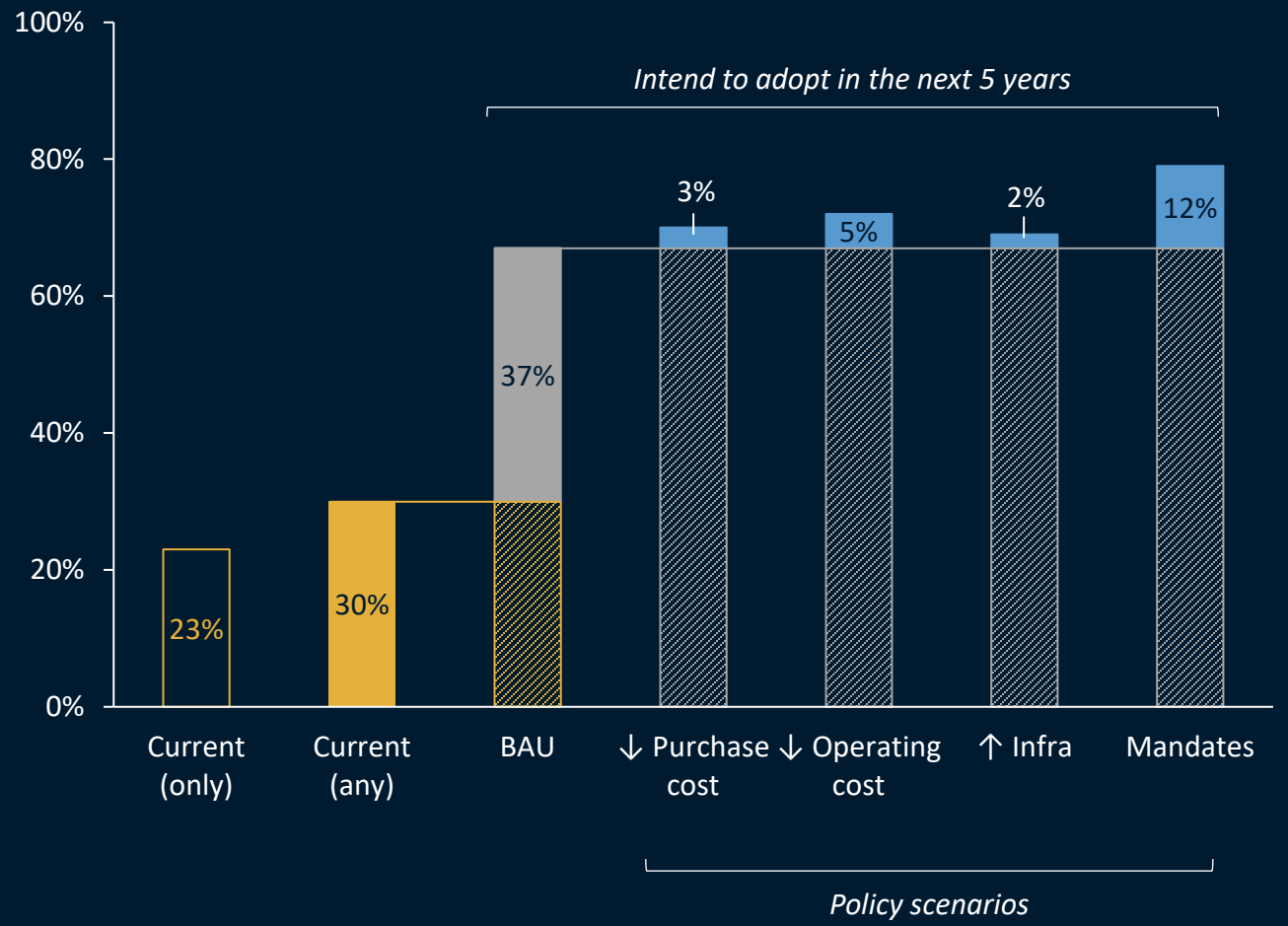
Technology: Electric cooktop (policy impact)

Strong BAU adoption intentions existed for electric cooktops

+ 30% of respondents reported that their current cooktop setup included an electric cooktop, with 23% reporting that they relied exclusively on an electric cooktop.
+ The business as usual (BAU) scenario, which involved no additional policy measures beyond those already in place, saw an additional 37% of respondents intending to adopt an electric cooktop in the next 5 years.

Mandates had the greatest effect on adoption intentions

+ The policy scenarios increased adoption intentions over the next 5 years by a further 2-12% above BAU, depending on the policy in question.
+ Significant differences were found across the policy scenarios, with Mandates leading to significantly greater gains in adoption intentions.



Technology: Electric cooktop (segmentation)

Psychographic segmentation: Adopter category

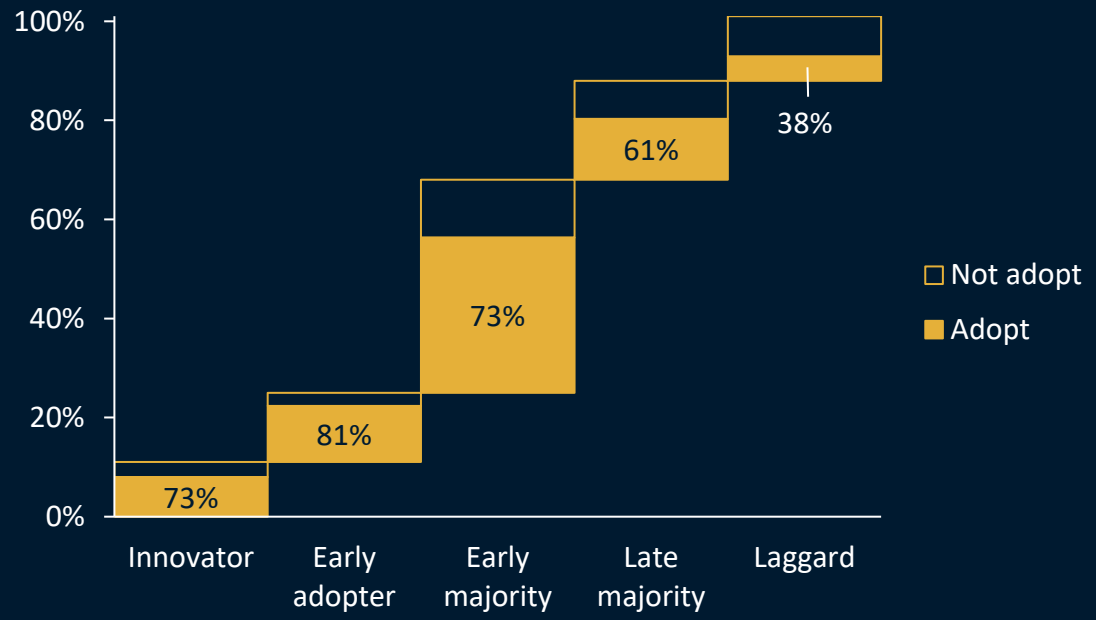
Adoption interest was greatest amongst early adopters and the early majority

+ Business as usual (BAU) adoption intentions significantly varied by adopter category:
  - 81% of early adopters and 73% of the early majority reported intending to adopt an electric cooktop in the next 5 years.
  - These rates of intended adoption were significantly greater than those observed in the late majority (61%) and laggard (38%) categories.

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Intended BAU adoption of an electric cooktop within each adopter category

Each adopter category is represented proportional to its percentage share of the total sample



Technology: Electric cooktop (segmentation)

Psychographic segmentation: Environmental worry

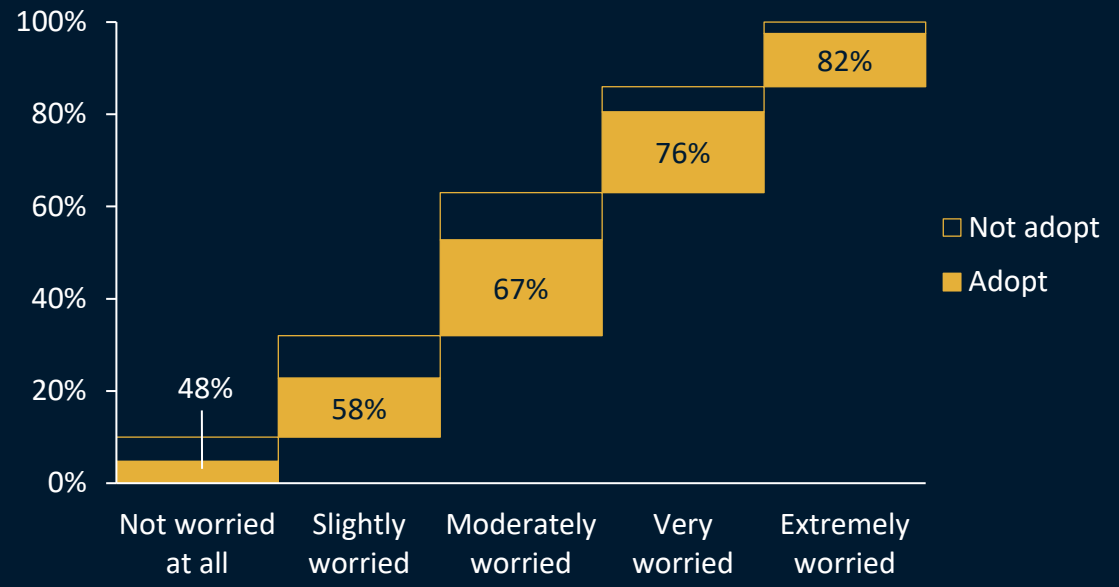
Increasing environmental worry was associated with greater adoption intentions

+ Business as usual (BAU) adoption intentions significantly varied by worry about the environment:
  - Intention to adopt electric cooktops was greatest among those who were very (76%) or extremely (82%) worried about the environment.
  - These rates of intended adoption were significantly greater than those observed for respondents who were not at all (48%) or slightly (58%) worried about the environment.

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Intended BAU adoption of an electric cooktop at varying levels of environmental worry

Each environmental worry level is represented proportional to its percentage share of the total sample



Technology: Electric cooktop (segmentation)

Demographic segmentation

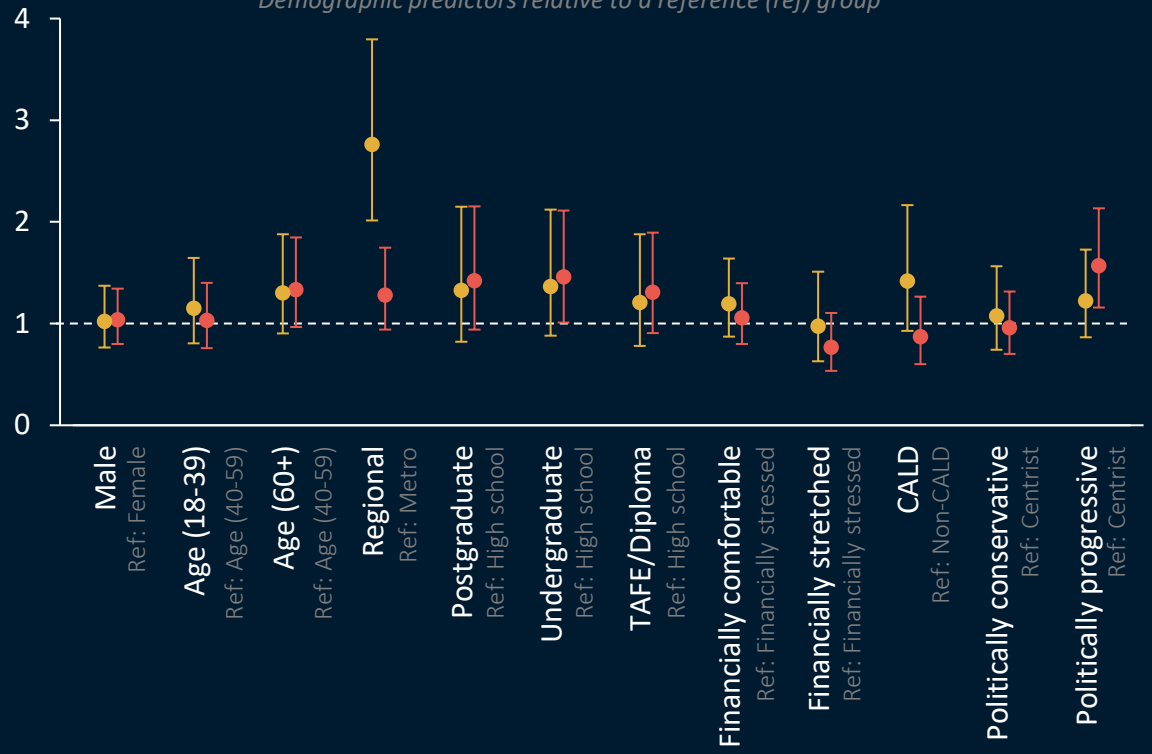
Regional residents were more likely to already have an electric cooktop

+ Relative to metro residents, regional respondents were 2.8x more likely to report current adoption.
+ Relative to high school graduates, those with an undergraduate education were 1.5x more likely to report intended adoption.
+ Relative to politically centrist respondents, those who were politically progressive were 1.6x likely to report intended adoption.
+ No other demographic predictors were significant.

Demographic predictors of current and intended BAU adoption of an electric cooktop

Odds ratio; 95% confidence intervals

Demographic predictors relative to a reference (ref) group



Technology: Electric cooktop

Key takeaways

+ Strong adoption intentions were observed for electric cooktops, with 67% of respondents reporting that they would choose an electric cooktop if they needed to purchase or replace a cooktop in the next 5 years under the business as usual (BAU) scenario. This is up from the 30% of respondents who currently have an electric cooktop.
+ The greatest policy-related gains in adoption intentions for electric cooktops were observed for Mandates (additional 12% adoption intentions above BAU).
+ Early adopters (81%) and the early majority (73%) reported significantly higher BAU adoption intentions relative to the late majority (61%) and laggards (38%).
+ BAU adoption intentions also increased with environmental worry, with those who were very (76%) or extremely (82%) worried about the environment reporting higher adoption intentions than those who were not at all (48%) or slightly (58%) worried.
+ Respondents residing in regional areas reported 2.8x higher current adoption rates than their metro counterparts.

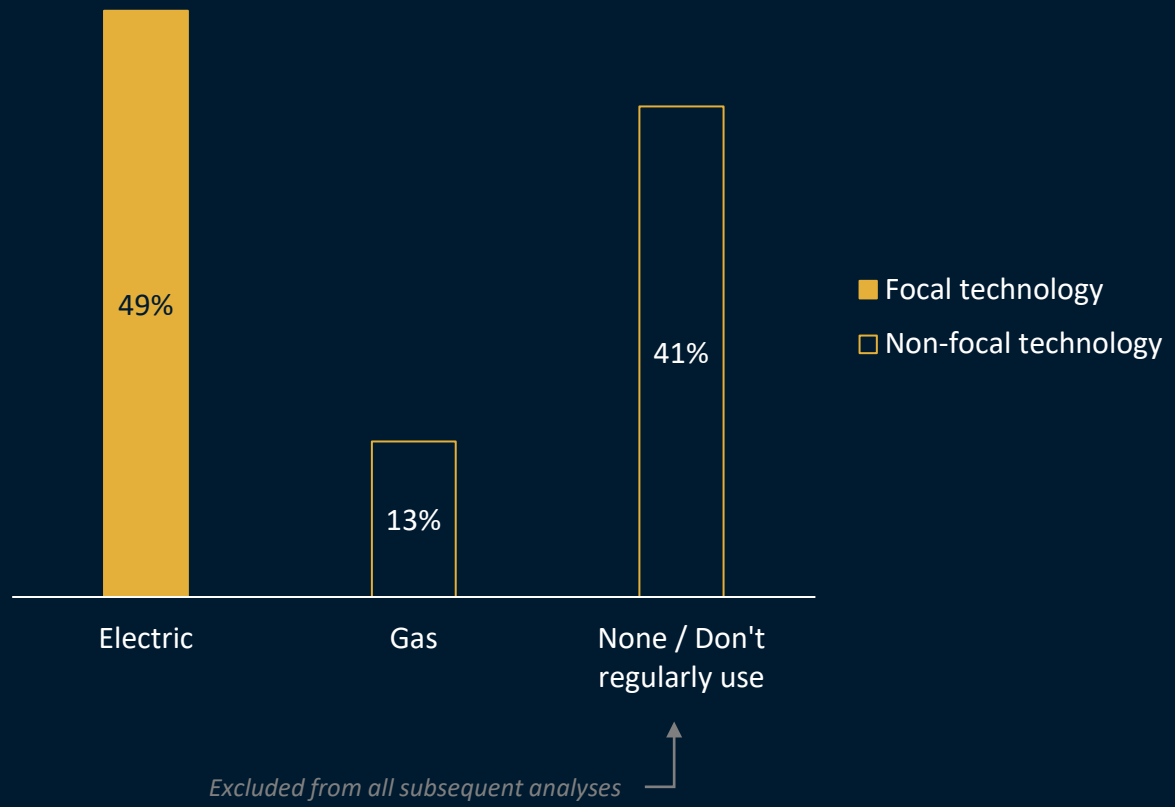
Technology: Electric oven

Electric ovens were used most by respondents

+ The most common type of oven used by respondents to prepare food at home was an electric oven (49%).
+ Notably, 41% of respondents reported either not owning or not regularly using their oven to prepare food at home.

Type of oven(s) currently used by respondents

Total percentage exceeds 100% because respondents may use multiple types of ovens



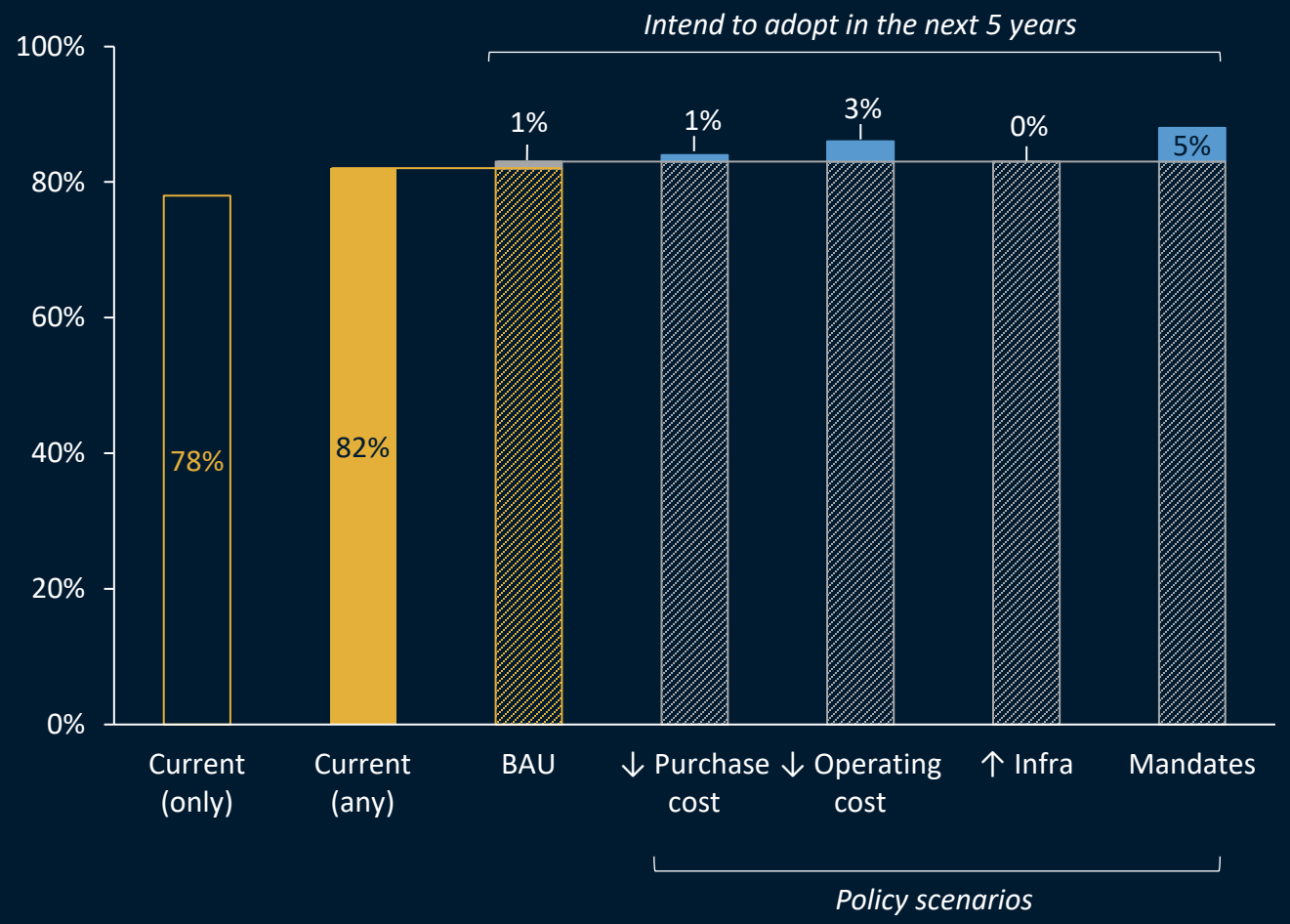
Technology: Electric oven (policy impact)

Current adoption of electric ovens among those who regularly use an oven was high

+ 82% of respondents who regularly used an oven for cooking reported that their current oven setup included an electric oven, with 78% reporting that they only used an electric oven.
+ The business as usual (BAU) scenario, which involved no additional policy measures beyond those already in place, saw an additional 1% of respondents intending to adopt an electric cooktop in the next 5 years.

The influence of the various policies in motivating additional electric oven adoption was relatively minor

+ The policy scenarios increased adoption intentions over BAU by an additional 0 - 5%, depending on the policy in question.
+ No significant adoption-related differences in policy effectiveness were observed.



Technology: Electric oven (segmentation)

Psychographic segmentation: Adopter category

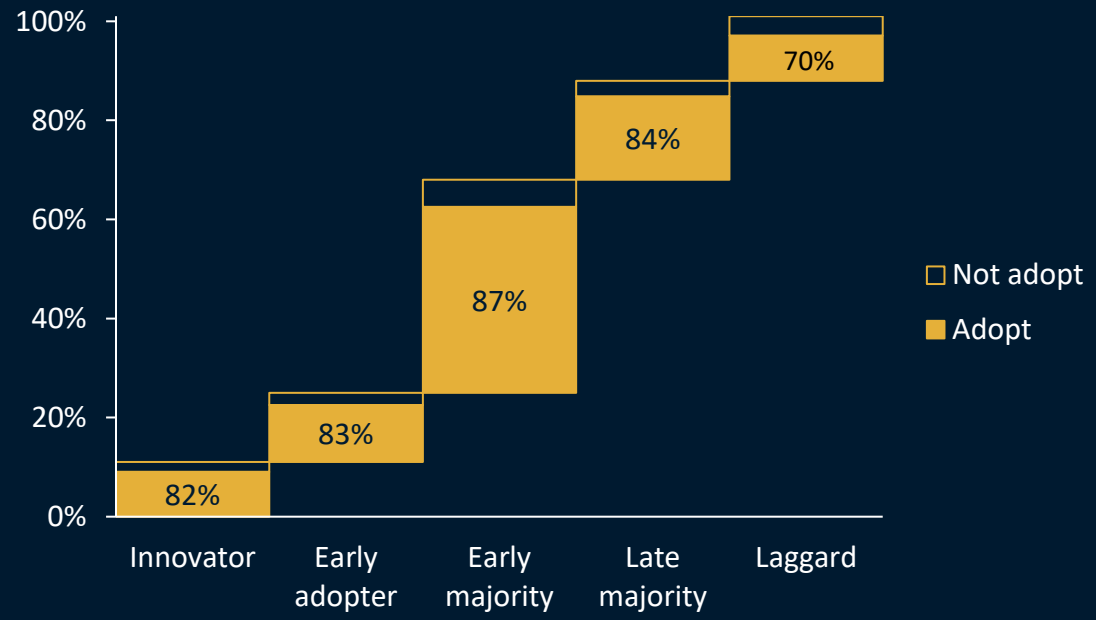
The early majority were most likely to report an intention to adopt an electric oven

+ Adoption intentions significantly varied by adopter category:
  - 87% of the early majority reported intending to adopt an electric oven in the next 5 years.
  - This proportion of adoption intentions was significantly higher than for those in the laggard adopter category (70%).

Note: Definitions for each adopter category – along with the size of each category – can be found in Appendix 2.

Intended BAU adoption of an electric oven within each adopter category

Each adopter category is represented proportional to its percentage share of the total sample



Technology: Electric oven (segmentation)

Psychographic segmentation: Environmental worry

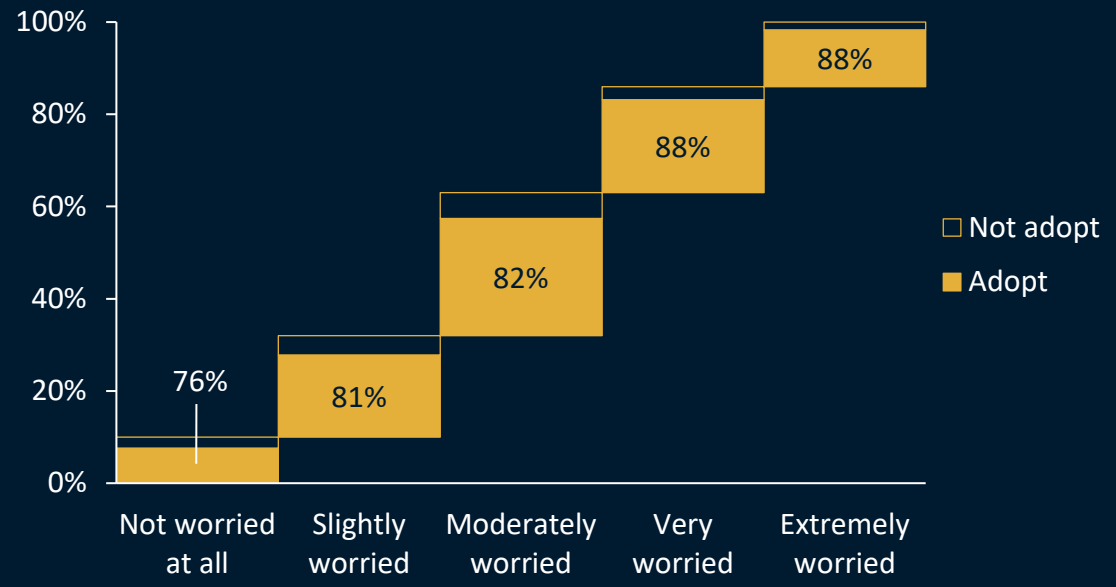
Those who were not at all worried about the environment reported the lowest electric oven adoption intentions

+ Business as usual (BAU) adoption intentions for electric ovens significantly varied as a function of worry about the environment.
  - 88% of respondents who were very worried about the environment reported the highest adoption intentions.
  - This was significantly greater than for respondents who were not at all worried about the environment (76%).

Note: The size of the groups holding each level of environmental worry can be found in Appendix 2.

Intended BAU adoption of an electric oven at varying levels of environmental worry

Each environmental worry level is represented proportional to its percentage share of the total sample



Technology: Electric oven (segmentation)

Demographic segmentation

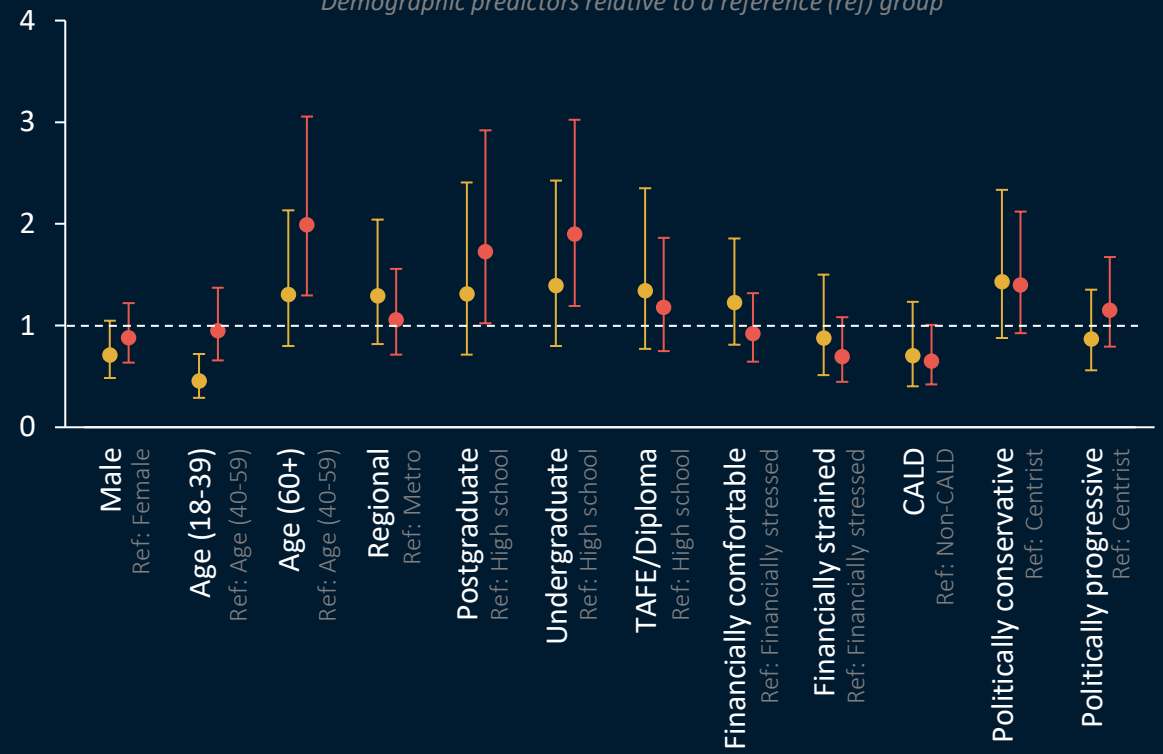
Adoption intentions tended to be stronger among older educated respondents

+ Relative to those aged 40-59 years:
  - Younger respondents (18-39) were 0.5x less likely to report current electric oven adoption.
  - Older respondents (60+) were 2.0x more likely to report intended electric oven adoption.
+ Relative to those with a high school education, those with a:
  - Postgraduate education were 1.7x more likely to report intended electric oven adoption.
  - Undergraduate education were 1.9x more likely to report intended electric oven adoption.
+ All other demographic predictors were not significant.

Demographic predictors of current and intended BAU adoption of an electric oven

Odds ratio; 95% confidence intervals

Demographic predictors relative to a reference (ref) group



Technology: Electric oven

Key takeaways

+ Electric ovens are already ubiquitous among those who regularly use an oven, with 82% of such respondents already having one. Indeed, in the business as usual (BAU) scenario, only an additional 1% reported intending to adopt an electric oven.
+ The policy scenarios had negligeable to modest influences on adoption intentions, with the greatest increase observed for Mandates (an additional 5% increase above BAU).
+ Although BAU adoption intentions were high across all adopter categories and levels of environmental concern, both psychographic segmentation variables were nevertheless positively associated with adoption intentions. That is, adoption intentions were higher among the earlier adopter categories and as environmental worry increased.
+ Older, more educated people were more likely to report BAU adoption intentions for electric ovens.

Appendices

1. Demographic profile of the study sample
   - Demographics are measures that can tell us about who people are and where they live.
2. Psychographic segmentation profiles
   - Psychographics are measures that distinguish between how people think, how they perceive things, and what they value.
   - The two key psychographics examined in this report are:
     - Adopter category
     - Environmental worry
3. Adoption rates by Distributed Network Service Provider
   - Adoption rates for:
     - CitiPower/Powercor residents
     - United Energy residents

Appendix 1: Demographic profile of the study sample

	n	%
Gender		
Male	562	45%
Female	684	55%
Age (years)		
18-39	423	34%
40-59	423	34%
60+	404	32%
Location		
Metro	957	77%
Regional	293	23%
Education		
Postgraduate	231	19%
Undergraduate	452	37%
TAFE/Diploma	310	25%
High school	245	20%

	n	%
Financial wellbeing		
Financially comfortable	572	46%
Financially stretched	463	38%
Financially stressed	199	16%
Culturally and linguistically diverse		
Yes	164	13%
No	1073	86%
Political identity		
Conservative	332	28%
Centrist	440	36%
Progressive	437	36%

n may not sum to 1,250 due to missing/other data
% may not sum to 100% due to rounding error

Appendix 2: Psychographic segmentation profiles

Adopter categories

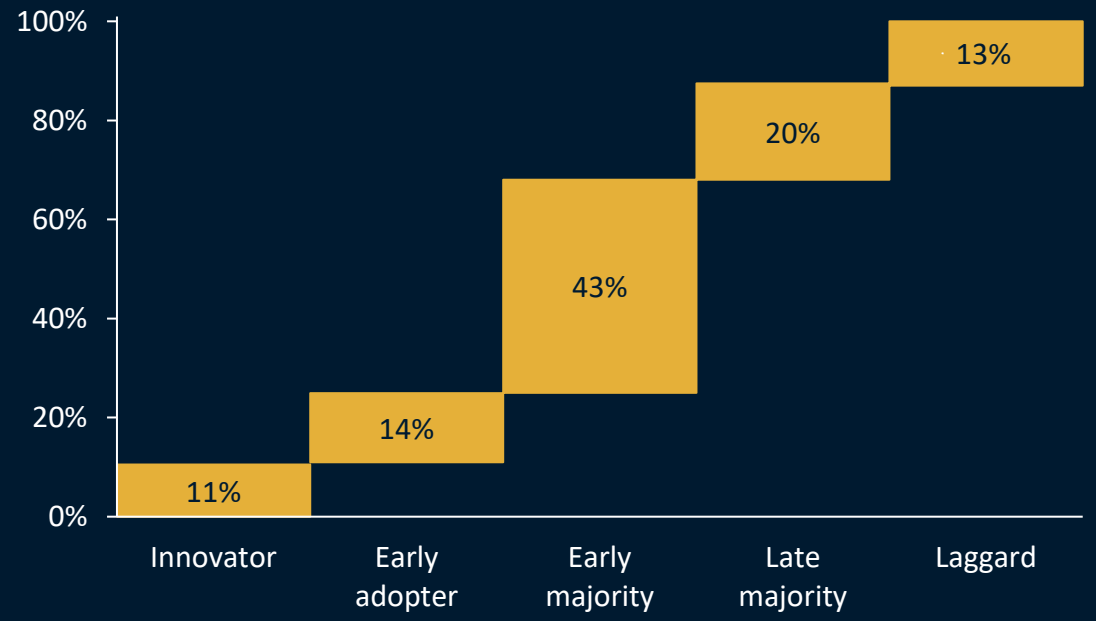
+ **Innovator:** First to adopt.
+ **Early adopter:** An adoption leader.
+ **Early majority:** Want to hear others' experiences first before adopting.
+ **Late majority:** Only adopt once others they trust have done so.
+ **Laggard:** Don't see much need in adopting.

Self-identified adopter category

+ Adopter categories, first advanced by Rogers (1962), group consumers according to how soon they adopt an innovation relative to the rest of the community.
+ Self-identified adopter category – and more specifically, the likelihood of adopting low emission technologies – was assessed to capture respondents' general, prospective likelihood of adopting new technologies of the type needed to reduce CO_2 emissions.
+ The largest adopter categories were the early majority (43%) and late majority (20%), with increasingly fewer respondents self-identifying as early adopters (14%), laggards (13%), or innovators (11%).

Proportion of respondents self-identifying in each adopter category

Total percentage exceeds 100% due to rounding error

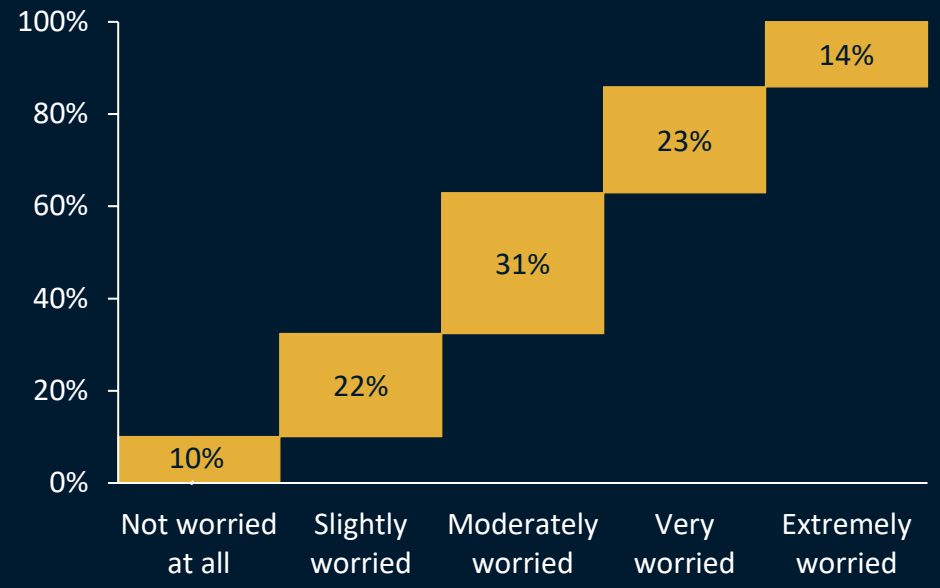


Appendix 2: Psychographic segmentation profiles

Self-identified environmental worry

- Environmental worry captures the degree to which participants are concerned about the state of the environment.
- On average, respondents were moderately worried about the environment.
- The largest grouping were those who reported being moderately worried about the environment (31%), followed by those who reported being very worried (23%). By contrast, the smallest groupings were those who reported being extremely worried (14%) and not worried at all (10%).

Proportion of respondents at each level of environmental worry



Appendix 3: Adoption rates by Distributed Network Service Provider

Explanatory notes

+ DNSP regions were determined using postcodes, and some postcodes may span multiple DNSP regions.
+ Two forms of current adoption are reported:
  - *Only adoption* refers to whether respondents only use/own electric technology within the broader product category. For example: current owned vehicle(s) are exclusively EV(s).
  - *Any adoption* refers to whether respondents use/own any form of electric technology within the broader product category. For example: current owned vehicle(s) include an EV.
+ Intended BAU adoption refers to the technology that respondents would purchase if they were going to buy or replace a technology within the product category in the next 5 years.
+ For all technologies (except battery and EV charger), reported adoption rates do not include respondents who have not adopted the category (for example, do not own a car) so that the relative adoption of focal electric technology vs. non-focal technology can be better evaluated.
+ The list of technologies that comprise focal electric technologies vs. non-focal technologies can be found in the body of the report.

Appendix 3: Adoption rates by Distributed Network Service Provider

CitiPower/Powercor

	Current adoption (only)	Current adoption (any)	Intended BAU adoption
New technologies			
EV	3%	8%	22%
Home EV charger	25%	-	48%
Battery	20%	-	57%
Familiar technologies			
Electric space heating	35%	60%	72%
Electric water heating	29%	39%	64%
Electric cooktop	28%	39%	68%
Electric oven	75%	81%	82%

Appendix 3: Adoption rates by Distributed Network Service Provider

United Energy

	Current adoption (only)	Current adoption (any)	Intended BAU adoption
New technologies			
EV	1%	3%	23%
Home EV charger	11%	-	38%
Battery	8%	-	40%
Familiar technologies			
Electric space heating	38%	54%	71%
Electric water heating	24%	29%	61%
Electric cooktop	18%	21%	64%
Electric oven	81%	87%	83%

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