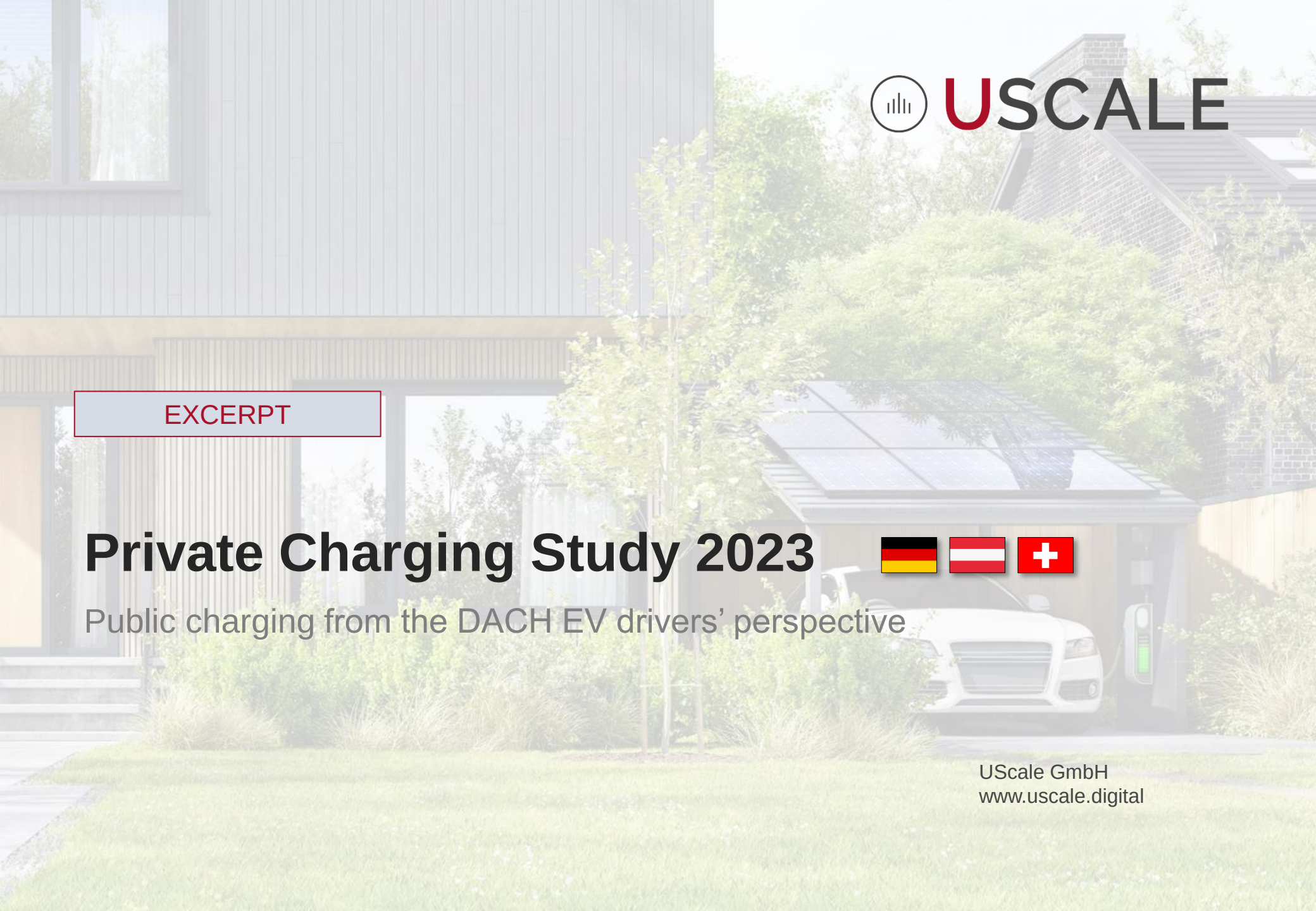


USCALE

EXCERPT

Private Charging Study 2023

Public charging from the DACH EV drivers' perspective

UScale GmbH
www.uscale.digital

Initial situation

eMobility offers enormous opportunities for established and new market participants. For private charging, there is a lot of potential for vendors to offer new products and services beyond a wall charger.

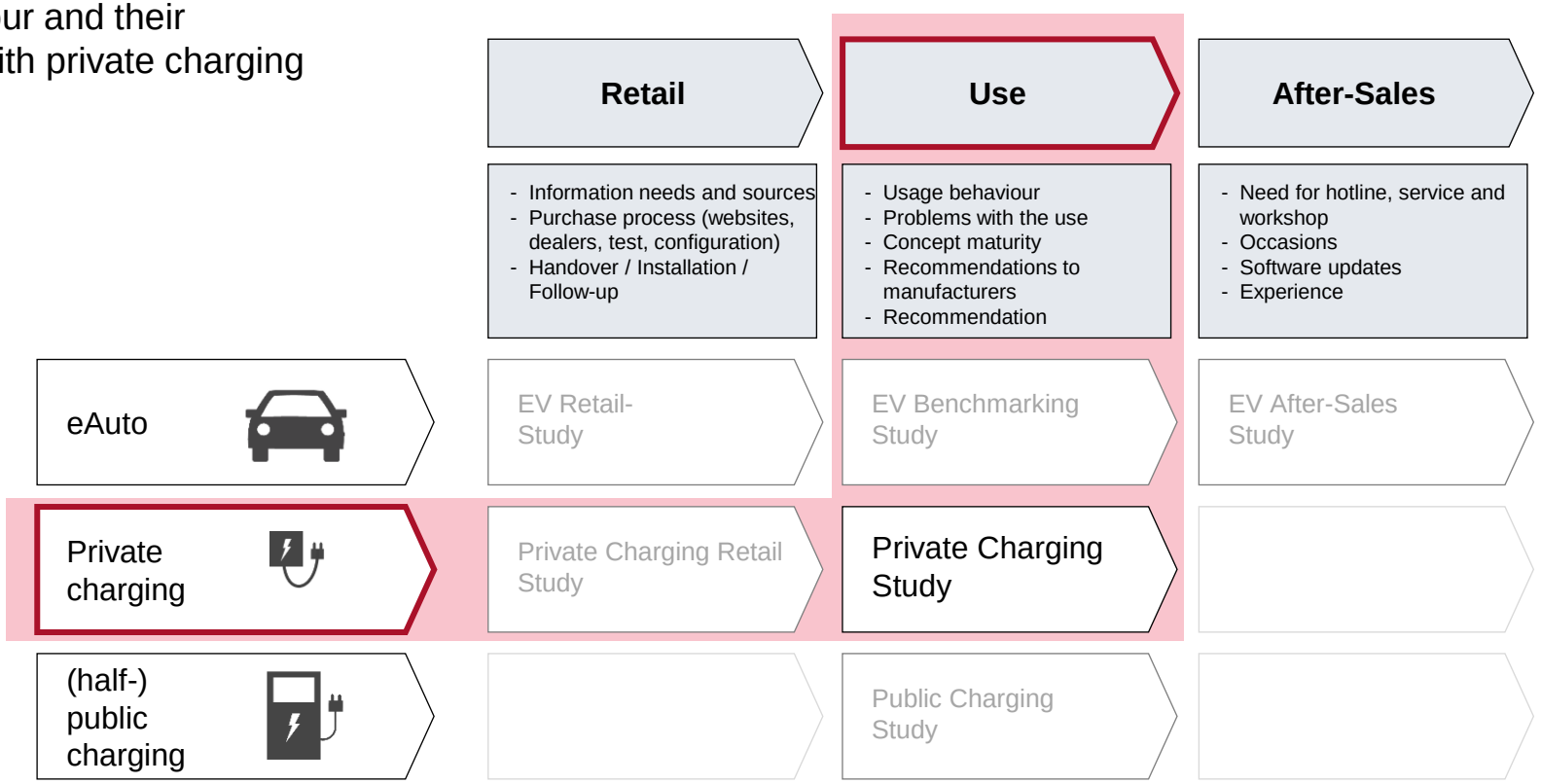
On the part of the users, there is also a great interest in PV surplus charging, which makes the challenges related to the selection of the appropriate charging solution at home even more difficult.

Vendors who best understand the expectations, wishes and pain points of EV drivers and offer convincing solutions will benefit most from the ramp-up of e-mobility.

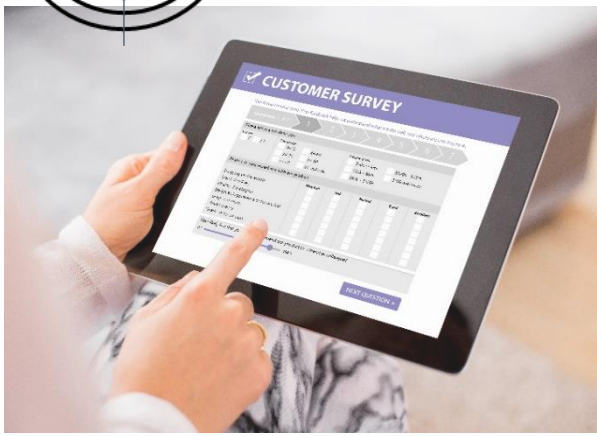
Private Charging Study 2023

Survey structure

The study asks EV drivers about their usage behaviour and their experiences with private charging infrastructure.



Target group



Survey:

- Target group: Electric car drivers (BEV only)
- Sampling: online
- Markets: DACH
- Recruitment: Social Media, Access Panel*
- Survey: together with Public Charging Study
- Interview duration: 15 - 20 min
- Field phase: May - July 2023

Sample:

- Total sample: N = 3,075 (chapter 2)
- Thereof:
  Sample for Private Charging: N = 1,544 (chapter 3)

* Unless otherwise mentioned, data from the social media and the access panel survey is shown in all charts.

If there are significant differences between recruitment via social media and the access panels, the charts only show the results from the access panel survey to ensure full comparability with the data from other EU countries.

Added value of the study

Time

Comprehensive, quantitative and qualitative customer input saves time in the development of new products and services.

Market share

Despite the current boom, the market for private charging infrastructure is under considerable pressure. With the right offers, vendors can score points against the consolidation pressure and gain market share.

Costs

Product concepts are blocked and fixed for the long term. Working with the *right* concepts at an early stage saves considerable costs by avoiding bad investments.

Diffusion

Manufacturers who meet or exceed customer expectations for charging infrastructure support the successful ramp-up of eMobility.

Working with the study

Manufacturers and resellers of charging infrastructure

The study shows developers, manufacturers and sales partners of private charging technology how home chargers use their private infrastructure and what their experiences are.

The data show vendors...

- which charging habits products, concepts and services must be designed for,
- which features home charger use and how, and which features they would like to see, and
- which problems need to be solved in a prioritised manner.

Neighbourhood and project developers, energy suppliers

The wishes and experiences of current users show neighbourhood developers and energy vendors which services need to be developed and installed with particular urgency.

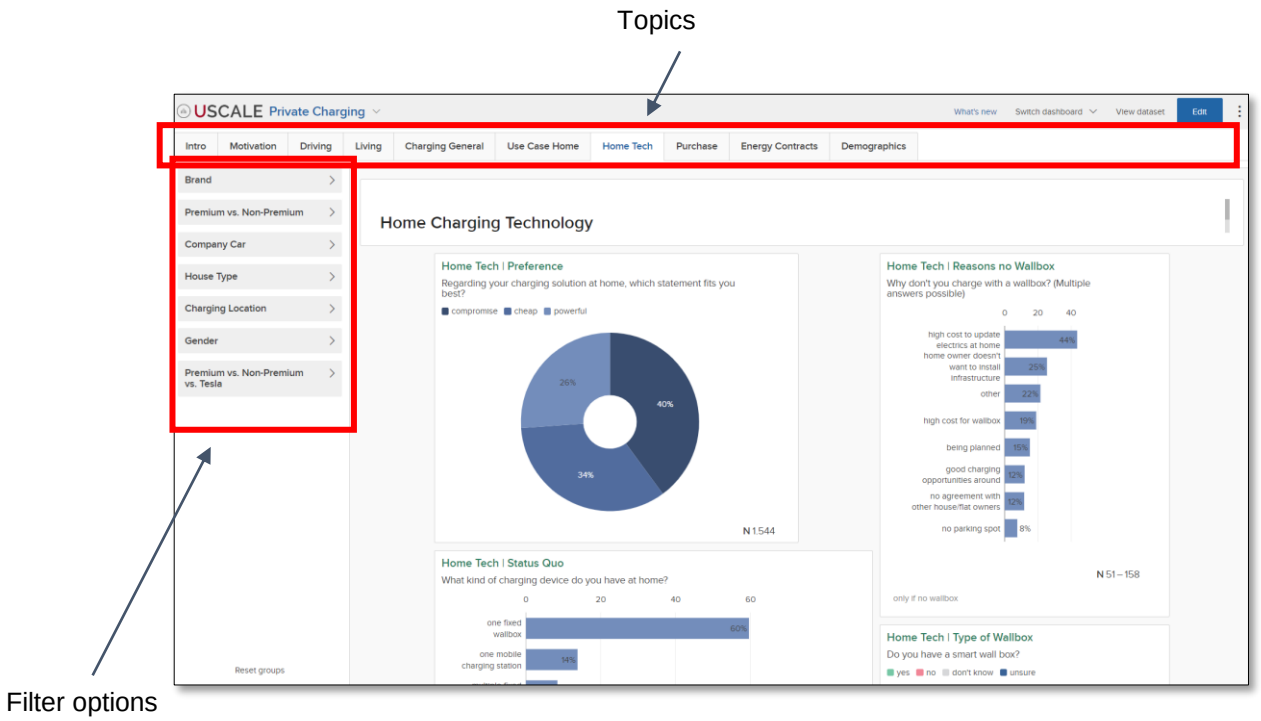
Dashboard for own analysis

Deep dives on individual brands, models and subgroups.

This document shows only selected splits.

In the associated dashboard, further splits between different customer groups can be carried out.

To register, please contact kontakt@uscale.digital.



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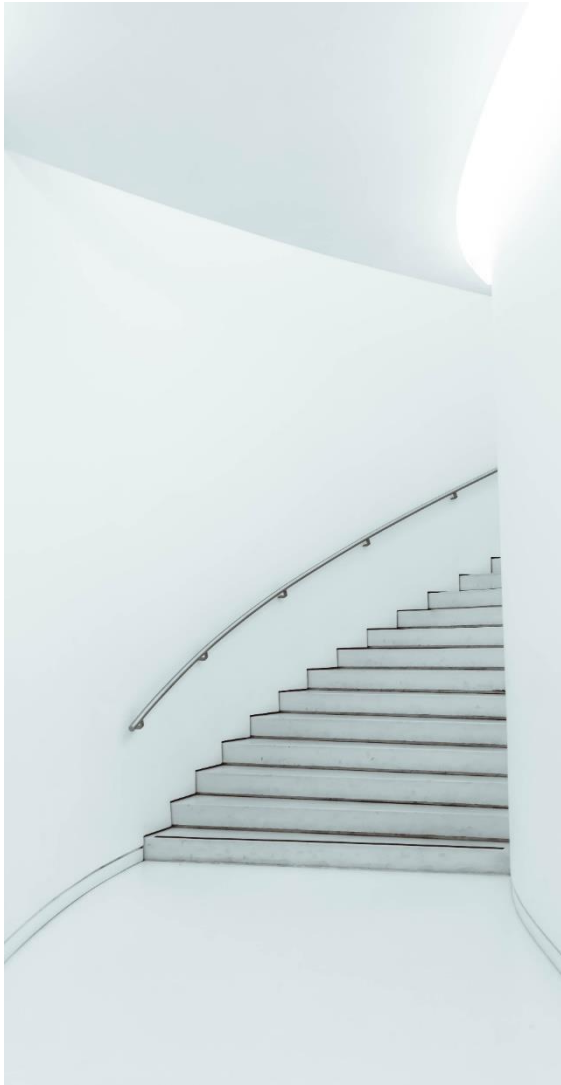


Living

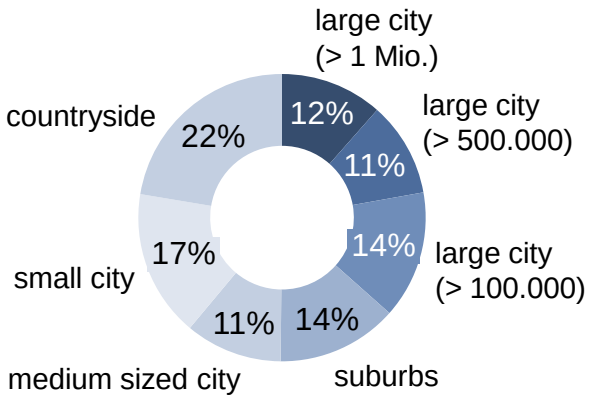
Residence

"Where do you live?"

Similar distribution between urban and rural areas.

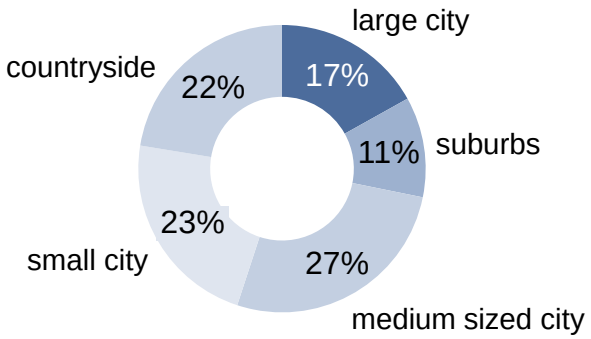
The respondents live in larger cities and small towns, or in the countryside, in roughly equal numbers.

The survey worked with access panels, i.e. the distribution by place of residence is not representative for the total market of EV drivers.



N = 3,075

Internal combustion engine drivers for comparison*:



* Data collected in 2022 in a German study among combustion car drivers (N = 400).

Living

Housing situation

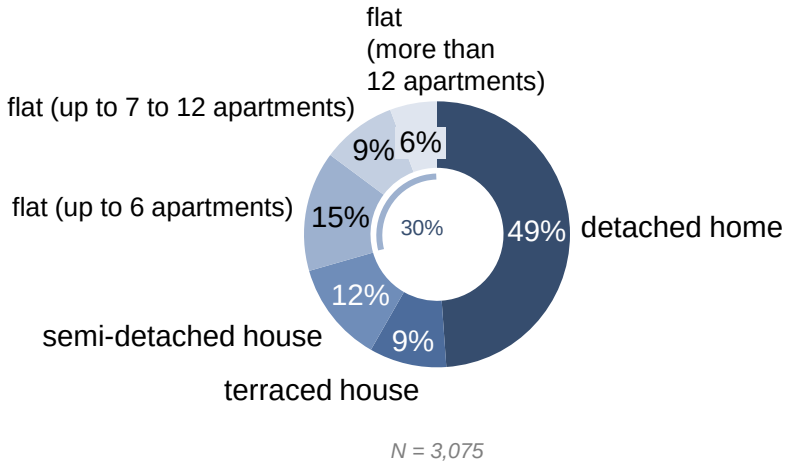
EV driver's end often in the family home.

The majority of the EV drivers surveyed lives in single-family homes.

In the study, the six types of housing are grouped into two clusters below:

SFH = Single-Family Home = detached house, semi-detached house, terraced house
AB = Apartment Building = apartment buildings of all sizes

"What kind of house do you live in?"



N = 3,075

Living

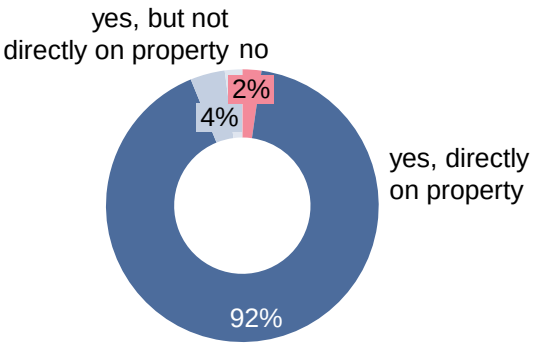
Parking situation

Large majority with own parking space.

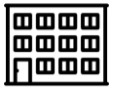
Only 2% of EV drivers in the single-family houses do not have their own parking space.

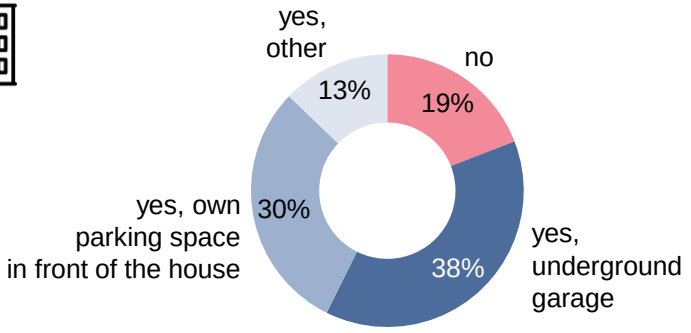
Among EV drivers in an apartment house, around one in five does not have a parking space at home.

"Do you have your own parking space at home?"



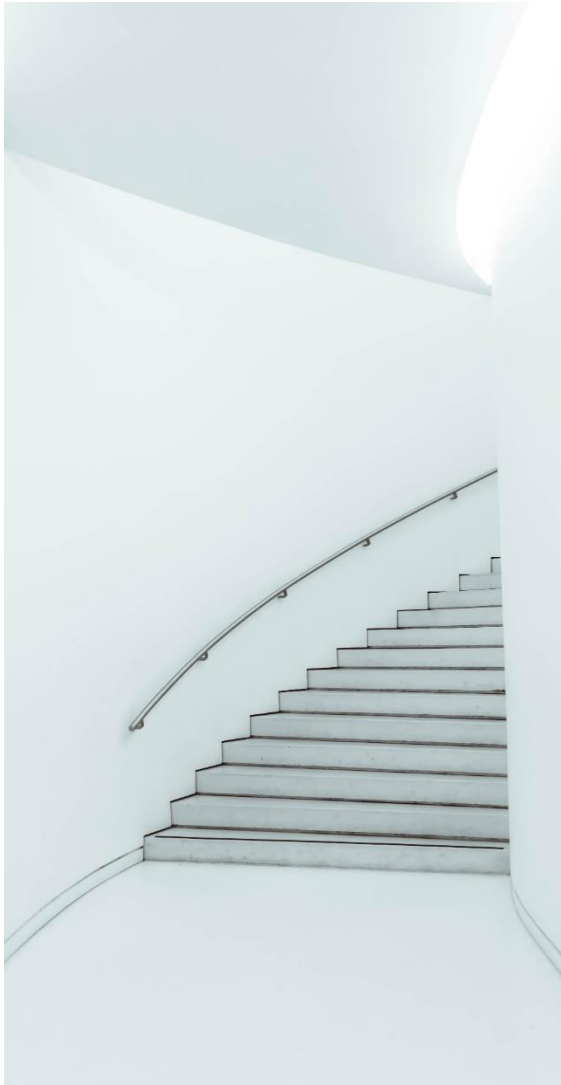
N = 2.170





N = 905

Content



Charging locations

The importance of almost all charging offers is increasing.

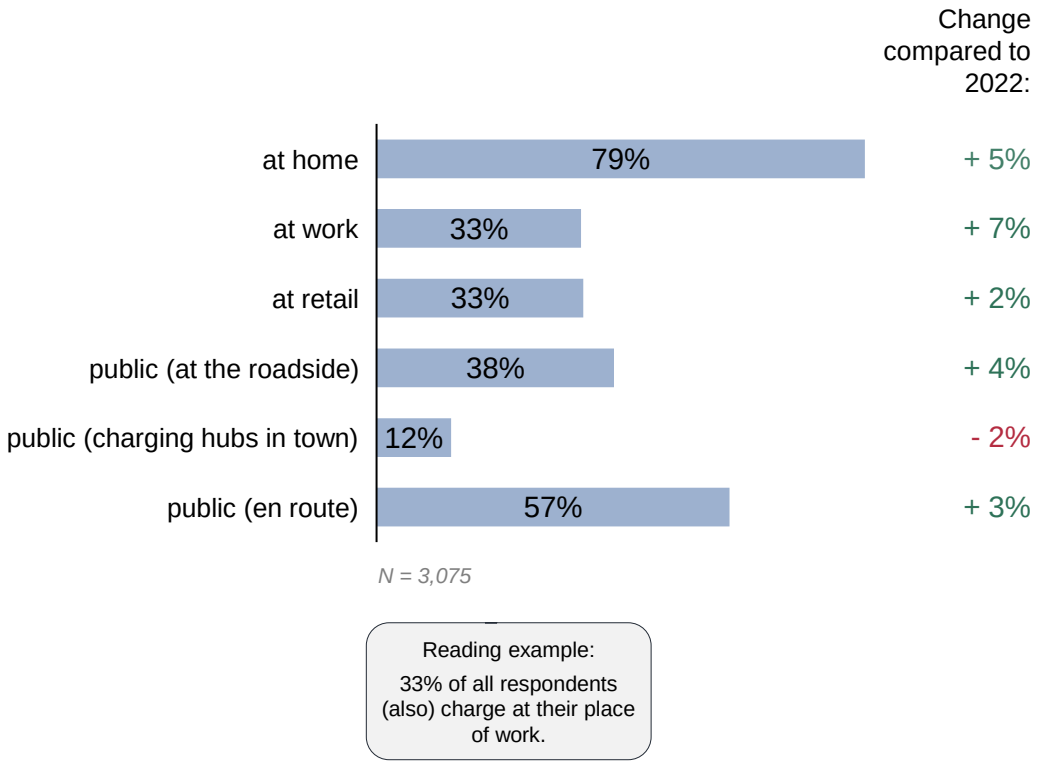
A good three quarters of respondents can charge at home and a third have a charging option at their employer.

If the data is analysed according to EV drivers who only use one charging option, the following data is obtained:

- 14% charge exclusively at home.
- 1.4% charge exclusively at the employer.
- 13% charge exclusively at public.
- 1.1% charges exclusively at public fast chargers.

21% never charge at public.

"Where do you charge your [brand]?"
(Multiple answers possible)



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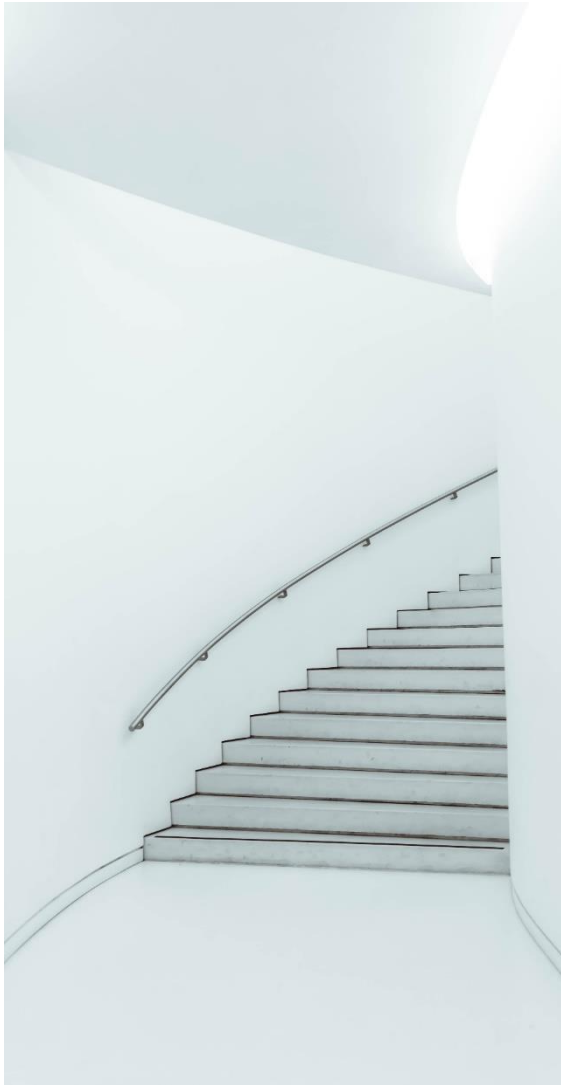


Preface

In UScale's multi-market studies on private charging, the purchase process is surveyed in an abbreviated form.

An extensive survey and detailed description of the purchasing process for private charging technology can be found in the Private Charging Retail Study.

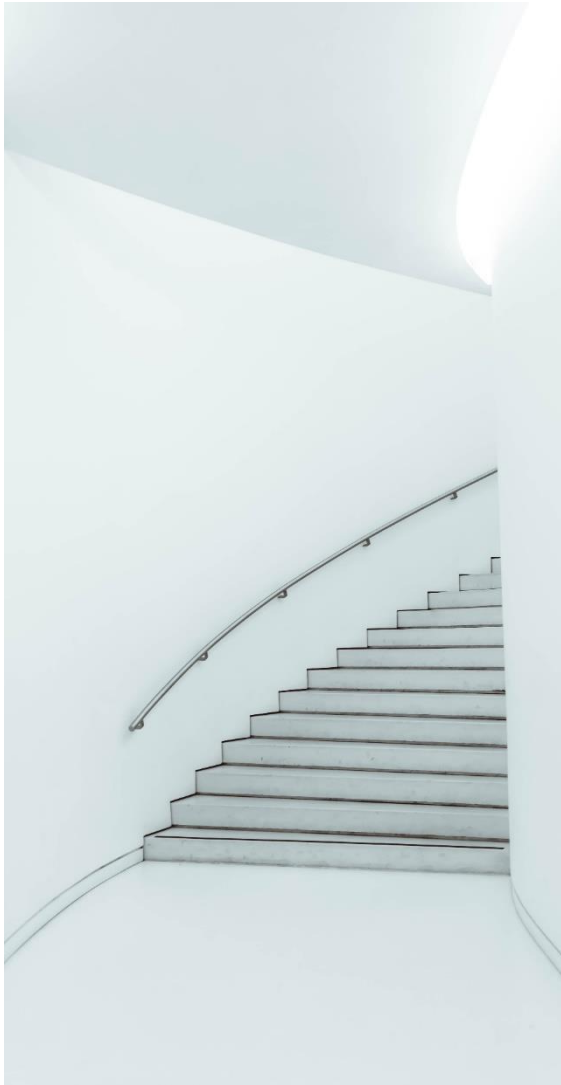
Cover of the Private Charging Retail Study

Purchase process for home charging technology

Places of purchase

"Where did you buy your wall charger?"

Content



Preface

What kind of infrastructure do the early adopters use? What do they recommend to the early majority?

We are all different. Not every EV driver wants the same or everything that is technically possible.

Questions for vendors:

- Which features are particularly relevant for buyers of private charging infrastructure?
- What are the pain points of those who shop for a home charging solution? What are the reasons for low willingness to recommend?

Private charging technology

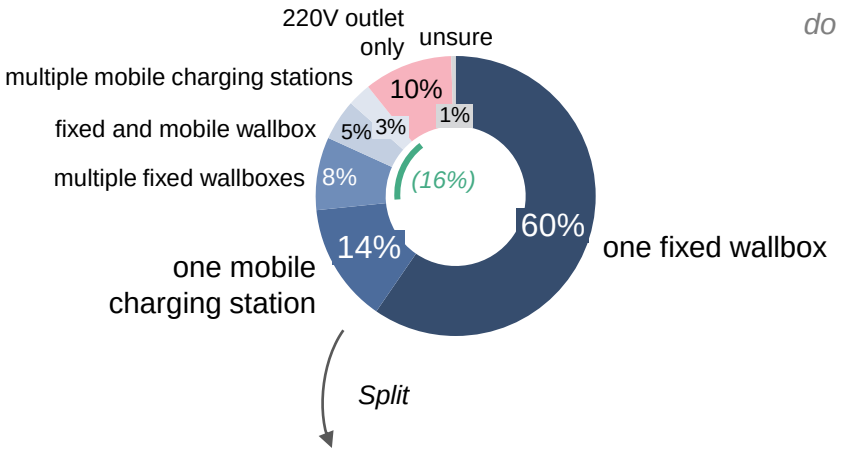
Wall charger at home

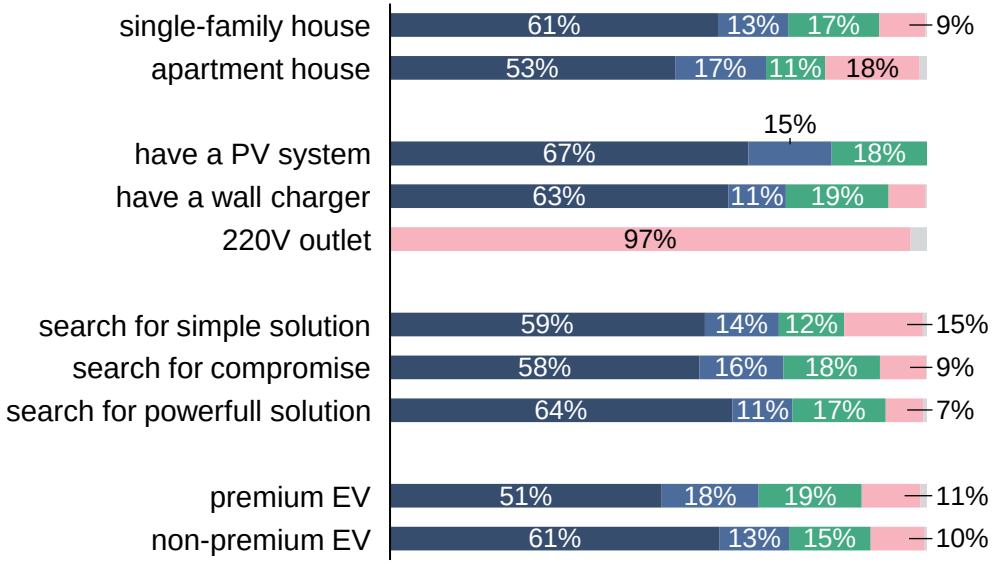
Vast majority with wall charger.

At 89%, the vast majority charges their EV with a wall charger. 16% even own several wall chargers. One in ten uses a 220V outlet.

Premium drivers are more likely to have one or more mobile wall chargers. Apartment building residents more frequently directly charge at a 220V power outlet.

"What kind of charger do you have at home?"

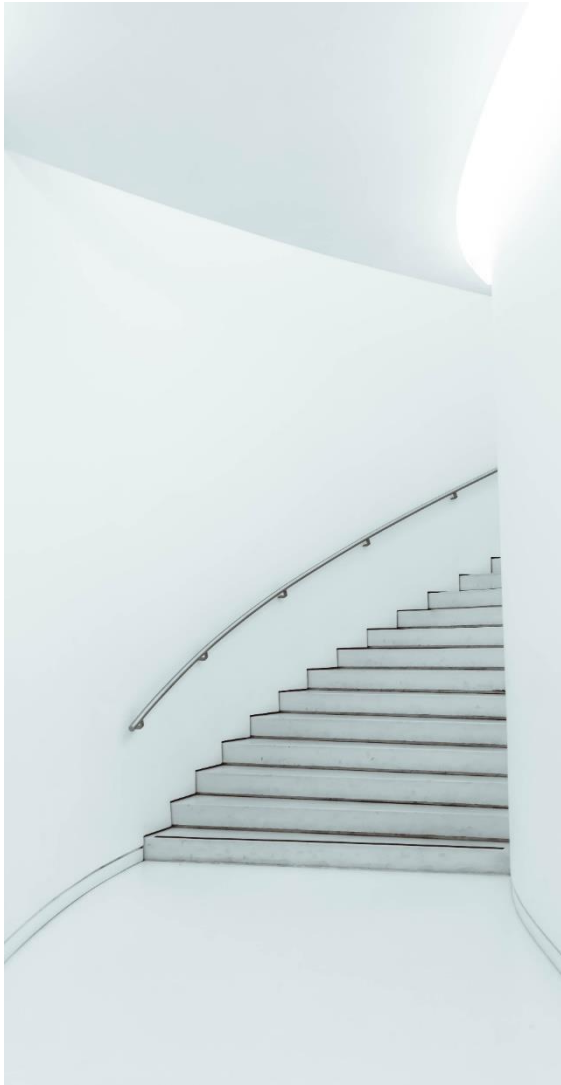




(Sum of several wall chargers)

N = 1,544

Content



User Story Charging at home

Relevance of charging locations (for comparison)

Home is the most common central charging location.

respective charging location = used:

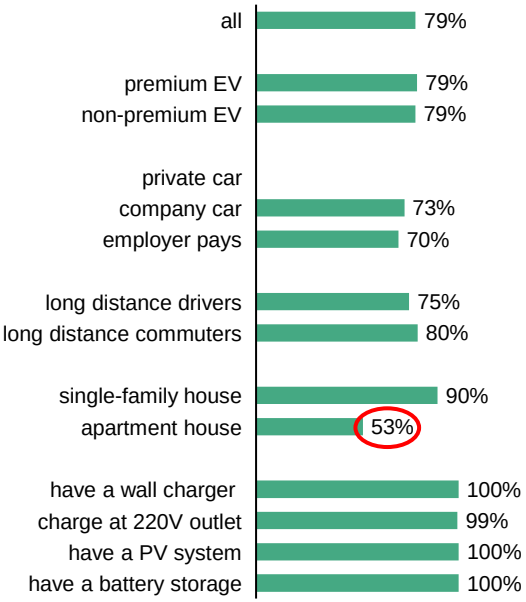
"What role do charging locations play in your charging behaviour?"

User Story Charging at home

Use-Case Charging at home (driving, living, charging technology)

Similar ratings from all subgroups, but: Charging at home less relevant for company car owners and flat dwellers.

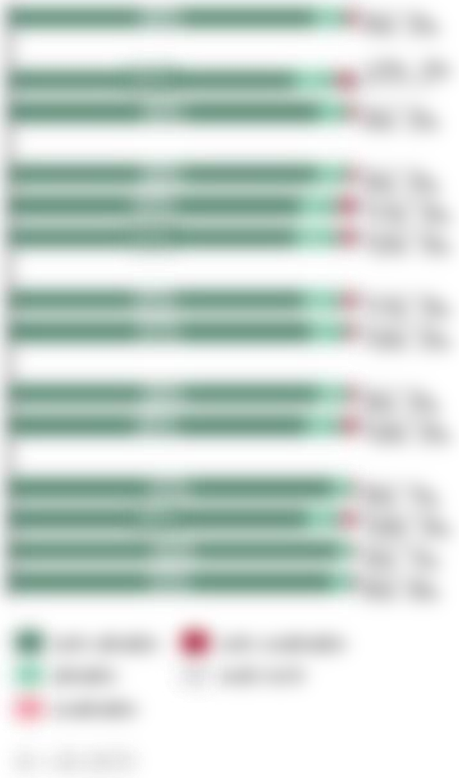
Used*



N = 83-3075

% Charging*

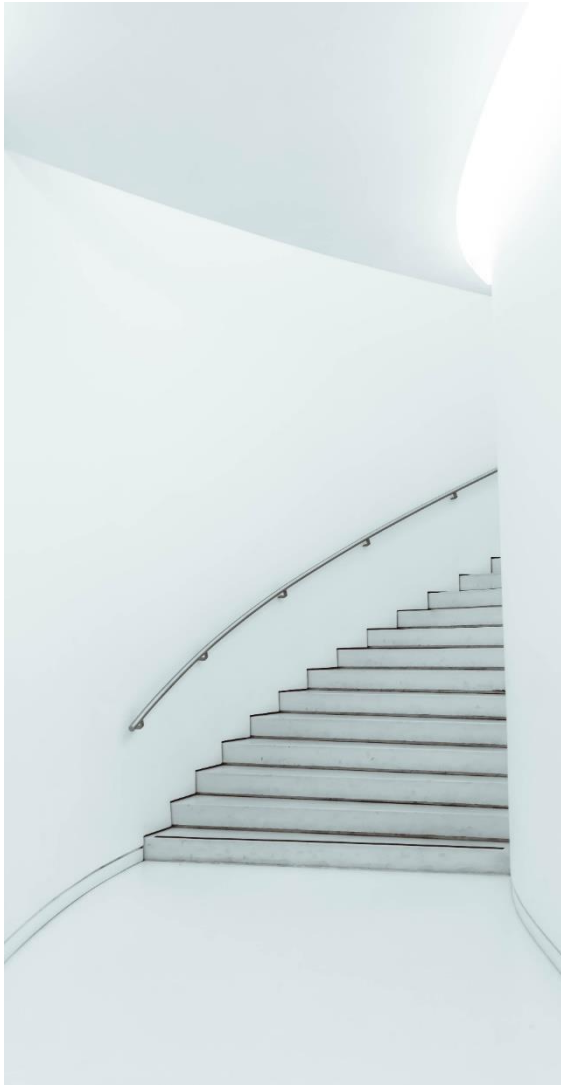
Attractiveness



Relevance

* Proportion of respondents who use the charging location
** Proportion of the electricity that is charged at this type of charging point.

Content



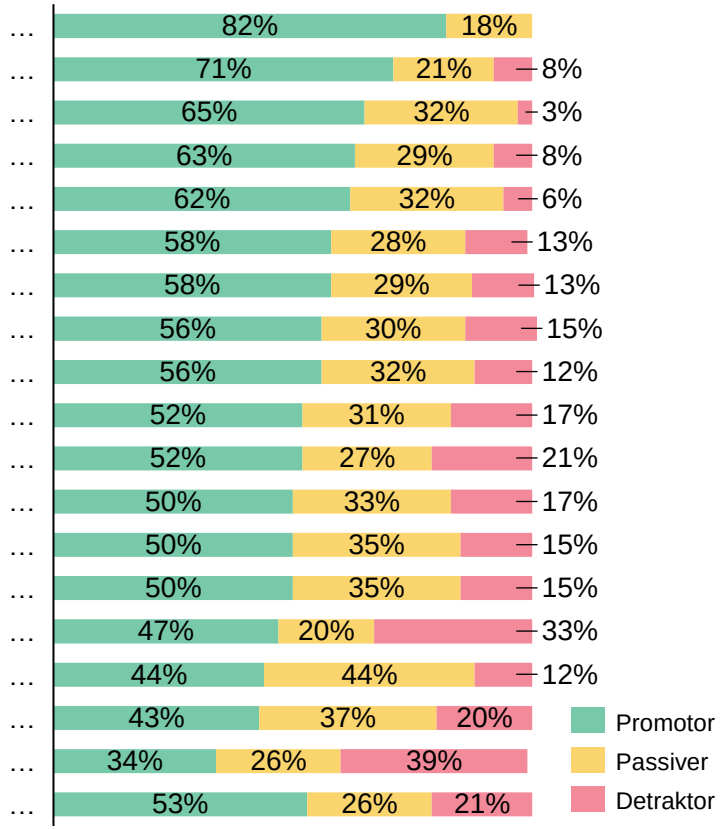
Problems and satisfaction

Net Promotor Score (NPS)

Clear differences between manufacturers.

Charging technology = wall charger:

"In summary: How likely are you to recommend your home charging solution to a friend or colleague?"



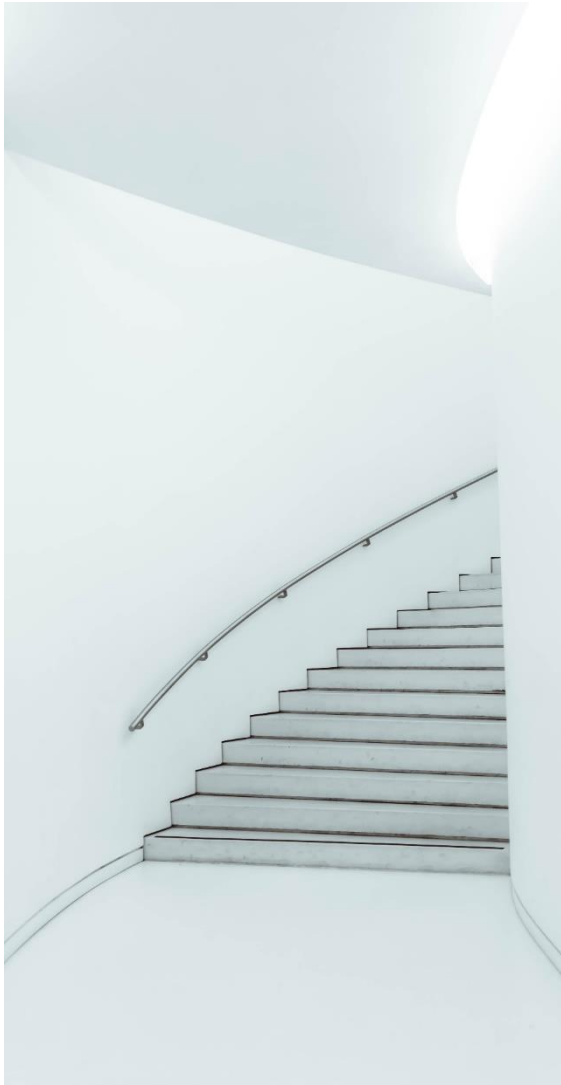
N = 20-134

Problems and satisfaction

Net Promotor Score (NPS)

"What is the main reason you would not clearly recommend your charging solution to others?"

Content



Preface

In UScale's multi-market studies on private charging, V2H is asked for as an important use case for smart charging.

Other smart charging use cases, such as variable tariffs, V2G, etc., are surveyed in detail in the smart charging study and presented including a target group analysis.

Cover picture of the Smart Charging study

Preface: Determination of net value added

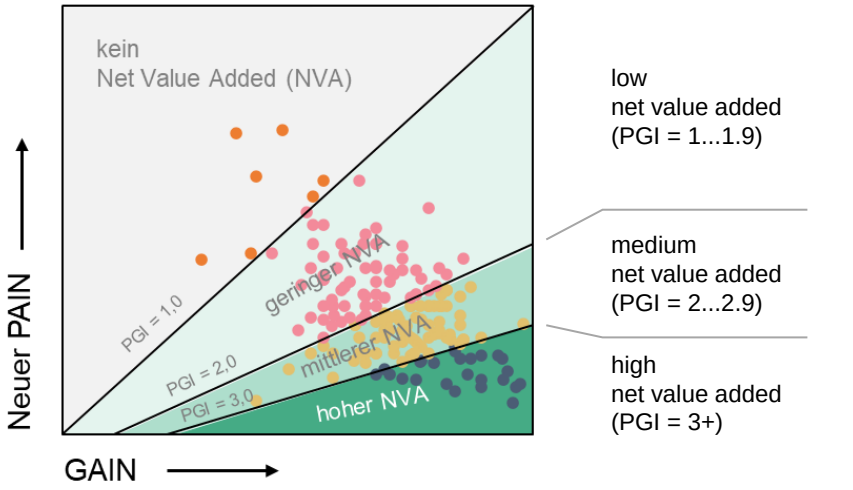
Determining the net value added for innovative services with the Pain-Gain test approach*

Every innovative service brings not only advantages, but also disadvantages for the users. These can be perceived expenses from the changeover to a new solution or concerns that have to be overcome.

The net value added of a service results from the ratio of advantages to disadvantages.

Step 1:
Evaluate advantages (gains) and new disadvantages (pains)

Step 2:
Determine net value added



* PGI = Pain-Gain-Index = Gain value / pain value

Bidirectional charging

Preface: Determination of product-market fit

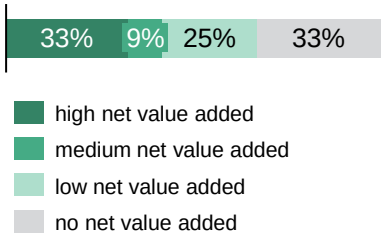
3-step procedure:

1 Net Value Added*

Question:

"In summary, how highly do you personally rate the advantages / disadvantages of the service presented?"

Result:

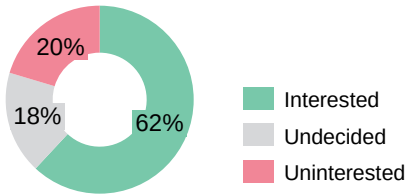


2 General Interest

Question:

"What do you think? Would using the service presented be an option for you personally?“

Result:

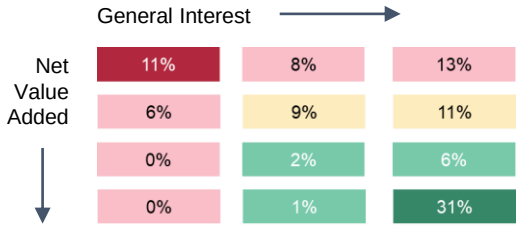


3 Product-Market Fit

Calculation:

Correlation of Net Value Added and general Interest

Result: Reachable target groups

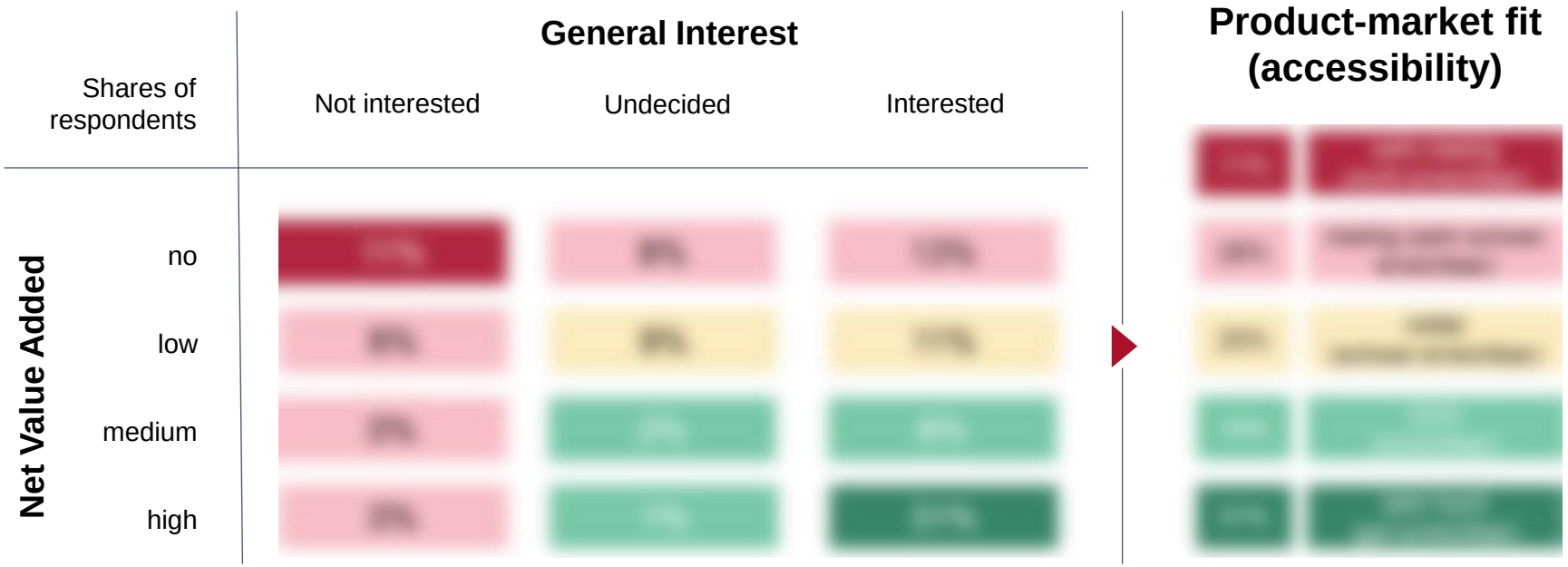


* According to PGI (Pain-Gain-Index calculated from the ratio of advantages to disadvantages according to the pain-gain method.)

Bidirectional charging

Product-Market Fit

31% of all EV drivers are easily accessible for V2H.



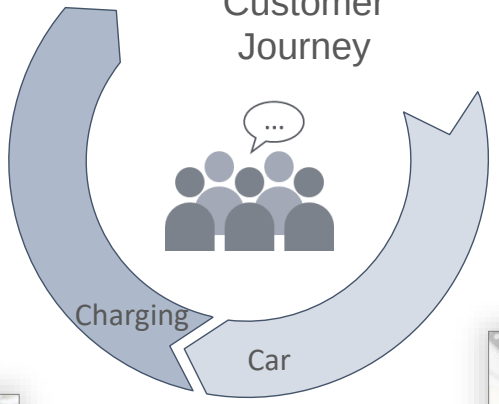
About UScale

- UScale advises automobile manufacturers, energy suppliers and service providers on the customer-orientated design of offers and the development of KPI systems for customer perception.
- UScale's work is based on a development framework for product-market fit for digital and innovative products and customer insights studies on all touchpoints of the e-mobile customer journey.

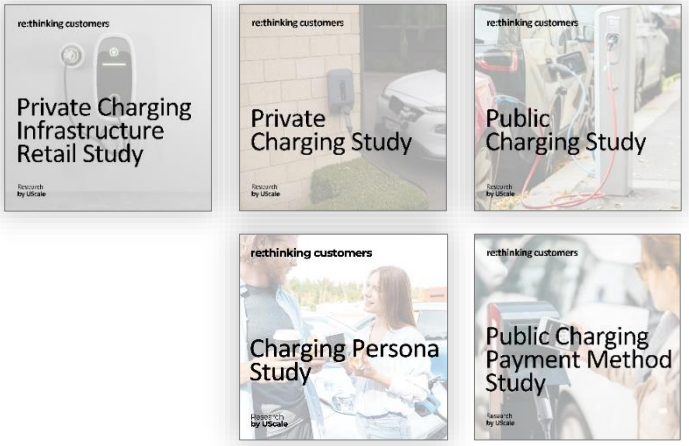
- UScale is the only provider of a panel specialising in eMobility with over 9,000 panellists in German-speaking countries.
- UScale makes the customer perspective tangible for managers, engineers and IT experts.
- UScale has extensive industry knowledge of the eMobility ecosystem.
- UScale combines extensive experience with the challenges of corporates with the agility of a start-up.

UScale focus studies

Business models



charging



Buying and driving

USCALE

SCALE YOUR USER
SCALE YOUR BUSINESS

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