



The 27th INTERNATIONAL
ELECTRIC VEHICLE
SYMPOSIUM & EXHIBITION.

Barcelona, Spain
17th-20th November 2013

Home charging of electric vehicles in Belgium

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KU Leuven & Vrije Universiteit Brussel

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- Flemish government
→ 5 living labs

1. Installation & monitoring of public charging network
2. Electric freight and public transport
3. Networked mobility (car sharing, e-bikes...)
4. Integration of electric vehicles in company fleets & local micro grids
5. Search for solutions that could expedite the breakthrough of EV's

Living labs in Flanders



Vlaamse Proeftuin
Elektrische
Voertuigen



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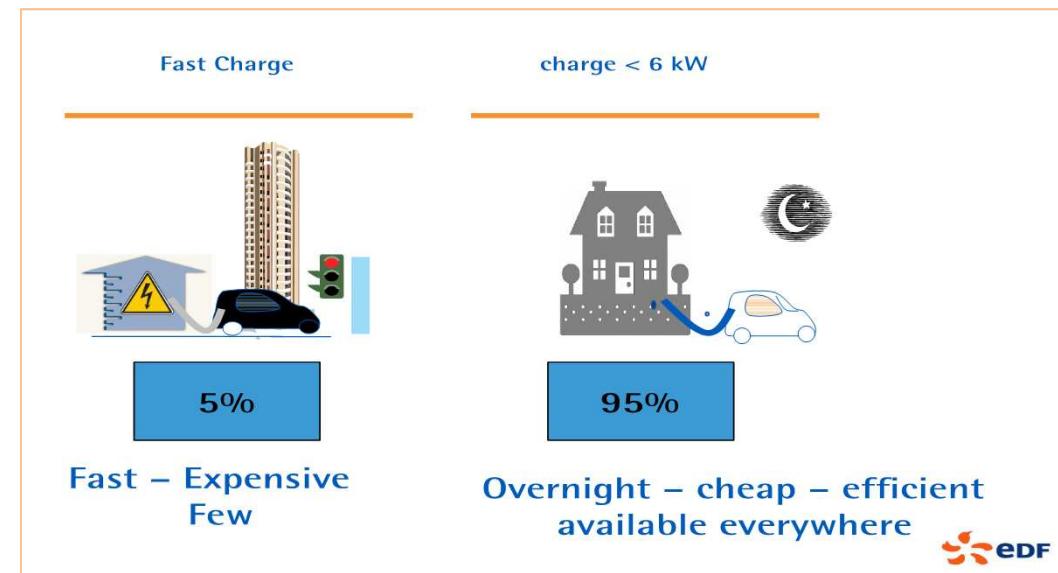
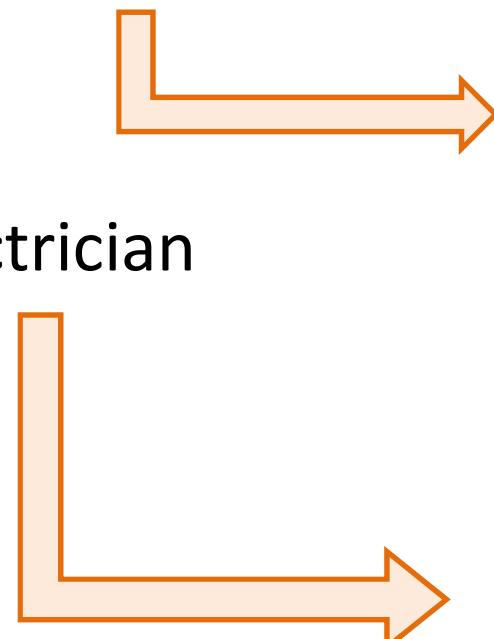


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- Out of scope of Flemish living labs
 - Home charging
 - Electrician



First point of contact for general public

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- Education of electricians on home charging
- Strategy determined by stakeholders

— Government



— Distribution network operators



— Manufacturers



— Electric control bodies



— Electricians



— Other



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- Workshops
 - Existing plug types & charging modes
 - Mode 3 charging protocol
 - Overview of available home charging stations
 - Self-assembly of home charging station
- 1 → — Average domestic electrical installation in Flanders
- 2 → — Charging problems on Belgian grid
- 3 → — Type B RCD ⇔ Belgian law

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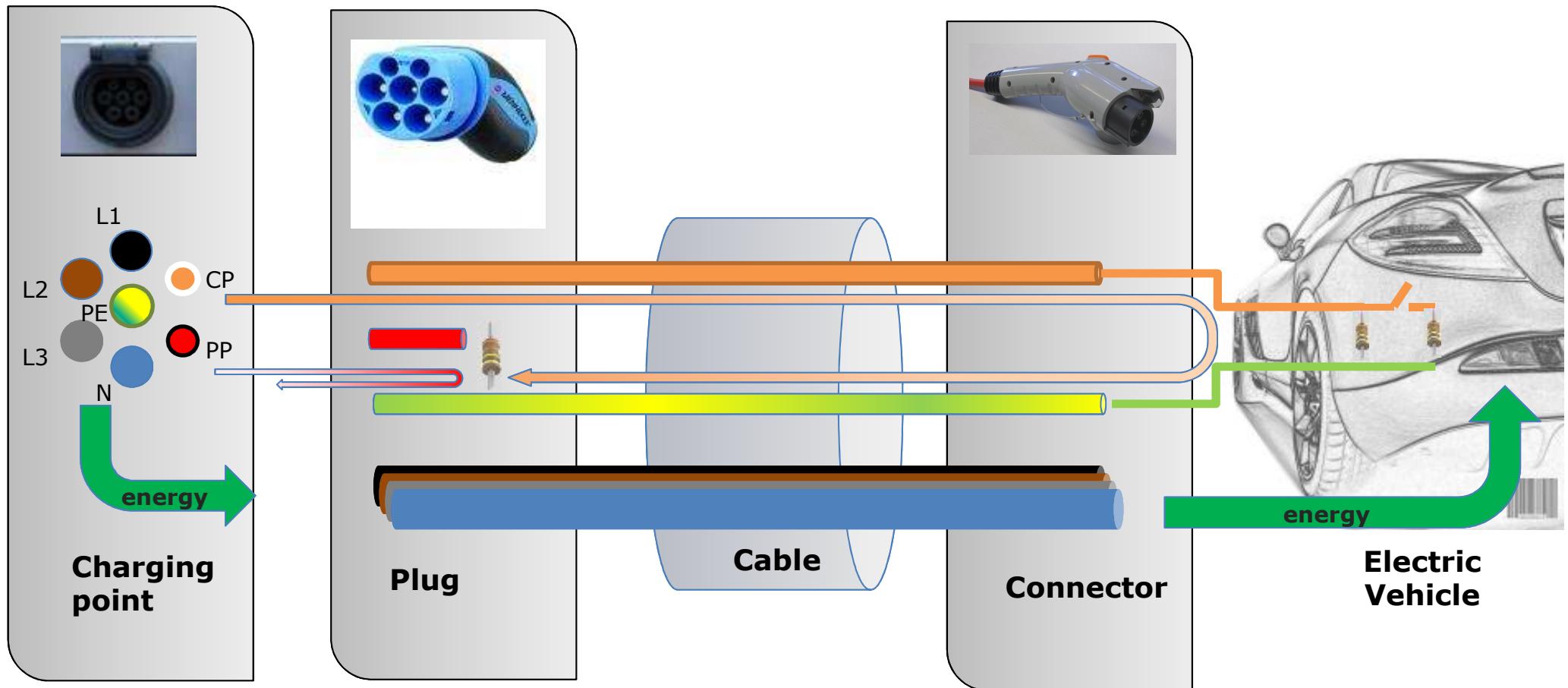


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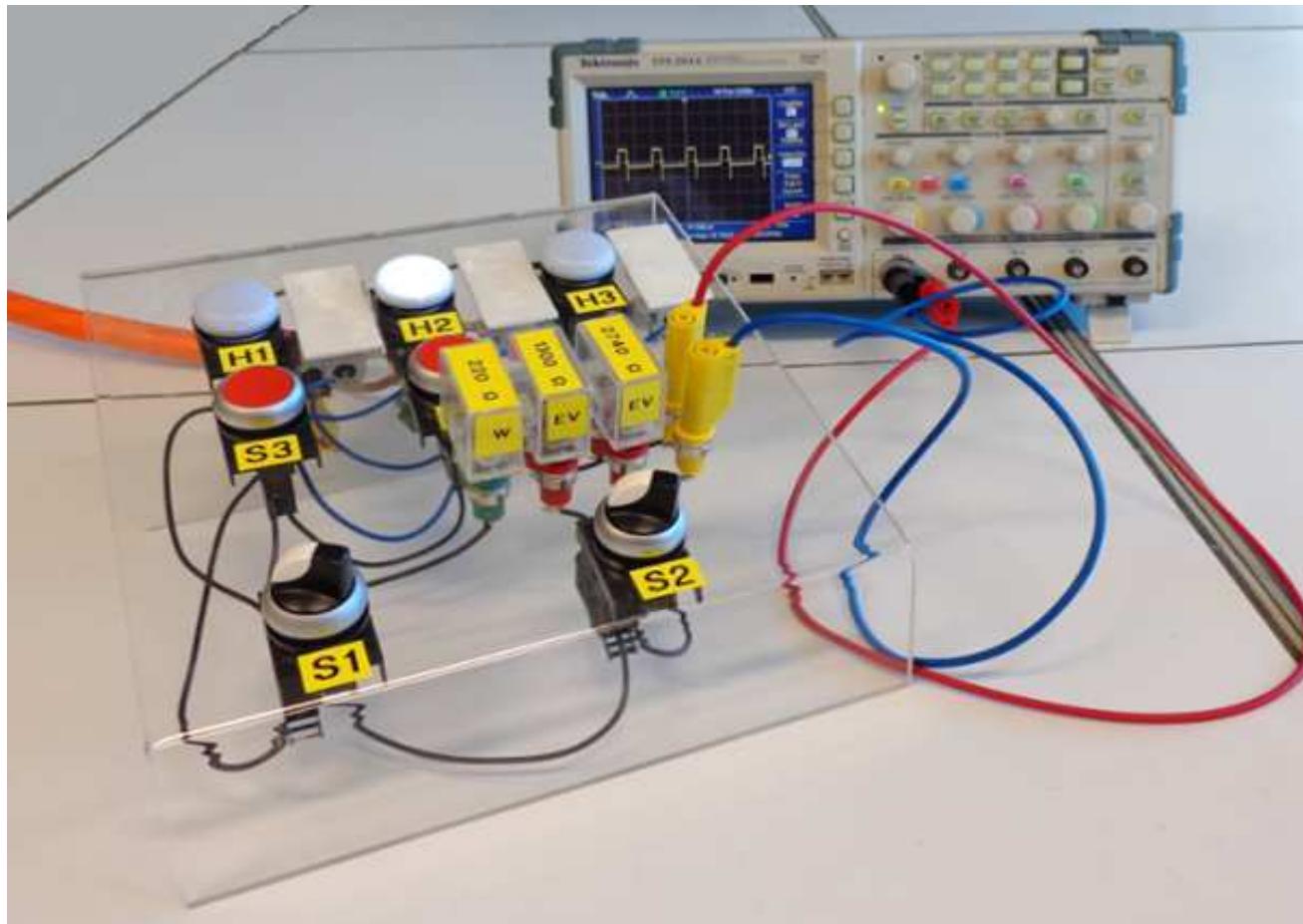


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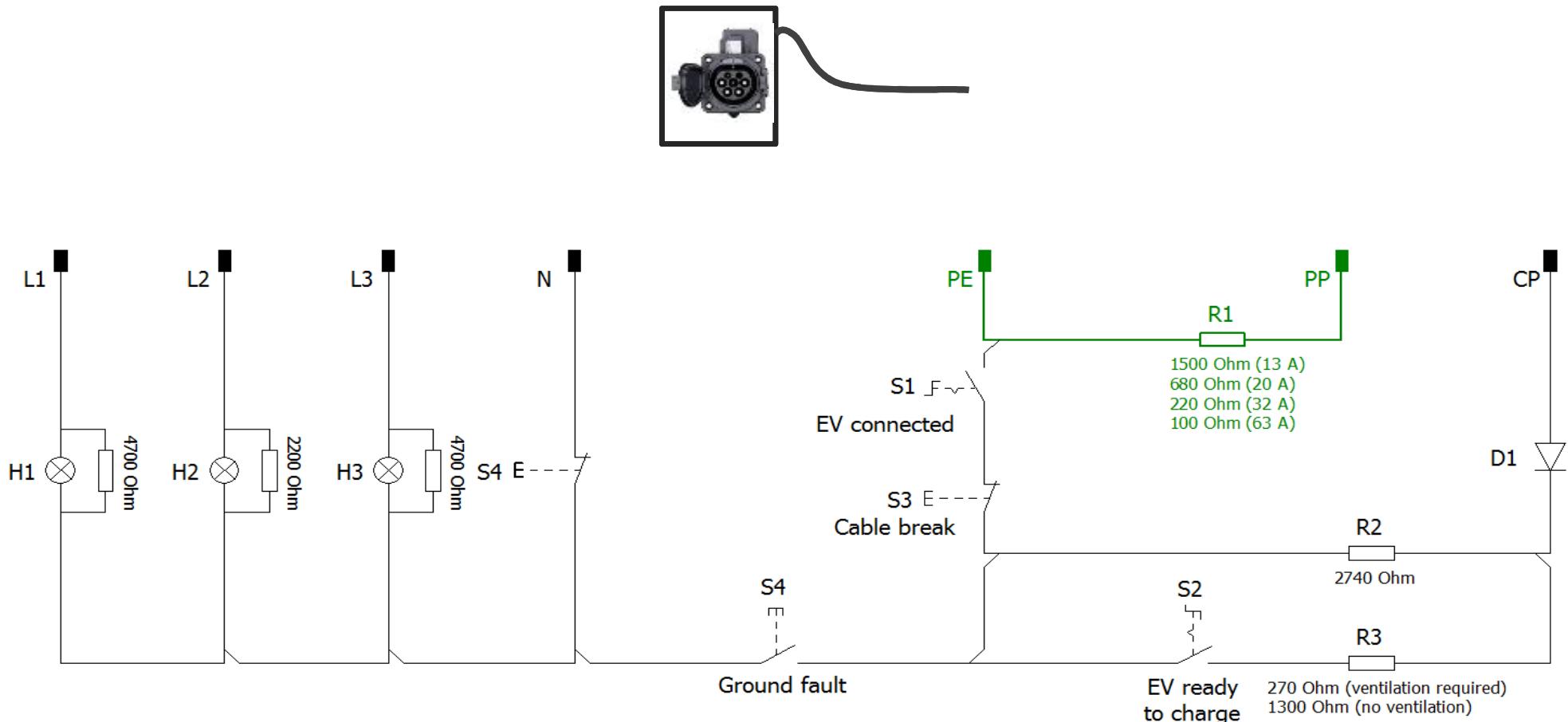


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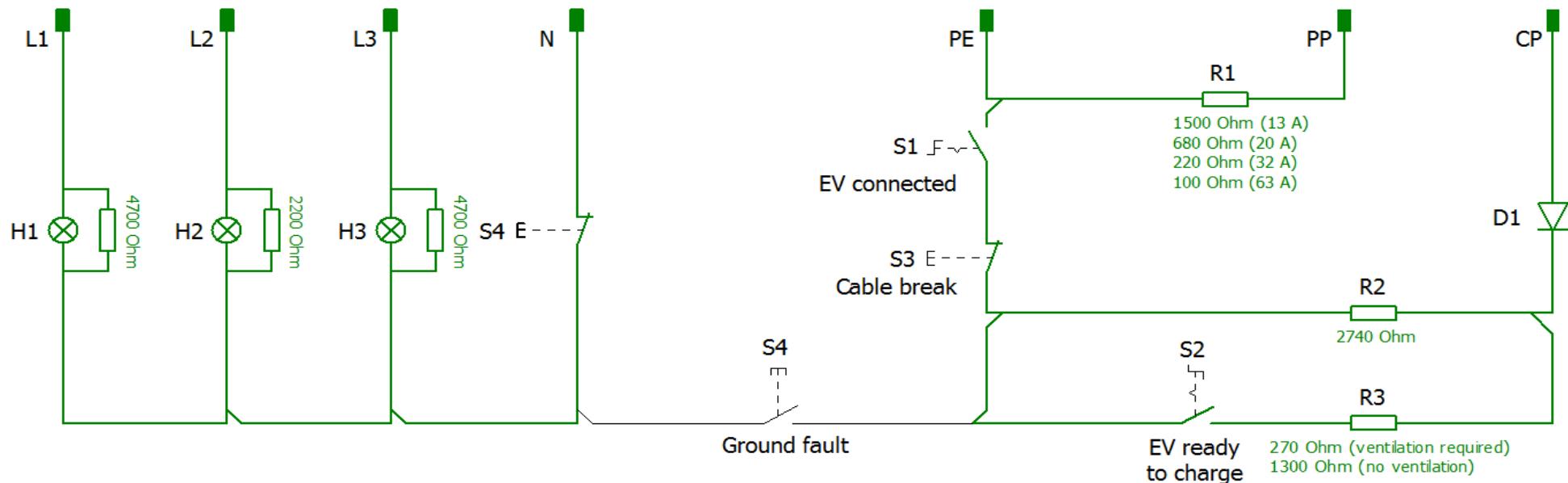
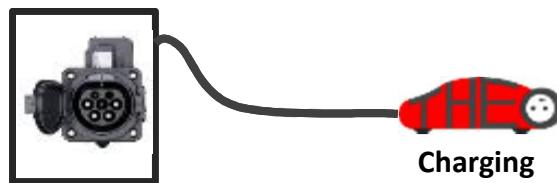


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- Average domestic installation in Belgium
- Adoptions needed to charge EV?
- On-line
- 815 respondents (Flanders & Brussels)

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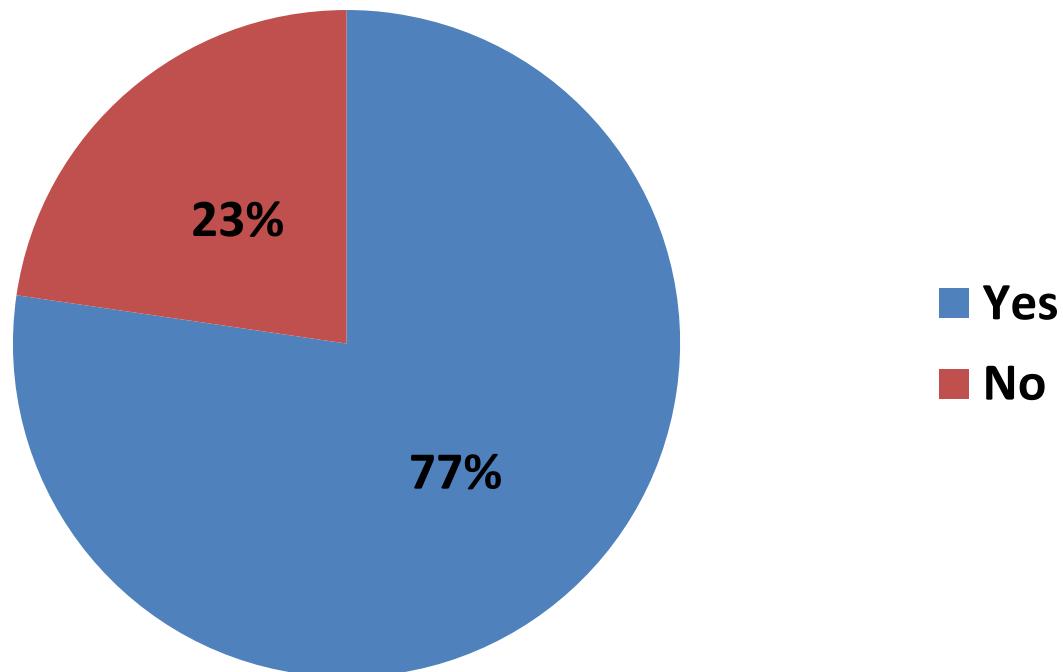
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Do you own a garage?



Charging without garage?
- Public charging?
- Charging at work?

■ Yes
■ No

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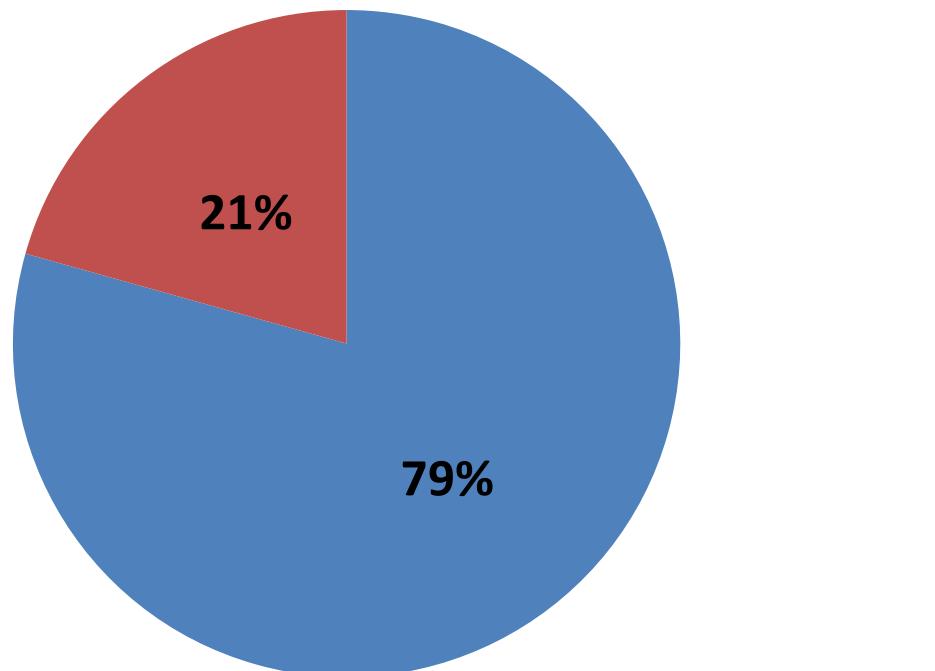
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Do you have a RCD in your electrical installation?



No proper earthing?
Investments are needed for
safely charging of EVs!

- Yes
- No

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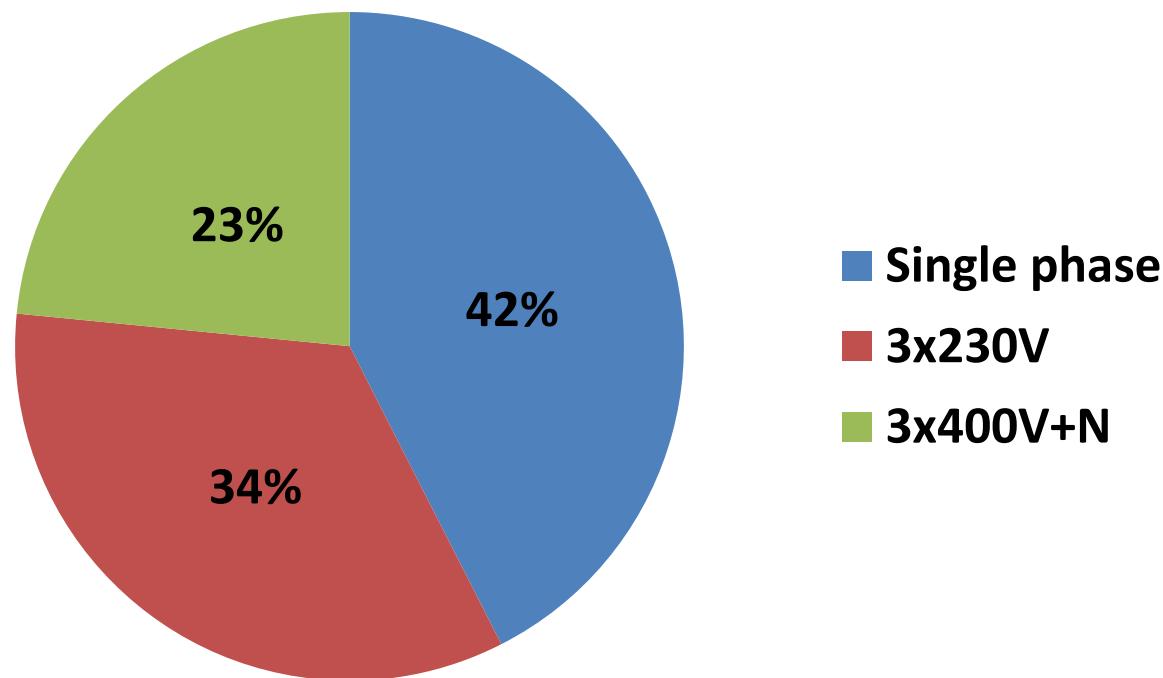
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Grid connection



3x400V+N:

Some EVs can charge up to three times faster!

3x230V-net:

Only single phase charging. Can cause problems with some EVs.

Single phase:

Sometimes connected to a 3x230V-grid

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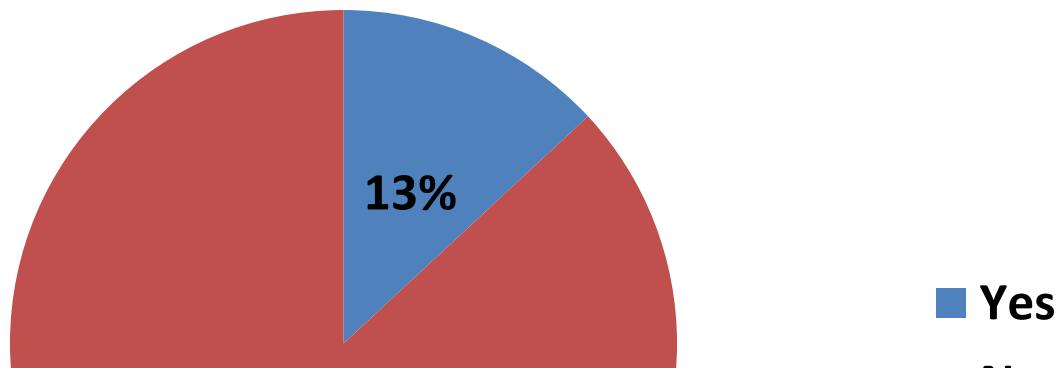
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Do you rent the building?



Rented building
Higher threshold to invest!

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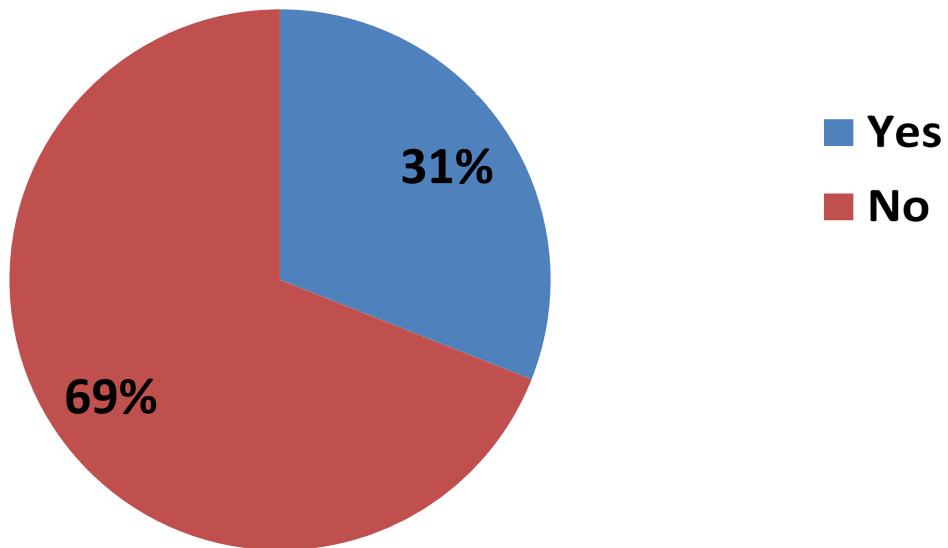
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Would you buy an EV when they would cost about the same as a car with ICE and with a minimal range of 300 km?



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- Belgian law
 - Type A RCD required (domestic)
 - Three phase charging
 - Fault current $< 6 \text{ mA}$ possible
 - Type A RCD not sufficient
- In Belgium: impossible to install 3-phase charging points both safely & legally compliant

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Thanks for your attention!
Questions?

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