



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



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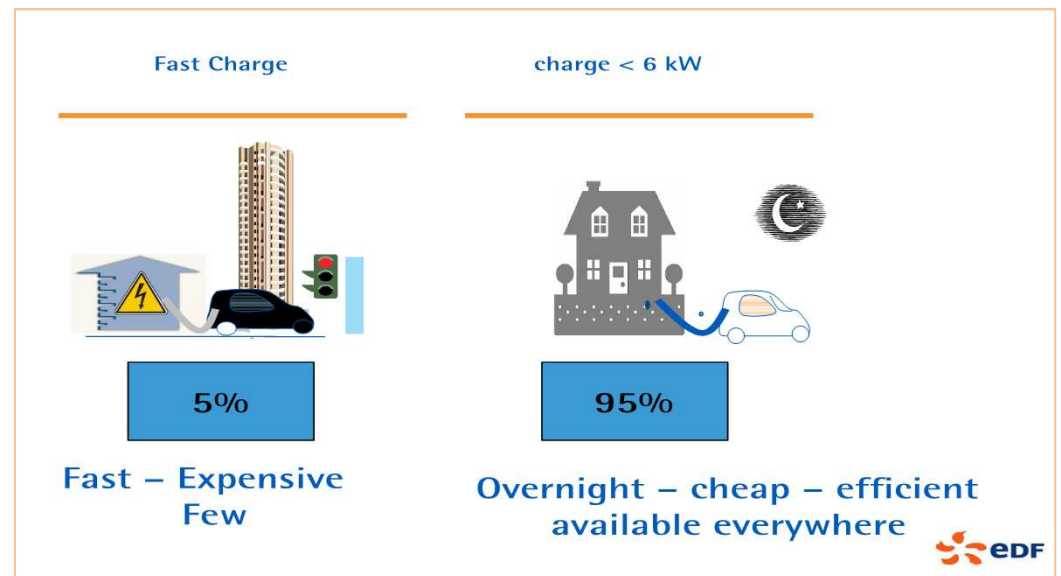
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- Out of scope of Flemish living labs
 - Home charging

– Electrician



First point of contact for general public

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



Vrije
Universiteit
Brussel

KU LEUVEN

KAHO
SINT-LIEVEN

— 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



- Average domestic electrical installation in Flanders

- Charging problems on Belgian grid



- Type B RCD ⇔ Belgian law

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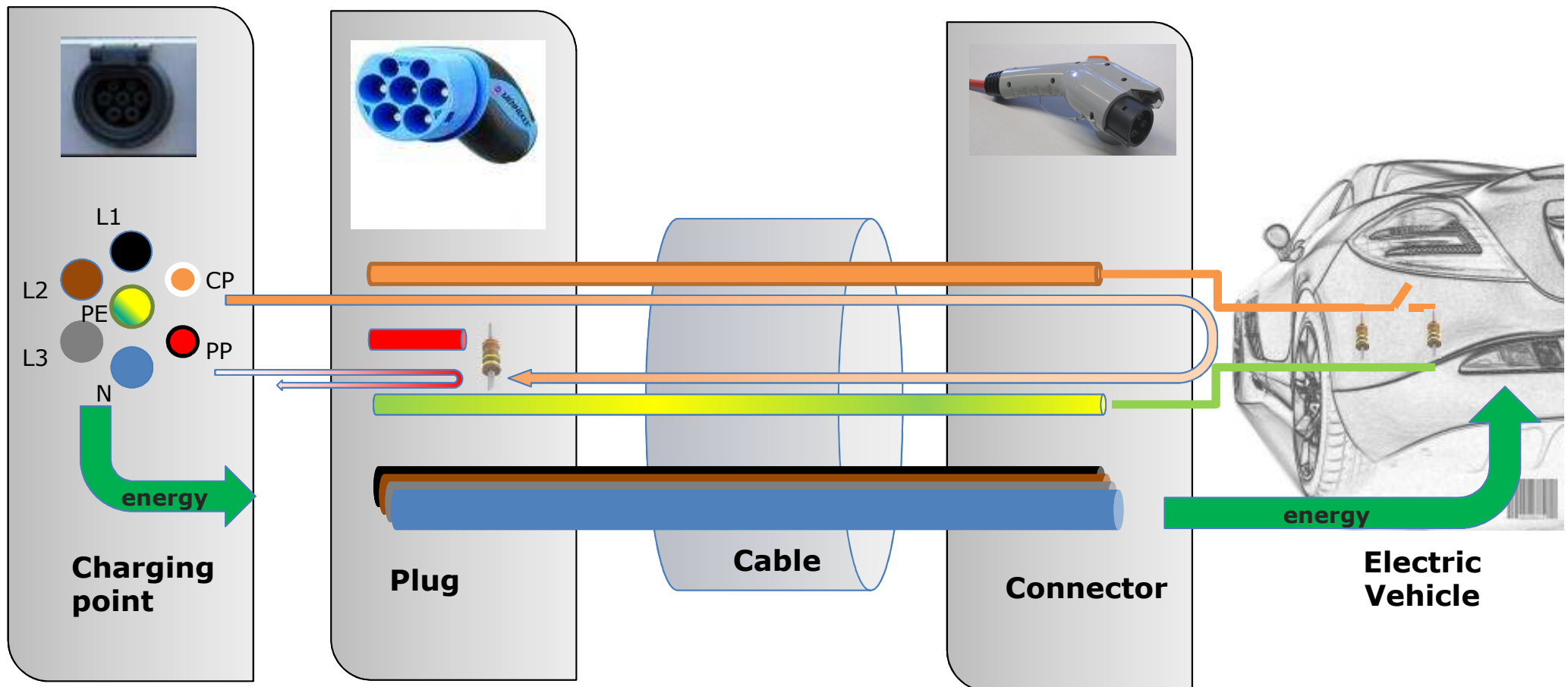
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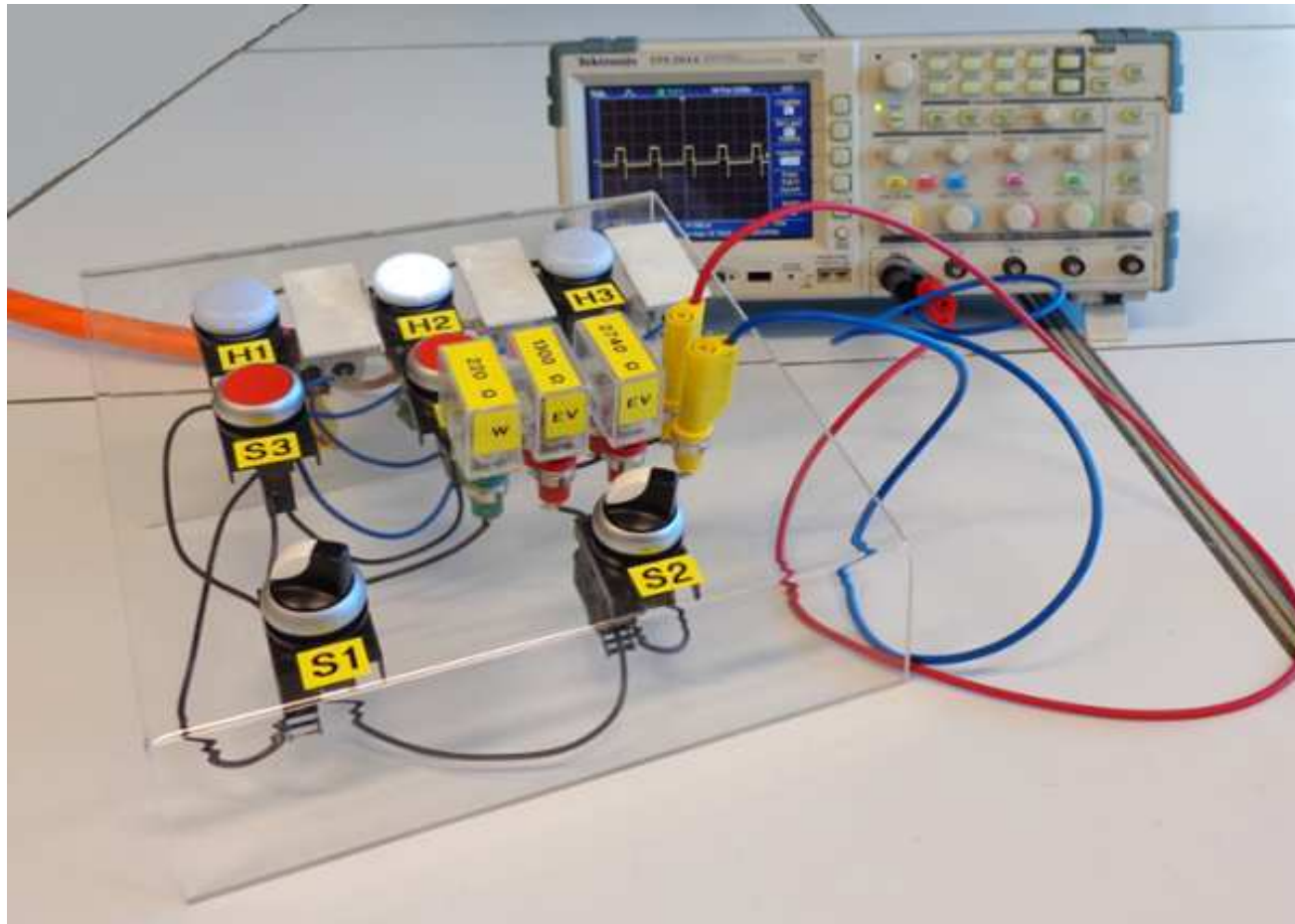
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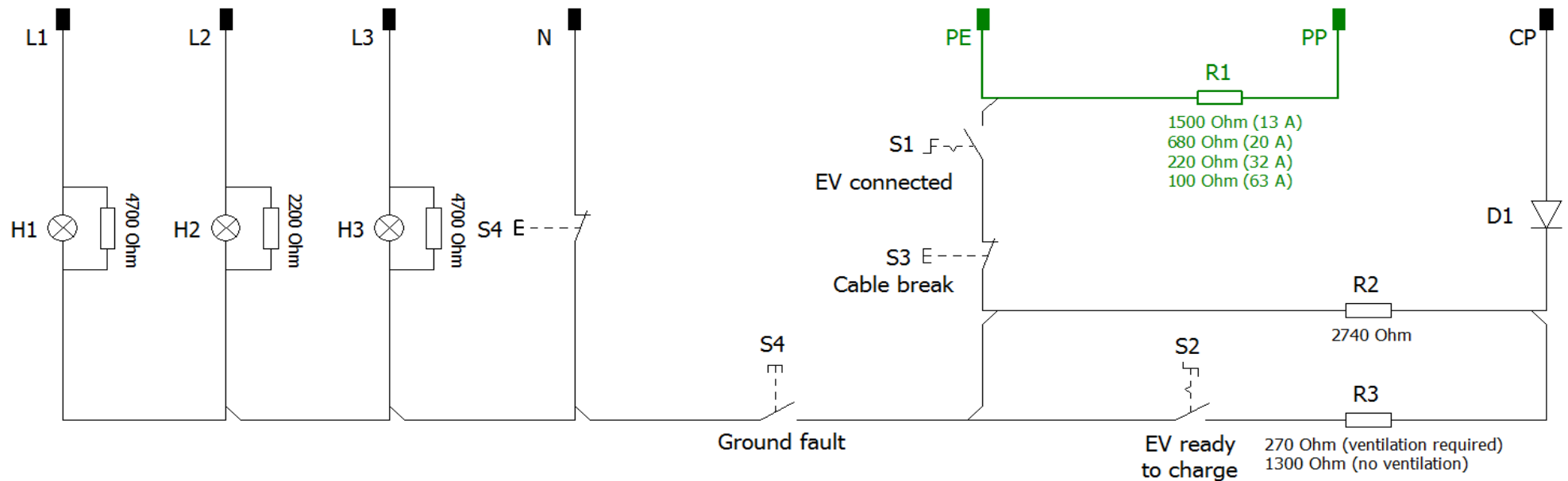
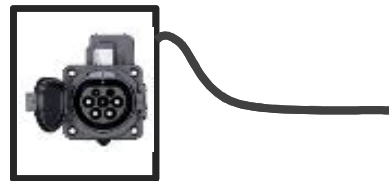
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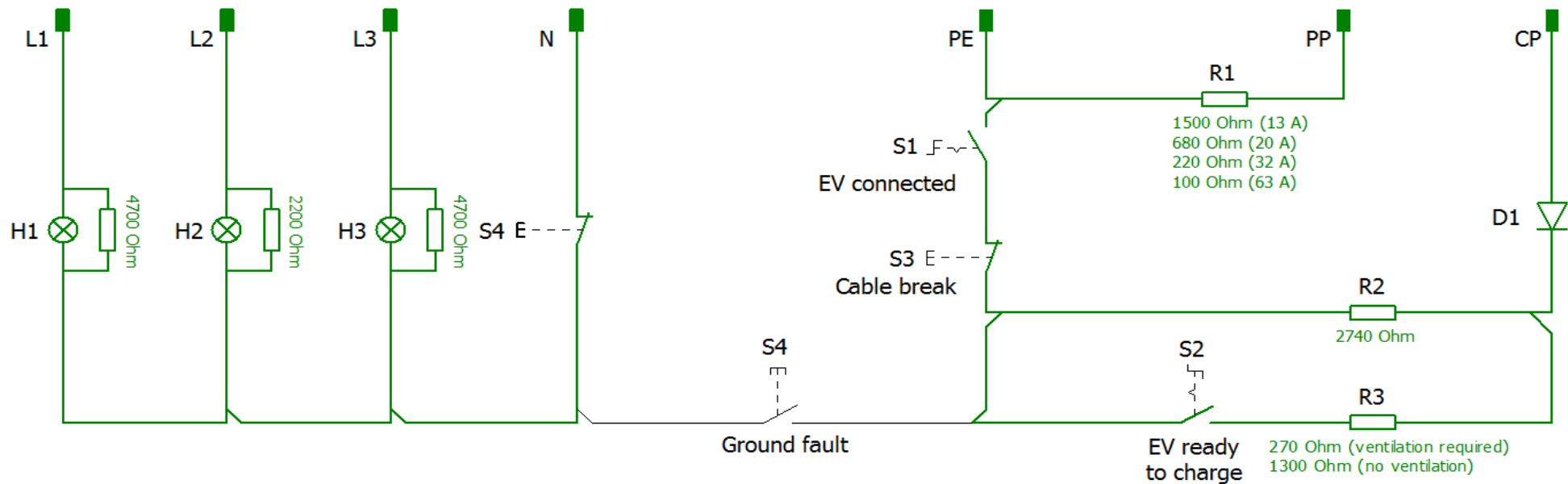


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- Average domestic installation in Belgium
- Adaptions needed to charge EV?
- On-line
- 815 respondents (Flanders & Brussels)

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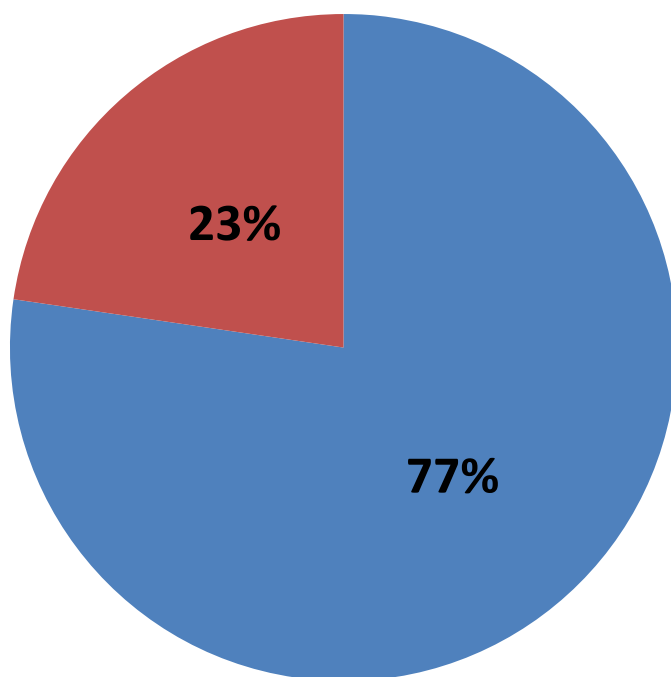
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Do you own a garage?



■ Yes

■ No

Charging without garage?

- Public charging?
- Charging at work?

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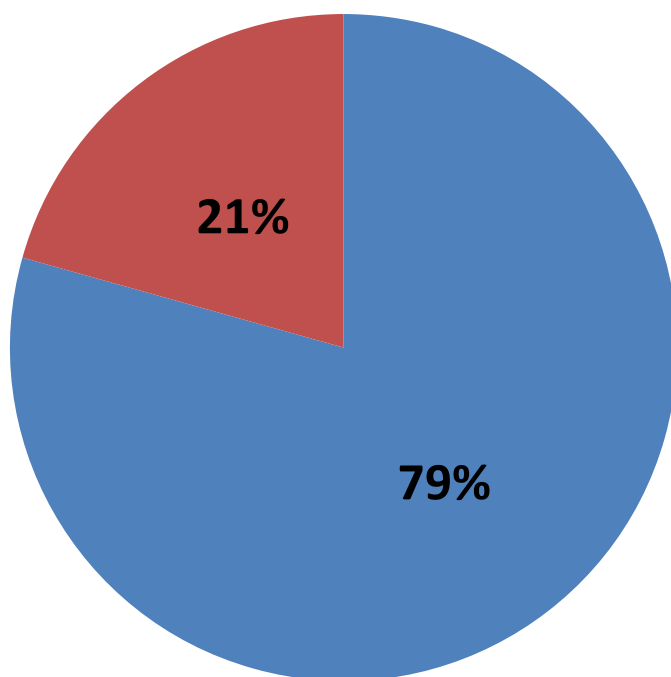


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Do you have a RCD in your electrical installation?



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

■ Yes

■ No

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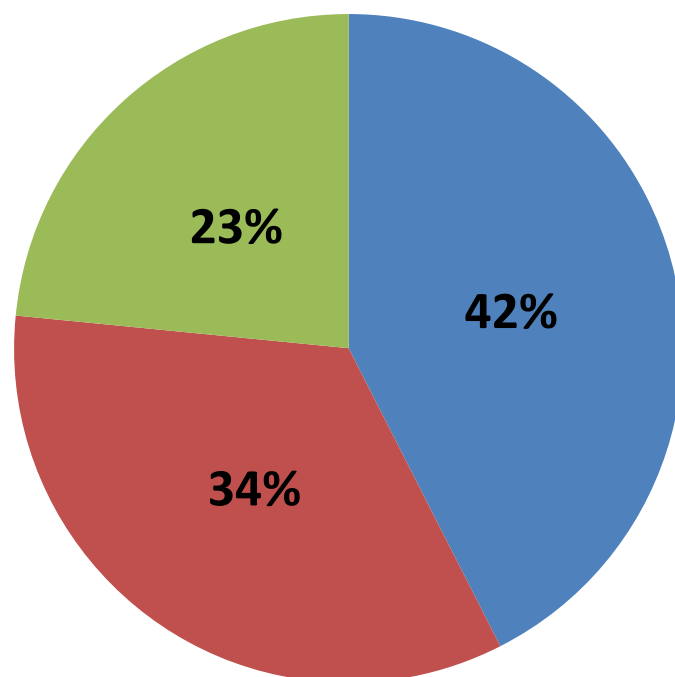


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Grid connection



■ Single phase

■ 3x230V

■ 3x400V+N

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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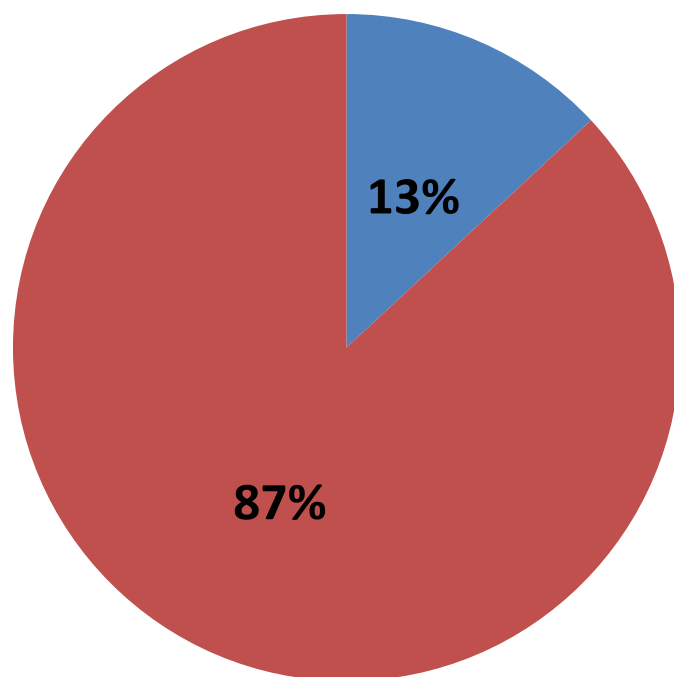


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Do you rent the building?



■ Yes
■ No

Rented building
Higher threshold to invest!

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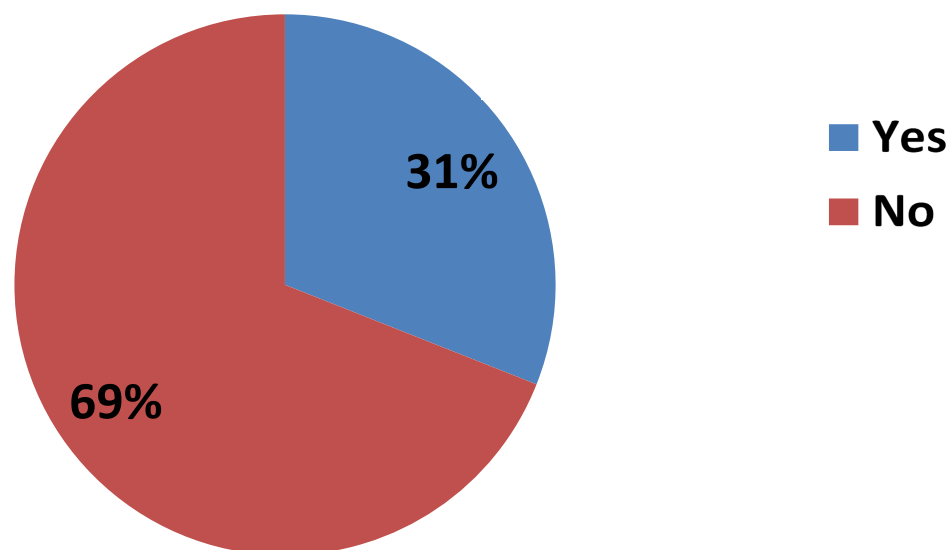


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Would you buy an EV when they would cost about the same as a car with ICE and with a minimal range of 300 km?



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- Belgian law
 - ➔ Type A RCD required (domestic)
- Three phase charging
 - ➔ Fault current < 6 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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