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Electric Vehicle Symposium & Exhibition

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DRIVE ELECTRIC INNOVATION
PROPULSER L'INNOVATION EN MOBILITÉ ÉLECTRIQUE

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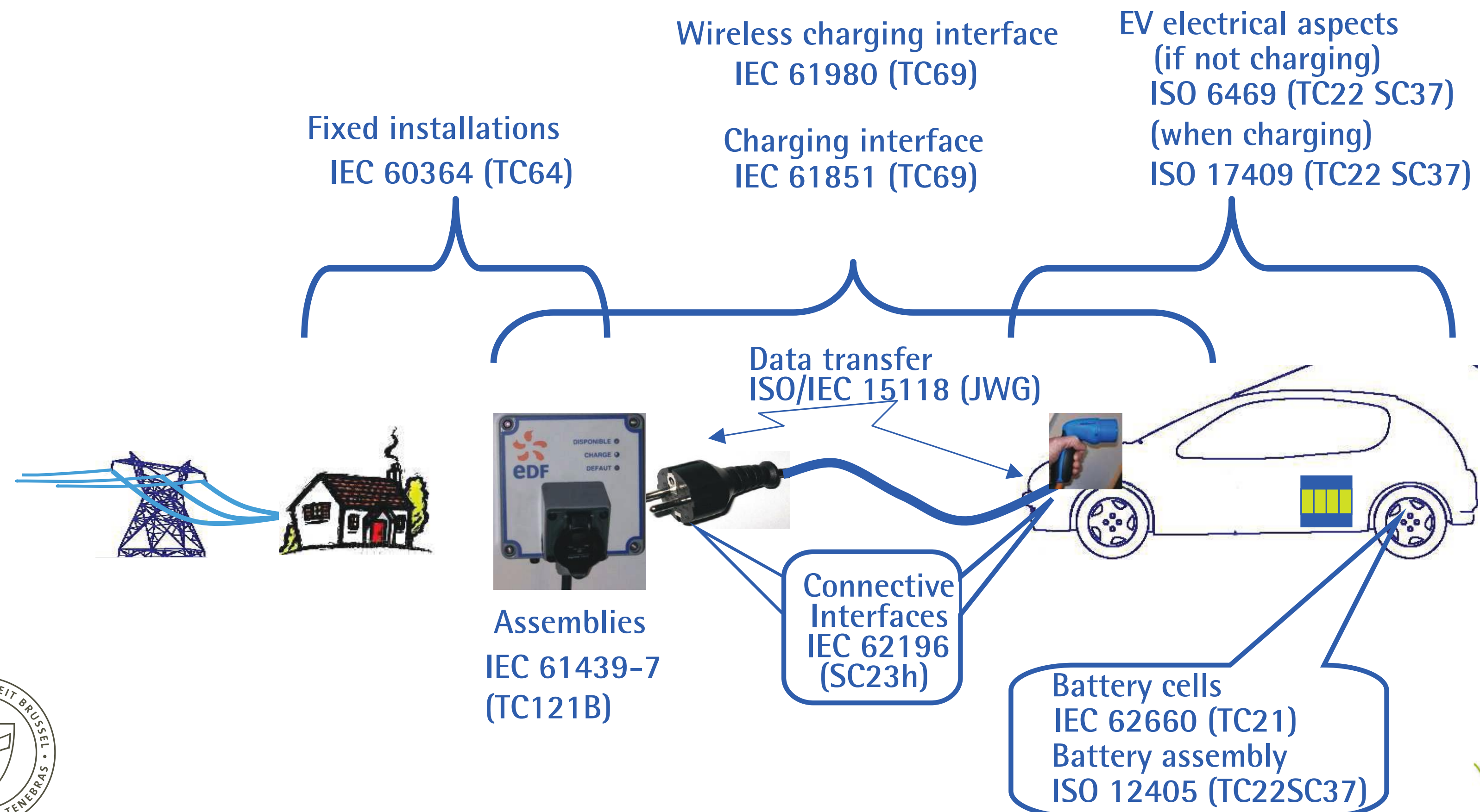
Developments and Challenges for EV Charging Infrastructure Standardization

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IEC TC69



Standardization scene

- Various committees involved
- IEC versus ISO: the electric and the vehicle





Conductive charging

- IEC61851 family of standards
- Third edition of IEC61851-1 due for FDIS
- Charging modes
 - Mode 1: deprecated, use for class II LEV?
 - Mode 2: IC-CPD
 - Mode 3: a.c. charging with pilot
 - Mode 4: d.c. charging



Charging with a.c.

- Type 1 connector, case "C" in North America
- Type 2 socket-outlet in Europe
 - Type 1 or 2 connector
 - Type 3 accessories phased out by EU Directive



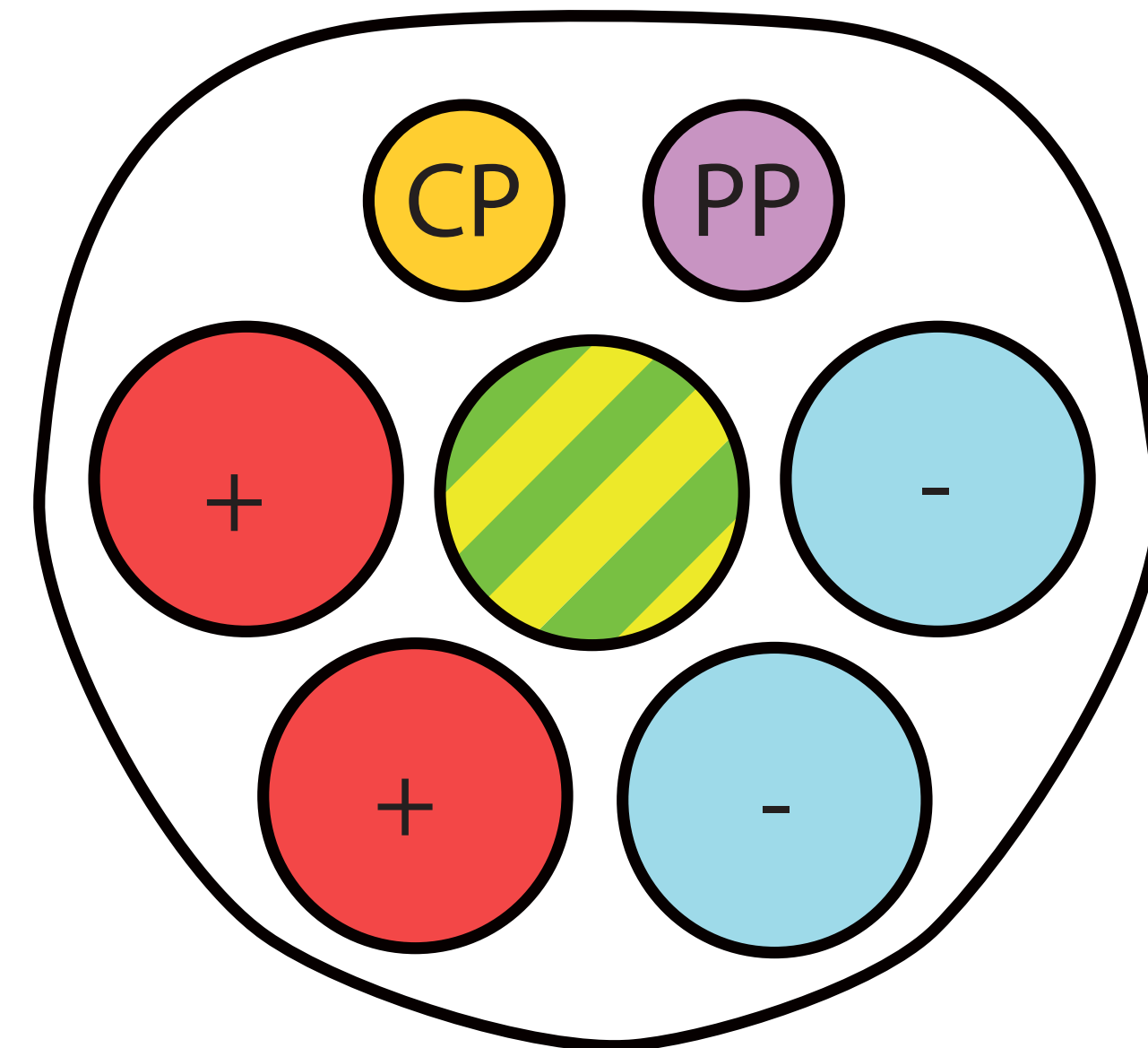
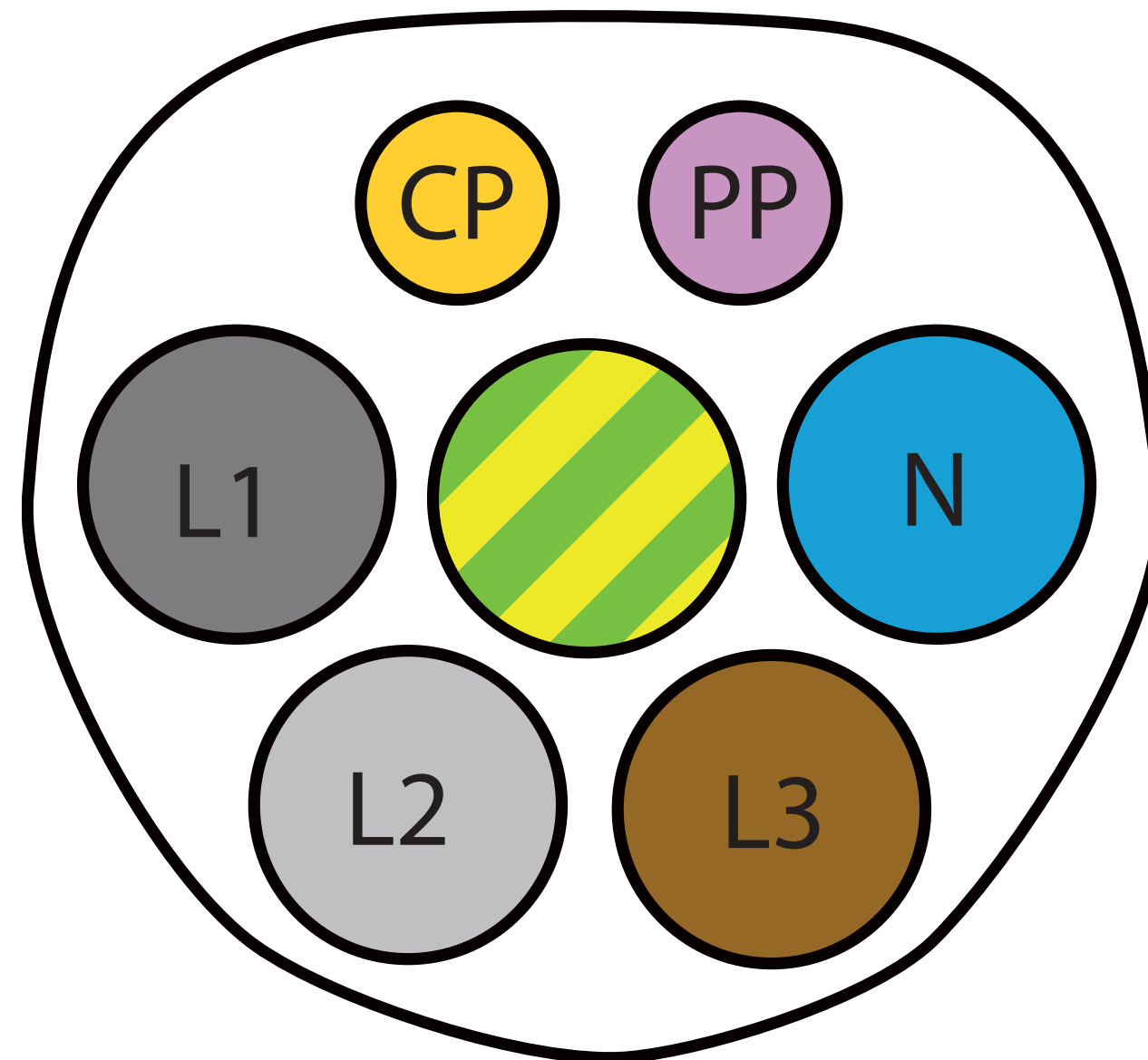
Charging with d.c.

- Three systems in IEC61851-23
- CHAdeMO, CCS (Combo), Chinese system
- Combo prescribed in European directive
- 3-way charging stations!
 - Combo Type 2
 - CHAdeMO
 - Type 2 (a.c.) 43 kW



Charging with d.c.

- Commutable pins
- Proposed by German manufacturers
- Teslas in Europe
- Fault d.c. currents in a.c. installation ?





“Light” electric vehicles

- What is a “light electric vehicle”
- Electrical characteristics
 - Protection against electric shock through reinforced insulation (Class II equipment) without earthing
 - Voltage d.c. < 120V
- Specific risks linked with domestic equipment for indoors
- New documents in preparation as TS



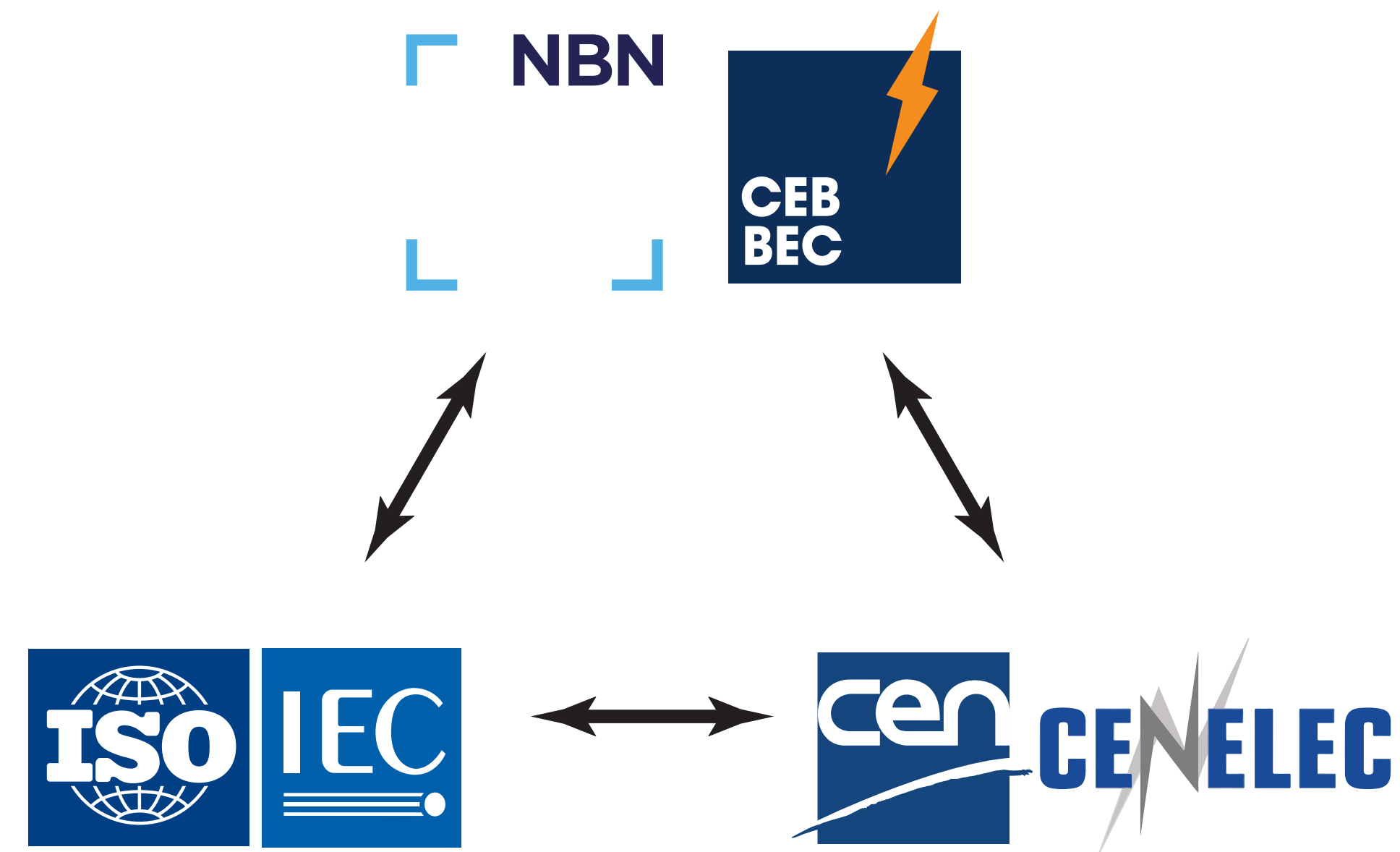


Wireless charging

- IEC 61980 series
- Part 1 (general characteristics) published
- Parts 2 and 3 under development as TS
- Safety issues: EMF and thermal risks
- Interoperability issues



European standards scene



- Example of national structure: Belgium
- EU itself does not draft standards
- Mandates to CEN and CENELEC
- Harmonized standards – New Approach directives

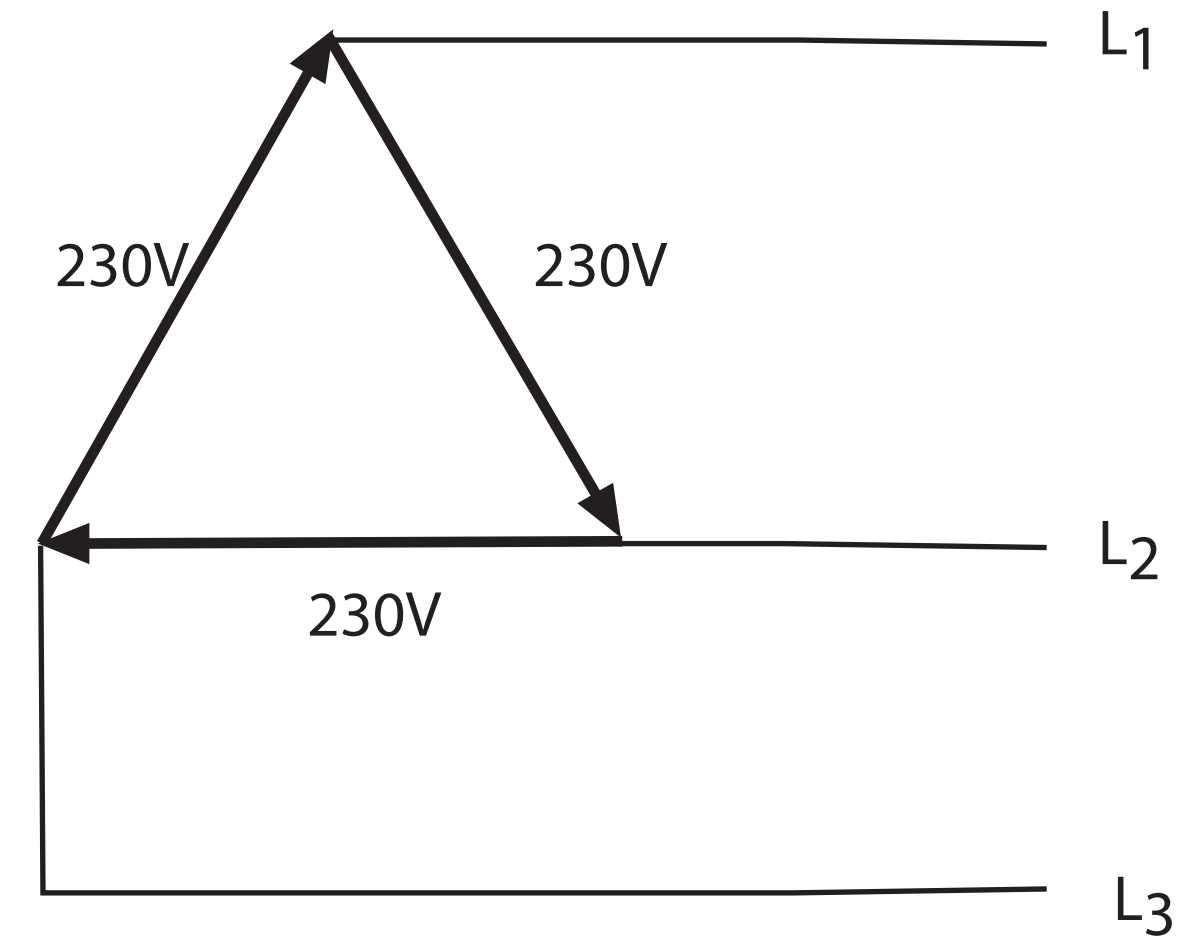
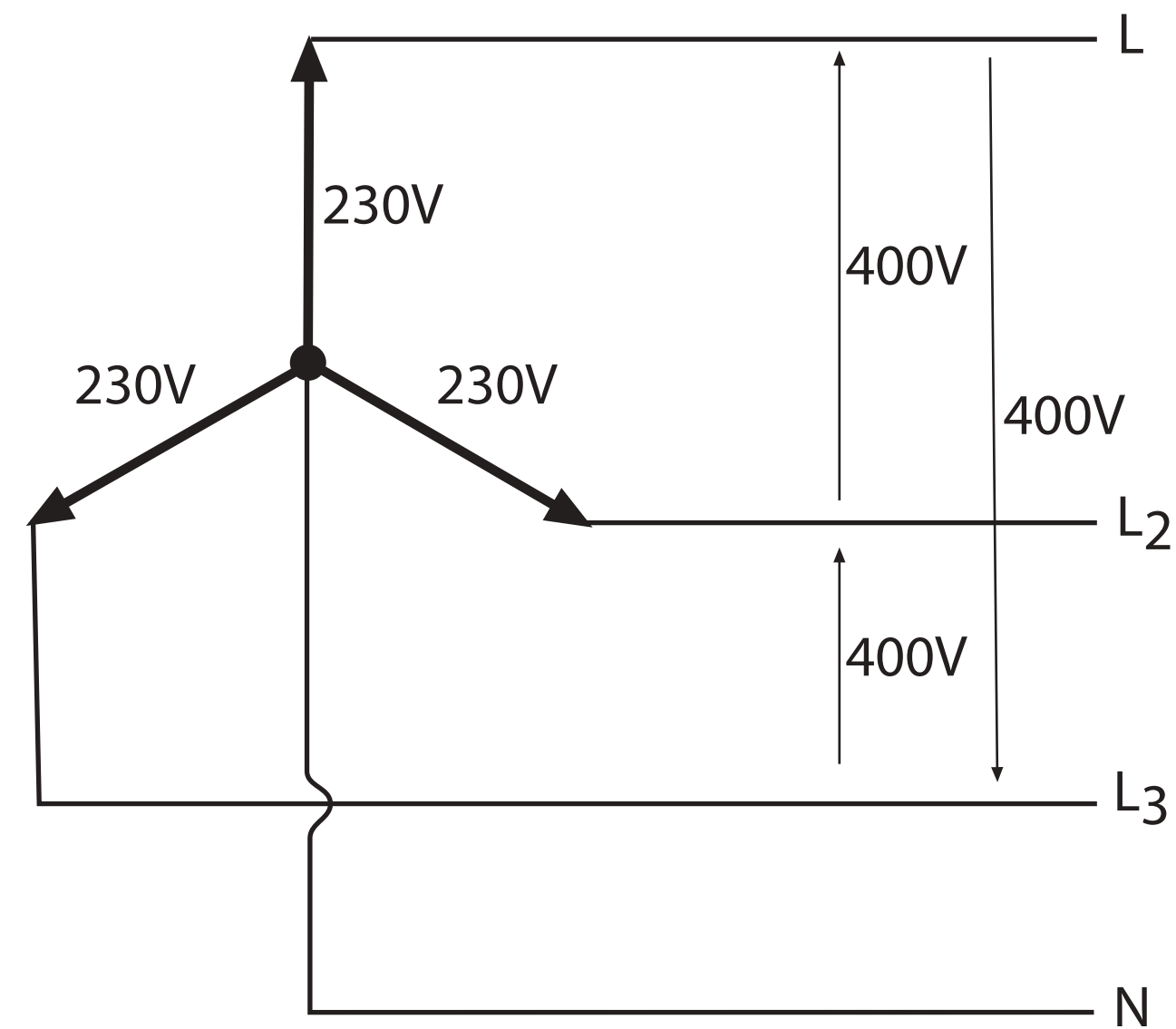


Cenelec TC69X

- Reactivated 2010
- Expediting the adoption of IEC standards as EN
- No parallel drafting of standards where avoidable
- Follow up EU mandates



European networks



- Typically 3x400V + N
- 3x230V widely used in Belgium (also Norway, Italy)
- Problems with some vehicles
- Interaction with local wiring regulations (AREI/RGIE)

Conclusion

- The House of Standards

