Knowledge and innovation center focused on Smart Charging infrastructure in the Netherlands.

Founded in 2009 by the Dutch grid operators.

- Outlooks
- Smart charging innovation
- Smart charging implementation
- EU largest testing site
  - Interoperability
  - Smart Charging
  - Cyber security
  - PQ
- Promoting open innovation & open protocols
- Tender support

Harm van den Brink
Harm.van.den.brink@elaad.nl
Outlooks

Growth scenario of BEV-busses

Growth scenario of city-logistics

Growth scenario of ‘long-haul’

Building equipment
Outlooks

Growth scenario of BEV-busses

Growth scenario of city-logistics

Growth scenario of ‘long-haul’

Building equipment

Prognoses number of EVs and chargepoints
Prognoses number of EVs and chargepoints

- 4 mio EV’s in 2035
- 3 mio CP’s

Source: ElaadNL outlook: Elektrificatie van personenauto’s tot 2050
Grid impact
Limited transport capacity for feed-in
Limited transport capacity for consumption on higher grid levels
Grid capacity situation on daily basis

New DSO products
Non-form capacity agreement
Grid impact of EV charging on LV-level
Regional spread EV adoption leads to EV hotspots

(Semi-) public chargestations (30.1%)

Fastchargers (0.6%)

Charging at home (40.8%)

Charging at work (28.4%)

Source: ElaadNL outlook: Elektrificatie van personenauto’s tot 2050
EV peak demand

Profile for residential area with 250 households, 100 EVs

Source: ElaadNL outlook: Elektrificatie van personenauto’s tot 2050
Different measures to prevent and solve LV grid impact in preparation.
Different measures to prevent and solve LV grid impact in preparation

Awareness campaigns and changing preconditions
Different measures to prevent and solve LV grid impact in preparation

Smart charging and new grid tariff scheme development
Different measures to prevent and solve LV grid impact in preparation

Adapt energy tariff scheme and non-firm capacity on residential level. DSO-control for certain compensation (= a.o. smart charging)
Different measures to prevent and solve LV grid impact in preparation

Direct control as a ‘grid shield’ (for emergency situations)
ElaadNL is involved in the development of all measures

Focus on smart charging for public charge stations

Smart charging and new grid tariff scheme development
Development of Dynamic grid aware charging with OpenADR

Offers more precise grid reduction
Pilot implementations

- Based on OpenLEADR
  - OpenADR to a Home Energy Management System
  - OpenADR to a charging hub
OpenADR and HEMS
OpenADR and HEMS
OpenADR and charging EVs
OpenADR and charging EVs

**Diagram:**

- **EPEX Dayahead price data**
- **ElaadNL**
  - OpenADR VTN
    - **EPEX Fetcher**
      - Fetches the dayahead prices everyday at midnight and transforms this into a set of 15 minute values for the next day that will be sent to Drivz to curtail/smart charge the charging stations.
  - OpenADR VEN
- **Drivz CPO**
- **ElaadNL Chargers**

**OpenADR Message**

- **signaltype:** x-loadControlCapacity
- **signal-name:** x-gridConnectionLimitMax

**Interval 0**

- **datetime_start:** 01-06-2023 00:00:00
- **duration:** 15m
- **max_value:** 80 (kW)

**Interval 1**

- **datetime_start:** 01-06-2023 00:15:00
- **duration:** 15m
- **max_value:** 120 (kW)
OpenADR and charging EVs

Driivz charge point operator backend
Questions