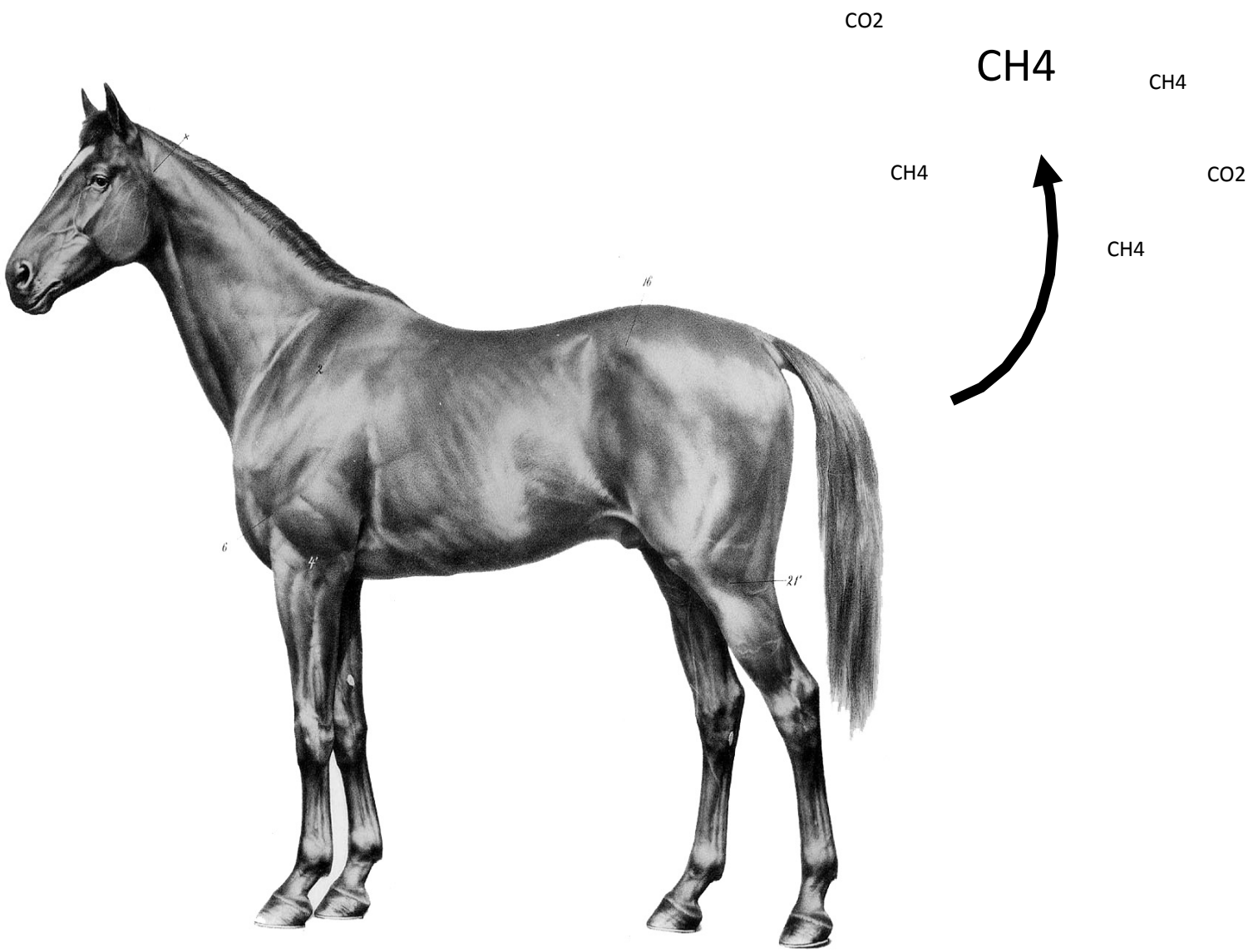
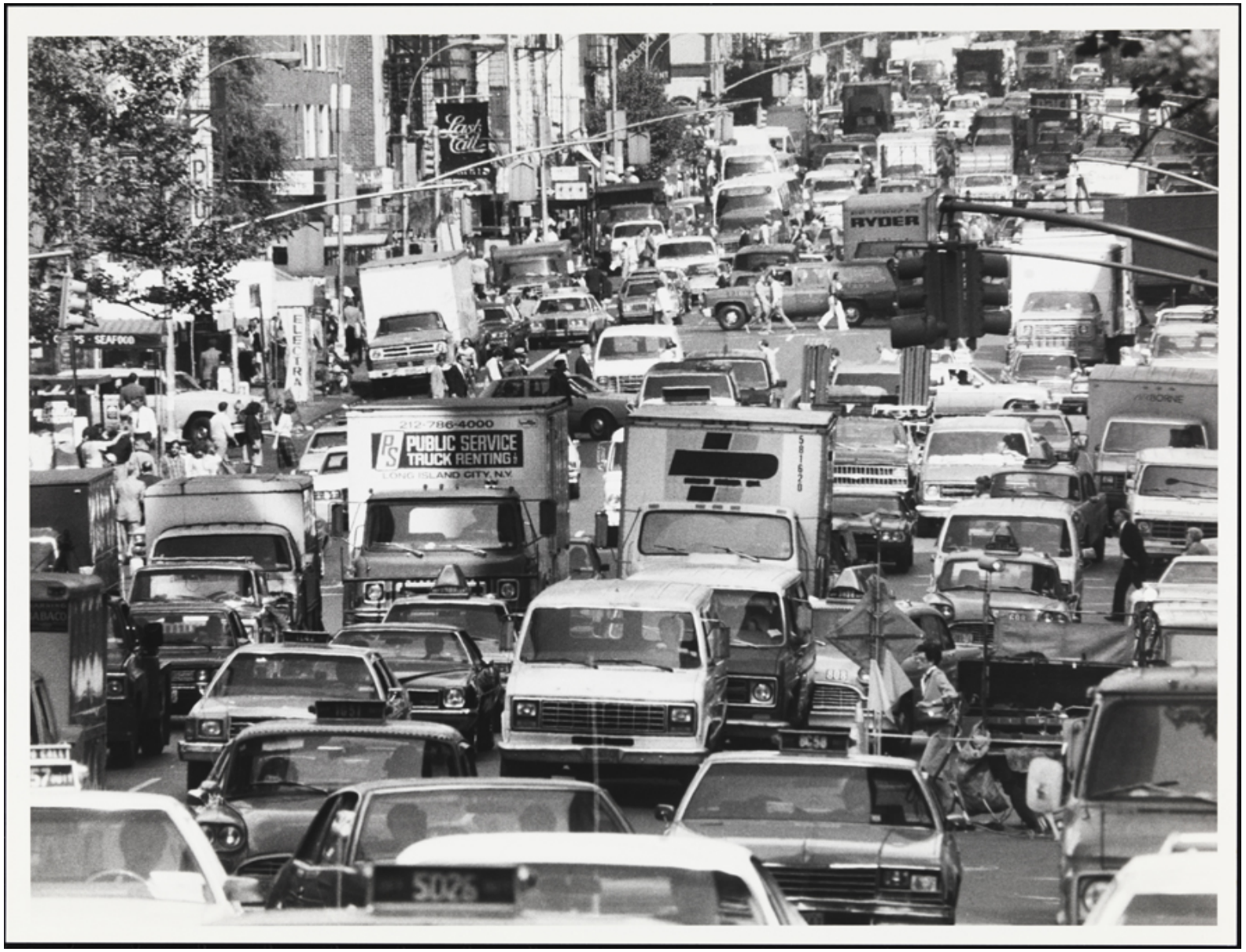
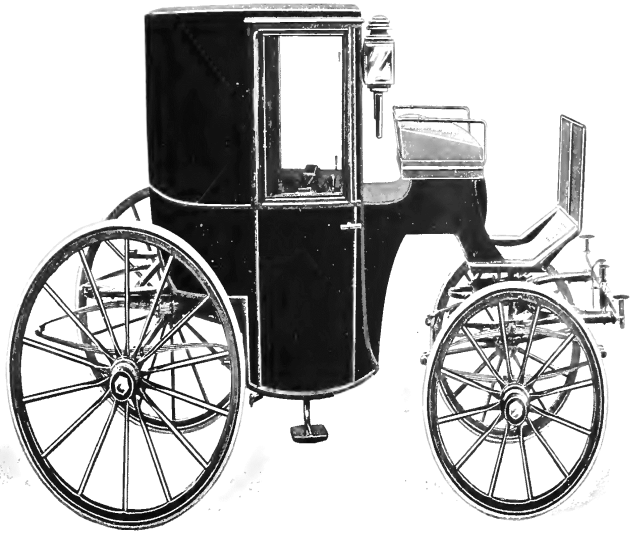
Live
off the
WIND and
drive on
the SUN
Elaadnl

BROTHERS
LOFTS
1884


CO2
CH4
CH4
CH4
CO2
CH4

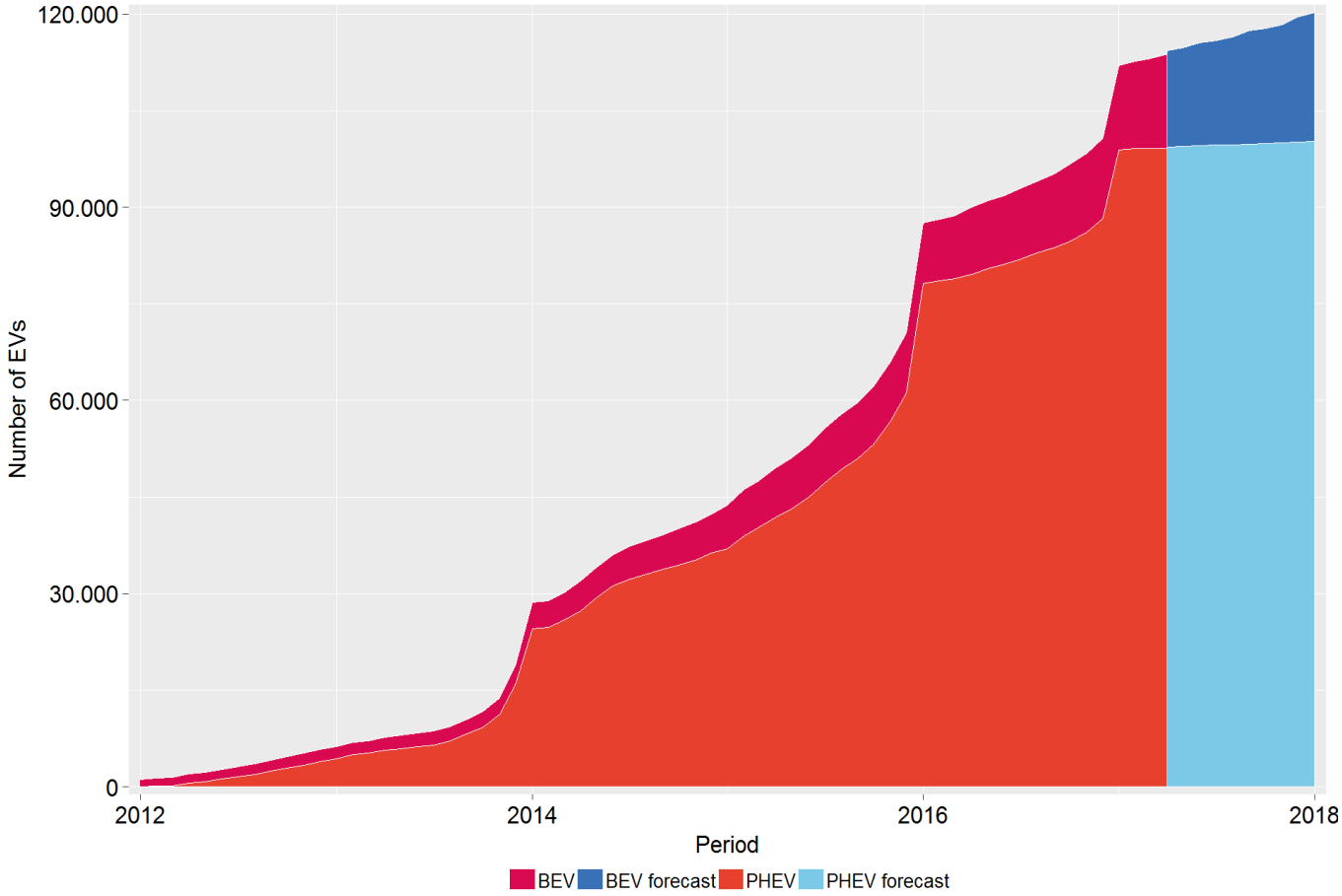
U.S.MAIL


Last Call
RYDER
212-786-4000
PUBLIC SERVICE
TRUCK RENTING
LONG ISLAND CITY, N.Y.



LIVING LAB SMARTCHARGING

115,000 EVs in the Netherlands



EV developments

V2G

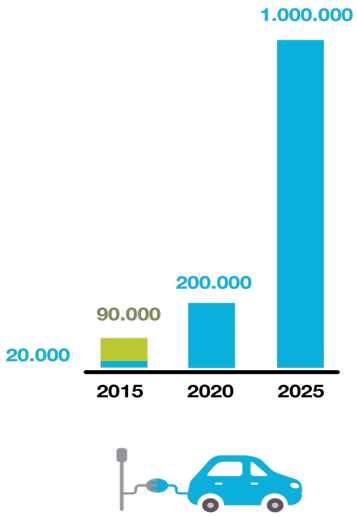
Wireless

Charging

Wireless charging

E-Buses and E-trucks

Growth EV



Bron cijfers: **RVO**

- Doel Rijksoverheid
- Gerealiseerd

2nd hand EVs

Private and semi private

Improved capacity

Charging plaza

(Ultra) fast chargers

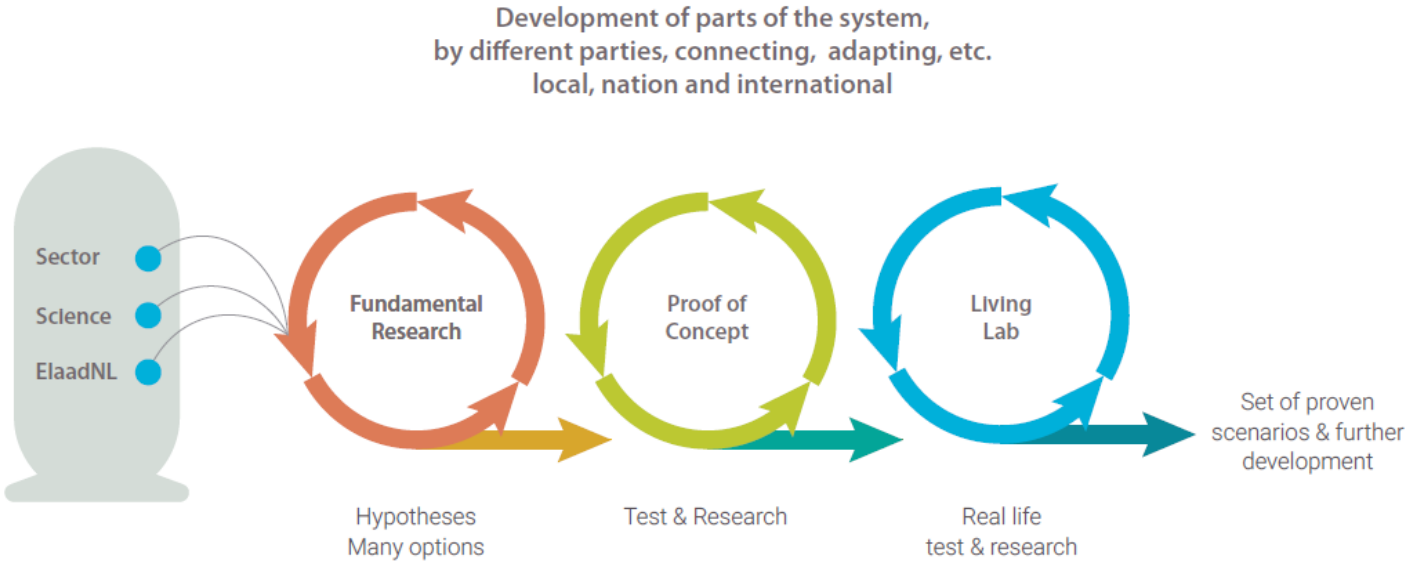
ELAADNL researches and tests the possibilities for Smart Charging

CHALLENGES

charging infrastructure
energy availability
grid balance
user acceptance

OUR WAY OF WORKING

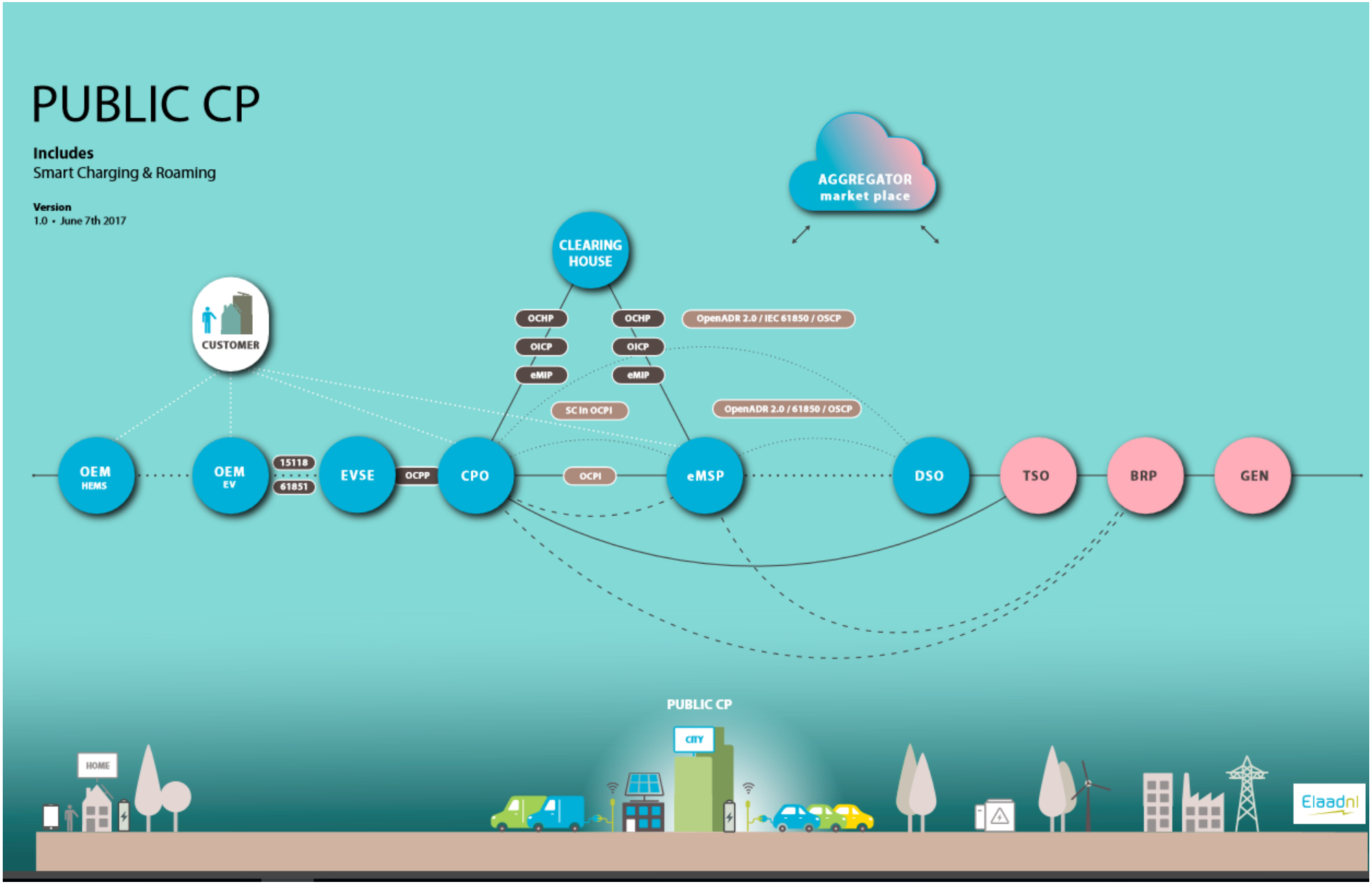
Development approach



Focus on interfaces/protocols for integration of EVs with the new energy system.

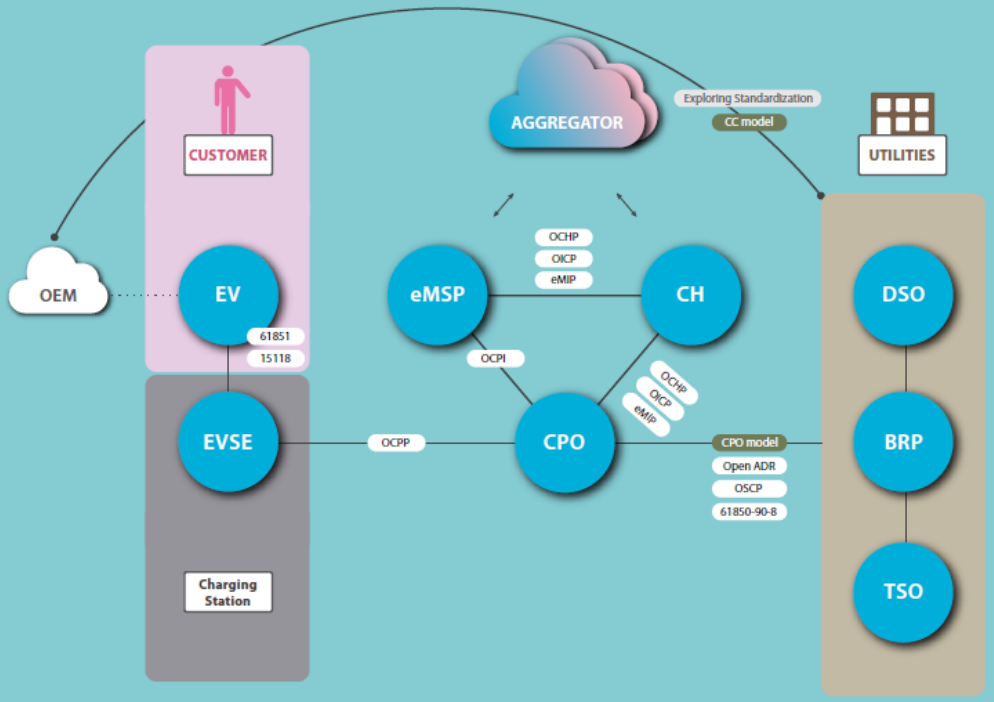
Besides focus on protocols there are other aspects in scope of our research.

- **Grid impact.** By assessing charge profiles irt grid-data
- **Flexibility mechanisms.** Assessing the potential of solutions on the spectrum from price signals to control signals. Finding the right balance / combination of customer-centric (choice) and 'closed loop controllability'.
- **Market organisation of flexibility** taking into account the different needs of the different 'flex-requesters', TSO, DSO, BRP (and 'aggregator'); DSO with a very local focus on capacity / congestion / voltage, TSO with a nation focus (control area) on frequency and BRP with focus on portfolio optimization. Layered model.
- **Components.** Focussing on grid-connection components and related aspects like selectivity to contribute to reducing the cost of charge infrastructure.

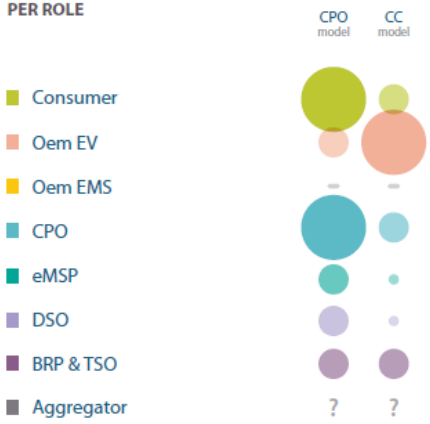

PUBLIC CP
Includes
Smart Charging & Roaming
Version
1.0 • June 7th 2017
AGGREGATOR
market place
CLEARING
HOUSE
CUSTOMER
OCHP
OICP
eMIP
OCHP
OICP
eMIP
OpenADR 2.0 / IEC 61850 / OSCP
SC in OCPI
OpenADR 2.0 / 61850 / OSCP
OEM
HEMS
OEM
EV
15118
61851
EVSE
OCPP
CPO
OCPI
eMSP
DSO
TSO
BRP
GEN
PUBLIC CP
HOME
CITY
Elaadnl

PUBLIC CP

CONSTELLATION No. 2
Version V9



INFLUENCE DISTRIBUTION
PER ROLE



ElaadNL is a foundation by: Cogas, Enexis Group, Liander, Rendo, Stedin, Tennet, Westland Infra

FAST
Charging
PUBLIC
CP
CPO model
CC model
PRIVATE
(b/h) EMS
EMS model
CPO model
CC model
SEMI PUBLIC
(b/h) EMS
EMS model
CPO model
CC model
PRIVATE
no (b/h) EMS
CPO model
CC model
Consumer
Oem EV
Oem EMS
CPO
eMSP
DSO
BRP & TSP
Aggregator
?

SMART CHARGING

Connecting electric vehicles with renewable energy

Living Lab Smart Charging

- Founded in March 2016 as part of the Green Deal Electric Transport 2016-2020
- Open platform for development of **Smart Charging**
- **65,000+** public and private Smart Charging Ready charging points
- National and international **partners**: governments, private companies, utilities, OEMs and more
- **100+ pilot projects** in the Netherlands

LIVING LAB SMARTCHARGING

Action plan

1. Make all charging stations Smart Charging Ready
2. Research and test Smart Charging in living lab
3. Develop standards and share experiences on (inter)national level

LIVING LAB SMARTCHARGING

1

All charging stations Smart Charging Ready

LIVING LAB
SMARTCHARGING

SMARTCHARGING

LIVING LAB SMARTCHARGING

2

Researching and testing

LIVING LAB SMARTCHARGING

Renewable energy

Dynamic pricing

Interoperability

Grid management

Communication protocols

Vehicle2X

Cyber security

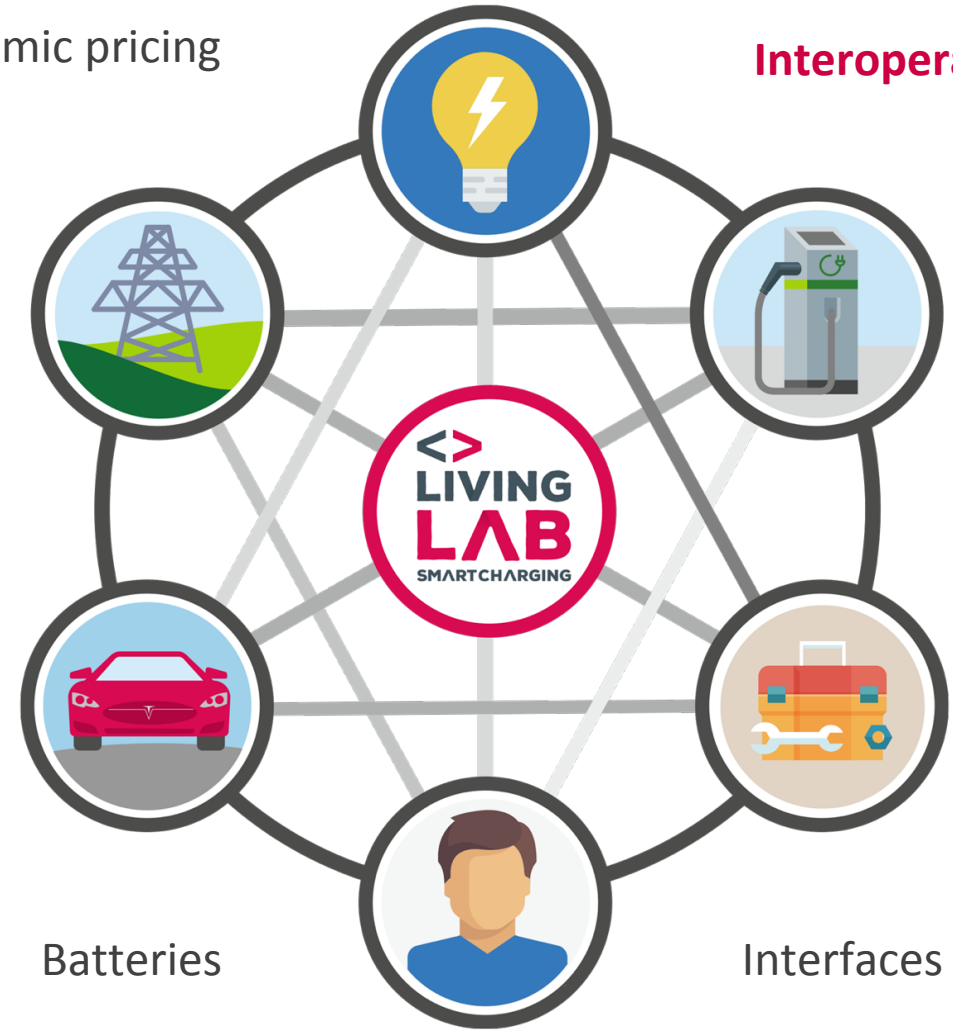
Electric vehicle

Charging algorithms

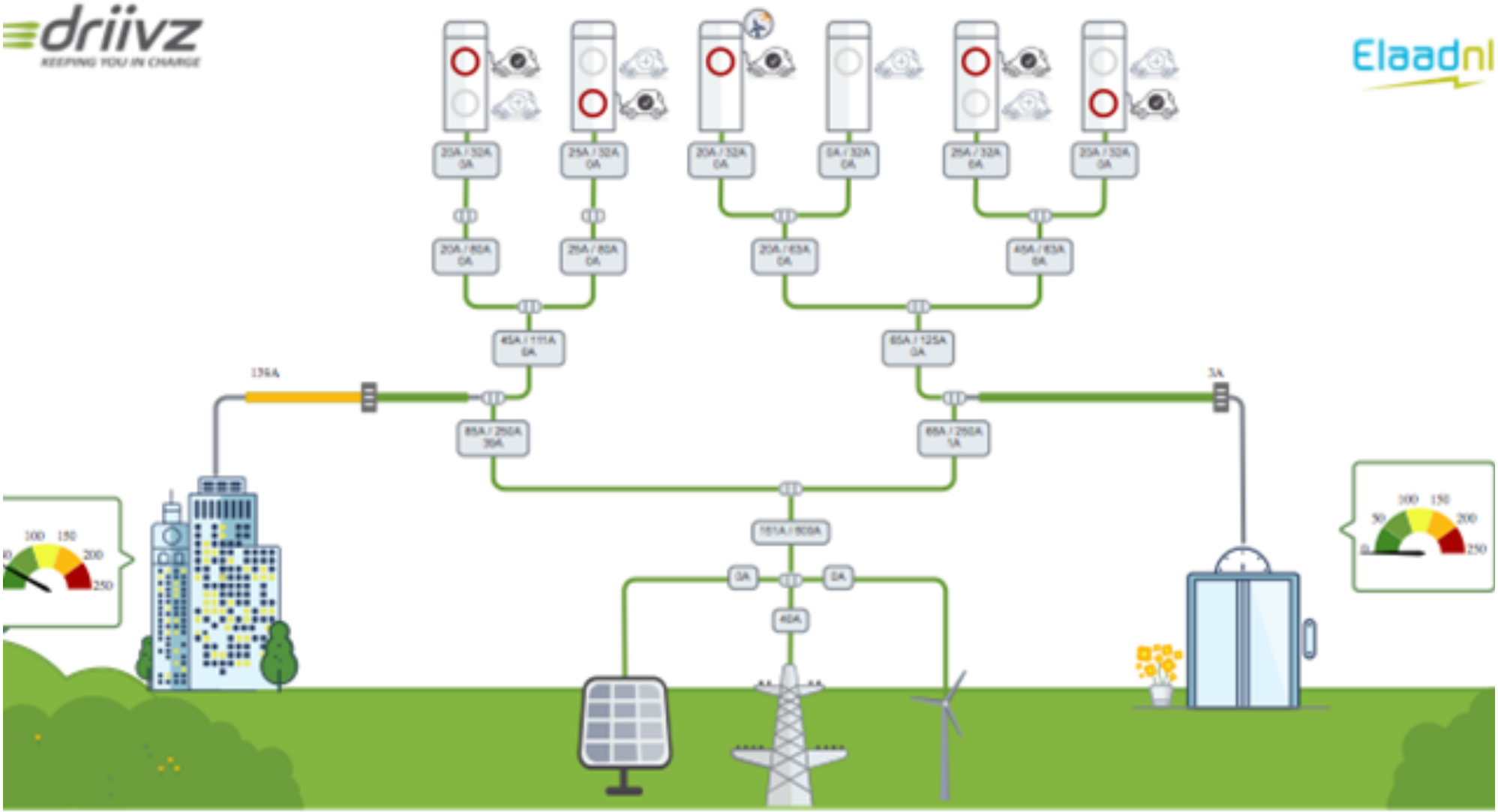
Batteries

Interfaces

User behavior



SmartChain

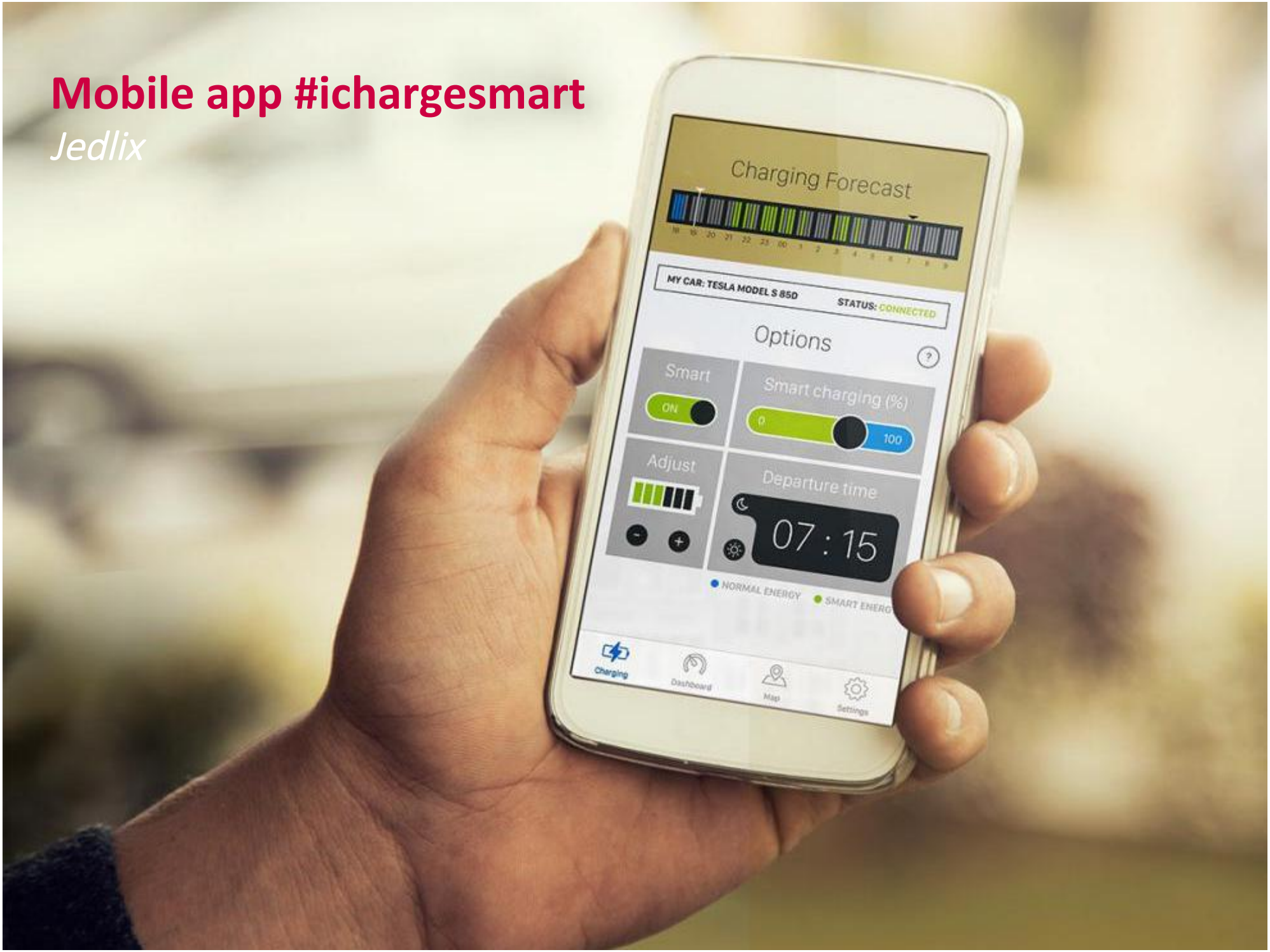


Smart Solar Charging and V2G

LomboXnet

Mobile app #ichargesmart

Jedlix

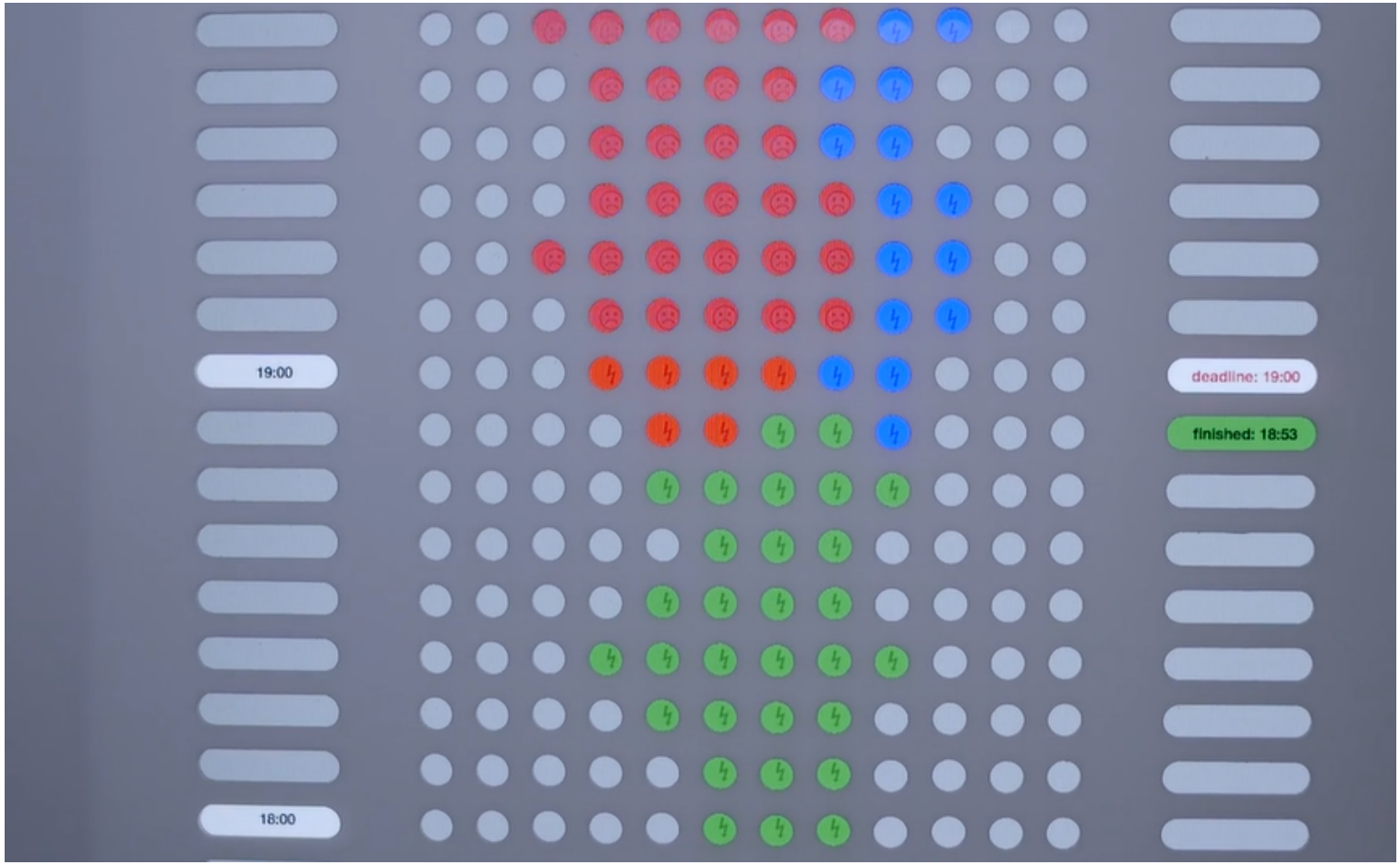


IOTA charging station

Transparent Charging Station

Green Charge
Chargecard
Tap your card to start
08:38
09:30
24 kWh
9 %
of 40 kWh

Probation I.D.
A-Mart
16:08


19:00
18:00
deadline: 19:00
finished: 18:53

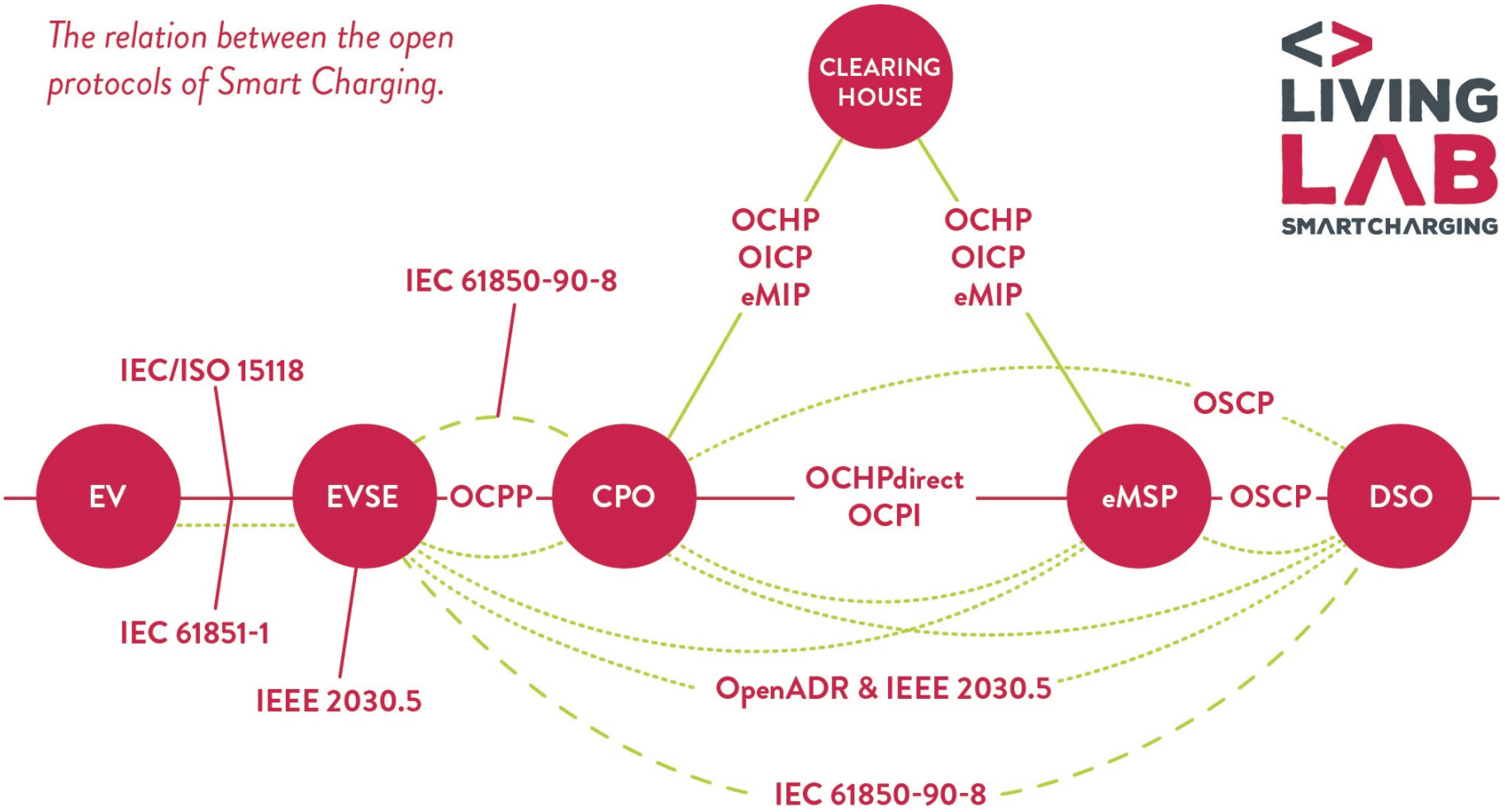
LIVING LAB SMARTCHARGING

3

Develop international standards

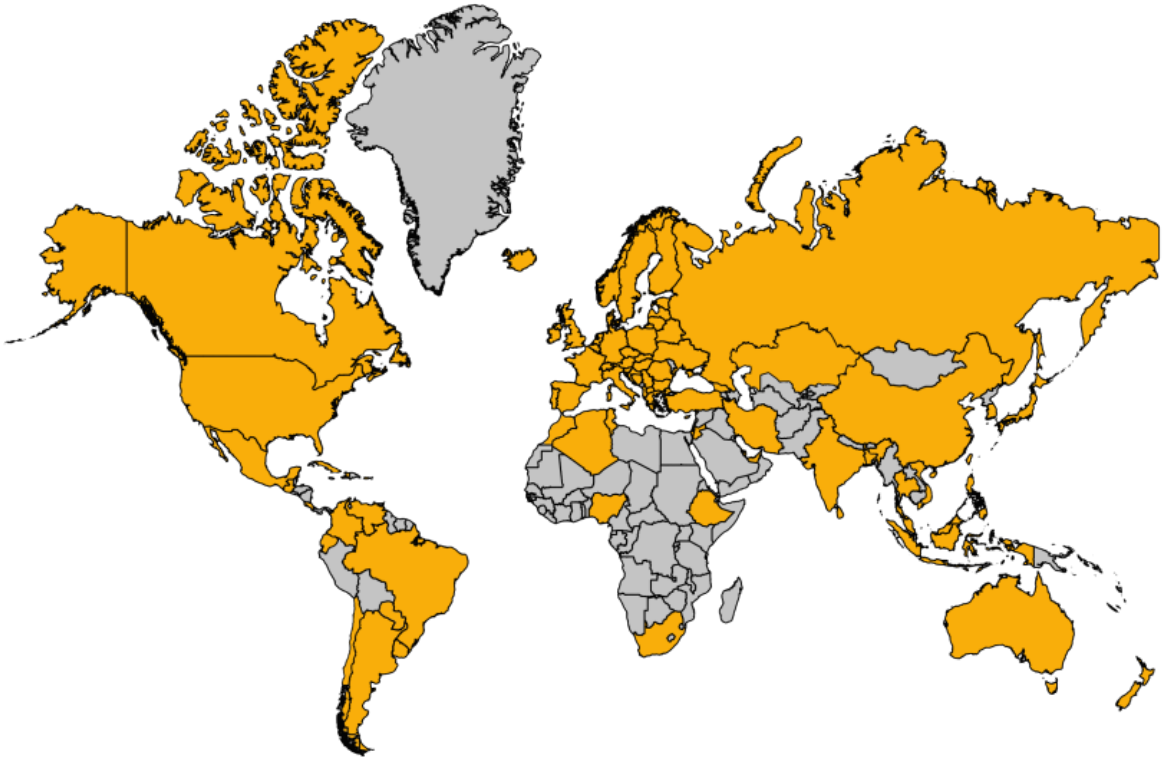
LIVING LAB SMARTCHARGING

The relation between the open protocols of Smart Charging.



LIVING LAB SMARTCHARGING

OCPP is helping the development of charging infrastructure globally



Downloaded by developers more than 17.000 times to 104 countries on all 6 continents

- OCPP provides a blueprint for how to set up a charging infrastructure
- Opens up markets, offering choice and diversity

testlab