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Arjan Wargers

SMARTGREENS 2014
3rd International Conference on Smart Grids and Green IT Systems
BARCELONA, SPAIN | 3 - 4 April, 2014

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E-Laad.nl: facts

- Introduction E-laad
- E-laad: facts
- The Problem
- Possibilities to decrease costs
- Interoperability
- Adding services
- A big part of the solution
- The use of open protocols

Goal

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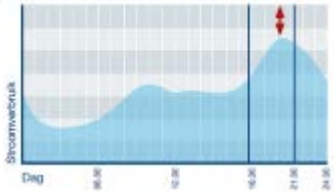
Stimulate electric transportation

Mass adoption of electric transport will have a huge impact on the grid



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e-laad foundation

- 8 Dutch DSO's

COGAS
DELTA
the multi-utility company
ENEXIS
Liander
endinet
RENDO NETWERKEN
STEDIN NET
Westland energy solutions

E-Laad.nl: some facts

- 2950 public charge stations
  (3600 in total, 2600 semi-public, over 12.000 private)
  32.000 plug-in EV's in the Netherlands
- 8 different chargestation-vendors
- Weekly energy consumption: 79.253 kWh
- No: weekly transactions: 9997
- Sharing Charge Data Records with 11 EMSP's
- Connected with Belgium and German network through 'e-clearing.net'
- Share static and dynamic data with over 25 parties

Why public charging infrastructure?

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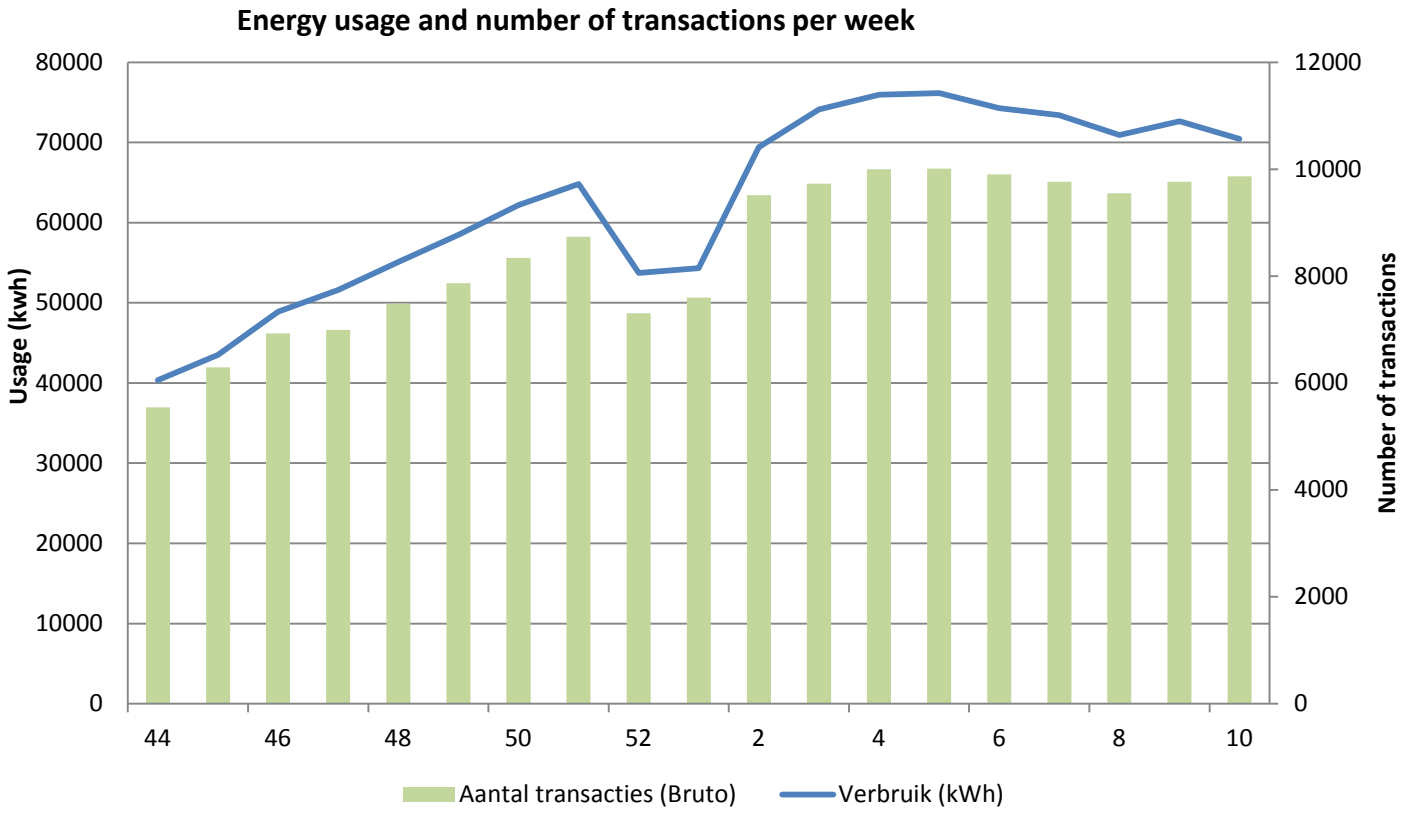
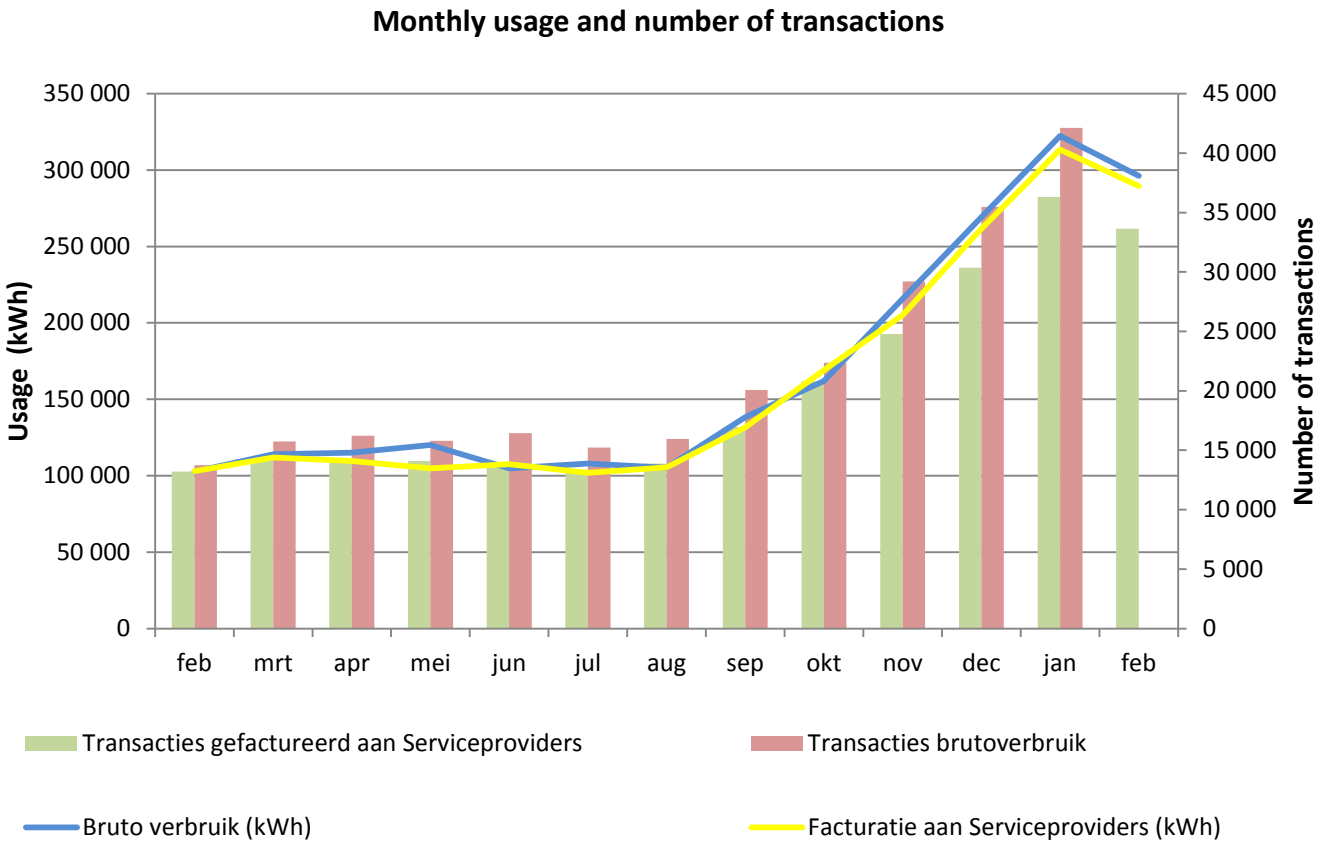
E-Laad.nl: facts &figures

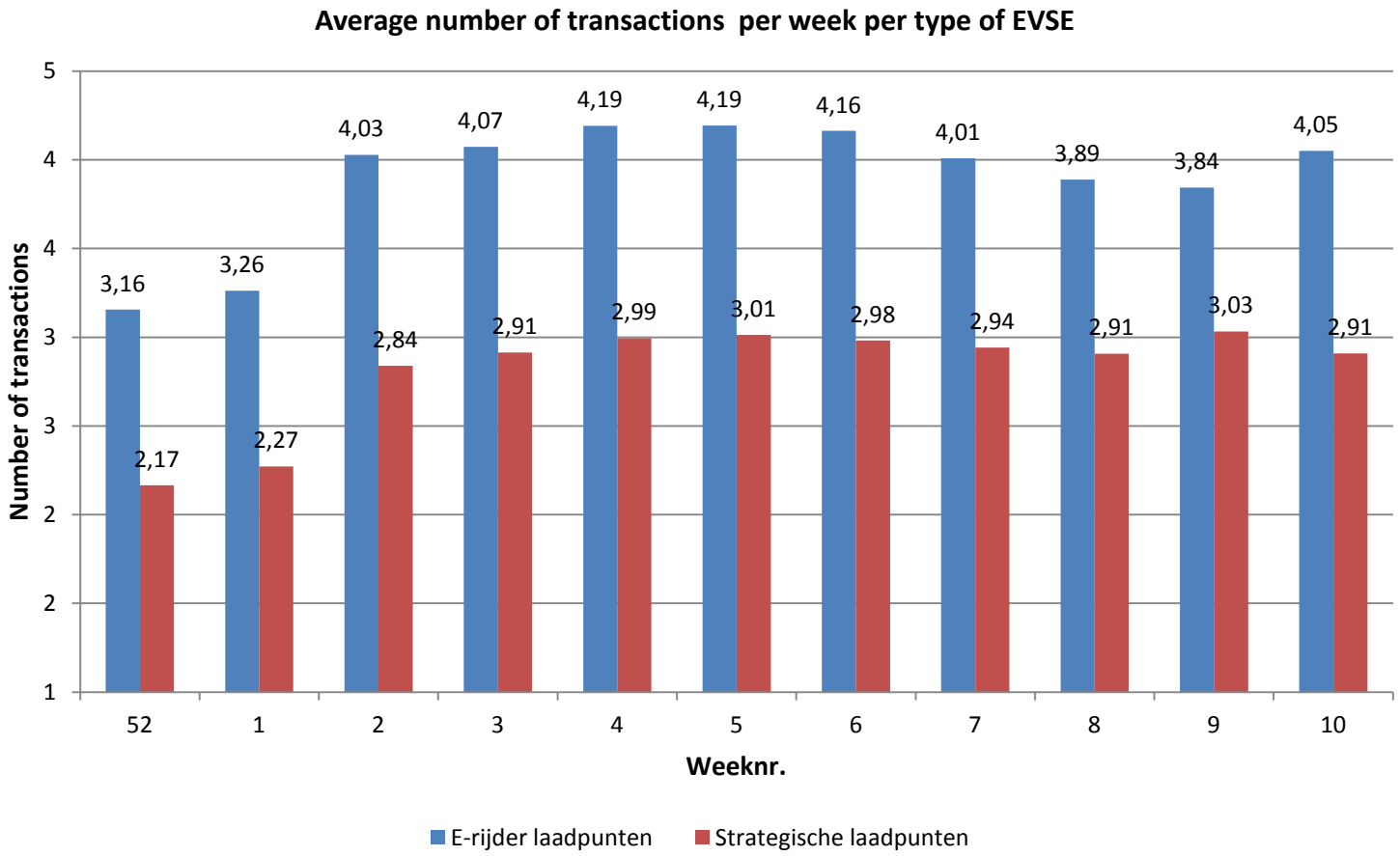


# transactions	9.766
Usage	73.039 kWh

E-Laad.nl: facts &figures

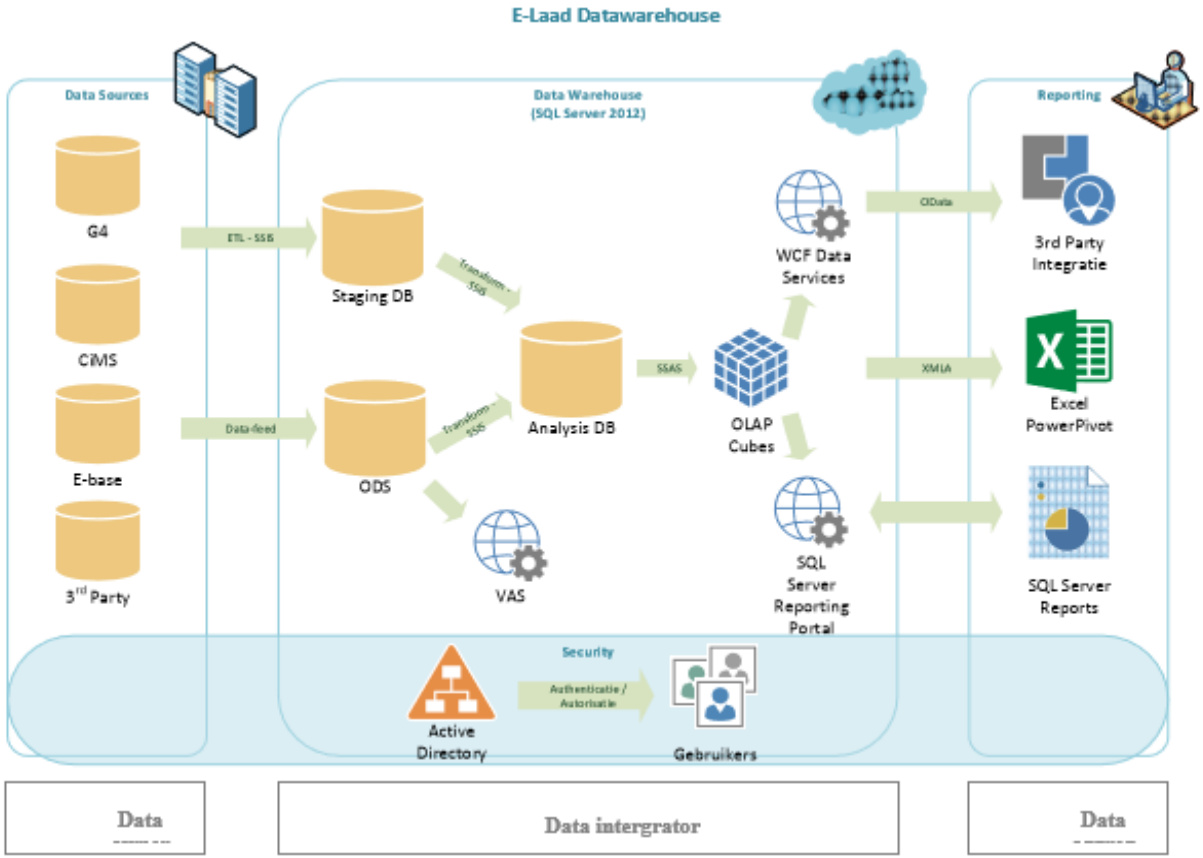


E-Laad.nl: facts &figures



E-Laad.nl: facts &figures

further developments



The Problem

The Total Cost of Ownership of the public charge infrastructure is too high.

Typical for the Dutch situation this is due to several issues related to:

- *DSO requirements*
- *Safety requirements*
- *Regulatory requirements*

Problem

The Total Cost of Ownership of the public charge infrastructure is too high.

CAPEX			
	station costs (average)	€ 1.750,00	
	collision protection	€ -	costs for local community
	parking sign	€ -	costs for local community
	equipe parking spot	€ -	costs for local community
	coordination costs local community	€ -	costs for local community
	direct personnel costs realisation	€ 80,00	
	installation	€ 720,00	
	direct personnel costs request/preparation	€ 120,00	
	connection	€ 700,00	
	Total	€ 2370,00	

Problem

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The Total Cost of Ownership of the public charge infrastructure is too high.

OPEX					
	preventive maintenance	€	---		
	corrective maintenance	€	400,00	Electricity €	0,062
	insurance	€	7,50	Energy taks €	0,113
	communications costs	€	3,50	VAT €	0,113
	backoffice costs	€	25,00	Service costs	
	meter costs	€	2,20	Total €	0,24
	capacity tariff	€	651,17		
	direct personnel costs	€	100,00		
	damages	€	25,00		
	Total	€	1215,00		

Possibilities to decrease costs

To reduce cost we have not only to look to component costs but also to installation as well as operation costs.

But keep in mind:

No reduction of safety

Same or even Increment of functionality

To realize this open mind and change of procedures for DSO and CPO (Charge Point Operators) are preconditions

Possibilities to decrease costs

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No regulation changes possible (at this moment):

For example energy tax:

Elektriciteit per kWh	2013, ex
0 t/m 10.000	€ 0,1165
10.001 t/m 50.000	€ 0,0424
50.001 t/m 10 mln	€ 0,0113
boven 10 mln niet-zakelijk	€ 0,0010
boven 10 mln zakelijk	€ 0,0005

Focus on:

Physical DSO requirements

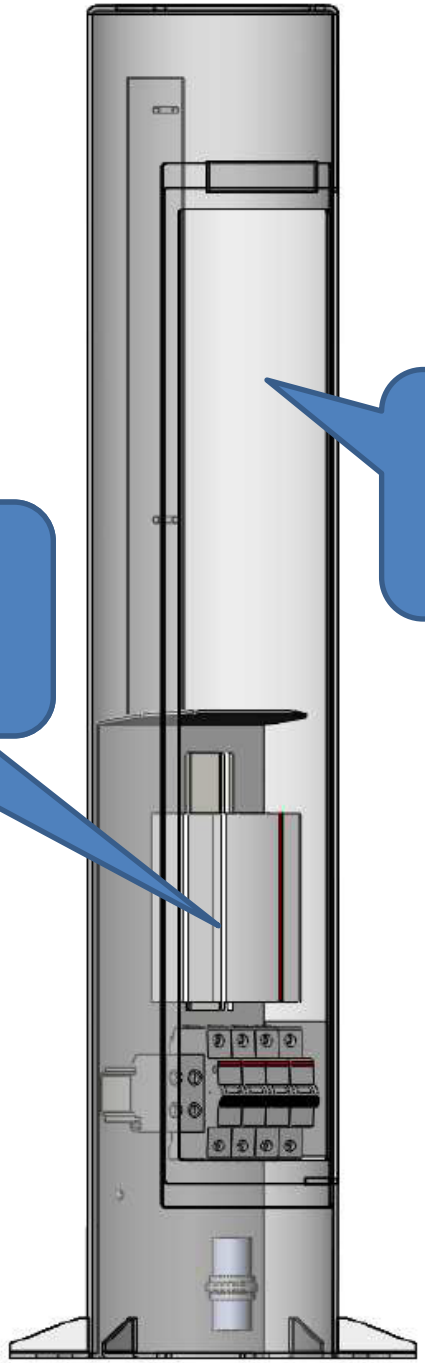
Intake, Installation

Metering, Data management

Typical Charge Post

DSO compartment

Third party compartment



Grid costs

Typical Dutch situation

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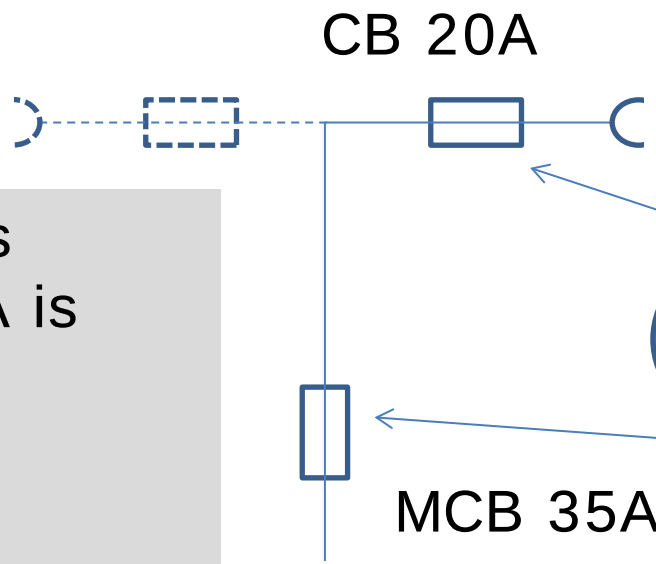
The DSO **installation cost** as well as the yearly **capacity tariff** are based on the pass thru value of the MCB

Connection	average	Enexis
t/m 25A	€ 569,35	€ 568,00
25-35	€ 790,52	€ 692,00
35-63	€ 833,61	€ 692,00
50-63	€ 1.093,60	€ 826,00
Yearly grid tariff		
25	€ 164,09	€ 106,04
25 - 35	€ 651,17	€ 530,20
35 - 50	€ 966,33	€ 795,30
50 - 63	€ 1.264,60	€ 1.060,40
63 - 80	€ 1.579,43	€ 1.325,50

Reduce value DSO protection

16A continuous requires 20A CB



Selectivity mandatory by grid code

Even when only 16A is required a MCB of 35A is necessary

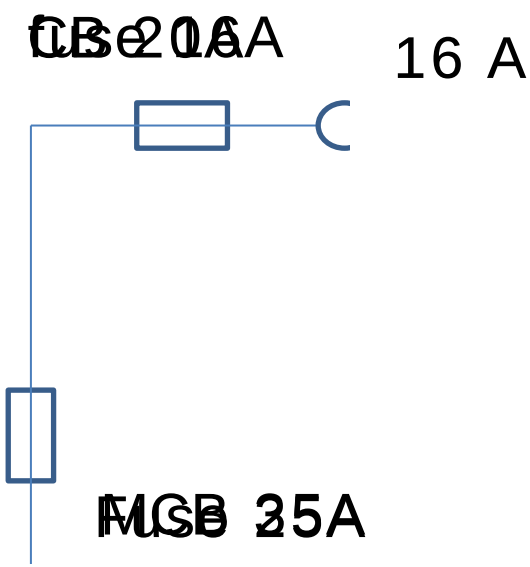
This leads to high installation cost + € 120,-

and high yearly costs + €500,-

Reduce value DSO protection

Replace CB 20A by fuse of 16A
Replace MCB 35A by fuse 25A

Selectivity still guaranteed



gF, gI-gG, aM

PMF 10x38

New grid connection demands

All specific DSO demands irt a 3x25A connection for a charge station

The goal of these demands is to enable Chargepoint Operators (CPO's) to use a much smaller 3x25A grid connection

Size does matter!

Smaller means cheaper (scale)

Intake Installation

One party takes care of everything:

One party does intake and site survey

One party installs in one labour act:

Start, placement, connect, test.

No differentiation between compartments of DSO and third party. Only one compartment is available and both have access.

Change metering

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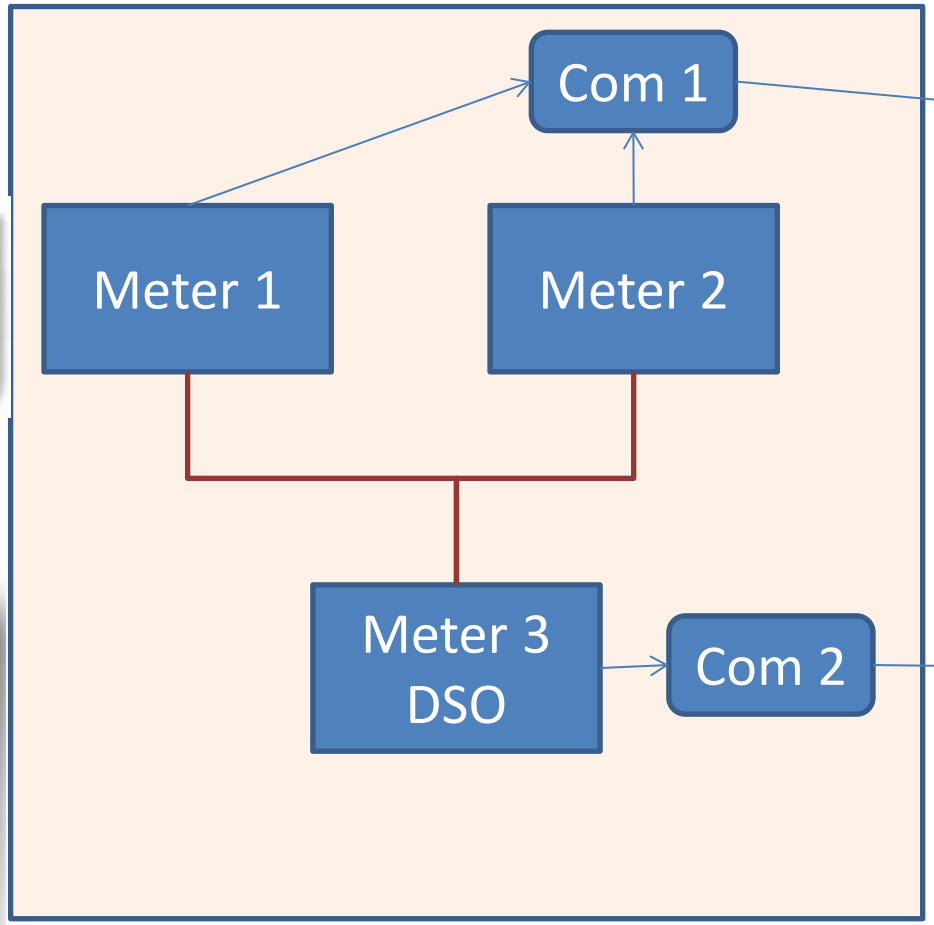

Back office

Metering system

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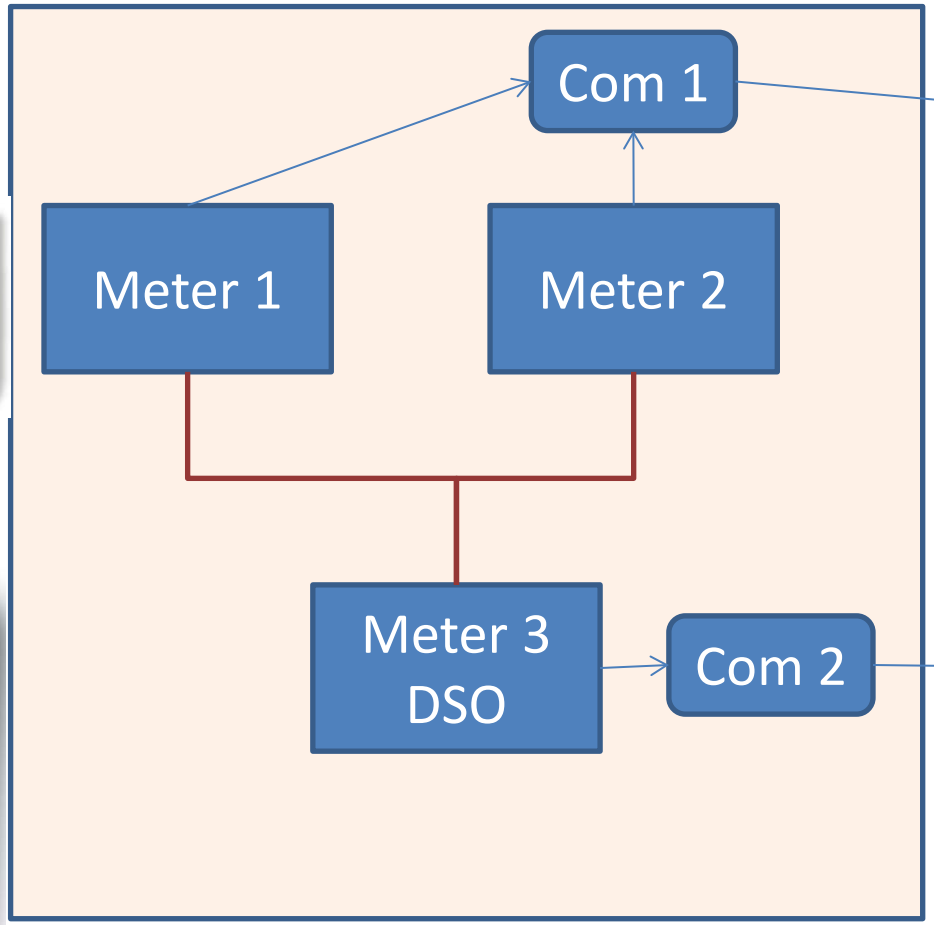
Change metering



Back office

Com

Metering system

Change metering

Avoid cost smart meter

Avoid cost SM com system

Reduces space (size does matter!)

Requirements on:

meter (MID)

meter maintenance (meterpool)

metering com system

Security and reliability

metering data format (P4 format) --- transparancy needed: open protocol!

Interoperability

Roaming of emobility services is a very important acknowledged aspect of the EV-ecosystem

But it does not solve The Problem

“The solution for effortless cross-boarder charging”

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International Roaming agreement

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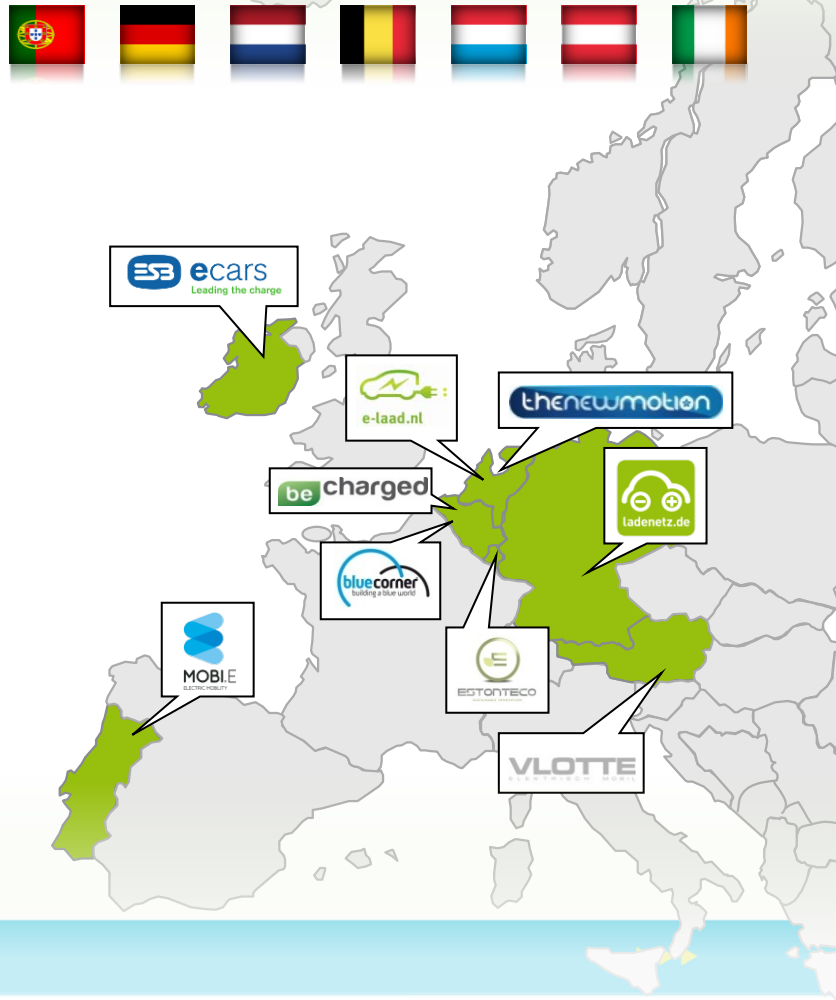
Starting point

- LOI signed in May 2012
- Agreement by 7 partners in 7 countries
- Agreed to roaming and cooperation

Current situation

- Further development based in NL, BE, GE
- In the cross border region (NL <-> B <-> D) ‘e-roaming is ‘business as usual’
- Organic growth in the different connected countries and Luxembourg



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Open Market Model

Open, independent, custom partnerships

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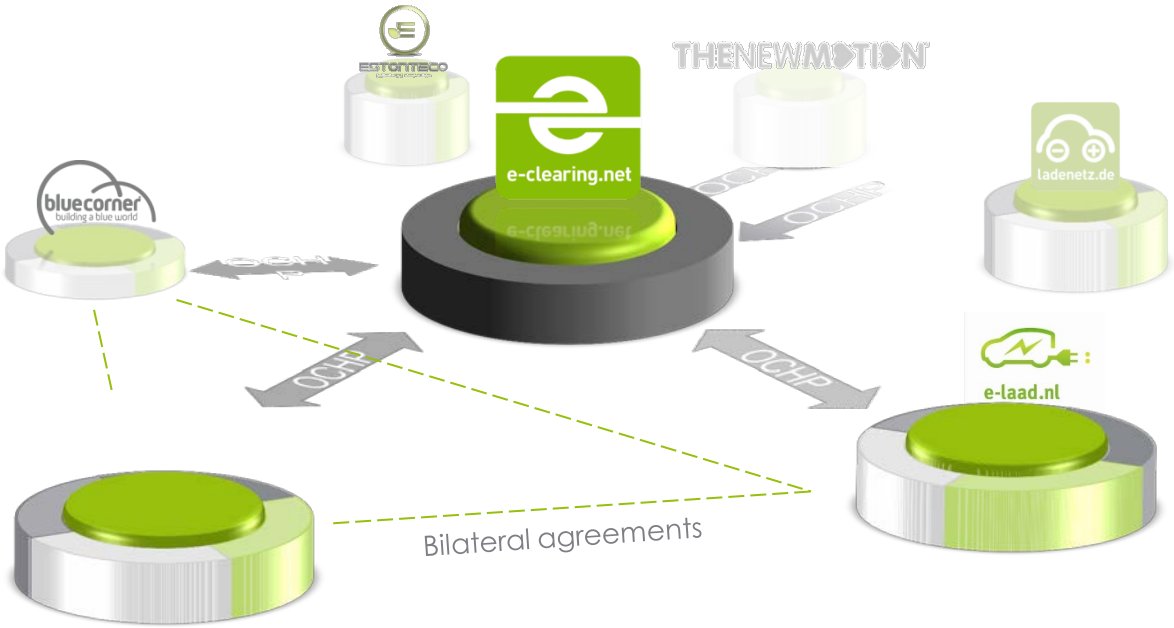
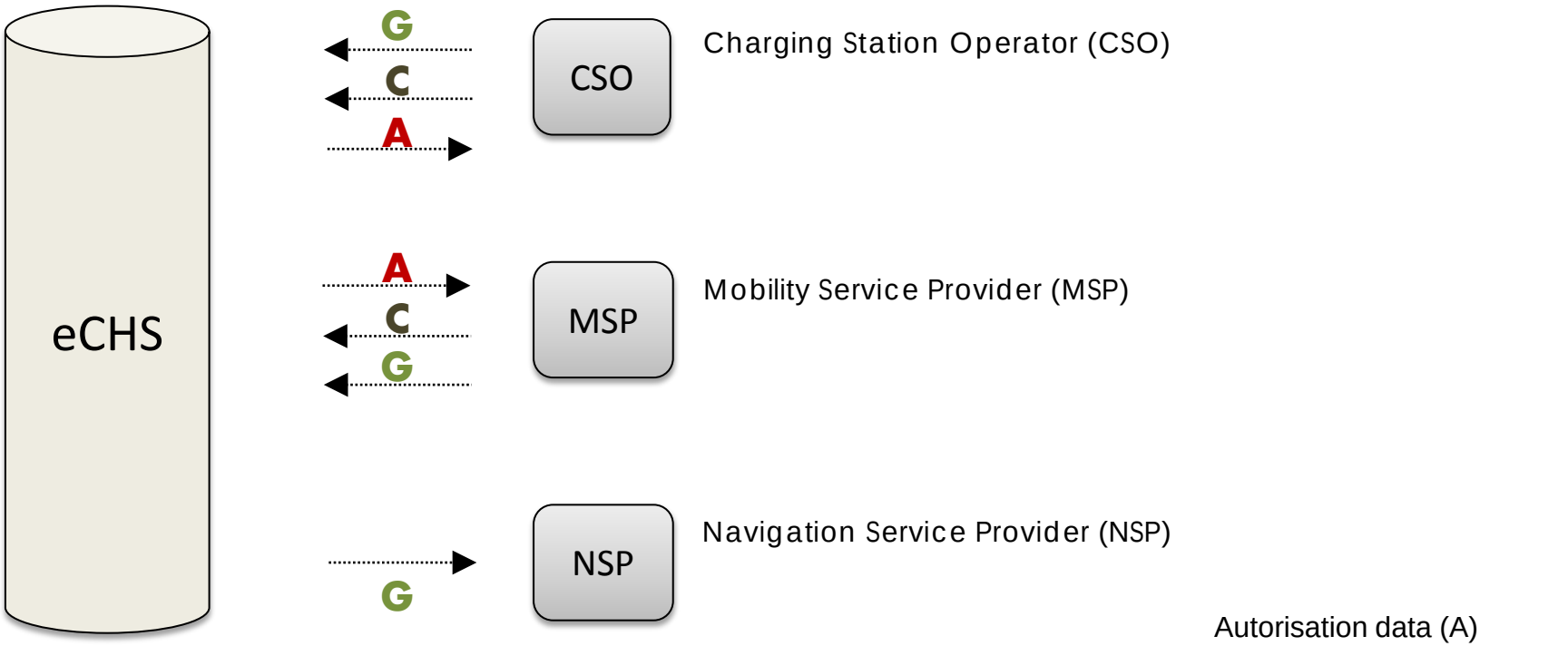


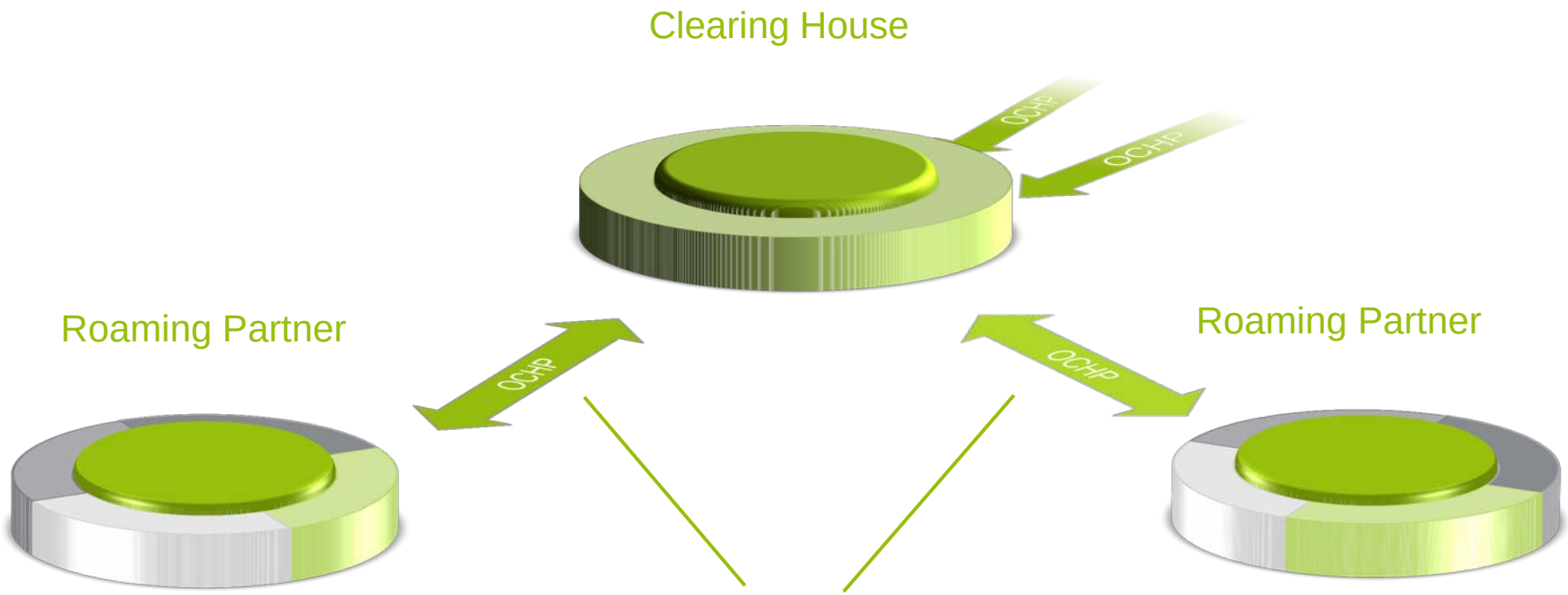
- Complexity reduction by central Roaming Platform
- Clearing European roaming agreements of different market roles (NSP, CSO, MSP)
- Open and established protocol: Open Clearinghouse Protocol (OCHP)

Data exchange

exchange of relevant data for an open market model



Communications structure



Total communication through one unified open communications protocol: OCHP

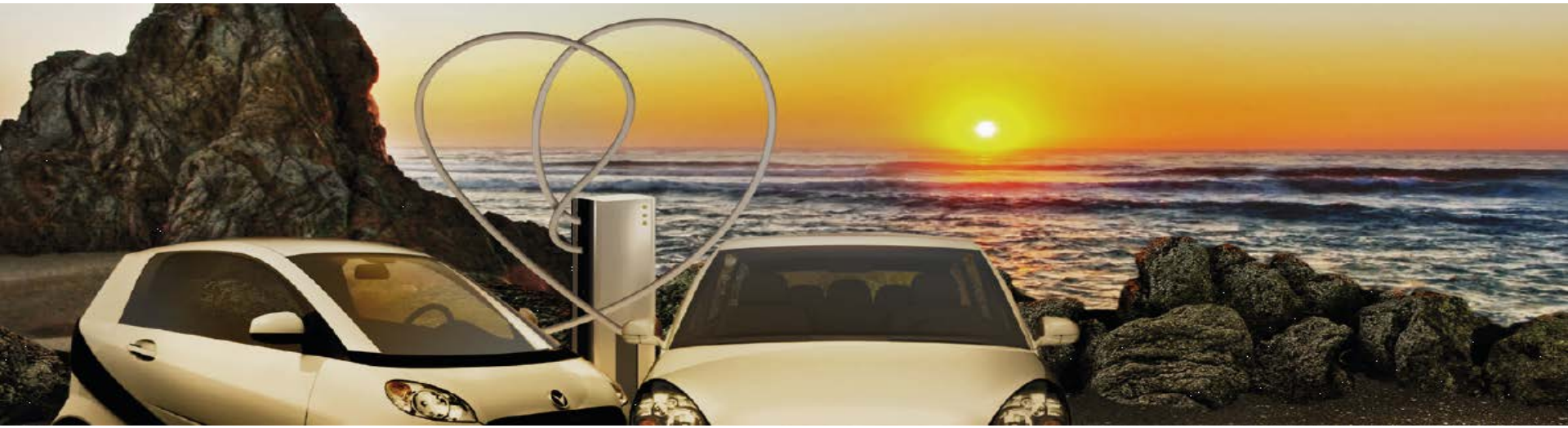
Open Protocol: OCHP

Open Clearing House Protocol

OCHP
OPEN CLEARING
HOUSE PROTOCOL

- Open communication protocol between IT-Back-Ends
- Free to implement- usage is independent of e-clearing.net
- Open for further development

Free and withouth registration
Download at
www.ochp.eu



EUROPEAN E-MOBILITY NETWORK

E-MOBILITY ACROSS BORDERS

Accelerating European wide e-mobility usage

www.european-e-mobility.net

e-clearing.net

CHARGING WITHOUT DETOURS

The solution for effortless cross-border charging

www.e-clearing.net
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EUROPEAN E-MOBILITY NETWORK

OCHP
OPEN CLEARING HOUSE PROTOCOL

MAKES EXCHANGE EASY

With a free open protocol for e-mobility interoperability

www.ochp.eu

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Adding services

*Adding services helps but does not solve not **the problem***

- *Dynamic geo-info*
- *Reservation*
- *Integration with 'parking'*
- *Free choice of electricity supplier*

Free choice supplier

Free choice supplier.

No Fixt supplier on the pole

Supplier will be allocated as soon as a EV-driver identifies.

Supplier of the E-mobility Service Provider is allocated. (actual end user of electricity)

Free choice supplier

Facilitates the market

Provides customer (more) choice

But has no direct impact on the business case of EV infrastructure

A big part of the solution

Smart charging

Smart Charging is the charging of an EV controlled by bidirectional communication between two or more actors to optimize all customer requirements, as well as grid management and energy production including renewables with respect to system limitations, reliability, security and safety. These four requirements which are already required by conventional non smart charging.

CEN-CENELEC

E-Mobility Coordination Group (M/468)

and

CEN-CENELEC-ETSI Smart Grid Coordination Group (M/490)

Smart Charging

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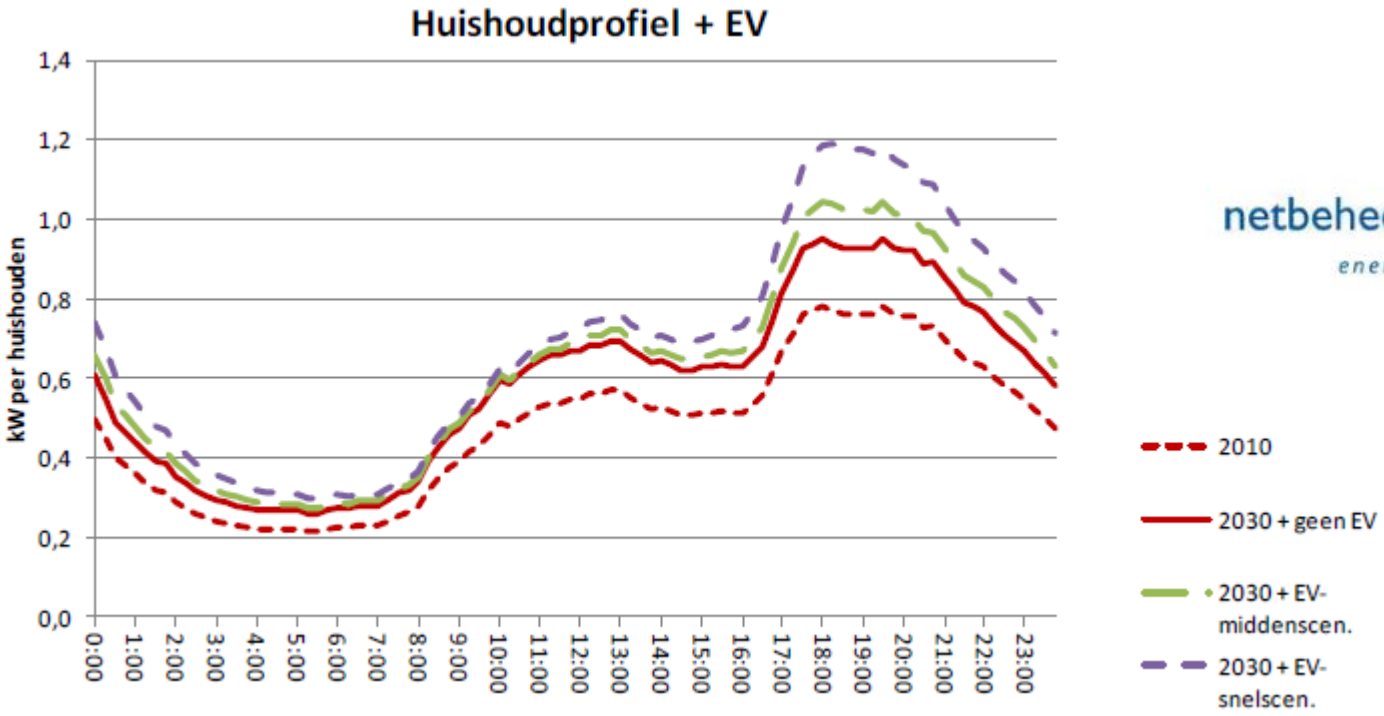
We might be looking to narrow to the EV Ecosystem

We need to broaden our scope:



Movares ENERGY

netbeheer nederland
energie in beweging

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Smart Charging

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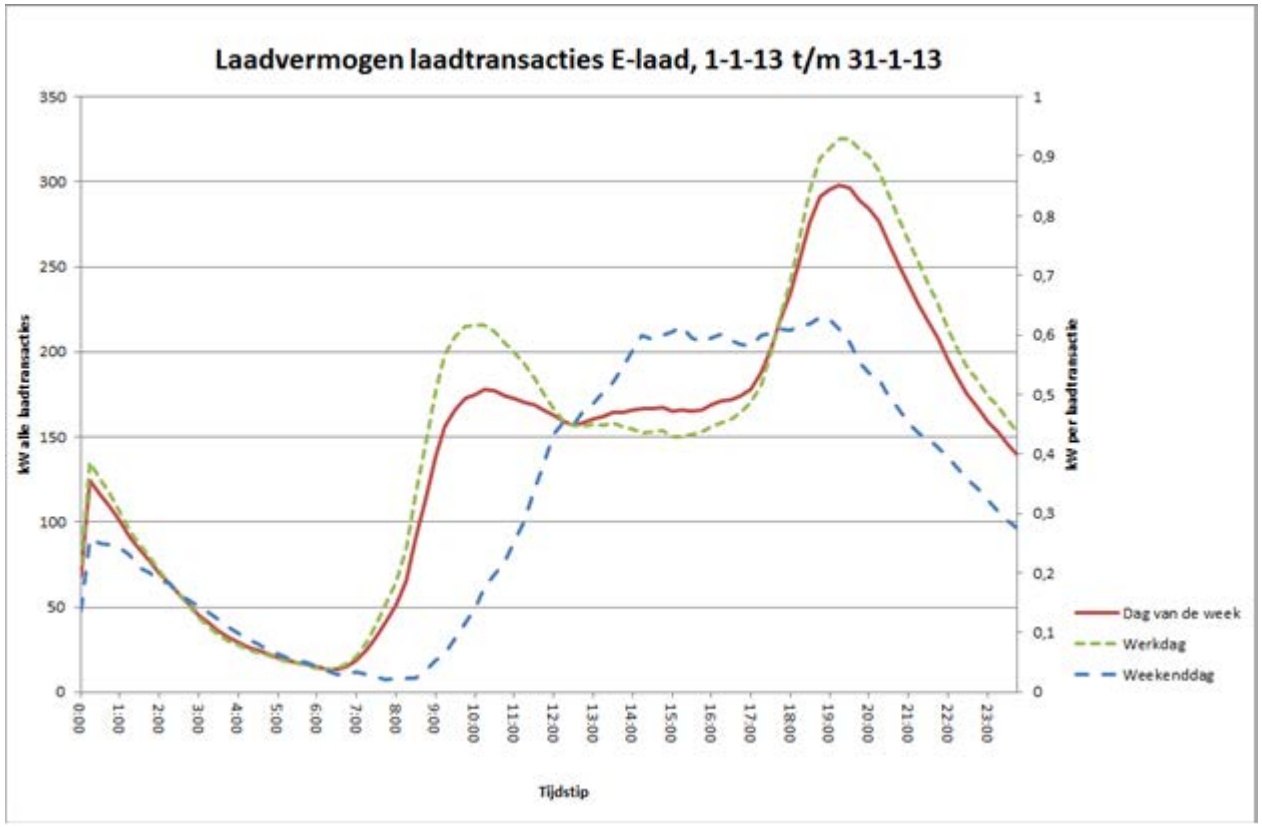
The development in practice



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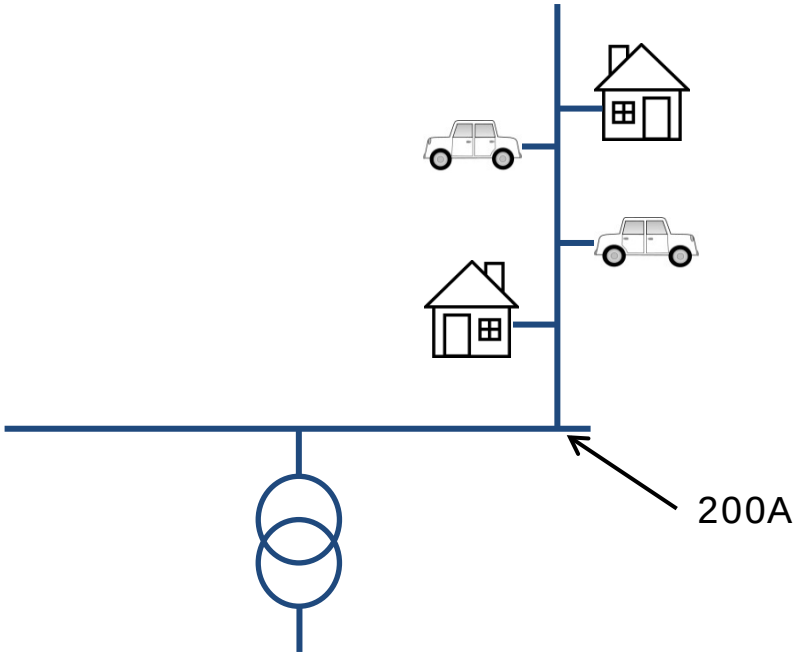
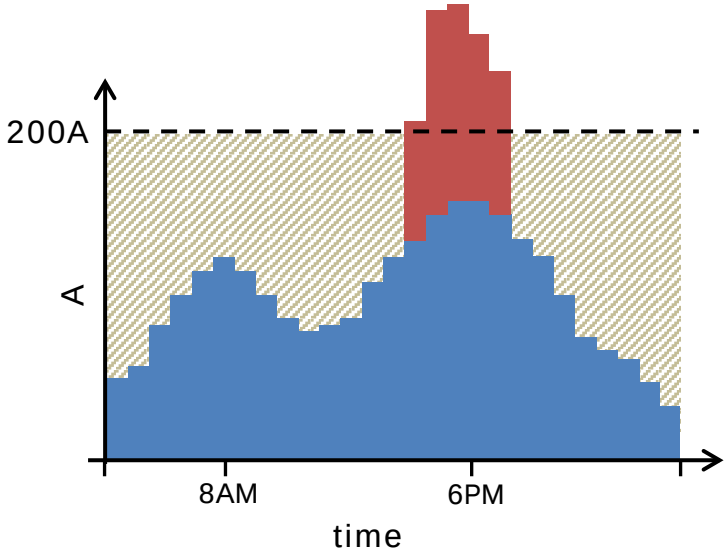
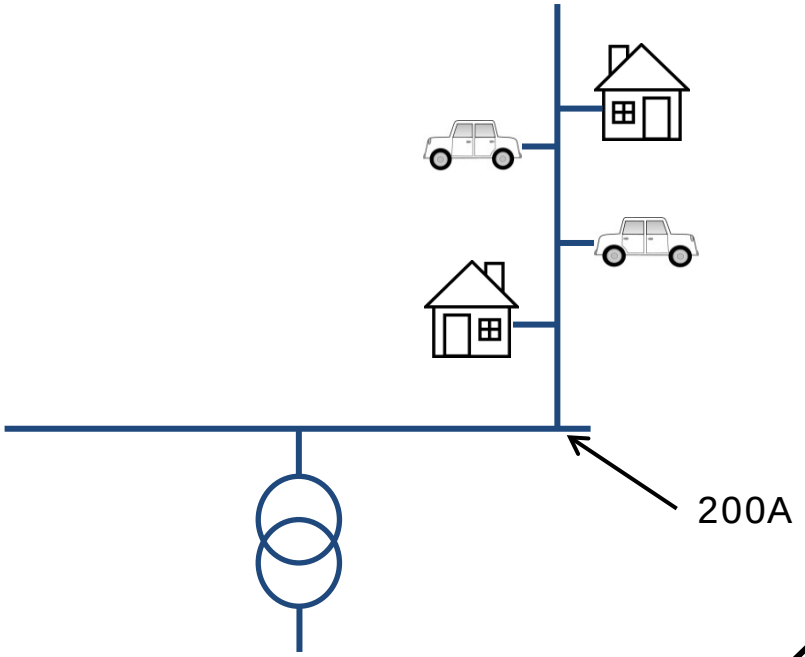
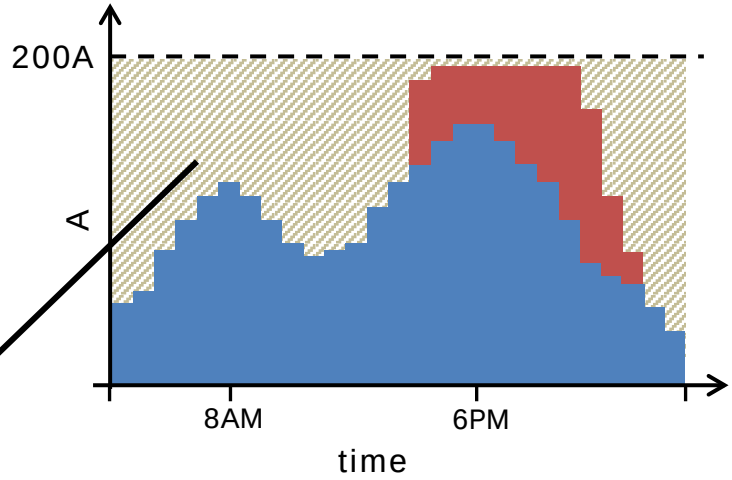
The challenge for (our) DSO's





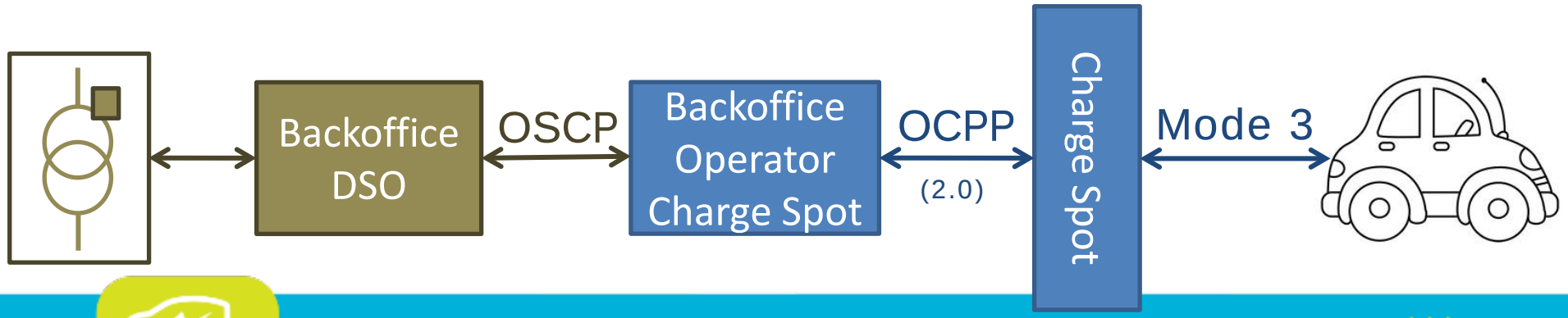
The challenge for (our) DSO's



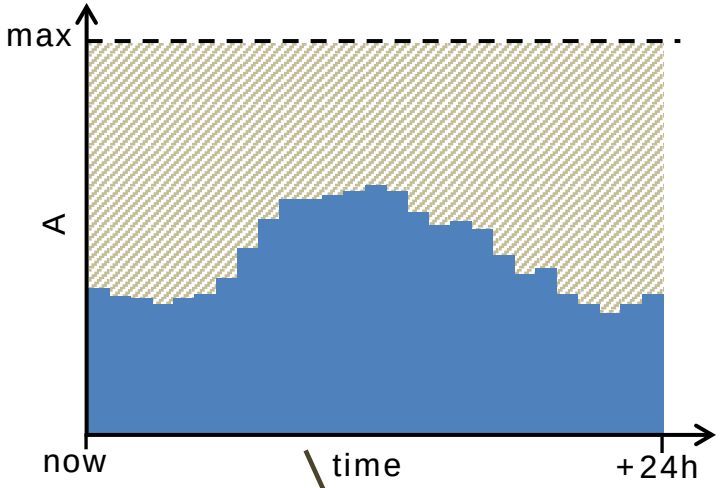


Het Open Smart Charging Protocol provides information about a forecast of the available capacity

OSCP - positioning

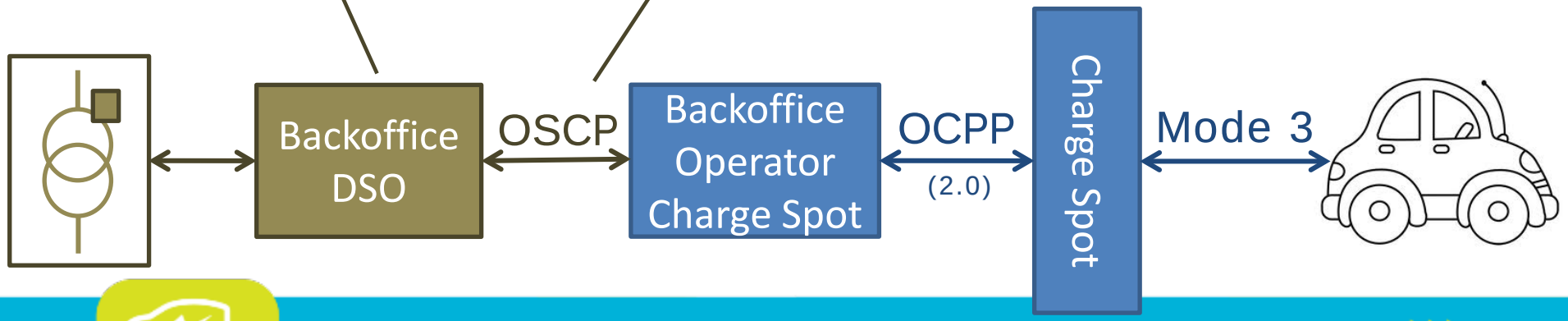


OSCP – what is it



Open Smart Charging Protocol

- information about available capacity for flexible loads
- possibility to request or offer extra capacity



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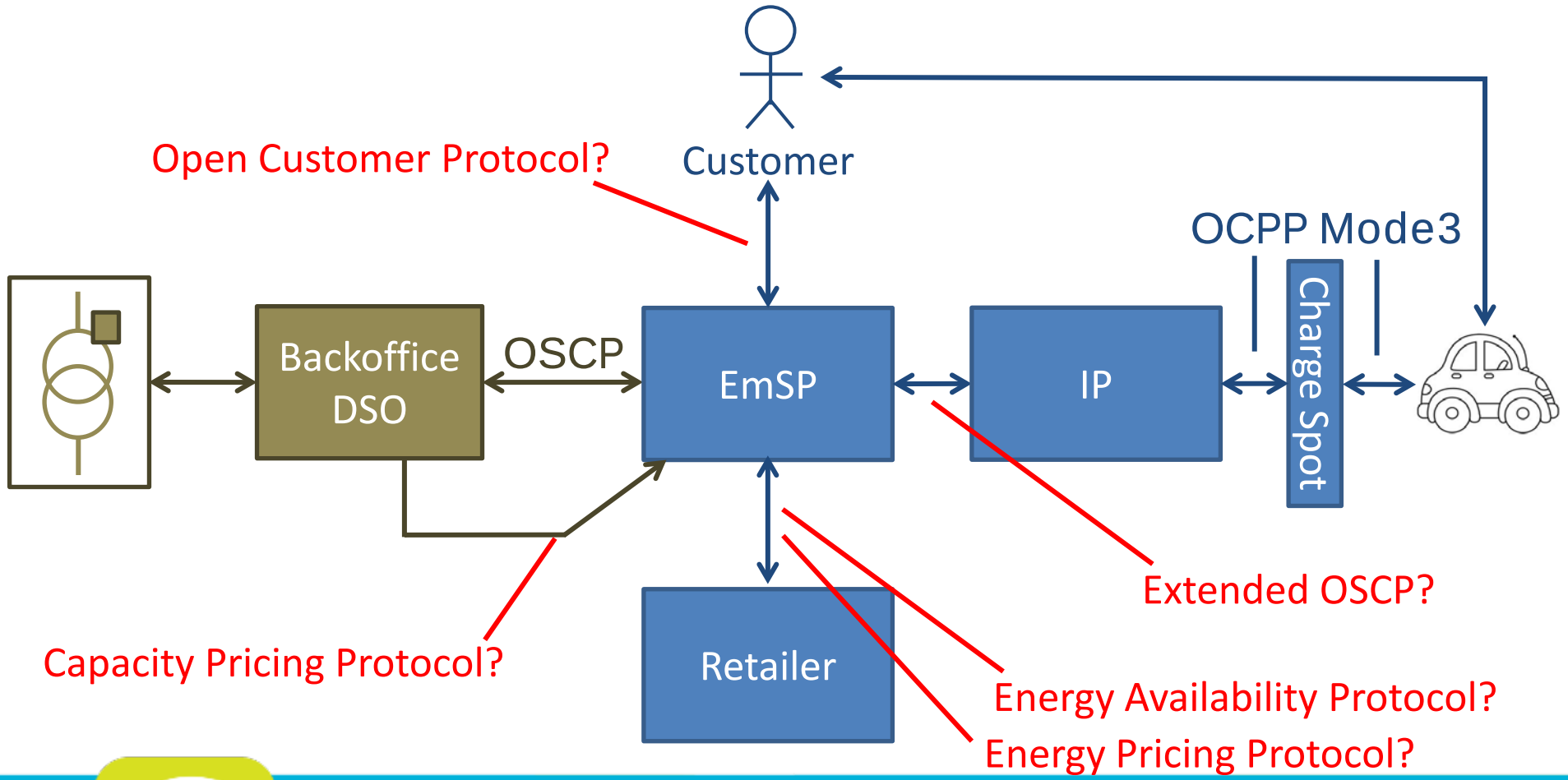
What is OSCP not?



Where are we now

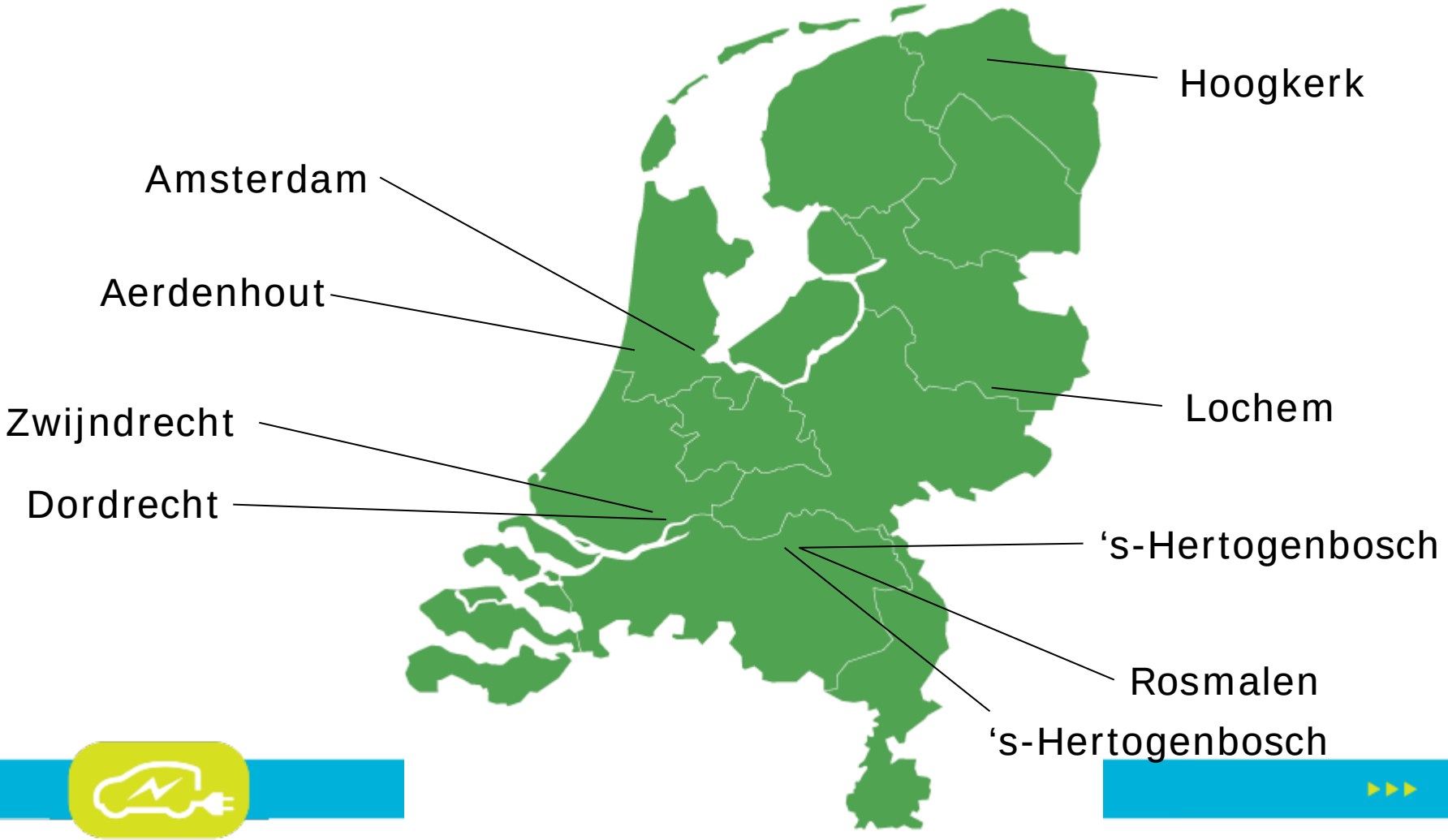
- Protocol defined
- first PoC's delivered
- adapting back-end systems
- involvement of multiple parties

DSO's

EmSP's

Charge Station suppliers

Where are we now



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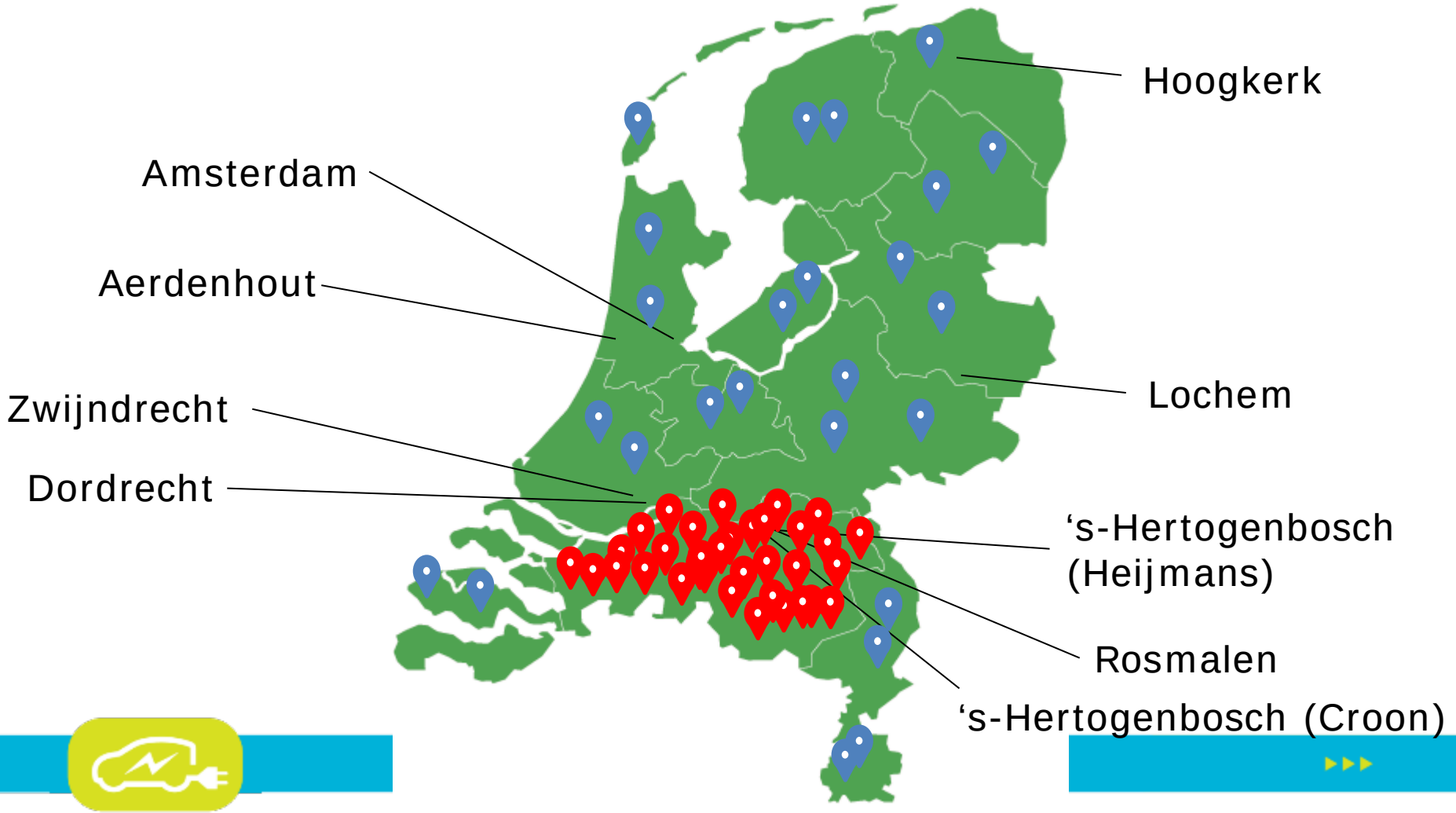
Where are we now



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Where do we want to go?

- International uniformity
- Smart charging as a service from DSO
- Value of flexibility determined

The use of open protocols was one of our directives when we started with e-laad

OPEN CHARGE ALLIANCE

www.OpenChargeAlliance.org

OCPP in a nutshell (What you may already know)

- OCPP is an abbreviation for Open Charge Point Protocol
- OCPP is an open and free communication standard between charging stations and central systems
- OCPP was initiated in 2009 by the E-Laad Foundation
- OCPP has become the protocol of choice in 50 countries, is used to manage over 10,000 charge stations
- In the European market OCPP has become the de facto standard
- E-Laad established the OCPP Forum as a community supporting the development and maintenance of OCPP

What do we need to solve?

- Charge stations are expensive
  - Expensive stations
  - Expensive back office/management systems
- Limited choice with proprietary systems
- Very limited flexibility for future changes or extensions when proprietary systems are used
- Risk on many different Human Machine Interactions on charge stations when proprietary systems are used
- To many different connections to tools and apps from 3rd parties

Expensive
Not flexible
Not user friendly
Not transparant

The answer

- Development and use of open, free to use, standard interfaces between charge stations and management systems
- Pragmatic approach
  - Only develop what is necessary
  - Focus on doing instead of talking
  - Effective governance structure
  - Good test tools
  - Reliable certification

Why a new name and organization?

- Indicates we're taking the protocol to the next level, to support growth in stakeholder types, number, and market geographies
- Emphasizes and marks a new level of maturity with OCA
  - Formalized "open and free" IPR Policy (RANDz)
  - Stronger governance structure and organization
  - More rigorous requirements management and traceability
  - Clearer working and decision processes, timelines and release cycles
  - Welcoming new and different types of users and stakeholders
  - Publication of OCPP 2.0, covering recent market requirements
  - Protocol compliancy: testing, tools, and formal certification
  - Growth of OCPP adoption

Why open protocols

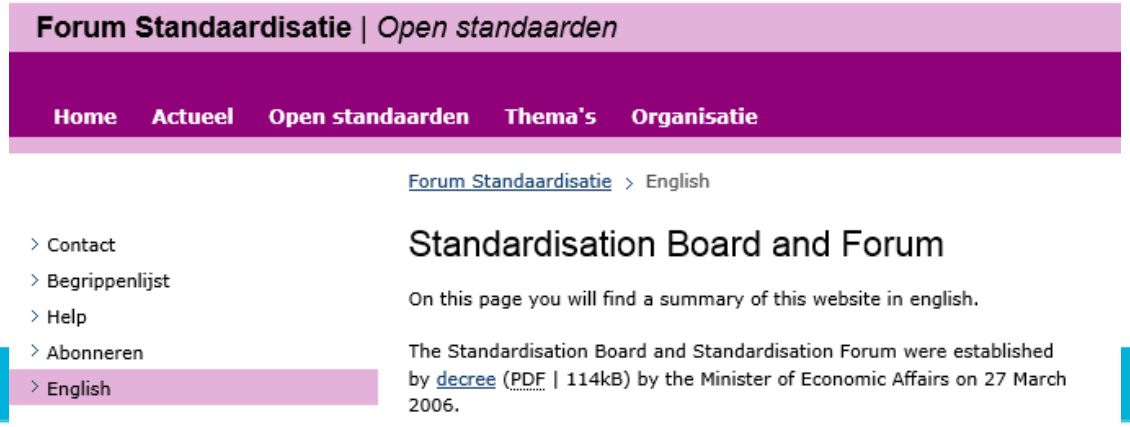
- First of all open standards contribute to interoperability. By using open standards the (digital) communication between different actors improves.

- In addition, open standards ensure that freedom is guaranteed. Open standards are by their very nature, not software-specific and can be installed by each supplier. They are necessary for achieving vendor independence.
- This leads to high-quality and cost-effective information exchange.

- Open standards involves creating and applying agreements on specifications of the interfaces between the co-operating applications, services, systems and networks. Characteristic of open standards is that there are no barriers to the use of the standards.

Why open protocols

- Besides vendor independence and interoperability Open standards also lead towards transparency, accountability and manageability.
- This is a very important aspect in de development of the ‘smart ecosystem’. The different building blocks e.g EVSE development, smart charging, smart grids, smart energy, smart traffic, etc. have to come together one day.
- It is impossible to design the whole ecosystem top-down, so we need to connect the building blocks by making use of open standards.



Questions?

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