NoAE project days - Workshop 'NL meets NRW'

Interoperability - cross-border charging

18 April 2012

Christian Pestel, Senior IT Manager, smartlab

Arjan Wargers, Manager R&D, e-laad

smartlab Innovationsgesellschaft mbH
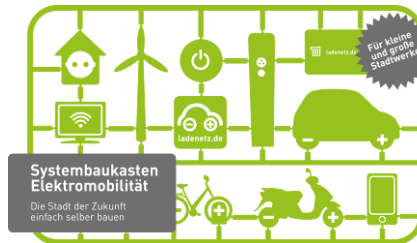## Electromobility from municipal utilities for municipal utilities

Research & Development

- Various federal research projects of BMWi and BMU

econnect Germany

23 Mio €

Smart Wheels

13,8 Mio €

E-Aix

5,8 Mio €

Entire volume > 43 Mio €

Product Solutions

- System tool box Electromobility
- „ladenetz.de" cooperation for national roaming
- Clearing & international roaming „e-clearing.net"

Systembaukasten Elektromobilität
Die Stadt der Zukunft einfach selber bauen

Für kleine und große Stadtwerke

Consulting

- Market entry & implementation consulting
- Process consulting
- Application support and project management for research projects
- Consortium management
- Design of business models

Subsidiary of municipal utilities of Aachen, Duisburg and Osnabrück

STAWAG

DVV
DUISBURGER VERSORGUNGS- UND VERKEHRSGESELLSCHAFT MBH

Stadtwerke Osnabrück
Immer für Sie da.

- Allgäuer Überlandwerk
- SW Aachen
- SW Bad Säckingen
- SW Duisburg
- SW Erfurt
- SW Fürstenfeldbruck
- SW Georgsmarienhütte
- SW Jülich
- SW München
- SW Osnabrück
- SW Rosenheim
- SW Schwäbisch Gmünd
- SW Springe
- Energieversorgung Sylt
- SW Trier
- Überlandzentrale Lülsfeld
- SW Union Nordhessen
- SW Waldkirch
- SW Waldshut-Tiengen

Interoperable cross-border charging
Motivation

- Win customer acceptance overcoming existing range anxiety

- Make e-mobility as feasible and attractive as possible for the customer

- Lower barriers in e-mobility market
  - Cost
  - Technology
  - Organisation

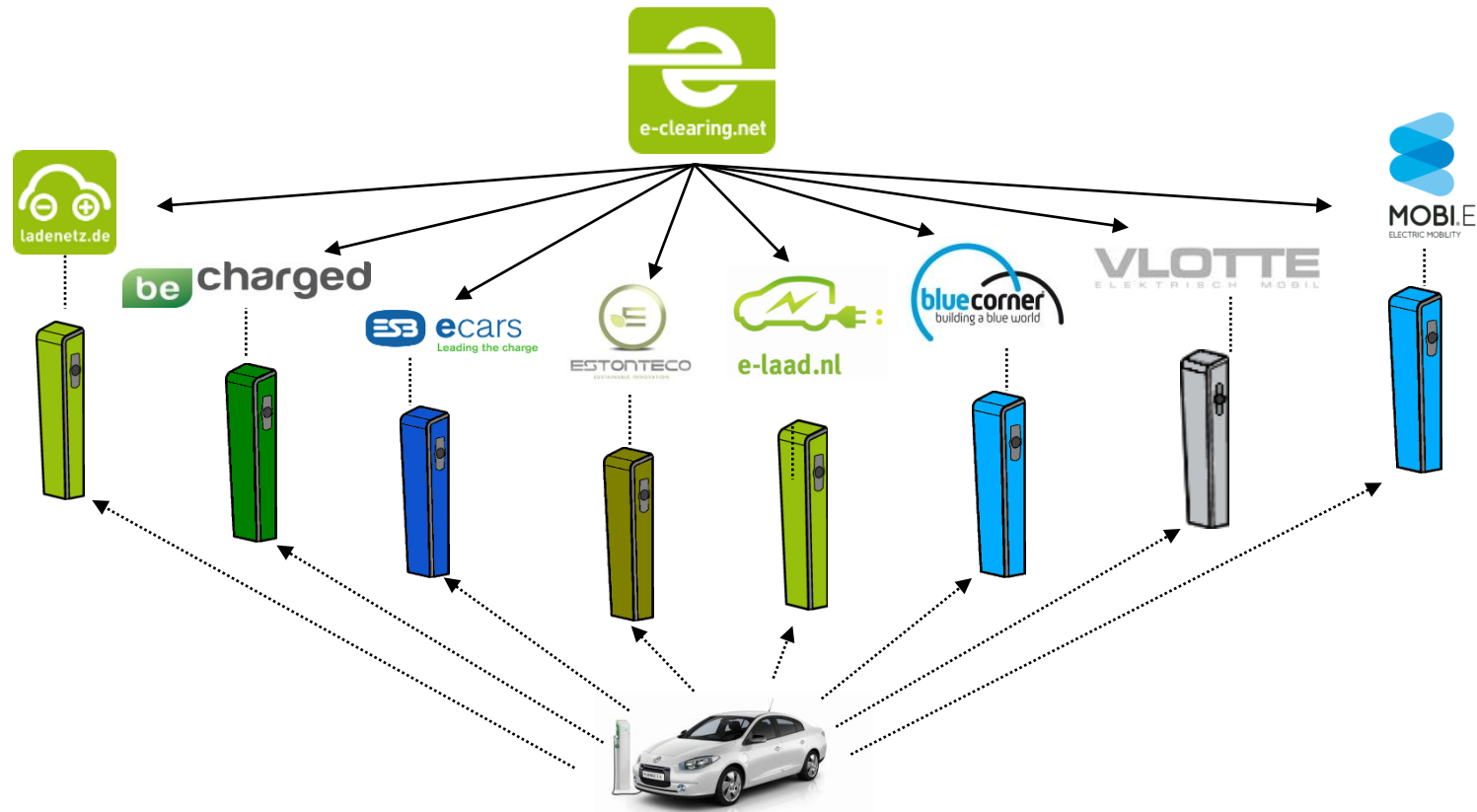- Cooperation of public charging station operators beyond national borders

Open European roaming and clearing platform
e-clearing.net

- Discrimination free authentication und authorization
- Clearing of European roaming contracts for various suppliers
- Value added services like data for geo-information providers

"Treaty of Vaals" – 30 March 2012
International roaming agreement

Openness

- ⑩ Open protocols are lowering system barriers of entry for joining parties
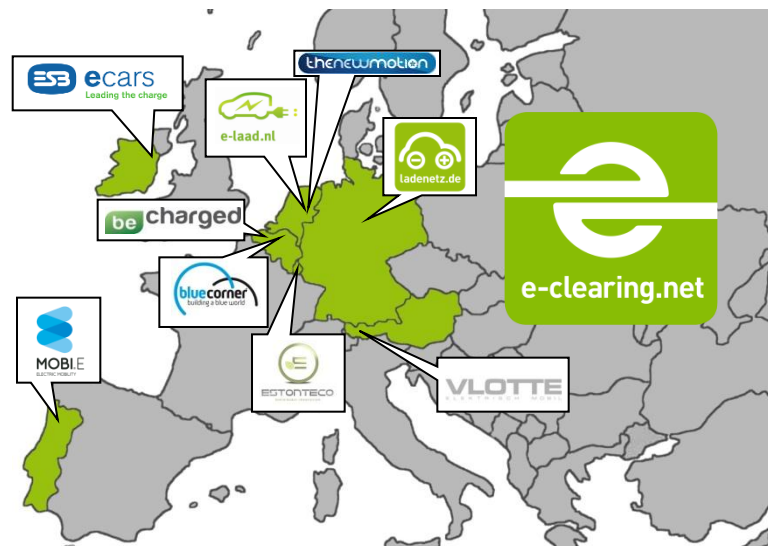
Scalability

- ⑩ Individual clearing conditions can be set on a bilateral basis between charging network operators for power consumption and/or pure access
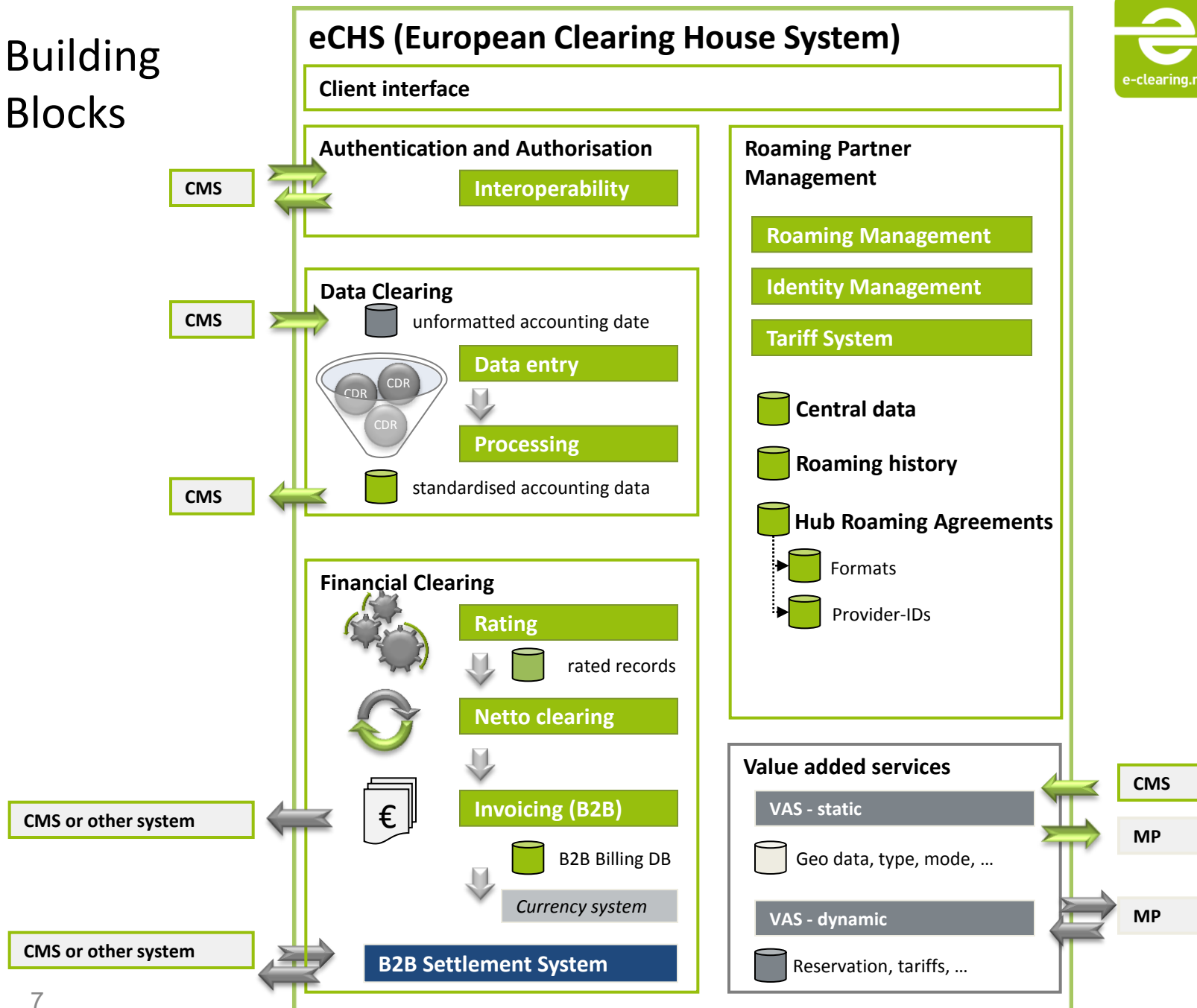
Ease of Integration

- ⑩ Web service applications can be set up easily on members' IT systems based on SOAP

Reduction of complexity

- ⑩ eCHS acts as roaming hub reducing complexity of relationships among roaming partners from m:n to 1:n

Building Blocks

eCHS (European Clearing House System)

Client interface

Authentication and Authorisation

Interoperability

CMS ⇄

Roaming Partner Management

Roaming Management

Identity Management

Tariff System

Data Clearing

CMS →

⬤ unformatted accounting date

Data entry

CDR · CDR · CDR

Processing

⬤ standardised accounting data

CMS ←

Central data

Roaming history

Hub Roaming Agreements

Formats

Provider-IDs

Financial Clearing

Rating

⬤ rated records

Netto clearing

€

Invoicing (B2B)

⬤ B2B Billing DB

Currency system

CMS or other system ←

CMS or other system ⇄

B2B Settlement System

Value added services

CMS →

MP →

VAS - static

⬤ Geo data, type, mode, …

VAS - dynamic

MP ⇄

⬤ Reservation, tariffs, …

Foundation e-laad.nl
Dutch charging infrastructure provider

- Cooperation of Dutch Distribution System Operators (DSO's) to prepare Dutch grid for the future

- Collaboration in joint venture e-laad.nl for roll-out of charging infrastructure with national coverage

- Initial goal 10.000 charging stations before end 2012
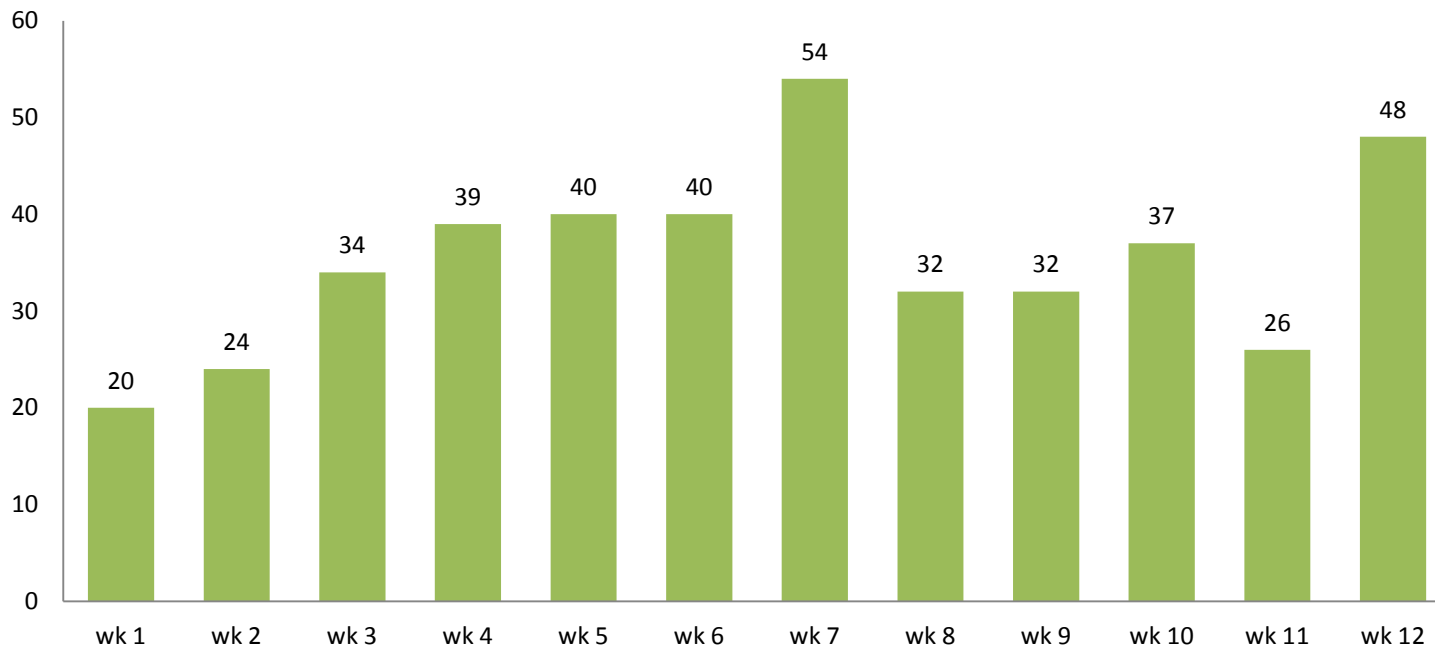
Strong increase of requests

Jaar Aanvraag	Aantal Aanvragen	Aantal aanvragen e-rijders
2009	34	-
2010	357	90
2011	942	310
2012	431	328
	1.764	728

In the first 3 months of 2012 already more private requests than 2011 in total

Number of private requests in 2012

Weekly requests show steady growth for public charging needs for private customers
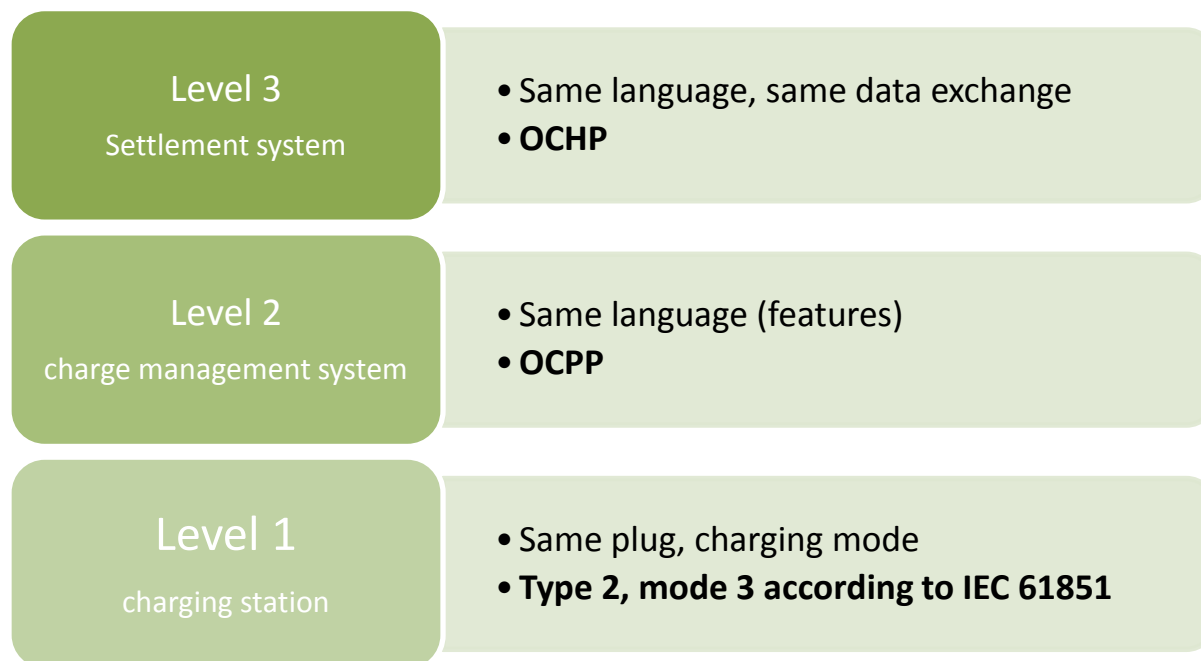
Cross-border example
Floriade in Venlo

- Market for cross-region and cross-border e-mobility will encounter rapid development
- Short one-day round trips between cities will expand to extended travels once trust is felt
- e-clearing.net addresses this trend

FLORIELECTRIC
Public charging stations at Floriade in Venlo

Levels of interoperability and standardisation

Standardisation paves the path for cross-border interoperability

| Level 3 Settlement system | • Same language, same data exchange
• **OCHP** |

| Level 2 charge management system | • Same language (features)
• **OCPP** |

| Level 1 charging station | • Same plug, charging mode
• **Type 2, mode 3 according to IEC 61851** |

- Involvement of DSOs in design of solutions for settlement between charging providers and mobility service providers
- Standardisation and coordination between all charging infrastructure and mobility service providers
- Seamless and integrated processes for settlement between companies enabling open consumer market

Outlook

Avoid multiple developments in EU sharing common costs

- Accessible for all participants
- Open system architecture
- Customer privacy and system security
- Scalable and robust

Establish European organisation independent of existing energy sector

- Satisfy growing demand for public cross-border charging needs
- Allow bilateral as well as multilateral commercial agreements

Open Clearing House Protocol (OCHP)

Version	0.1
Status	Final
Date	29 March 2012

	Version	Date	Author	Commentary

Link:

http://www.e-clearing.net

NL meets NRW
Experience public cross-border charging today