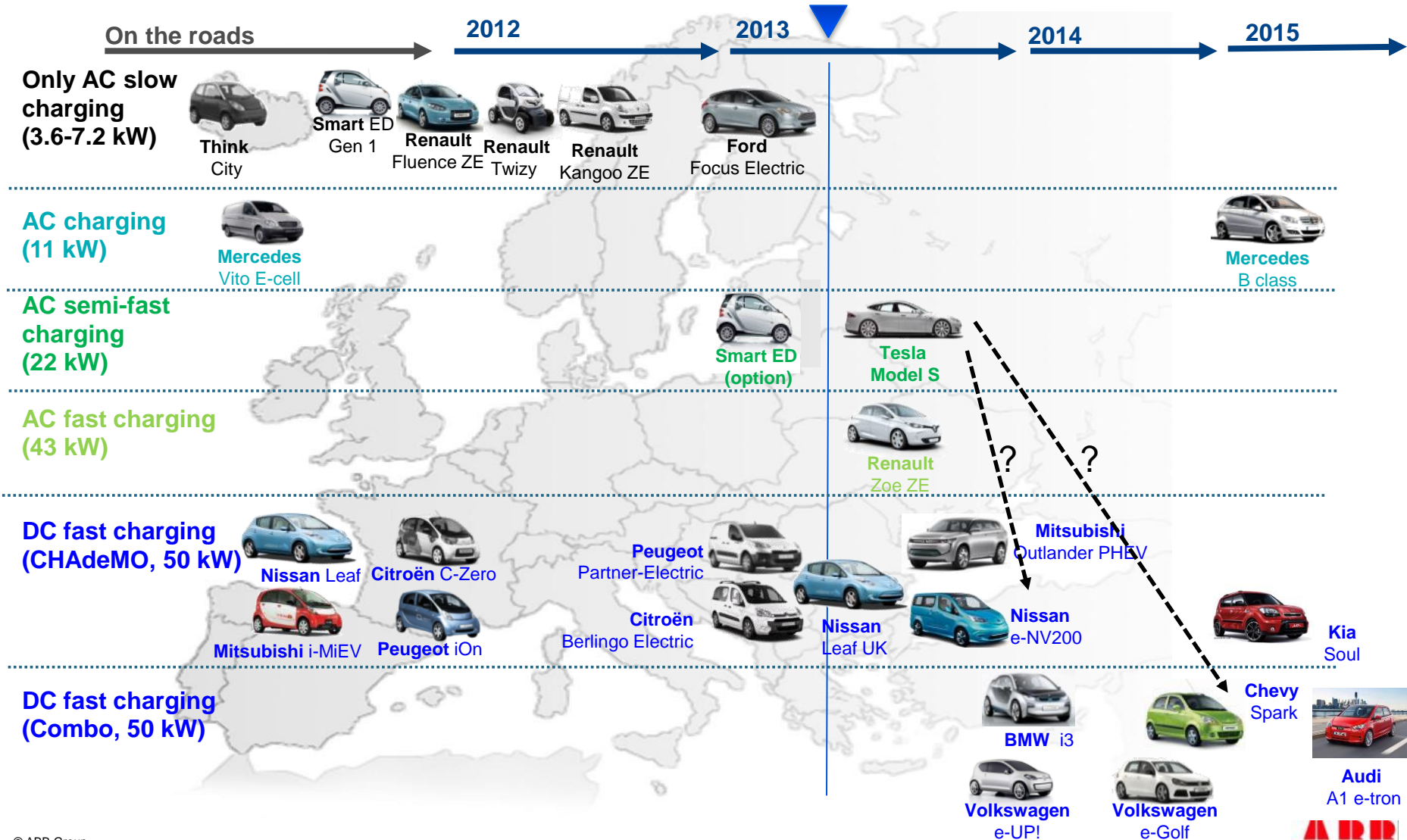




June 12<sup>th</sup>, 2013 / Steven Dorresteyn, PG EVCI

# EV Charging infrastructure International NoAE Project-Day E-mobility Aachen

# Follow the car through Europe: Which car, when? Which infrastructure is required?



# ABB is following the OEM Fast Charging standards CHAdeMO / 22 kW AC / Combo 2





# Berlin, May 27<sup>th</sup>, 2013 / Combo -CCS

## Internationalen Konferenz Elektromobilität der Bundesregierung



DAIMLER



# DC-Fast Charging is happening in Europe

## Taking a global perspective





# ABB DC fast charge installations

## Proven technology in the field since May 2010

- **Actual:**

Germany, Norway, The Netherlands, UK, Ireland, Finland, Denmark, Sweden, Switzerland, Austria, France, Czech, Estonia, Turkey, Hungary, Italy, Hong Kong, China, USA, Taiwan, Slovenia, South Africa, Belgium, Slovakia, Bulgaria, Poland, China, Canada, Chile, Singapore, Northern Ireland

- **Total around 600 DC fast chargers installed / over 1.000 sold)**



# Project Estonia: Country wide network “Elmo”

## ABB awarded Europe’s largest EV infrastructure project



200 DC + AC combined fast chargers  
507 AC chargers at office locations  
Turnkey project & network services

- ABB awarded Europe’s largest ever EV infrastructure deployment
- Nationwide network: every main road in Estonia will have a fast charger approximately every 50 km
- Opened on 20/02/2013

### Payment systems

- ✓ Membership model, RFiD
- ✓ SMS payments
- ✓ Smartphone payments
- ✓ Automated acces via phone
- ✓ E-wallet payments

# ViteaMobility: network of 50 DC chargers in Belgium

## ABB's Terra Smart Connect ideal for the business case



- Installations at restaurants, diners, meeting centers and shopping malls throughout Belgium
- Offering convenient 30-120 minute fast charge times at retail locations
- Power level of 20kW fits the available grid connection capacity at these locations



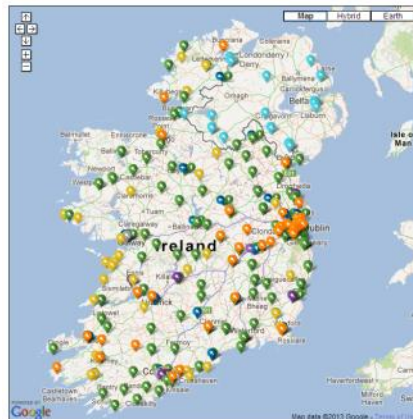


# ABB – eCars, Ireland

## Rapid Charger network for ESB and NIE

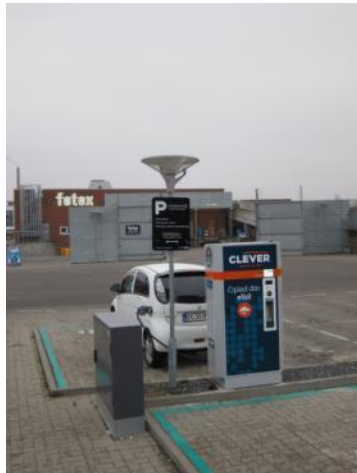


- ABB with ESB and NIE roll out a network of DC fast chargers at petrol stations in the North and South
- Cross boarder joined up network of over 30 fast chargers
- ABB supply hardware, maintenance services, connectivity and back office integration services
- ABB certified to install at petrol sites



# CLEVER & ABB roll out 50 connected DC fast chargers

## Country wide network throughout Denmark

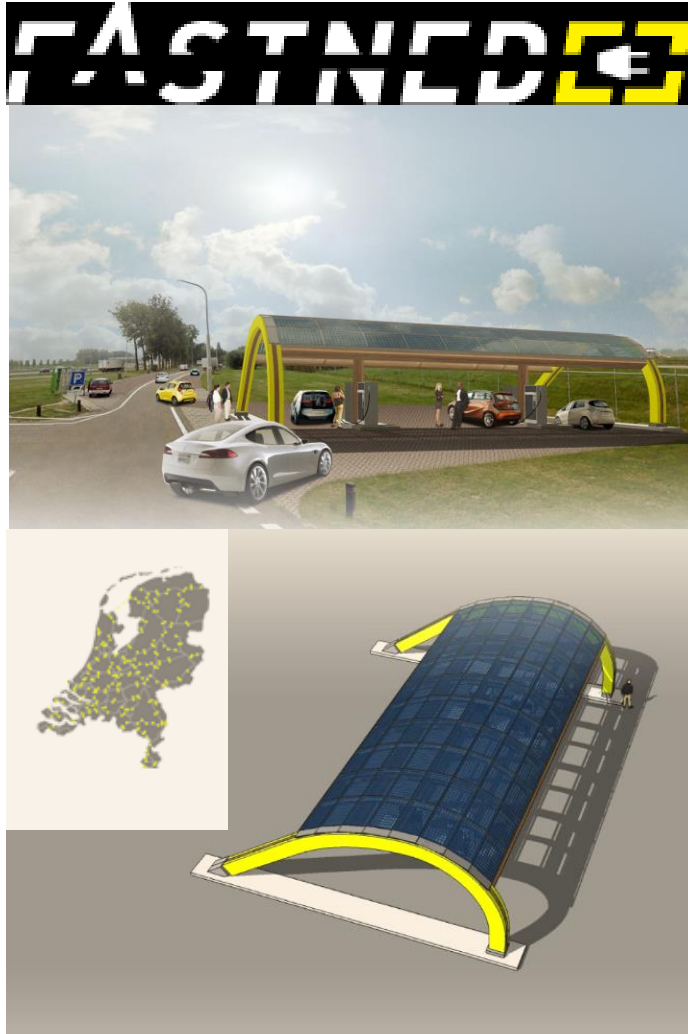


- Clever & ABB roll out a network of 50 Terra 51 DC fast chargers in just 3 months time
- Network supported by ABB's remote management, remote assistance and local Danish ABB service team
- Cloud based OCPP network connections to CLEVER's payment and subscription service



# FastNed & ABB to roll out connected DC fast chargers

## Country wide network throughout Netherlands



- Announcement on 03/06/2013
- FastNed & ABB will roll out a network of Terra DC fast throughout the Netherlands
- Fully commercially driven business model present.
- Multiple chargers per site (201 locations)
- Network supported by ABB's remote management, remote assistance and local Dutch ABB service team
- Cloud based network connections to FastNed's Driver Care Center
- Connection to Third Party Backoffice via OCPP



# Use cases in electric vehicle charging

## Different solutions for each specific use case



### Highway

- DC fast charging
- 15-30 minutes



### Commercial

- DC & AC charging
- 30-60 min.



### Office

- AC & DC charging
- 30-60 min. (fast)
- 8 hours (workday)



### Home

- AC & DC charging
- 8 hours (overnight)
- 2 hours (top-off)

# Highway segment

## A solution for any use case



**Terra 100.2**  
**Dual DC**  
**Highway Charger**

- 2x 50kW DC CHAdeMO
  - 15-30 min.
- 



**Terra 51**  
**DC**  
**Highway Charger**

- 50kW DC CHAdeMO
  - 15-30 min.
- 



**Terra 52**  
**DC + AC**  
**Highway Charger**

- 50kW DC CHAdeMO
  - 22kW AC
  - 15-30 min.
-

# Highway segment

## Combo / Multi-standard chargers



**Now**

**NEW**



**Terra 53 C  
DC  
Highway Charger**

- 50kW DC Combo
- 15-30 min.

**October  
2013**

**NEW**



**Terra 53 CJ  
DC  
Highway Charger**

- 50kW DC Combo
- 50kW DC CHAdeMO
- 15-30 min.

**December  
2013**

**NEW**



**Terra 53 CJG  
DC + AC  
Highway Charger**

- 50kW DC Combo
- 50kW CHAdeMO
- 22kW AC
- 15-30 min.



# Commercial and Office segment

## A solution for any use case



**Terra SC  
DC  
Commercial Charger**

- 20kW DC CHAdeMO
- 30-60 min



**Terra SC Duo  
DC + AC  
Commercial Charger**

- 20kW DC CHAdeMO
- 22kW AC
- 30-60 min.

**Target  
October  
2013**

**NEW**



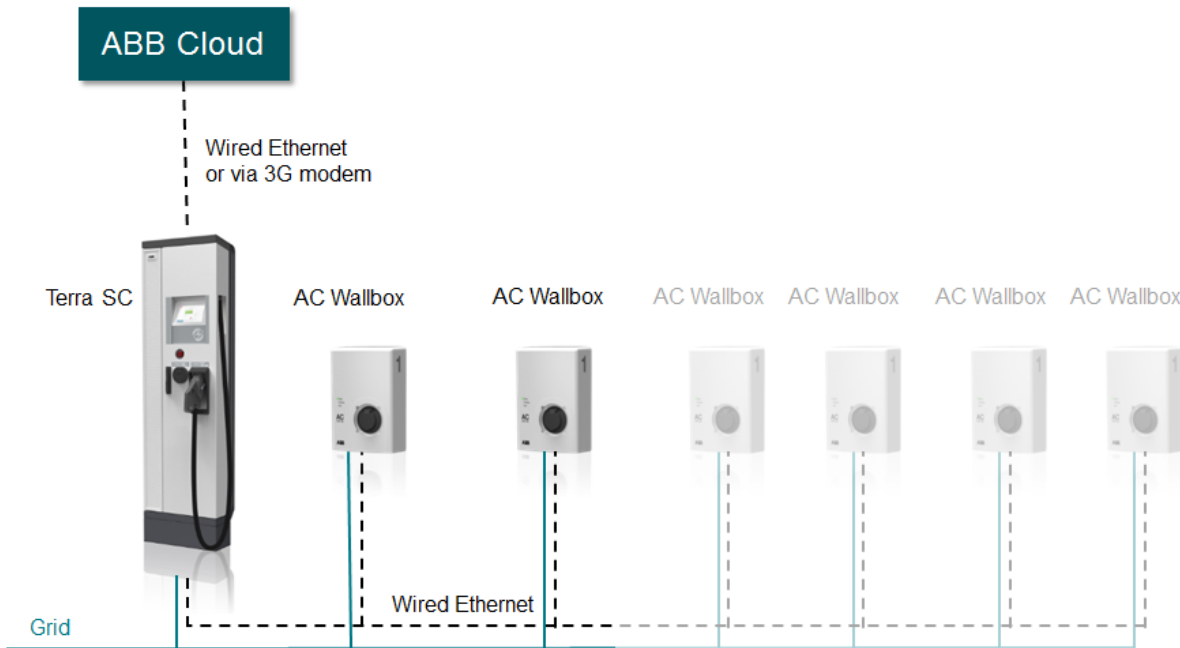
**Terra SC C  
DC  
Commercial Charger**

- 20kW DC Combo
- 30-60 min.

# Terra Charge Clusters (Terra 53 or Terra SC Duo)

## AC & DC charging in one networked solution

- One networked solution for 8 hour workday charging & 30-120 minute fast charging during a meeting
- The network automatically arranges authorization between AC & DC chargers
- All user statistics are aggregated into Galaxy webbased software tools
- Specially designed for turnkey fleet & large parking installations
- Up to 6 AC Wallboxes can be connected to one Terra 53 C(J)(G) or Terra SC (Duo)



# Data Architecture

## Designed for reliability and security

### Cloud access

Your data can be accessed via the 'cloud', a reliable interface which enables you to connect your own back office or user administration system directly to your charging network.

### Data transportation and security

Your charger data, settings and software updates are transported via TLS and X509 certificates, a security standard widely used to protect classified industrial and governmental information.

**API (Application Program Interface)**  
Connection to Back Office systems etc.



**Galaxy (Online Management Tool)**  
Web based interface to access real-time status information and usage statistics

your sites and configure the chargers at your sites. Galaxy utilises a secure HTTPS connection to access your data.

professional backup systems. Software updates are also provided via the cloud, separate from your data. ABB cannot access your raw data.

keeps your software updated, helping you to improve the overall performance of your operation.



It is all about making your business work  
We are looking forward to empowering you!

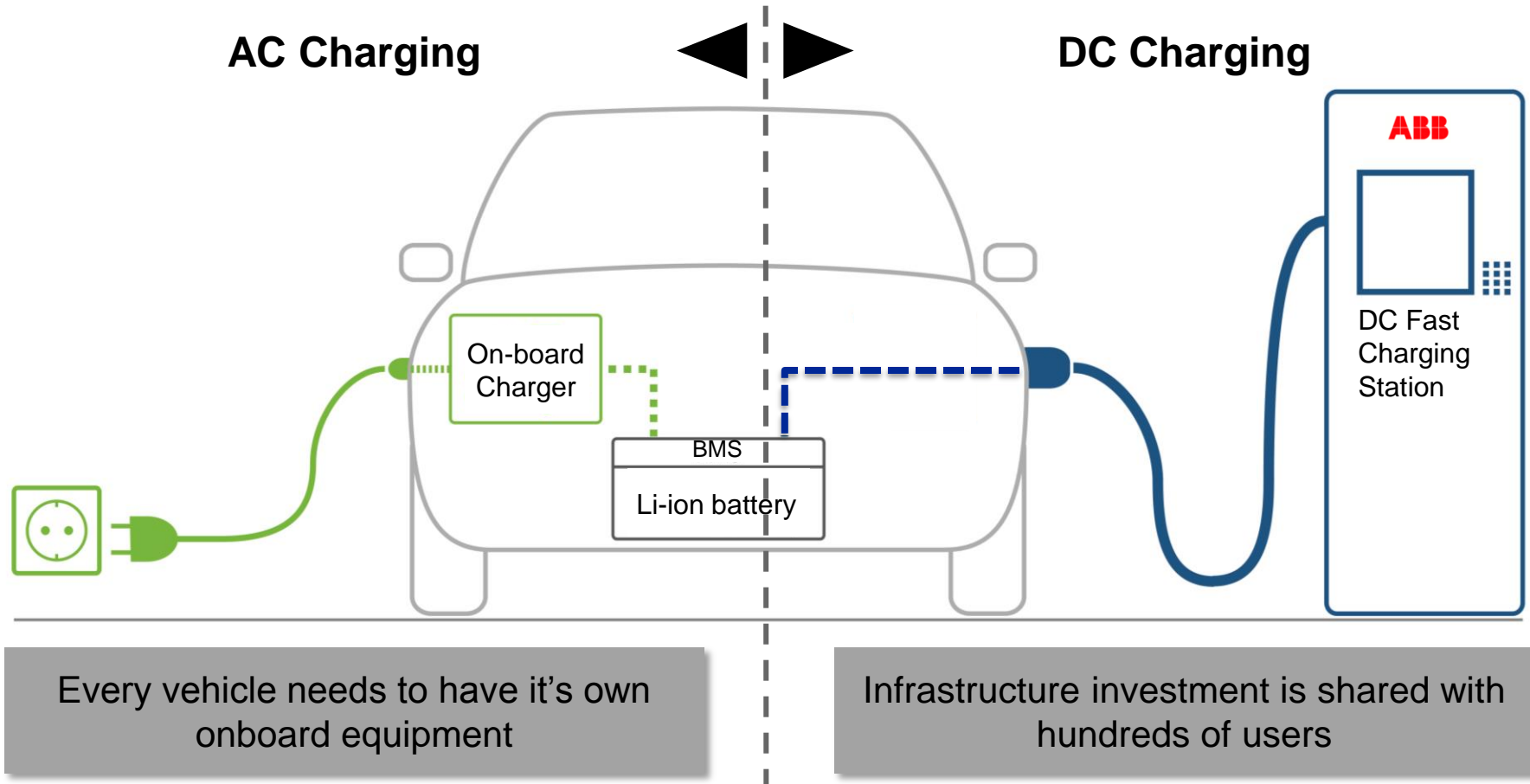


Power and productivity  
for a better world™



# DC charging versus AC charging

## On-board versus Off-board equipment



# Contact information



Steven Dorresteyn  
Sales Manager Europe

ABB B.V.

Product Group EV Charging Infrastructure  
High Tech Campus 5, Room p-093

5656 AE Eindhoven

The Netherlands

M: +31 6 2342 7031

E: [steven.dorresteyn@nl.abb.com](mailto:steven.dorresteyn@nl.abb.com)

I: <http://www.abb.com/evcharging>