

2013-EU-92043-S

European Long-distance Electric Clean Transport Road Infrastructure Corridor (ELECTRIC)



Preface

Today EVs (Electric Vehicles) are still not considered as a fully viable alternative to traditional vehicles powered by internal combustion engines. The existing lack of comprehensive infrastructure that would allow open access and long-distance electric driving is one of the major reasons discouraging potential users. Despite of various political incentives the mass uptake of e-mobility at European, national, regional and local level has not yet been achieved since e-mobility is mostly associated with urban transport and short distance travel. Therefore, range anxiety and recharging times are still major issues for medium-distance commuters, long-distance travellers and businesses.

In order to **realise a true mass uptake of EVs**, users must be offered the possibility to **charge rapidly without wasting time** on actions related to the charging, such as easy access to charging stations or payment methods. Drivers need to be able to travel to their final destination without being forced to deviate from their trajectory due

to the location of the charging site. This is why charging should not only be restrained to urban areas but should also **include major transport routes**, such as motorways.

A contribution to such needs is precisely at the core of this TEN-T project “European Long-distance Electric Clean Transport Road Infrastructure Corridor” (**ELECTRIC**) which aimed to **enable long distance electric driving** across four European Member States. ELECTRIC is the first piece of a Global Project that established an **open access multi-standard fast charging corridor for EVs** across major routes from **Scandinavia to the Benelux countries**.

The ELECTRIC project contributes to the political commitment to encourage e-mobility (Transport White Paper, the Clean Power for Transport Package, support by the Connecting Europe Facility and the infrastructure initiative by President Juncker and the European Investment Bank).

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About ELECTRIC

ELECTRIC created a corridor of **103 multi-standard fast chargers** along motorways crossing **Sweden, Denmark, Germany and the Netherlands** at a maximum distance of 80 kilometres. The **open access** multi-standard fast chargers combine **ABB's AC, CHAdeMO and CCS** compatible electric charging station technology which covers the most common types of EV charging. With **charging power of 50kW** typical **charging times range between 15 and 30 minutes**.

Charging stations deployed:

- 23 in Denmark;
- 4 in Germany;
- 44 in Sweden;
- 32 in the Netherlands.

The corridor enables more EVs to gain access and charge without any prior engagement with the network providers than any other charging or payment technology.

- 24/7 service
Users only need a smartphone and an internationally recognised credit card to be able to charge
- The charger is unlocked via the smartphone and credit card payment is made via a secure smartphone connection
- There is no roaming at the charging stations
- The customer is able to see the price charged by the provider and receives an electronic receipt
- All information are available in English
- Using CO₂ friendly energy as much as possible

Please visit our ELECTRIC website for further information: www.electric-project.eu

Advantages of connected charging

Flexible interfacing with customer's added value systems



back-office systems



smart grid energy systems



secure payment solutions



uptime monitoring



remote updates & upgrades



remote troubleshooting & repair

Optimal insight in charger operation



online statistics



24/7 charger status



user remote access app & sms



user direct access PIN code & RFID



location & availability online visible

Maximize charger uptime with fast and reliable service

Optimize user experience

Project value and EU contribution

The total project value of ELECTRIC amounted to around 8 million Euros. 50% of the costs were covered by EU funding.

The project 'European Long-distance Electric Clean Transport Road Infrastructure Corridor (ELECTRIC)' - 2013-EU-92043-S was co-financed by the European Union's TEN-T programme in the course of the CALLS FOR PROPOSALS 2013. The TEN-T programme consists of hundreds of projects – defined as studies or works – whose ultimate purpose is to ensure the cohesion, interconnection and interoperability of the Trans-European Transport Network, as well as access to it. TEN-T projects, which are located in every EU Member State, include all modes of transport.



The global project

ELECTRIC is the first piece of a Global Project that aims at establishing a **multi-standard fast charging corridor for EVs across major routes in continental Europe**. The Global Project will rely on mature, reliable and easy-to-install state-of-the-art fast charging technology. Multi-standard fast chargers are to be installed **at maximum 80 kilometre intervals** along major motorways from Scandinavia to the Southeast of Europe.

While multi-standard fast charging infrastructure is increasingly being built in urban areas, so far it is rather inexistent along major long-distance routes crossing borders. This is what ELECTRIC as part of the Global Project is dedicated to, the realisation of

long-distance cross-border electric driving with passenger cars based on an open-access fast charging corridor.

At present, fast charging has become the breakthrough technology ensuring both urban and long-distance CO₂-friendly driving with EVs. All major studies on e-mobility predict an even greater technological improvement in battery technology and acceleration in terms of battery fast charging. These factors encourage e-mobility uptake and make suitable infrastructure all the more relevant and necessary. Thus, e-mobility is the only alternative propulsion system for which a consistent pan-European infrastructure can be set up at this instant in a simple and cost-efficient way and without any delay.

Project partners

The Consortium of ELECTRIC is built around the objective to keep the list of partners limited to a **group of dynamic, renowned and high-performing beneficiaries in the field of e-mobility**. It gathers representatives from the manufacturing industry, e-mobility operators and a leading testing and certification institute; representing the pivotal market actors needed for a successful and swift deployment of high-quality multi-standard fast charging infrastructure.

- ABB B.V. (Netherlands) manufacturer of fast charge solutions, coordinator:
ABB
- CLEVER A/S (Denmark) e-mobility operator:
CLEVER
- Fastned B.V. (Netherlands) e-mobility operator and retailer:
Fastned
- Öresundskraft AB (Sweden) public utility and e-mobility operator:
Öresundskraft
- VDE Prüf- und Zertifizierungsinstitut GmbH (Germany) Testing and Certification Institute:
VDE



ABB plays a vital role in the development of sustainable mobility by providing innovative and efficient technologies for EV charging infrastructure. Various projects in the Netherlands, Denmark, Estonia and Northern Ireland show that ABB is a global player in the field of power and automation technology and is able to participate in the creation of nationwide and EU-wide charging network infrastructure. ABB is leading with internet-based charging infrastructure, supporting all EV charging standards. It offers a complete solution: specific charging solutions for any location type and connected services; the chargers easily connect to any service or payment application; internet-connected chargers enable fast global service and pro-active maintenance. ABB has years of experience in creating, installing and maintaining charging infrastructure, including several nationwide charger networks.



CLEVER is an electric mobility operator with a charging network for electric vehicles in Denmark, Sweden, and Northern Germany. CLEVER facilitates charging of all electric vehicles on the market by charging stations at home and at the work place.

CLEVER operates an extensive fast charging network of more than 900 charging points in Denmark, Sweden, and Northern Germany, which caters to all electric vehicles on the market.

CLEVER was established in Denmark in 2009 and in Sweden in 2015.



Fastned is the leading Dutch fast charging e-mobility operator and concession owner. Early on Fastned's founders saw the need for EV infrastructure. Hence, Fastned is building fast-charging stations at the most convenient locations along the motorways throughout the Netherlands. This constantly increases the overall attractiveness of electric transportation in the Netherlands and elsewhere in Europe. Fastned is currently rolling out over 200 fast charging stations in the Netherlands, such as the ones built in this project and has 51 stations operational at this point in time.



Öresundskraft is a Swedish energy company delivering electricity, district heating, natural gas, district cooling, broadband and services to 260,000 customers. Öresundskraft's vision "Energy for a better world, Power for the region" is more than words. 80% of the district heating that Öresundskraft produces is based on waste heat, municipal waste and biofuel. Öresundskraft provides vehicle gas for reduced emissions. The company supports small-scale, renewable production of electricity based on wind, water and sunshine. Öresundskraft champions EVs, offers smart energy solutions and invests in local wind power. Since 2009, Öresundskraft has been establishing chargers and charging points in the Öresund region and has started a public, solar cell powered carpool.



VDE, the German Association for Electrical, Electronic & Information Technologies is one of the largest technical and scientific associations in Europe with more than 36,000 members. For several years, VDE has been involved in e-mobility. The VDE Testing and Certification Institute is a highly qualified neutral and independent partner for testing and certification. Furthermore, the VDE Testing and Certification Institute is an accredited Notified Body (no. 0366) with regard to the MID (Measurement Instruments Directive) for Electricity Meters.

Locations of the charging stations

The ELECTRIC corridor of

103

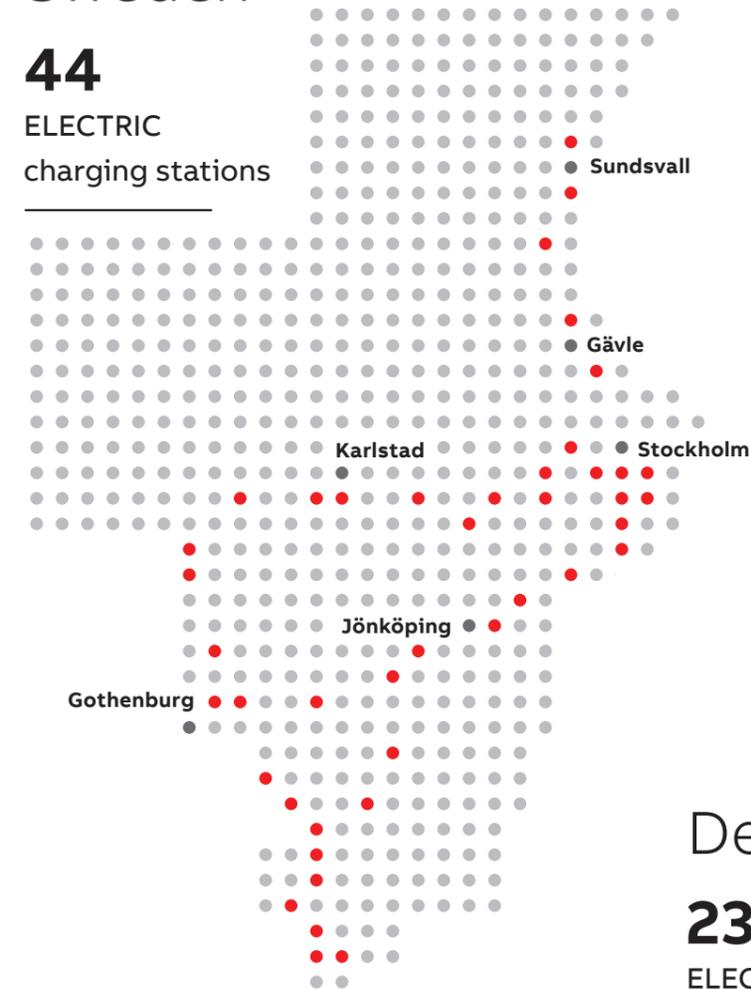
charging stations



Sweden

44

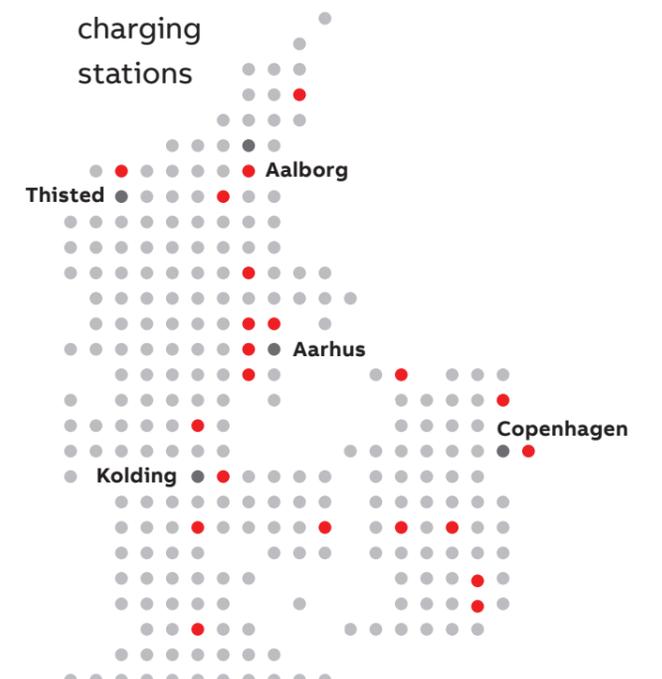
ELECTRIC charging stations



Denmark

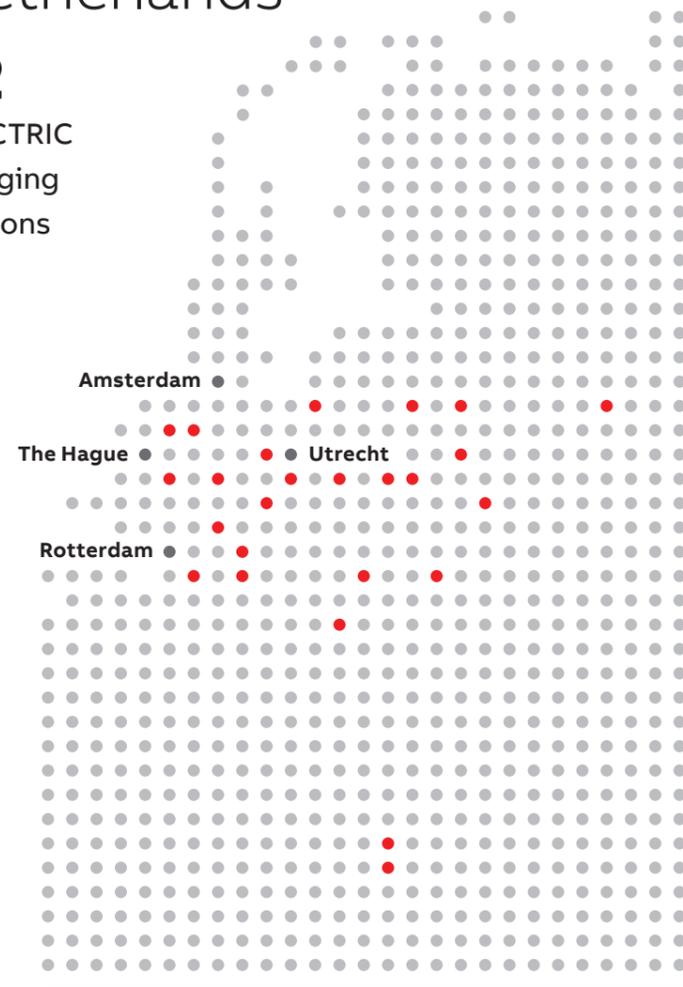
23

ELECTRIC charging stations



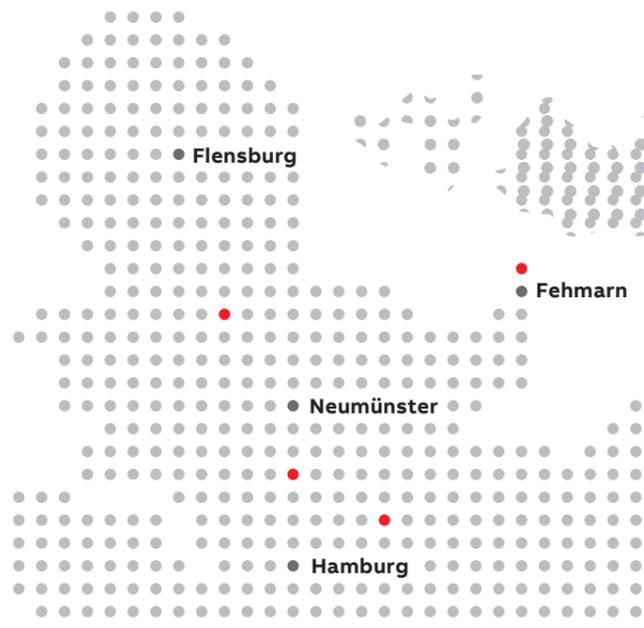
Netherlands

32
ELECTRIC
charging
stations



Germany

4
ELECTRIC
charging stations



(Ultra-) fast charging

ABB's Terra 53 charger series

AC	CHAdeMO	CCS
DAIMLER RENAULT TESLA	 NISSAN MITSUBISHI KIA PEUGEOT CITROËN	 BMW Volkswagen GM

EVs that can make use of ABB's multi-standard fast charging stations provided in line with the ELECTRIC project.

Q4-2012 22 – 43 kW AC	2010 CHAdeMO	Q4-2013 Combo 2

ABB's Terra fast charging stations features

- **Technology performance:** ABB models T53CT (50kW CCS & 22kW AC), T53CJ (50kW CCS & 50kW CHAdeMO 1.0) & T53CJG (50kW CCS, 50kW CHAdeMO 1.0 & 43kW AC)
- **Connected chargers:** The Terra products are designed from the onset to serve as connected charging solutions. This enables a smooth integration with intelligent local energy distribution systems, a wide range of back-office functions, such as authentication and payment processes, along with remote services and the integration of Intelligent Transport Systems (ITS) services.
- **Easily upgradeable and future-proof:** The system allows remote software updates, as for example updates of charging protocols.
- **Software and technical features:** The Terra charging stations are equipped with all necessary software and technical features related to connected charging. This provides the users with secure payment solutions and back-office systems. These services include ITS (e.g. informing the user of the nearest station and the supported charging protocols, information on the availability of each of the charging stations on-site and accepted payment methods).
- **Remote maintenance:** The fast-charging stations are remotely monitored and serviced via a secure internet connection.
- **Low noise:** The chargers have a very low noise level when in use (<50dBA) and are barely audible above normal outdoor background noise.
- **Stainless steel cabinets:** The cabinets are coated (powder coating) and made from stainless steel (AISI 430). This provides a durable and easy-to-maintain finish, with no corrosion hazards; they are also well suited for salty climates.
- **User friendliness:** The chargers feature an intuitive user interface that does not require training.
- **Environmental impact:** The installation of electric fast charging stations and the concomitant usage of EVs led to a notable saving of 3.500 tons of CO₂. This calculation is based on 25 million electric kilometres driven in the measuring period comparing with 140 grams (real world figure) of CO₂ per kilometre driven aboard with a conventional fuel vehicle (we considered that, on average, 10% of the charging is done via fast charging and the other 90% at home or with slow chargers). For 2016 a direct effect of 20.000 tons of CO₂ savings is expected.

Testimonials

What our customers think...



“The stations are easy to find, they stand out!”

“I trust Fastned, their chargers work and if a problem would occur I know I can count on their excellent 24/7h customer support.”

FASTNED CHARGING STATION IN THE NETHERLANDS

“I like its design, charging underneath solar panels feels right.”

“I have too many cards in my wallet. Using an app is perfect for me. I always have my phone with me.”

Brand new Fastned station A30 De Poel: he does it! In the meantime napping. @fastned #snelfie



RETWEETS 2 FAVORITES 5

8:13 PM - 7 May 2015 - Details

TWEET @FASTNED

“I really want to thank your customer service. They were so helpful when the batteries in my new Tesla were drained. It was so good to get their help.”



FASTNED CHARGING STATION IN THE NETHERLANDS

“Low usage costs and tax benefits make it financially attractive.”

FASTNED CHARGING STATION IN THE NETHERLANDS



“We drove 750 km in Denmark using CLEVER app, map and charging points. It worked so well. So great to be an EV-driver in Denmark.”



CLEVER FACEBOOK FEED

“Please bring CLEVER to Norway. Speed and user friendly charging is much better than what I have experienced in Norway.”



“EV’s contribute to less dependency of traditional energy sources.”

“Convenience is the key to travelling abroad in an EV.”

What the project partners say...

“The ELECTRIC project made it possible for CLEVER Denmark to secure the driving experience across borders from Norway and Sweden through Denmark to Hamburg in Germany. It is no longer a worry for electric car drivers to drive longer distances within Denmark or just across the border to the surrounding countries. Furthermore tourists from especially Norway praise the Danish Network for its consistency and coverage.”

CLEVER CHARGING STATION IN SWEDEN



CLEVER CHARGING STATION IN DENMARK





Approved by

ABB B.V.
Fastned B.V.
Clever A/S
Öresundskraft AB
VDE Prüf- und Zertifizierungsinstitut GmbH

