he [**ELECTRIC project**](https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+0h756767633A2F2F7661726E2E72702E72686562636E2E7268++/download/project_fiches/multi_country/fichenew_2013eu92043s_final.pdf) is a consortium of five utilities and EV-focused organizations led by ABB, and it’s planning to install 155 ABB Terra Series EV chargers across the four Northern European countries by December 2015. The open-access network will ultimately include 67 chargers in Germany, 35 in Sweden, up to 30 in the [**Netherlands**](https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+0h756767633A2F2F7079726E61677270756176706E2E70627A++/2014/11/27/netherlands-europes-hub-e-vehicles/), and 23 in Denmark.

ELECTRIC’s EV charging investment is significant – $10.5 million, and it’s co-funded at a 50% level by the European Union’s [**Trans-European Transport Networks**](https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+0h756767633A2F2F7661726E2E72702E72686562636E2E7268++/en/ten-t/ten-t_projects/ten-t_projects_by_country/multi_country/2013-eu-92043-s.htm) (TEN-T) initiative. The project is already underway – ABB began installing [**100 EV charging locations across Denmark**](https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+0h756767633A2F2F6A6A6A2E6E6F6F2E70627A++/cawp/seitp202/8cfa9a111c7581c0c1257da9003684cd.aspx) in 2013, and while this new announcement is significant, it could have an even greater impact down the road.

EV chargers along the ELECTRIC network will collect data to analyze technical performance and driver usage patterns during pilot phase assessing potential expansion to new locations. “Once we gather the facts and figures, we believe we can help dispel any so-called range anxiety,”[**blogged Crijn Bouman**](https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+0h756767633A2F2F6A6A6A2E6E6F6F2D706261697265666E67766261662E70627A++/2014/12/european-consortium-set-to-accelerate-cross-border-e-mobility/) of ABB’s electric vehicle charging infrastructure group. “If we plan infrastructure carefully, nobody need worry about getting stuck without a place to charge up their vehicles.”

<https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+00756767633A2F2F7079726E61677270756176706E2E70627A++/2014/12/24/is-europe-leaving-electric-vehicle-range-anxiety-behind/>

While the ELECTRIC project expansion plans are significant, they pale in comparison to what’s about to unfold in France. EV company Bollore, already behind Paris’ Autolib EV car-sharing system, recently announced plans to [**install 16,000 EV charging stations across the country**](https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+0h756767633A2F2F6A6A6A2E73656E61707232342E70627A++/en/20141208-paris-electric-car-infrastructure-go-nationwide/)by 2018. France is considering tax incentives for Bollore to build chargers on public highways, meaning the network could theoretically link to the TEN-T system.

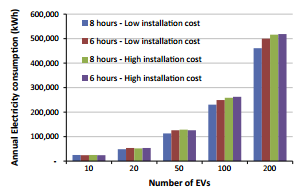
The massive EV charging infrastructure expansion is expected to cost $186 million, and while the exact charging locations aren’t yet determined, Bollore CEO Vincent Bollore said in a radio interview the ultimate network would ensure “no one in France will be more than 40 kilometers (around 25 miles) from a charging station.”

[**France’s EV sales are increasing**](https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+0h756767633A2F2F7079726E61677270756176706E2E70627A++/2014/01/13/electric-vehicle-sales-increase-55-france/) fast, meaning more and more drivers are looking to power up. 25 miles is well within the given range of nearly every EV on the road today, so driver anxiety may switch from worrying about running out of juice to debating which station is most convenient.

<https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+00756767633A2F2F7661667671727269662E70627A++/chademo-reports-2501-charging-stations-worldwid/>

<https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+00756767633A2F2F6A6A6A2E70756E71727A622E70627A++/wp/blog/2013/01/06/346/>

<http://ac.els-cdn.com/S0968090X15000303/1-s2.0-S0968090X15000303-main.pdf?_tid=edda4cc2-0532-11e5-b134-00000aab0f26&acdnat=1432815380_04d70af03a970e4afec805eaf258edac>



<https://cisr-sslvpn-out2.insa-lyon.fr/+CSCO+00756767633A2F2F6F7962742E657A762E626574++/blog_2014_04_29_pulling_back_the_veil_on_ev_charging_station_costs>

\_ distribution system operator (DSO): is the owner and operator of the distribution grid

\_ supplier or retailer (SA): agent who sells energy to the final customer, generally same as DSO

\_ final customer: requires electricity

\_ plug-in vehicle owner: requires electricity to charge his own EV

\_ EV supplier-agregator: sells electricity to the EV owner. Contract not location based

\_ EV charging point manager (CPM): he acts as a final customer if considering the electricity market. Buy electricity to charge his own EV or to resell it to EV user. Generally, he is a residential customer, or an office building owner, a commercial building owner, an EV charging station owner (that wants to sell the charging service)

Authorization

A great challenge that can be an obstacle or an advantage for the development of the charging stations are the regulations concerning the authorization or not to deploy a charging station, and about the contract with the EV owner and the payment system.

Nowadays, the regulation easily allows every person to install a charging station at his home’s garage. Many companies, such as Chargepoint, proposes the sale of the charger and the service of the installation at home. However, such a system is supposed to be used only by the owner. In other situations, such as the implementation of a charger in a commercial area, the actual owner of the charging station is not the user.

In such situations, from the perspective of the supplier of electricity (generally the owner of the distribution grid), the owner of the charging station, called the charging point manager, is considered as the final customer. That means that he needs to pay the electricity supplier for the electricity use. Then, he can resell the electricity for the charging service to the EV owner. This means, first, that the pricing needs to take into account the price of the electricity bought from the grid; second, that at the same time the business model can be established relatively independently from the electricity provider.

In many cities, one of the big issue concerning the charging station is the dependency of a resident that is actually renting his home, or that is living in an appartement. Generally, the regulation is not favorable for the residents, because he has no right to do such investments. Indeed, the property manager is actually the owner, and he has the right to decide for such investments. However, according to Tesla employee (<http://my.teslamotors.com/fr_CA/forum/forums/charging-apartments>), the installation of such charging station could leads to high tax benefits for the property owner in this kind of situation. Concerning Chargepoint, their actual strategy now is to wait for a demand from an EV owner, and then try to contact and convince the property owner to install such charging stations. (http://www.chargepoint.com/multifamily-residents) In the situation of coproperty, which is often the case for instance in France, this kind of investment should conventionnaly be decided by the coproprietaries. Nevertheless, a French company called Borne Recharge Service (http://www.bornerecharge.fr/) has created an intelligent device that meters the electricity used for the charging, so that the electricity expenses of the building could be fairly distributed among the owners.

However, the dependency to the property owner still gives some deterrence for the residents in an apartment. Indeed, according to a the data revealed by Tesla China’s sales team, *more than 60% of Model S owners in China have complained difficulty when negociating their property management about setting up charging poles at their residential building.* (quote, from the paper *Allocation Strategy for Tesla’s Charging Stations in Beijing CBD*). In high density cities, without better communication about charging station, and good incentives for property owners, difficulties could remain to install home charging stations.

Concerning the installation of charging stations in general, it is also submitted to the demand of an installation permit to the mayor of the city, except for single house. (<http://www.driveelectricvt.com/docs/default-source/default-document-library/electric-vehicle-charging-station-guidebook-.pdf?sfvrsn=0>) As far as we know, and according to the regulations in Vermont, this kind of installation permit is to guarantee that the owner calls for professionals to install the charging station (a professional with an electricity certification is required), respects elementary safety conditions, and prevent some negative environmental impact. Even if the permit seems to be quite easy to obtain, it should be deeper investigated whether or not the need of such a permit could consist in business barriers in practice (action in justice to slow down the process as for construction permit for instance). Nevertheless, at least in Vermont, the installation of a charging station has not the same status as a building permit, which avoid already many complications.

Payment system

The payment system is absolutely essential to the business model of the company that wants to exploit charging stations. Currently, one of the most advanced pricing system is Chargepoint’s (see page …). In exchange of a fee, Chargepoint provides all the services of the charging station (installation, maintenance,…) to the property owner, that can choose himself the pricing conditions for his customers. The payment is done through Chargepoint payment system: a Chargepoint ChargePass smart card that is doing no contact payment.

(http://www.afdc.energy.gov/pdfs/51227.pdf)

Payment

Subscription, pay per charge, parking fee