Authorization and payment

**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 apartment. 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 a Tesla employee, 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. In the situation of co-property, which is often the case for instance in France, this kind of investment should conventionally be decided by the co-proprietaries. Nevertheless, a French company called Borne Recharge Service 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 (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. 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.

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Layar:

3rd paragraph : <http://www.sciencedirect.com/science/article/pii/S0301421511005696>

4th paragraph chargepoint http://www.chargepoint.com/multifamily-residents

5th paragraph: http://www.barrywaite.org/gis/projects/fall-2014/Zhang-Nuobei-PPD%20631%20GIS%20-%20Revised.pdf

6th paragraph demand of an installation permit : (<http://www.driveelectricvt.com/docs/default-source/default-document-library/electric-vehicle-charging-station-guidebook-.pdf?sfvrsn=0>

Images:

Put the visio document to explain the roles

<https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0CAYQjB0&url=http%3A%2F%2Fwww.teslamotors.com%2Fmodelx&ei=q69yVbb_DoWMmwW9xYHADw&psig=AFQjCNGRH1tt_3bMV9v9jEbFTNuOZp6fNg&ust=1433665583662448>

https://www.google.com/search?q=charging+station+sketch&espv=2&biw=1366&bih=599&source=lnms&tbm=isch&sa=X&ei=HrByVdHkCsPSmAXFo4GgBA&ved=0CAYQ\_AUoAQ#imgrc=UIo4Xp4Vp8dQBM%253A%3B901cnF1ephdRmM%3Bhttps%253A%252F%252Fd30y9cdsu7xlg0.cloudfront.net%252Fpng%252F95599-200.png%3Bhttps%253A%252F%252Fthenounproject.com%252Fterm%252Fcharging-station%252F3101%252F%3B200%3B200

Put bullshit images if it is not enough

Quotes:

The charging station owner needs to pay the electricity supplier for the electricity use

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



Paying at a Chargepoint charging station

[https://www.google.com/search?q=chargepoint+payment&espv=2&biw=1366&bih=643&source=lnms&tbm=isch&sa=X&ei=kf5nVdyTFajpmQXCqoP4Cg&ved=0CAkQ\_AUoBA#imgrc=fEj\_XZspnPCFzM%253A%3Bmxy1I6\_gQp7CQM%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fsites%252Fdefault%252Ffiles%252Fcoulomb-charger-card.jpg%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fultimate-guide-electric-car-charging-networks-126530.html%3B620%3B465](https://www.google.com/search?q=chargepoint+payment&espv=2&biw=1366&bih=643&source=lnms&tbm=isch&sa=X&ei=kf5nVdyTFajpmQXCqoP4Cg&ved=0CAkQ_AUoBA#imgrc=fEj_XZspnPCFzM%253A%3Bmxy1I6_gQp7CQM%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fsites%252Fdefault%252Ffiles%252Fcoulomb-charger-card.jpg%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fultimate-guide-electric-car-charging-networks-126530.html%3B620%3B4)

**Payment system**

The payment system is absolutely essential to the business model of the company that wants to exploit charging stations. Basically, three main payment concepts exist: by subscription to a company, payment per charge, or through a parking fee. Currently, one of the most advanced pricing system is Chargepoint’s. 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 (time spent charging, corresponding price of electricity taking into account peak hours,…). The payment is done through Chargepoint payment system: a Chargepoint ChargePass smart card that is doing no contact payment.

As there are many other payment systems, there is still an issue of compatibility of the means of payment as well as of transparency. Some attempts are being made by some companies to provide charging payment for a large number of charging stations, by they are generally limited to a specific country or area and does not cover all charging stations. For instance, PlugSurfing is only restricted to Germany and Netherlands, and allows to pay through the app.

This decentralized payment system with no transparency is a real challenge, which is a barrier for the development of the market. Many EV users are dissatisfied and confused about this situation. We believe that in this area, the use of a decentralized and transparent payment system could help the market to thrive. Internet payment system with Bitcoin or Blockchain technology could help a lot in uniforming the payment system in the World, and should be a technology to be considered in a few years.

Quote:

Internet payment system with Bitcoin or Blockchain technology could help a lot in uniforming the payment system

Layar:

For the charging station image:

[https://www.google.com/search?q=chargepoint+payment&espv=2&biw=1366&bih=643&source=lnms&tbm=isch&sa=X&ei=kf5nVdyTFajpmQXCqoP4Cg&ved=0CAkQ\_AUoBA#imgrc=fEj\_XZspnPCFzM%253A%3Bmxy1I6\_gQp7CQM%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fsites%252Fdefault%252Ffiles%252Fcoulomb-charger-card.jpg%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fultimate-guide-electric-car-charging-networks-126530.html%3B620%3B465](https://www.google.com/search?q=chargepoint+payment&espv=2&biw=1366&bih=643&source=lnms&tbm=isch&sa=X&ei=kf5nVdyTFajpmQXCqoP4Cg&ved=0CAkQ_AUoBA#imgrc=fEj_XZspnPCFzM%253A%3Bmxy1I6_gQp7CQM%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fsites%252Fdefault%252Ffiles%252Fcoulomb-charger-card.jpg%3Bhttp%253A%252F%252Fwww.plugincars.com%252Fultimate-guide-electric-car-charging-networks-126530.html%3B620%3B4)

2nd paragraph : https://www.plugsurfing.com/

3rd paragraph : for « many EV users are dissatisfied and confused about this situation <http://www.bloomberg.com/bw/articles/2013-05-30/electric-car-owners-face-confusion-at-the-charging-station>

3rd paragraph: Bitcoin : https://bitcoin.org/bitcoin.pdf

3rd paragraph : Blockchain (if possible) : http://www.melanieswan.com/documents/BlockchainThinking\_SWAN.pdf

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Links (easier access, but already counted in the reference)

Reference payment system:

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http://www.chargepoint.com/

(<http://www.bloomberg.com/bw/articles/2013-05-30/electric-car-owners-face-confusion-at-the-charging-station>

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Norway study:

<http://elbil.no/elbilforeningen/dokumentarkiv/finish/10-dokumenter/382-norwegian-electric-car-user-experiences-2014>

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