EV infrastructure: opportunities and challenges

Q&A with André ten Bloemendal, VP Commercial Sales, Europe, ChargePoint

Autovista Group

Autovista Group
5th Floor, Wellington House
125 Strand
London WC2R 0AP
UK

June 2020

Introduction

André ten Bloemendal, VP Commercial Sales, Europe, at ChargePoint *and Dr Christof Engelskirchen, Chief Economist at Autovista Group, explore the world of electric vehicle infrastructure – from pricing to grid capacity management to leasing models – and envisage the infrastructure of the future.*

Christof Engelskirchen, Autovista Group

André ten Bloemendal, ChargePoint

Christof: If I visit ChargePoint's website it tells me that you 'bring vehicle electric charging to more people and places'. What has that looked like over the past 12 months and – crucially – how do you make money?

Andre: What we have been doing over the past 12 months is introducing ChargePoint into many European markets. In detail, that means that we provide infrastructure – so the hardware as well as the software (and particularly the software) – to enable end users to charge their vehicles. We enable hosts to be reimbursed, and drivers to pay, and therefore we are able to establish EV driving as a good alternative to ICEs in Europe and the UK.

André ten Bloemendal was scheduled to speak at Auto Mobility LIVE 2020. While we are unable to bring you the face-to-face event, Autovista is still committed to bringing you the same great insight from our speakers. To stay up-to-date with all of Autovista's speaker insights and plans for future events, register at: www.automobilitylive.com.

How do we make money? First of all, we make money by selling the equipment and then installing the equipment for the hosts: that's one of the revenue streams. Second is, of course, by providing drivers with software and services around charging.

Where we don't make money – and it's our strong belief that we shouldn't – is from the charging sessions themselves

Where we don't make money – and it's our strong belief that we shouldn't – is from the charging sessions themselves. Although the driver pays for the cost of the electricity provided in the charging session, we don't add a margin there.

Christof: Is it a subscription service? Users pay a monthly fee for access to your network?

Andre: Yes, that's correct. In that sense, we are primarily a software company rather than a hardware company, but you need the hardware to enable the software.

Christof: There is a lot of coverage on what is happening in the used car markets as a result of Covid-19, on how sales are plummeting. But for electric vehicles and plug-in hybrids, sales are actually rising year on year, in some European markets at least. What has been the impact of coronavirus for your business?

Andre: We haven't been affected so far but it is difficult to look ahead into the future. There is actually an increased level of activity due to coronavirus in some areas. Logistics companies, online companies, those kinds of companies, which have massively increased their number of vehicles and activities: there the EV market is actually growing as a result of the coronavirus.

There are other segments where you have less growth or even a little bit of a decline, where people are waiting to see what is going on before committing to an EV. So, it's a bit of both. In general, we are doing okay.

Christof: What's your view on the technology roadmap for BEVs and PHEVs?

Andre: If you look at a plug-in hybrid, that's a little bit of a strange animal, because it has two engines in one car. Why would you want two engines in one car? It is a transitional technology towards the battery electric vehicle.

If you look at the recent press release from Daimler saying that they have decided to stop all efforts to make a hydrogen fuel cell private car, that is along the lines that we think things will go. Fuel cells will play a role in heavy-duty trucks, but less so for private consumers. Where you need a fuel cell to store more energy than you can with a battery, fuel cells make sense. Batteries would be too big and too heavy if they were to power a long-distance drive in trucks. Here, you offset the less efficient means of getting energy into the vehicle against the mileage capacity you gain from the fuel cell.

Christof: There is also the question of prioritisation in the automotive industry. When it is struggling financially, there might just be technologies that can no longer be invested in.

Andre: Yes, that could well be true. But then again, if you look at energy density and if you look at the efficiency of creating energy, then battery storage and getting electricity into your car as your primary energy source still makes perfect sense.

Christof: We've recently seen a range of a better electric vehicles come to market, and prices coming down. Tesla's Model 3 is more affordable than previous versions, from a TCO perspective. The VW ID3 also appears to be more affordable. On top, you have government incentives that make electric vehicles more attractive. But what barriers remain to electric vehicles' success, in your perspective? Is there anything else that is still a problem?

Andre: Honestly, no. With the exception of infrastructure that undoubtedly continues to require investment.

Christof: Do you have a vision for what electric vehicle infrastructure looks like? How far should you have to drive to find an empty charging station, for example?

Andre: If you drive an ICE car, you normally would drive it until your tank goes empty, until your fuel tank indicator lights up on your dashboard. That's not the behaviour you see in people driving BEVs. When you see somebody driving a BEV, he or she readily adopts the behaviour of connecting the car to the grid the moment the car is parked for a long time. Not for 10 minutes, but say you park your car at your home, you connect it. If you park your car at your workplace, you connect it. That's generally what you do.

I would rephrase that question, from 'how far should you have to drive' to 'how likely should it be that a charging station is available at the place I leave my car for, say, longer than three hours?'.

Christof: So, if I plan to park my car for three hours or more…?

Andre: …you should assume there will be a charging station available, in 100% of the cases.

There are two reasons this is desirable. One is you always start with a charged battery, which means on normal use, the size of the battery doesn't matter that much anymore so you don't need oversized batteries.

The second thing, which is maybe more important is, to do with one of the questions I often am asked: 'what about grid capacity? Can the grid in Europe cope with the enormous amount of energy that has to distributed if everyone uses EVs?'. The answer to that is 'no, not at all'. But how can that be? For a very simple reason: the behaviour of people is that they start working in the morning and start going back home in the evening and there is only a window of two, two and a half hours where people arrive at their workplace and arrive at their home. If, as I just explained, you then connect your car to the grid, and everybody does so at the same time, the peak at the start of the charging session is enormous and the grid can't cope. But that's not an issue if you allow smart charging, whereby you allow the start point of your session, or the maximum power provided in your session, to be influenced by the grid, or by the station operator or by whoever does it, so that the peak is flattened. Again, this requires easy access to charging stations at the places people park the longest.

The next step – if you have a lot of people who now have full power in their battery most of the time – is to allow people to reuse that power in a smart way, to charge the car of their neighbour. I've a long history in the telecoms industry and if you would have asked me three years ago, 'will there be a market for smartphones that you can put on top of each other to charge one smartphone via the other smartphone?' I would have told you, 'you are absolutely out of your mind, that will never happen'. Yet, if you look at my kids, teenagers, they share their battery energy with their friends.

Christof: How does ChargePoint ensure charging stations work in a smart, optimal way?

Andre: Normally what you find in a typical parking place, when you are at a workplace, or a fleet operator, or a logistics company is that the grid connection there will have a maximum capacity. What you want to avoid is having to extend that capacity to accommodate your EVs because it is rather expensive, and it takes a long time. What you need to do is work with the available grid capacity and create the ability to use the grid to the maximum at all times. ChargePoint stations read the maximum available energy and moderate the supply accordingly. Say the building's energy use increases – the air conditioning switches on; the conveyor belt switches on – then we have less to use in our charging stations.

You need to work with the available grid capacity and create the ability to use the grid to the maximum at all times

This system is used in our Eco fleet management solution, which also knows how much energy a car needs to drive its next journey, what charge level it needs to have in the battery before it can set off, and ensures that when the car needs to leave the premises the battery is charged to the appropriate level.

Christof: it is not always desirable for good battery health for a battery to be charged to 100% all the time. How do you manage those types of considerations? What are the rules for battery charging?

Andre: Our systems 'handshake' with the car. We listen to the car, and in fact the charge power is allowed by the car. It is set by the manufacturer of the car. While the manufacturer has to provide a warranty to the driver or owner of the car, it does that on the basis that the battery is treated in the right way. So, the manufacturer allows the charging station to influence the length of the session and the amount of power that you push to the car, but the car in the end decides what the maximum charge is, what the minimum is. The rules are set between the car manufacturer and us.

The car in the end decides what the maximum charge is, what the minimum is. The rules are set between the car manufacturer and us

Christof: Let's talk about cost. The last time I charged an electric vehicle was on a highway in Germany. The station charged me EUR 15 for 25 kWh. It took 30 minutes and would then last for 100km of range. Does that sound right to you? Is this to where we should be heading?

Andre: This is certainly not where we should be heading. Let me elaborate on pricing to explain how this has come about.

As a driver, you can either pay ad hoc or by using a service from a Mobility Service Provider (MSP): an RFID card or an app, for instance. The MSP actually provides the invoice and collects the money. At the station-side the operator (the CPO) transacts the electricity from the station owner to the MSP. Without going into too much detail, it is clear that both CPO and MSP might add cost and margin.

ChargePoint strongly believes that the MSP should not pass through the cost to the driver. ChargePoint also strongly believes that transparency and predictability are vital. We will always show the price per unit upfront in the app and make it transparent what you are going to pay at that location.

Christof: What about charging solutions for consumers at their house?

Andre: We offer a solution here, which includes automatic reimbursement for company car users, so you don't have to do anything as a driver, we take care of that for you. We reimburse automatically to you the driver, and we charge the company for the reimbursement without adding any margin to that, because again, that is not what we believe in. What's more, if the driver has a partner who also has an EV, we would only reimburse the driver's charges and not the ones of their partner.

What this results in is the lowest cost of charging for a company because, in general, what private users pay when charging at home is much less than charging via a public station.

In some markets, we even have a system with some stations where drivers can specify if their charging session relates to personal or business use and can therefore be charged appropriately.

Christof: The thing is though, is If I rent the hardware in this way, at the end of the subscription period it will be taken away?

Andre: Yes, it can be. Or you can buy it at its residual value.

Christof: I can imagine companies finding this hard to understand. How do you educate them on this model?

Andre: We do a lot of education of employers on how they can offer an EV solution for their drivers, but it depends on the country. If you look at the Netherlands, the vast majority of EVs – and cars in general – are leased by companies so they understand things better. The leasing market in France is enormous too. Germany's is less big, in terms of the percentage of the total market.

Christof: Which are the most advanced markets with regards electric vehicle leasing?

Andre: Norway, Sweden.

The UK is clearly at the bottom of the list when it comes to EV leasing, the reason being that the UK market is an allowance-based market, with regards the fuel situation

Christof: Where do the UK and Germany stand in terms of maturity of electric vehicle leasing?

Andre: Germany is in the middle. The UK is clearly at the bottom of the list when it comes to EV leasing, the reason being that the UK market is an allowance-based market, with regards the fuel situation. Employers tend to provide a fuel allowance rather than cover all fuel costs, which can make reimbursement more complicated.

Spain and Italy are just below Germany. With the exception of the UK, it generally that Northern Europe has higher adoption than Southern Europe. In the Netherlands, last year up to 80% of EVs were leased.

Christof: After the coronavirus, people's budgets will be tight. Driving a car will be more of a cost play than before. How can you convince people to buy a BEV under these circumstances?

Andre: People will start wondering about the residual value of the car, especially as bans and restrictions on ICE vehicles come into force around 2030.

If you buy an EV, there is no reason to buy a new car every two years or after a certain mileage because the number of turning units is far lower than for a regular car; it is less likely to break down. There is little or no maintenance on an electric car, apart from tyres. You might like to have a new car every three to four years, but it is not necessary because of wear and tear.

Christof: I can see that the impact of impending bans will push people towards the BEV, which has been the intention with the announcement of such bans. But even if residual values continue to develop favourably, I feel it is important that charging becomes more affordable than it is now.

Andre: There is one thing that we forget in this equation: one of the main reasons people at this moment change to EVs is due to the enjoyment of driving them. Driving an EV is much more fun that driving a combustion engine, particularly in the medium segment of the market. If you look at the medium segment, you get high performances and low noise levels that those people can never get access to unless they drive an EV.

Christof: The performance argument is a good one. You get more performance, you get more power, and less noise. If you were trying to encourage an individual to 'cross the finish line' in terms of committing to buying an EV, how would you convince them?

Andre: There's a number of things you can do. One is to get them into a BEV to experience it. That is the best way of doing it. In private leasing, we have seen people test driving and EV for a week and the take-up rates after that are incredible. I am not allowed to share the numbers…

Christof: More than 50%?

Andre: More, more!

In private leasing, we have seen people test driving an EV for a week and the take-up rates after that are incredible

The second thing is to have the ability to charge when the car is parked near your house. If you have your own house, it is pretty simple. Ideally, you should be able to get the costs of installing a charging station reimbursed. If you have a shared car park, say attached to your apartment building, what you want to have is what we call a 'multi-family approach'. You have to be able to share the infrastructure, to share the cost. We have specific solutions for that.

If you rely on public parking, where maybe you have a parking permit or you just park on the street, increasingly in Europe we see public charging stations being set up to ensure people have the right to charge. If you have two or three charging stations in your street, they are reserved for EV parking. This is very important and again something that we support.

There are a lot of things that need to be influenced on a government and a local level to add more of these types of charging stations. At ChargePoint, we have a policy team consisting of four full time people who do solely this type of work: influencing local governments up to the European government, in order to come up with solutions that can work for the industry, not just for us as a company.

One thing we think is vital is enabling freedom of movement around Europe. We provide access to 120,000 publicly available stations, which is more than 80% of all available stations in Europe. But still you have areas in Europe where governments are still not actively enabling this. In the UK, this is the case. If you are an EV driver in the UK, you probably have a wallet full of charging cards as the infrastructure is so fragmented, and you never know what you are going to pay. That needs to change.

Autovista Group
5th Floor, Wellington House
125 Strand
London WC2R 0AP
UK

Email: information@autovistaintelligence.com
Tel: +44 (0)20 3897 2450

Interviewee	André ten Bloemendal, VP Commercial Sales, Europe, ChargePoint
Interviewer	Dr Christof Engelskirchen, Chief Economist, Autovista Group

Autovista Group