



**newmotion®**

A Member of the Shell Group

# EV Smart Charging Whitepaper



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# What is smart charging and why is it important?

**In today's world, everything is smart. We have smart phones in our pockets, smart meters in our homes and some even have smart fridges in our kitchens. These commodities provide clear improvements to our day-to-day lives as we become more used to smart technology.**

## **Why do we need smart charging?    A real life example.**

As the average price of an EV falls and more electric vehicles appear on the road, new energy demands present themselves. Whilst the EV movement is reducing CO2 and emission levels and benefiting the environment, a challenge arises in how all of these new vehicles can be collectively charged.

Presently, when you plug in your EV at home, it starts charging immediately, even if your charge is not needed at that very moment. This means most drivers would likely be charging their EVs at around the same time, and the national grid will struggle to support this as demand increases. This makes the need for a smart charging infrastructure ever more urgent, with this white paper explaining the full rationale behind how smart charging can help.

Let's consider the day-to-day life of your typical EV driver, Jen. We imagine that she commutes to work by car, and then comes home in the evening to recharge overnight having done between 25-30 miles in total that day. Typically the car will have been fully charged from setting off that morning and when Jen returns home will subsequently be plugged in for 12 hours or more each night. Despite all that time being plugged in, on average Jen's car will only need one hour's worth of charge to "top-up" back to 100%. Most people on Jen's street have the same sort of lifestyles, and at around 6pm they all come home and plug in their cars.



# What is smart charging and why is it important?

## Enter, smart charging.

By looking at daily charging trends from driver to driver, we know that opportunities exist to make better use of our energy grid's capacity - particularly during times of low or high demand. If we can better balance the energy distribution among EVs, they could pose less of a challenge to our electricity grid, whilst also benefiting drivers and our environment alike.

Smart charging distributes and balances available grid power by only charging a connected EV when it really needs power. During a typical working day, or in the evenings, there is considerable flexibility for when charging can actually take place. Because drivers have significant sized windows of opportunity to charge, smart charging can spread the demand for electricity to increase grid stability and consequently support the adoption of EVs.

## In detail, to us at NewMotion smart charging means:



### CONNECTIVITY

With online-connection and a cloud-based management software we can match features to vehicles, constantly keep charge points up-to-date with over-the-air updates and configure charge points to react to a multitude of signals.



### REMOTE ACCESS

A smart charge point is a more reliable charge point. We can access charge points remotely the minute there is an issue – removing the need for an engineer visit in over 90% of cases.



### MONITORING PLATFORM

A completely managed way to initialise, configure and track charge point operation. Plus insights in charging data, CO2 savings and access to services like remote start from any device anytime, anywhere.

# Snapshot into the UK EV Market

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**At NewMotion, we've been pioneering smart charging solutions for 10 years, providing over 45,000 smart charge points to the European market since 2009 so to us, the benefits of smart are clear.**

The UK EV market has gone from strength to strength in recent years, with public attitudes to electric mobility shifting dramatically. In 2016, the government pledged £290 million to boost the EV industry, and along with a number of tax incentives, this paved the way to providing accessible and affordable charging solutions for both consumers and businesses. 191,117 EVs have now been registered in the UK, and as charging infrastructure continues to expand, so does competition amongst major automotive players to produce innovative and efficient EV models.

In July 2019, the Office for Low Emissions Vehicles announced changes to the terms of its home charging grants, which began to be offered as part of the government's 2016 commitment. All EV chargers now need to be smart to be eligible.



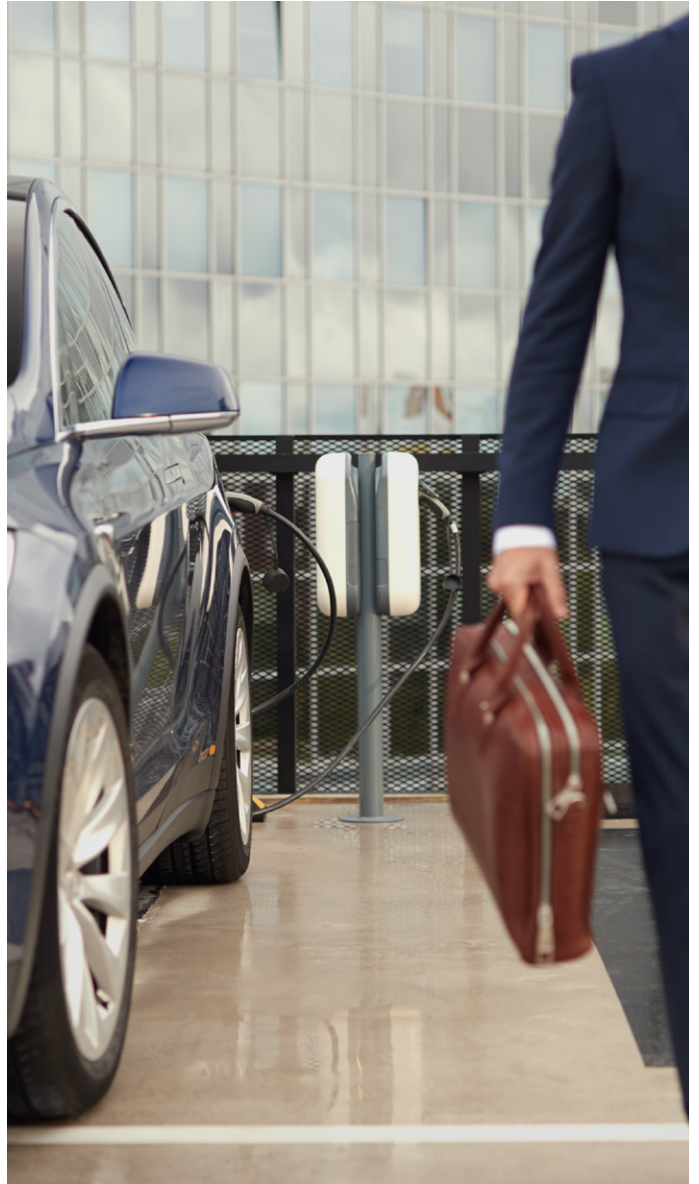
## Great ambitions, smart solutions

To really understand the need for smart infrastructure, we have to take a step back and look at the bigger picture. The UK Government has announced its Road to Zero plans, including a phase-out of the sale of internal combustion engine vehicles by 2040. With over 30 million cars on the UK roads today, this is going to mean a lot of electric cars and require smart charging infrastructure to match.

Whilst the e-mobility movement offers great benefits in terms of reducing CO2 and other harmful emissions, the scale of EV adoption needed does present a serious challenge in terms of energy and charging infrastructure. In parallel, our electricity supply itself is changing as we adopt more renewable energy sources, such as wind and solar power. This kind of power generation cannot be switched on and off as with traditional forms of energy due to its fluctuation, meaning supply cannot easily be adjusted with demand.

# What are the benefits of smart charging for drivers?

What does the driver have to look forward to with smart charging? Well, it will certainly lower the overall cost of their electricity. Currently when an EV is plugged in at home, it starts charging immediately, even if charging is not needed. With smart charging this can be delayed to a later time when grid demand is lower and electricity is less expensive, resulting in a cheaper energy bill at the end of the month, approximately £150 a year cheaper in fact. In addition, by implementing smart charging infrastructure, grid congestion will become a thing of the past, taking away the need to increase grid capacity. As a result of less expansion on the grid, consumer energy bills will fall further and the overall total cost of ownership of an EV with it. Smart chargers also offer superior customer experience. Being communications-enabled, 90% of user issues can be fixed remotely, saving drivers the hassle of an engineering visit. The software is regularly updated via the cloud, so customers always have access to the latest features. Our smart charging monitoring platforms allow customers to initialise, configure and track charge point operation.



**By charging at off-peak times, consumers can save around £150/year, if you are on a time of use tariff, for instance.**

# What are the benefits of smart charging for drivers?

## Cities, Homes and Energy Potentials

The most valuable component inside an EV is the battery. Typical EV batteries have the capacity to charge an entire home for nearly a week, essentially turning our cars into thousands of mobile power plants. With Vehicle to Grid (V2G) and Vehicle to Everything (V2X) smart charging, an EV battery would allow us to not only store electrical energy, but redistribute it during times of peak demand - effectively turning your home into an energy self-sufficient smart home.

**A smart charge point is a much more reliable charge point – customers experience a far superior experience when anything goes wrong and we can remotely fix 90% of issues remotely, saving drivers the time and hassle of an engineer visiting.**



**As new propositions and features become available, a smart charge post can be updated over-the-air, making sure your customers always have access to the latest features.**

# What are the benefits of smart charging for drivers?

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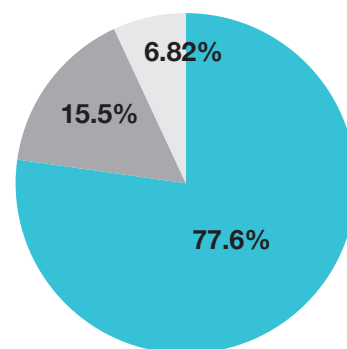
## Each year we conduct Europe's largest annual EV Driver Survey.

With nearly 5,000 respondents this year, we have compiled the data into graphs and visuals below that give you an indication of the current state of the EV industry, what drivers are looking forward to, and other general demographics of EV drivers.

### Would you like to make use of smart charging?

A large majority (77.6%) of participants stated they would make use of smart charging if they had the possibility.

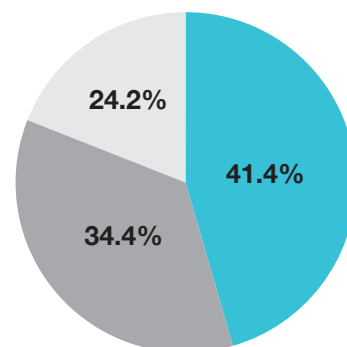
yes	2.83K	77.6%
indifferent	567	15.5%
no	249	6.82%



### Why do you want to make use of smart charging?

The main reason for using smart charging among participants was to balance the electrical grid.

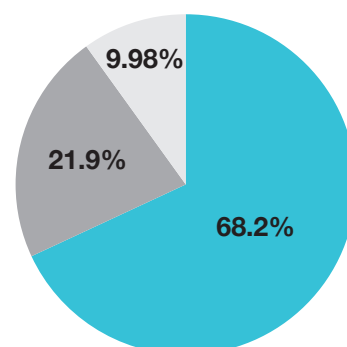
to balance the electricity grid	
to save money on energy bills	
to protect the environment	



### Would you like to make use of V2G charging?

68% of participants said they would make use of V2G charging if they could.

yes	2.49K	68.2%
indifferent	797	21.9%
no	364	9.98%





# What can your organisation get from NewMotion today?

With our parent company, Shell, we are an exclusive charging solutions partner that can cater to you and your customers' needs. Our Sales Partner Rebate can also help your organisation pass on extra savings to your customers and earn back significant costs per annum.

We pride ourselves on being the partner of choice to car manufacturers, dealerships and leasing companies Europe-wide, championing your teams to experience EV success across the board. We train your organisation and provide the most up-to-date knowledge to facilitate better all-round understanding – helping you to help your customers overcome their perceived barriers and enhance the likelihood of selling the right product to the right customer.



# What can your organisation get from NewMotion today?

## Exclusive home charge point offer

From only £359 after the £500 OLEV grant, your customers can get a NewMotion smart charge point fully installed at home\*. This provides the full array of smart features for: viewing your charging data, over-the-air updates, and even managing how the charge point works with other electrical demand in the home. With NewMotion charge points you're able to make use of Dynamic Power Management Home\*\* – ensuring the available energy capacity from the home connection is distributed in the best way possible with no danger of power outages due to electric car charging habits.

### This is how it works:

- The charge point works with the capacity of your grid connection.
- Constantly monitoring of how much energy is being used in the home.
- The Dynamic Power Management Module continuously relays the total consumption.
- The charge point calculates and supplies all available energy in the home to the vehicle.
- When demand in the home is high, the charge speed to your vehicle goes down to balance use.
- When demand in the home drops the charge speeds back up to the vehicle again, ensuring you are fully charged when you need it.

\* Price from £359 includes standard installation.  
Prices may vary according to installation requirements.

\*\* Additional charges apply for the Dynamic Power Management Module.

At Shell and NewMotion we're always looking for new ways to use smart charging to save our customers money. We're working with Mitsubishi on vehicle to grid, where you can take the energy stored within the battery in your vehicle and put it back into the grid when it makes sense to, introducing a new potential earnings model for electric drivers, and more importantly helping to balance the grid by putting energy back in at times of peak consumption.



We're also partnering with Sonnen, Europe's leading battery storage provider, to combine the benefits of smart charging with home battery storage and solar. This will allow you to recharge your car from your own solar panels, no matter when you're plugged in. And if you've got some extra energy, you'll be able to share it with your friends. Now that's really smart!

And when it comes to external factors to consider – the UK government recently announced the newest Benefit in Kind (BiK) taxation rates for company cars will be 0% from 2020/21 which will offer a huge financial incentive for drivers to go electric. There's never been a more critical time to help customers make the transition.