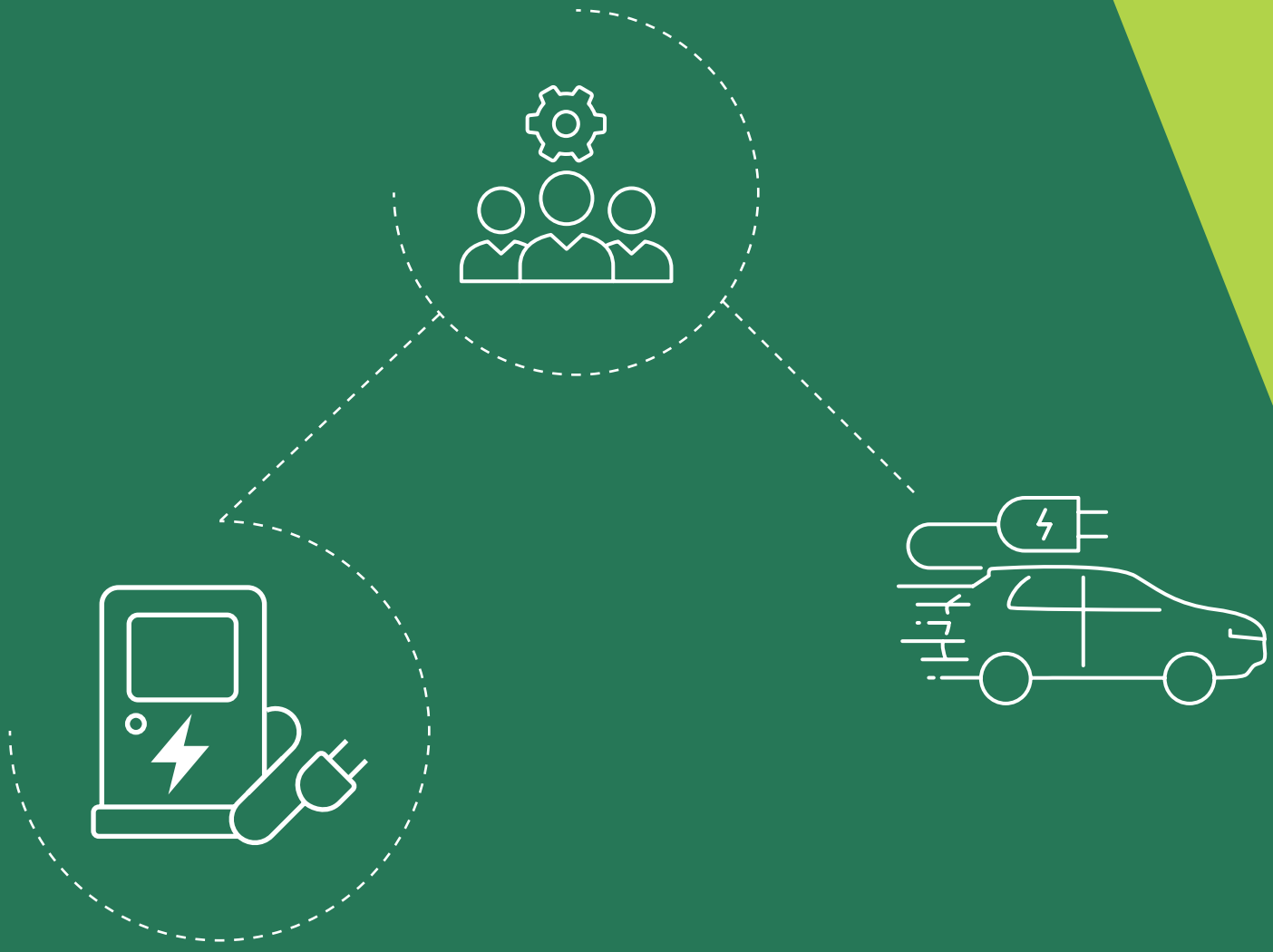
June 2020

Comparing international electric vehicle policies: Lessons for the UK

WA Communications



We are WA

WA Communications is a public affairs and communications consultancy that guides clients through knotty business challenges.

We are defined by our agility and entrepreneurial mindset and a relentless focus on campaigns and communications that deliver significant commercial results.

Awarded UK's PR Consultancy of the Year 2020, we provide big consultancy thinking coupled with boutique-style service.

We apply clear thinking and creative problem solving with well-structured advice to help clients tackle issues, mitigate risk and capitalise on opportunities.

Know-how blended with expertise
We devise campaigns to address policy, legislative, regulatory and reputation issues for our clients.

Our consultants bring decades of experience working on successful campaigns across a range of sectors and we have developed particular expertise and specialist knowledge in principal areas, including:

- Energy and the environment
- Health
- Transport and Infrastructure
- Education and children's services
- Investor risk analysis
- Change and crisis management

In this report

wacomms.co.uk

The UK government has ambitions to ban the sale of all petrol and diesel vehicles from 2035, with further ideas of a diesel and petrol car scrappage scheme being discussed as part of a "green recovery" following Covid-19. A successful and active EV market is key to realising these ambitions and those set out in the government's Road to Zero Strategy, which aims to achieve emissions of virtually zero carbon by 2050. However, the UK's EV market remains underdeveloped in comparison to some of its international counterparts and risks being left behind.

Below we compare and examine some of the key factors that have played a role in the success of other international EV markets, including the UK, the USA, the Netherlands, Norway and South Korea. For each, we have provided some key lessons for the UK if it is to fully realise its EV ambitions by 2035.

	EV sales as % of new domestic market
Norway A true global leader but must not get complacent about its natural advantages	75%[1]
Netherlands An early front runner in all things EV, helped by its cultural attitudes towards protecting the environment	14%[2]
UK Work to be done but still has huge potential	7.2%[3]
South Korea Falling behind its neighbours China and Japan, South Korea will be keen to impress upon the world their standing as a leader in electric vehicle design, production and infrastructure	3.3%[4]
US Things are done differently here but a force to be reckoned with both now and in the future	1.94%[5]

1. CleanTechnica, Norway EV Market Share Breaks All Records, April 2020
2. EV Sales Blog, Netherlands May 2020
3. SMMT, EV & AFV Registrations: Year to date, May 2020
4. CleanTechnica, Tesla Model 3 = 45% of South Korea's Electric Vehicle Market, April 2020
5. Abc, Has cheap fuel plugged the plug on electric vehicles?, May 2020

California accounts for around 50% of US EV sales. EVs made up 13.2% of the California market in 2019.

The race for EVs*

Leader Board

	Growth of EV market share	New EV sales (thousands of vehicles)
UK	**+1.93%** (to 2.1%)	**+1,243%** 3,750 > 50,360
Norway	**+40.53%** (to 46.42%)	**+753%** 8,520 > 72,690
Netherlands	**+1.19%** (to 6.57%)	**+30%** 22,420 > 29,160
US	**+1.74%** (to 2.45%)	**+274%** 96,700 > 361,320
South Korea	**+2.16%** (to 2.21%)	**+5,513%** 600 > 33,680

* Comparing progress over 5 years from 2013 to 2018 (using latest comparable data available from International Energy Agency Global EV Outlook 2019)

Section 1.

Adopt an ambitious strategy

As early as the 1990s, Norway introduced financial incentives to tackle the fixed costs associated with EV ownership

Overview

Having a strategy in the first place may seem obvious but having one that goes beyond just targets is a key differentiating factor between countries. Countries with clear strategies and policies that support their execution fare far better in boosting EV uptake than those that don't. Governments cannot rely on one policy lever but must use a mix of activity to boost the EV market.

Think now, act now

Norway conceived and implemented its EV plans early and has been consistent ever since, and is now considered a global leader. This can be, in part, attributed to its plentiful renewable energy and income from oil. However, its success is primarily down to the fact it was consistent in making and implementing supportive policies. As early as the 1990s, Norway introduced financial incentives to tackle the fixed costs associated with EV ownership, including exempting EVs from registration costs and cutting VAT on new sales. By the turn of the millennium, Oslo had widened these incentives to tackle running costs: lowering road taxes, offering free parking, and removing road charges[6].

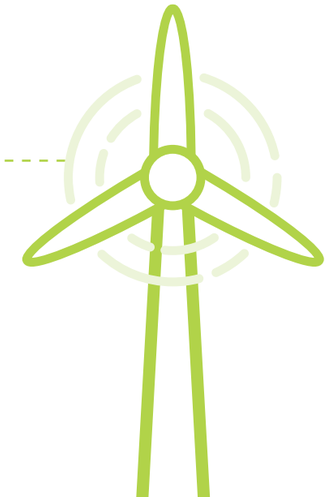
By 2010, Norway was surpassing its own targets. However, it didn't stop there and, instead, turned its attention to one of the biggest issues EV users face: access and usability of EV charging infrastructure. The government kickstarted private investment through establishing Enova, a public agency which helped to establish their first generation of charging infrastructure, thereby pioneering the way forward that many others have followed[7].

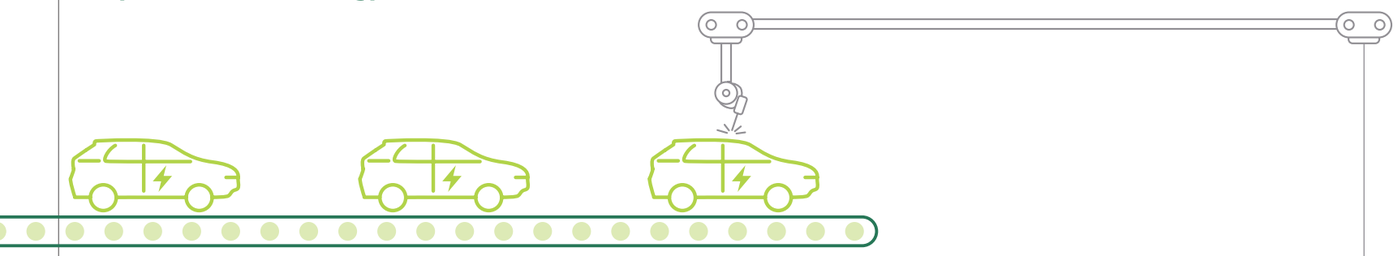
A three-pronged approach

South Korea is a relatively new starter in comparison, but its EV industry is growing quickly. Between 2004 and 2011, three laws were passed with the aim to develop the industry – the first encouraged consistent development of the industry across three government ministries, the second aimed to promote development of the national economy by a low carbon green growth strategy through integrating national and local policy, and the final act gave national government responsibility for EV deployment policy in restructuring the national transport system[8]. However, targets of 1,000,000 EVs in 2020 were reduced in 2012 from 1,000,000 to 200,000. Government simply had not done enough, and this was widely blamed on a poor policy framework and implementation process[9].

However, South Korea has recently significantly scaled up the scope of subsidies and incentives, both for fixed and running costs, and has seen short term results which it hopes will accelerate over the next decade. The government is acutely aware it will still lag behind its neighbours China and Japan, and so has set ambitious targets for the next ten years, promising to invest to support the private sector, both in terms of the vehicles themselves and the supporting infrastructure. Recognising its small domestic market and reputation for cutting-edge technologies, South Korea is also turning to its export potential and is supporting industry in manufacturing and battery technology. EVs bring a double advantage for the nation – reaping environmental and economic benefits following a concerted government strategy.

6. Forbes, Electric Cars: Why Little Norway Leads the World In EV Usage, 18 June 2019
7. Enova, Enova SF Annual Report, 2019
8. Law for Eco-Friendly Cars R&D (2004); Law for Local Carbon-Green Growth (2010); Law for Sustainable Transport Development (2011)
9. Sang Kyu Hwang, Comparative Study on Electric Vehicles Policies between Korea and EU Countries, World Electric Vehicle Journal Vol 7, 2015





Horses for courses

Back in Europe, the Netherlands joins Norway as a market leader and is known for its forward-thinking approach to green mobility. The country implemented its first EV policy in 2009 which involved three key activities: creating a taskforce to boost adoption; endorsing R&D, installing infrastructure, introducing financial incentives; and setting targets. This diverse mix of measures saw the country reach its 2015 targets two years early, even though the country had much lower levels of financial incentives than Norway has been able to implement by benefit of its oil revenue[10]. A comprehensive policy platform has made the Netherlands a European leader and the country is set to boost this approach this year with a new enhanced subsidy programme. The Dutch government is also one of the strongest voices in Europe, pushing hard for ambitious targets from both the EU Council and Europe.

The carrot and stick approach

Across the Atlantic, the federal US government has been proactive in providing tax breaks and incentives to support the marketisation and uptake of EVs since the early 1990s. Tax support was further strengthened and extended in 2008, with one study attributing more than 30% of sales to federal tax credit (and 49% of Nissan Leaf sales)[11]. The Department of Energy's Clean Cities programme awards states and cities funding for projects to increase consumer awareness, building on initial incentive-focused strategies.

However, the federal government is far from the only actor as lots of policy is decided on a state-by-state basis. Zero-emission vehicle mandates, further financial incentives, free high-occupancy vehicle lane access and charging infrastructure grants, rebates and tax credits have, statistically, been shown to lead to states having a significantly higher market share of EVs than those without[12]. In particular, those states that opt to go further than the federal government, setting stricter emissions standards (following California) is the single most effective policy. At a federal level, policies and initiatives have set a strong foundation for states. Those that have adopted a varied, ambitious policy approach have reaped rewards.

In the UK, we have seen how a mix of policies can be effective, but more needs to be done by the government to create a secure market and reach its targets which are set to be brought forward. The UK government's first EV strategy was published in 2009, but it was ultimately still being left to the private sector. By 2014, the main policy was on charging infrastructure and provision of a modest funding pot, but little policy activity from government meant EVs didn't take off. By 2018, the UK government began to understand the importance of EVs and published a Road to Zero Strategy which set out next steps to 'clean up' road transport and become a world leader in developing, manufacturing and using zero emission vehicles[13]. This included investment in charging infrastructure, government grants to support purchasing an EV and installing chargers at home and setting an 'ambition' for at least 50% of new car sales to be ultra-low emission by 2030.

10. The International Council on Clean Transportation (icct), Comparison of Leading Electric Vehicle Policy and Deployment in Europe, 2016
11. Gil Tal and Michael Nicholas, Exploring the Impact of the Federal Tax Credit on the Plug-In Vehicle Market, Transportation Research Record: Journal of the Transportation Research Board 2572, 2016
12. Centre for American Progress, Plug-In Electric Vehicle Policy: Evaluating the Effectiveness of State Policies for Increasing Deployment, June 2018
13. HM government, The Road to Zero, July 2018

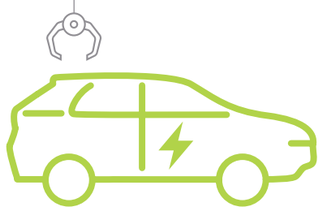
Section 1.
Adopt an ambitious strategy

However, whilst this put forward several policy measures, the following year there were already question marks over how long the support would last, the promised investment that hadn't been spent and the slow uptake of EVs. Now, with government working on a Transport Decarbonisation Action Plan and consulting on bringing forward a legal ban on the sale of petrol and diesel vehicles to 2035 or earlier, the government has an opportunity to put in place a balanced and varied policy platform, but it must act fast.

Despite significant successes, there's still a long way to go for all of the countries mentioned. Even in Norway, where EVs make up an impressively high percentage of new car sales (75% in March 2020 and 64% in January pre-Covid[14]), they aren't yet within touching distance of a total shift to EVs. In fact, Norway mustn't forget its past successes, with some criticising its most recent strategy for lacking clarity and ambition. Governments can't afford to rest on their laurels or become complacent. Support cannot be left to expire. To be successful, countries must continue to build bold, broad and varied policy support systems or risk being left behind in the EV revolution.

Lessons for the UK

- **Develop a clear, varied strategy**
  – a successful strategy will involve a mix of financial incentives, industrial support and behavioural change measures.
- **Be clear and unambiguous in support**
  – offer industry certainty over strategy and the environment that government will support.
- **Be bold and ambitious**
  – although some countries had a head start, learning the lessons from others' experience and building a clear, ambitious, multi-faceted policy platform, will allow the UK to move up in the leader boards.

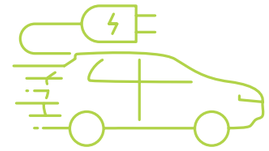


In the UK, we have seen how a mix of policies can be effective, but more needs to be done by the government

14. CleanTechnica, Norway EV Market Share Breaks All Records, April 2020

Section 2.

Empower local and regional government



Overview

While the Westminster government will be leading the charge on promoting electric vehicles in the UK, they cannot deliver the scale and pace of revolution they envisage alone. Clearly partnership with industry will be critical but there is another piece of the puzzle that also needs to fall into place: the role played by regional and local government.

The Scottish Parliament, Welsh Parliament and Northern Ireland Assembly are well established and have the power to take their own approaches to driving electric vehicle charging infrastructure. Furthermore, directly elected metro mayors and local authorities will have crucial roles to play. But one potential pitfall is the lack of an overarching strategy that ties all these layers of government into a coherent plan with roles and responsibilities clearly demarcated.

As the number of electric vehicles in the UK grows, it will be critical that people are able to charge them at or near their homes. While at home charging solutions will be an important part of this, there will also be a need for a public network of charge points in residential areas, in addition to places such as supermarkets, shopping centres, car parks and motorway service areas for longer journeys. Responsibility for directing and facilitating such a network should logically fall to either local authorities or metro mayors who have a more detailed understanding of transport patterns in their local area.

Inconsistency in local approaches in the UK

To date, the UK has offered a number of different grant and incentive schemes that local councils are able to access to subsidise the roll out of EV charging infrastructure. However, take up of these has been patchy and relies heavily on councils being proactive in applying for the grants. Several London councils are taking advantage of these grants with Wandsworth Council developing plans to install 900 charge points across the borough. Interestingly, the most recent wave of charge points that Wandsworth has announced are being strategically placed near the edges of the London Ultra Low Emission Zone (ULEZ)[15], indicating the interplay between policies driven by the Mayor and local authorities can work effectively.

However, this approach is far from universal. Funding pressures on local authorities mean that EV charging is often far down the list of priorities. A Guardian investigation last year found that around a third of all councils (107) said they had no plan to increase the number of charging points in their area[16]. Clearly, there is a need for more strategic intervention to meet the government's ambitions.

So, are metro mayors doing any better? In short, they face similar challenges. They can coordinate and work with local authorities in their areas but do not have direct powers or funding to drive a charging network on the scale required. Indeed, West Midlands Mayor Andy Street put the ball firmly back in the court of national government in an article for Conservative Home in July 2019[17], stating:

> **"The biggest challenge lies in the infrastructure investment the new electric era will require – in terms of charging networks where vehicles can 'refuel' – and government needs to step up to play its part. No single car manufacturer will be able to justify investing in such a vast endeavour.**
>
> **It will be up to governments across the globe to intervene and accelerate a healthier and sustainable age of motoring, by creating charging networks and building capacity in power grids. New production facilities will require capital investment too."**

15. Wandsworth Council, Another 220 electric vehicle sockets fitted to Wandsworth streetlights, May 2019
16. The Guardian, Councils stall on adding charging points for electric vehicles, March 2019
17. Andy Street, Conservative Home, What's needed to make the West Midlands the world centre for electric cars, July 2019

So, what can the UK learn from the way other countries have approached EV charging rollout across different layers of government? Two interesting examples are the Netherlands and the United States. Both have federal governance structures, and both have taken quite different approaches.

The Netherlands: Cooperation and coordination

The approach taken in the Netherlands is well summarised by Sonja Munnix, Senior Advisor, Netherlands Enterprise Agency in an article from April 2019[18]. Their approach emphasises close collaboration with industry and local government. It is driven by large scale tenders for public charging infrastructure, run jointly by provinces and municipalities, in which innovations such as smart charging, open protocols, and cyber security are the norm.

The contracts awarded from these tenders typically see one or more parties given the right to install and operate charging stations in public spaces at no cost to government agencies. Furthermore, many municipalities are seeking further acceleration of their charging networks and are using data on demand for charge points to inform their approach.

When residents without their own parking space buy an electric car, they can request to have a charge point installed in a public space, at no cost to them. This is facilitating an increasingly data-driven approach, where charging infrastructure is installed on the basis of predictions about where electric cars will be charged in the future.

What is notable about this approach is the emphasis on collaboration. It was also helpful that the Dutch provinces, the middle layer of government between national and municipalities, have explicit responsibility for transport and regional infrastructure. They were therefore well placed to lead on these widescale tenders. The closest equivalent in UK politics would be either county councils or the combined authorities that support some of the metro mayors. However, their powers are not so clearly defined.

The US: states vs federal

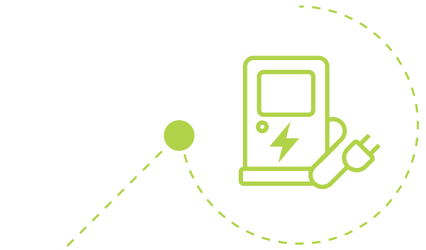
The United States provides yet another, quite contrasting example. Clearly, the power of individual states in the US are considerable and very different approaches in different states has led to an uneven rollout of public EV charging infrastructure to date. California leads the way with 13,787 charging outlets, far higher than any other state. New York comes in second with only 3,784 and many States have fewer than 1,000.

California's approach has been characterised by ambitious targets and generous subsidy for the rollout of charging infrastructure. California has a target of installing 250,000 chargers across the state to support 5 million electric vehicles by 2030. To help get there, it has established a number of support schemes run by the California Energy Commission. The most recent of these was $15m of subsidy[19] to help businesses, not-for-profit organisations and government agencies cover some of the costs associated with installing electric vehicle charging stations for public use.

California leads the way with 13,787 charging outlets, far higher than any other state.

18. Renewablecities.ca,The Netherlands and electric vehicles: A policy model for the world, April 2019
19. Govtech.com, $15 Million Available to Support EV Stations in California, December 2019

Section 2.
Empower local and regional government



Clearly, the fact that California is a relatively rich state with significant powers to pursue the policies it chooses within its jurisdiction has been critical in allowing it to make this progress. It demonstrates that with political will and the resource to back it up, progress can be made more quickly. But due to the lack of a more interventionist role from the federal government, progress has not been made evenly across the US.

In 2016, Barack Obama's administration unveiled a significant programme of measures aimed at boosting electric vehicle use in the US, including $4.5 billion in loan guarantees and inviting applications to support the commercial-scale deployment of innovative electric vehicle charging facilities. However, similar support has not been repeated under President Trump with his administration moving to block the expansion of tax credits for electric vehicles. There has also been a fierce dispute in the courts between the State of California and the Trump administration over the enforcement of exhaust emissions that are stricter than federal standards, designed to drive the uptake of electric vehicles.

Ultimately, it appears that powerful and motivated governments, at a national or local level, have the capacity to drive EV charging and vehicle take-up much more quickly where there is political will. However, a consistent adoption across the country cannot happen without a more collaborative approach between the national and regional layers of government.

Lessons for the UK

- **It's important the various layers of local government are empowered** to lead on the rollout of charging infrastructure in their local area. There needs to be clarity about where responsibility should sit for ensuring that provision is keeping pace with and, ideally, getting ahead of predicted demand. This clarity is currently lacking, as demonstrated by Councillor Martin Tett, LGA Transport spokesperson, who said that[20]:

  "[councils] cannot take on the role of replacing petrol stations. Any new responsibilities to ensure there is sufficient electric car charging infrastructure must be matched with adequate funding. Long term this must be a role for the private sector".

- **As noted by Tett, it is important that sufficient resource is provided** to stimulate the network where there is no clear commercial route to do so. Given the restriction on revenue raising powers for local councils and metro mayors, this will most likely need to come from the Westminster government and its counterparts in Wales and Scotland. However, it is important that this sits alongside clarity over who has responsibility for driving rollout at a local level.

- **While some element of subsidy is likely still required,** the experience in the Netherlands shows that where there is effective coordination across different layers of government, as well as with the private sector, the need for public subsidy can be reduced. This is especially the case if better use of data to predict demand can be used.

20. Current-news.co.uk, Minister Call for Council to take up electric vehicle charging fund, January 2018

Section 3.

Ensure a healthy balance between public-private investment

In the 2020 Budget, the government committed to provide £500m over the next five years to support the rollout of a fast-charging network.

Overview

This section looks at the varying degrees of public-private investment in EV infrastructure. Since the early 90s, the amount of private investment by each country has largely been dictated by its approach to public spending.

Take the UK, USA and South Korea, for example. They've used public funding in the shape of grants and subsidies to support and nurture the emerging market. Norway and the Netherlands, on the other hand, have invested heavily in the industry itself. Norway's natural resources and extensive hydropower energy system gives it a distinct advantage, hence why it is leading the way in terms of both public and private investment in the market.

The UK: A hybrid approach

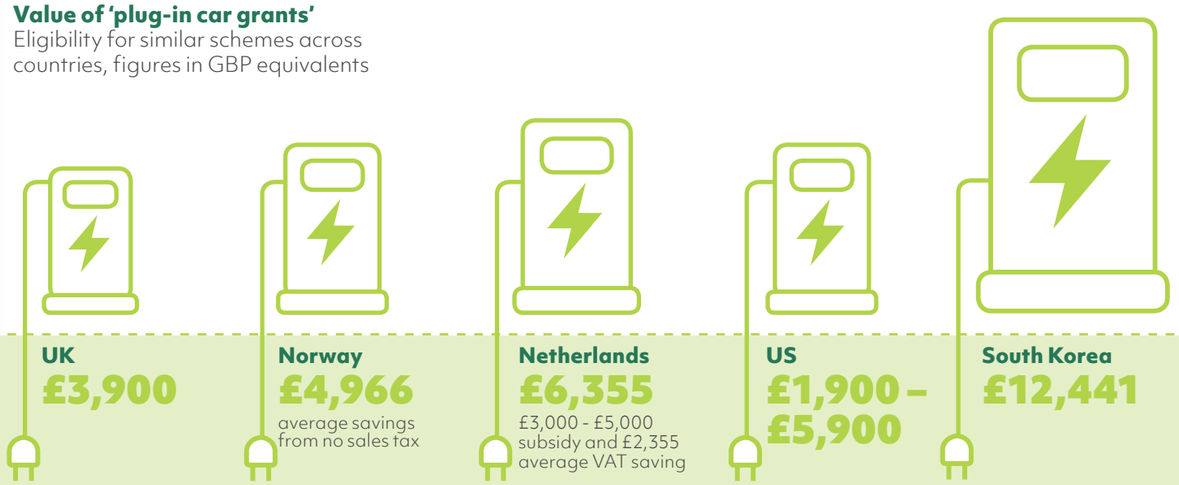
The UK has invested heavily in EV infrastructure which is supported by private sector investment in order to create a "self-sustaining" network[21].

Government's Charging Infrastructure Investment Fund (CIIF), established in the 2017 Budget to boost charging infrastructure and strengthen connectivity, saw the government commit to match private investment pound-for-pound[22]. As of April 2020, this fund is on track to raise £400 million[23].

In the 2020 Budget, the government committed to provide £500 million over the next five years to support the rollout of a fast-charging network. Whilst the UK government largely views the uptake of charging infrastructure as being "dictated by the market", since their introduction in 2016 a number of grants to incentivise EV ownership have been introduced, including the offsetting of costs to chargepoint installation or the Electric Vehicle Homecharge Scheme (EVHS)[24].

Value of 'plug-in car grants'

Eligibility for similar schemes across countries, figures in GBP equivalents



21. Electric Vehicles and Infrastructure; Briefing Paper; House of Commons; 14-16, March 2020
22. HMT, Charging Infrastructure Investment Fund Policy Paper, July 2018
23. The Energyst, Investors 'lining up' to fund charging networks, April 2020
24. OLEV, Grant Schemes for electric vehicles charging infrastructure, January 2019

Unsynchronised funding across the USA

Transportation makes up the largest share of emissions produced by the world's second largest producer of greenhouse gasses[25]. Since the 1990s, the US has adopted a "market-driven" development approach to tackling this issue and in its support for EVs and EV charging infrastructure.

Due to the federal, state-led nature of this approach, the balance of private-public investment varies across the US, and largely consists of variable degrees of funding. This includes privately-owned retailers, real estate investment trusts, EV supply equipment companies (EVSE), utilities and other commercial interests as well as government funding.

The available government support varies from state to state. At the federal level, the purchasers of Plug-in Electric Vehicles, for example, are eligible for a tax credit of between $2,500 and $7,500 based on a vehicle's battery capacity[26]. At the state level, California is leading the electrification charge in the US, as it offers the most rebates and incentives of any state, including granting drivers of alternative-fuel cars high occupancy vehicle lane 'congestion charge' exemptions and rebates up to $2,500 to consumers who purchase light duty zero emission vehicles[27].

Norway: a natural advantage

Almost 60% of new cars sold in Norway in March 2019 were entirely electric-powered[28]. It comes as no surprise then that there is large-scale public investment within the EV market in Norway. Since around 2010, there has been a focus on the usability of EV's. Kickstarted by government money, private companies and overseas investments are now beginning to take over operations. The government met its target of 50,000 zero-emission vehicles on the road three years earlier than planned. Despite this, the current centre-right coalition has kept most of the incentives in place to at least 2021.

Due to the country's large hydropower energy source, the switch to EVs is much greener than for many other countries. As such, the government has invested heavily in financial incentives and charging infrastructure since the 1990s. For example, through incentives such as reduced road taxes, the removal of toll charges and free parking being offered to EV owners. In 2001 Norway's 25% sales tax was removed from all EV purchases[29].

A united approach in the Netherlands

The Dutch approach to funding EVs involves a comprehensive package of taxation incentives and infrastructure investment from the government set within a booming EV market[30].

The Netherlands offers a variety of tax incentives for the take up of EVs, primarily the vehicle tax exemption which is based on the CO2 emissions produced by vehicles. Combined with incentives such as free parking and charging in public places, these initiatives drive public investment into the EV market.

Almost 60% of new cars sold in Norway in March 2019 were entirely electric-powered

25. Greenhouse Gas Emissions, United States Environmental Protection Agency (Accessed 01/06/2020)
26. Qualified Plug-in Electric Vehicle PEV Tax Credit, United States Department for Renewable Energy (Accessed 01/06/2020)
27. Plugin Hybrid and Zero Emission Light-Duty Vehicle Rebates, United States Department for Renewable Energy (Accessed 01/06/2020)
28. Electric Cars; Why Little Norway Leads The World In EV Usage, Forbes, June 2019
29. Ibid
30. Fleetcarma, What can we learn from the Netherlands about EV adoption, July 2018

Section 3.
Ensure a healthy balance between public-private investment

As part of its package of measures supporting the market, the Netherlands has adopted a "joint force" approach between government, private businesses and educational institutions in what is called the Green Deal (GD) approach. Through the GD approach the government facilitates private projects by removing any legislative barriers to investment[31].

South Korea: battery charged market

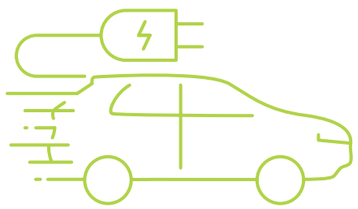
Over the last year, South Korea has focused its interventions on increasing consumer subsidies for EVs as part of an investment programme aimed at speeding up the roll out of zero emission cars. In 2020, incentives such as subsidies of up to $15,700 for the purchase of an EV have been made available. Further measures included as part of an enhanced spending programme include funding to help build charge stations[32].

South Korea has an advanced battery industry, which drives its private investment within the EV market[33]. This strong domestic battery market supports the industry and has seen South Korea lead in the production of EVs for a number of years.

Given the country's commitment to ensure 20% of vehicles sold being EVs by 2020, this year it will invest a total of $813 million to subsidise EVs and expand charging stations across the country[34]. Since 2014 the country has invested $345 million in battery and plug-in related technologies to support its booming battery market.

Lessons for the UK

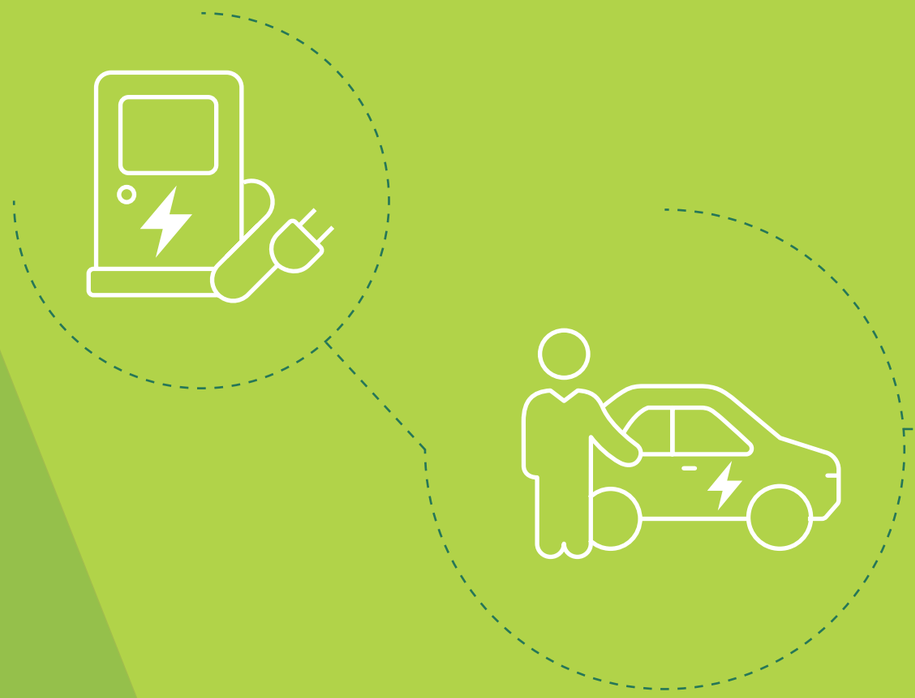
- **To adopt a "market driven" approach, requires an already booming market.** The UK's EV market will continue to depend on considerable public investment until consumer habits change and private investment returns can be guaranteed as in South Korea and Norway.
- **The hybrid and united approach require clear signals of intent from government,** ambitious and bold tax exemptions for EVs, alongside a supportive climate for private enterprise and Industry to develop the market.



31. Electrive.com, Netherlands Planning Private EV Subsidies, February 2020
32. Argus, South Korea boosts EV subsidies to spur demand, January 2020
33. International Economic Development Council, Analysis of the Electric Vehicle Industry, 2013
34. PetrolPlaze, South Korea expands e-mobility subsidies, January 2020

Section 4.

Work collaboratively to ensure a positive user experience



Overview

This section looks at how consumers' EV experiences differ in each country and how interoperable and accessible their charging infrastructure is.

Digitisation is transforming every corner of every industry. Customers' expectations are changing rapidly giving them increasing power over service providers and their offerings. For EVs, meeting these new expectations is one of the biggest challenges facing their widespread adoption. Having the right business model is therefore key to ensuring as seamless an experience as possible for consumers, which is where interoperability comes in.

Interoperability (sometimes referred to as driver 'roaming') is increasingly present in different industries. Take the telecommunications industry, for example. Interoperability refers to the interworking of telecom services meaning users can communicate with people on different devices / networks to their own. So, for people with EVs, this translates into being able to use various charging networks under different operators by taking membership with just one operator. By having membership of a single charging operator, which has signed 'interoperability agreements', the driver can use that one membership to locate, access and pay for EV charging stations on different networks through one app.

Customers' expectations are changing rapidly giving them increasing power over service providers and their offerings.

All this is underpinned by the widespread adoption of open standards like the Open Charge Point Protocol (OCPP) or the Open Clearing House Protocol (OCHP), for example. These standards allow for efficient communication between charging stations, the grid, and back-end offices to ensure interoperability in both operation and payment.

In other words, the more charging stations can become 'operator-agnostic' for drivers, the more interoperable and user friendly they will be. However, the progress made in this area varies by country.

A 'State-by-State' basis

Interoperability is perhaps least developed in the USA. However, several projects are on-going to help improve this. For example, BMW, Nissan, ChargePoint, and EVgo founded the Roaming for EV Charging Association to advance interoperability[35]. California has also put considerable resource into implementing the Electric Vehicle Charging Open Access Act[36]. This places emphasis on customer interaction with the charging infrastructure and requires publication of all station locations on the Alternative Fuels Data Centre (AFDC) website. It also requires disclosure of all fees before a charging event begins, including plug-in fees if not a member of the network, and charge point accessibility to non-members of the network, including the ability to accept multiple forms of payment.

Other individual states such as Washington and Massachusetts have also been pursuing interoperability initiatives of varying kinds[37]. These projects, as well as government support for interoperability and the use of open standards, may be important for the long-term growth of electric vehicle charging networks in the USA.

35. Chargedevs.com, ROEV Association brings together major players to promote charging network interoperability,
36. Zero-Emission Vehicles in California: Community readiness guidebook, 2013
37. Electric Vehicle Infrastructure A Guide for Local Governments in Washington State, July 2010

Leading the charge in the Netherlands

On the contrary, the Netherlands' charging infrastructure is well organised and often considered the gold standard, with open standards now enforced through all public tenders. As early as 2011, private and public parties created an open and competitive market model for the development of EV charging infrastructure, making national agreements on interoperability that corresponded to European standards[38]. Making these kinds of agreements early to use the same identification and communication systems for charging stations, to ensure interoperability at a national level, seems to be a key success factor for the Netherlands.

The Netherlands has also been highly successful in increasing innovation and competition, thereby reducing the cost to drivers. The government requires data collection and the use of open standards for publicly funded projects to help market development. They are also pioneering several other projects. For example, Ladenetz, a government-sponsored collaboration among municipal utilities, universities, and private electric vehicle service equipment operators in Germany and the Netherlands, is seeking to create a Europe-wide network of interoperable and user-friendly charging stations.

The Netherlands' charging infrastructure is well organised and often considered the gold standard

Up and coming Norway

Norway, along with the UK, generally falls behind its European counterparts when it comes to interoperability. One big move to improve this was made in partnership with the UK last year and nine of the major electric car charging suppliers who agreed to use a single subscription service[39]. Not only does this agreement allow drivers to pay for their charging services via a single subscription, it also means the sharing of station information between one another.

It's also important to note most European countries don't have a national interoperability scheme or are in the very early stages of making one. Interoperability is therefore often based on multiple regional standards. Despite this diversity in standards, however, Norway is a good example of how countries can implement a more unified, national approach to electromobility. One initiative it has implemented provides each newly registered EV owner with a radio frequency identification (RFID) tag that can be registered into all Norwegian operators' networks.

The UK: Better late than never

Interoperability in the UK has progressed in the last two years, primarily through provisions made in the Automated and Electric Vehicle Act (2018). These allowed for regulations which could address any lack of interoperability between public charging point connectors or sockets and would ensure an electric vehicle could charge at any public charging (or refuelling) point. It also enabled regulations to be made that would allow the Secretary of State to set availability, maintenance and performance standards for public charging infrastructure. This would help to increase the number and reliability of charging or refuelling points available for use by the public at any given time.

38. Nederlandelectrisch.nl, Charging infrastructure
39. Express and Star, Major electric car charging suppliers agree on single subscription service, October 2019

Section 4.
Work collaboratively to ensure a positive user experience

Despite these powers providing the ability to set a direction for the market, the UK government has yet to fully utilise them through fear of any regulatory intervention stifling innovation, hampering competition and having unintended consequences at this early stage.

However, there have been signs of early improvements in the accessibility of operators' charge points by offering payment via smartphone apps and contactless payment. The government is continuing to monitor market developments closely and has been clear that, should the market fail to deliver further improvements across the entire network or takes too long to do so, it will intervene using the powers in the Automated and Electric Vehicles Act to ensure a good deal for consumers.

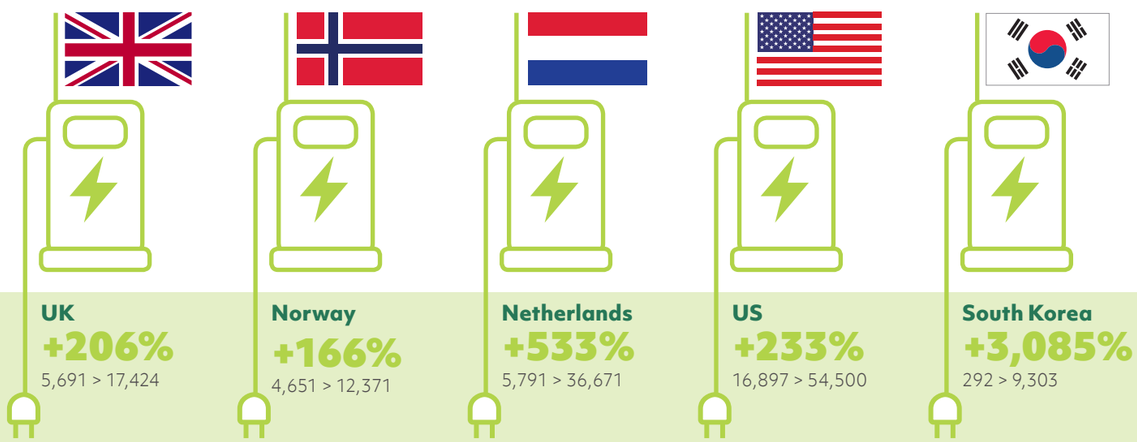
As such, a consultation looking at consumers' experience and interoperability is due to be published later this year. The challenge to industry will be to provide an environment that is just as accessible and interoperable as that currently experienced for petrol and diesel cars.

Lessons for the UK

- → **Governments, local authorities, OEMs, utilities and charging operators must cooperate** to ensure communications across all channels are accurate and visible.
- → **Open standardisation is the way forward** for rolling out future-proof and reliable charging infrastructure.
- → **Interoperability can deliver the most returns** for those who will fund, deploy, operate and use the infrastructure.
- → **The industry has a small window of opportunity in the UK to show they are moving in the right direction** before the government takes a more interventionist approach.

Availability of chargepoints*

Comparing progress over 5 years from 2013 to 2018 (using latest comparable data available from International Energy Agency Global EV Outlook 2019)

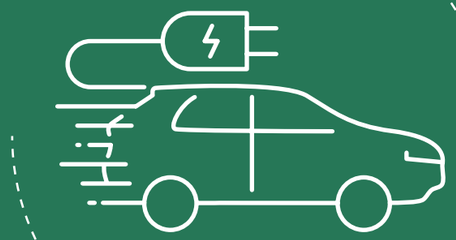


* Comparing progress over 5 years from 2013 to 2018 (using latest comparable data available from International Energy Agency Global EV Outlook 2019)

Section 5.

Lessons for the UK

This report has examined the approaches taken by different countries to develop their EV markets in order to identify key lessons the UK could take forward. Learning these lessons will be crucial if the UK is to meet its EV and wider net zero ambitions.



So what are these lessons?

- **1. Develop a clear, varied strategy** – a successful strategy will involve a mix of financial incentives, industrial support and behavioural change measures.
- **2. Be clear and unambiguous in support** – offer industry certainty by having a clear strategy and the environment that government will support in nurturing.
- **3. Be bold and ambitious** – although some countries had a head start, learning the lessons from others' experience and building a clear, ambitious, multi-faceted policy platform will allow the UK to move up in the leader boards.
- **4. Returns on private investment must be guaranteed** – the UK's EV market depends on considerable public investment until consumer habits change and private investment returns can be guaranteed.
- **5. Government needs to lead the way** – a hybrid approach of public-private investment requires clear signals of intent from government, ambitious and bold tax exemptions for EVs, alongside a supportive climate for private enterprise and industry to develop the market. Enough resources must be provided to stimulate the network where there is no clear commercial route to do so.
- **6. Empower local government** – it's important the various layers of local government and metro mayors are empowered to lead on the rollout of charging infrastructure in their local area. There needs to be clarity about where responsibility should sit for ensuring that provision is keeping pace with and, ideally, getting ahead of predicted demand.
- **7. Cooperation is key to a good consumer experience** – governments, local authorities, manufacturers, utilities and charging operators must cooperate to ensure communications across all channels are accurate and visible if the consumer experience is to be a positive one. Equally, rolling out future-proof and reliable charging infrastructure must be based on open standardisation.
- **8. Interoperability can deliver the most returns** – by ensuring the network is interoperable, those who will fund, deploy, operate and use the infrastructure will all benefit.
- **9. Use the window of opportunity** – the industry has a small window of opportunity in the UK to show they are moving in the right direction before the government takes a more interventionist approach.

If you would like to discuss this report, its findings, and how they may impact your business, then please don't hesitate to get in touch with either of the following:

Marc Woolfson, Director
Mobile: 07960 476 947
marcwoolfson@wacomms.co.uk

Peter Jones, Associate Director
Mobile: 07934 853 228
peterjones@wacomms.co.uk