



Northern Ireland's electric future



Electric cars are vital to Northern Ireland's plans to cut carbon emissions, but the country's once-pioneering charging network has fallen behind the rest of the UK. We look at how best to move forward.

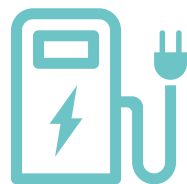
Northern Ireland faces a unique challenge in the UK if it is to meet the Government's ambitious carbon emission targets. Huge improvements in renewable electricity generation have been made in the last 15 years but still much of the country relies entirely on an outdated power grid, solid fuel or gas for cooking and heating and diesel or petrol for transport.

Despite making an early start, progress in building the necessary infrastructure for mass adoption of electric vehicles [EVs] has been slow and we must look at reasons why if we are to find solutions in the public and private sectors.

Where we are now

Almost all public chargers in Northern Ireland are part of the EcarNI network, operated by power supplier ESB. There are 334 22kW fast chargers and 16 rapid chargers – more than 22kW – on or near major roads. There are a further 44 7kW chargers in public places, a rapid charger at Ikea in Belfast, plus Ecotricity public chargers and Asda car park charge points, all accessible using one ecarNI card.

Rapid chargers
per 100,000
people



Scotland **10**
England **5.7**
Wales **3.2**
Northern Ireland **1.1**

While no one in Northern Ireland is more than 30 miles from a fast charger, the country currently has the fewest rapid chargers per head of population in the UK, at 1.1 per 100,000 people. Scotland has 10, England has 5.7 and Wales has 3.2. Fast chargers are suitable for destinations such as car parks and supermarkets, where motorists can charge up while shopping or watching a film, but only rapid chargers make long journeys without long interruptions possible on battery power.

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Much of the current network was put in place by ESB eight years ago or more and is concentrated in urban areas. Surveys show that up to half of the rapid charge points on the network are unavailable at some point in any given month, making it difficult to rely on charging mid-journey and drastically reducing the distance that can be travelled in a day. If people are to be persuaded to make the change to an EV, they have to be confident in their ability to travel freely.

It is currently free to charge cars at ecarNI charge points, as the cost has been absorbed by ESB. While this has been a great short-term benefit in Northern Ireland, the costs of expanding and maintaining the network has not been covered by the users. An increase in users leads to an increase in costs, disincentivising the provider. It has been uneconomic to provide the improvements needed to encourage further EV adoption.

A black and white photograph of a woman with long hair, wearing a light-colored cardigan, smiling as she plugs a charging cable into a modern, dark-colored electric vehicle charging station. The station has a small screen and a charging port. In the background, there is a building with large windows and a sign that reads 'Dodge, Skoda, Opel'. The scene is set outdoors, likely in a parking lot or a shopping area.

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Delivering power to drivers

Like the rest of the UK, the electricity grid between the National Grid and the end user's front gate is run by a Distribution Network Operator (DNO), licensed by area. Northern Ireland's DNO is NIE. In their April 2021 policy statement, Networks for Net Zero, NIE committed to providing funding for the best solution for an EV charging network in Northern Ireland and called for the establishment of a cross-departmental Government EV taskforce.

Currently, a grant covers 75% and up to £350 of the cost of a home charger. Houses with older connections to the grid, however, may not be able to safely supply the amount of current required for a domestic 7kW charging point. In Networks for Net Zero, NIE also committed to undertaking the grid upgrades required for widespread home charging, subject to regulatory approval and the opportunity to recoup their investment.

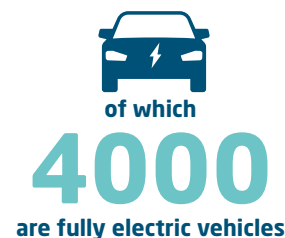
There were 999,580 cars on the road in Northern Ireland at the end of 2020, of which 4,000 were pure battery electric with no internal combustion backup or hybrid drive.



Even the cheapest start at £15,000-£20,000 and quickly go up to £25,000 even after the government grant, making them far more expensive to buy than petrol or diesel equivalents. A petrol-powered Skoda Citigo, for example, starts at under £9,000; that's £6,000 less than the battery model. In the Northern Ireland market, there are currently no electric pick-up trucks or rugged 4x4s for farm use and a very limited number of estate cars.

'Sales of plug-in hybrids and pure battery EVs rose by 290 per cent from 2019 to 2020...'

Sales of plug-in hybrids and pure battery EVs rose by 290 per cent from 2019 to 2020 – even with the unreliable charging network, sales are accelerating, if more slowly than in Britain. The grid must work to catch up or risk loss of service, especially in rural areas. In the absence of a grid that can cope with widespread home charging, a robust and convenient public network is the only possible answer. Big GB charging companies such as Gridserve are reluctant to risk large investments when there are few electric vehicles on the road, and the public are reluctant to pay extra for an electric car when they are difficult to charge. How, then, can the deadlock be broken in time to hit the UK's climate targets, and what are those targets?



The road to 2030

Government, the population and business agree that climate change is an existential threat to the United Kingdom way of life and must be met with the utmost urgency.

The UK Government has committed to reducing the amount of carbon dioxide emitted by homes, businesses and transport by 78%, compared to 1992 levels, by 2035. To help achieve this ambitious target, the sale of petrol and diesel cars and vans will be disallowed after 2030, and hybrids after 2035.

In Northern Ireland, the Committee for Climate Change recommends reduction of emissions by 82% by 2050 but no official target has been set. The NI Government hopes to decarbonise energy entirely by that year and two Climate Change Bills are currently under consideration by the NI Executive.

The Department for the Economy will publish its energy strategy in March 2022, which will include a section on transport and electric vehicles. The options paper published to lead up to that document, published in March 2021, points out that 50% of NI's electricity consumption is fulfilled by renewables, but the country has a high proportion of heat coming from solid fuel, which cannot be decarbonised. Demand for electricity will rise sharply when heat and transport must both come from electricity rather than coal, oil, wood, diesel and petrol.

Domestic connection upgrades from the DNO currently take up to a year and nine months. Experts maintain that the required 7kW supply is within the capability of many urban domestic supplies – the cable is the same as that required for an electric oven – and that smart metering would give NIE the data required for wholesale improvements to the grid, instead of waiting for individual requests.



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Northern Ireland-specific challenges

The current public charging network has been in place for eight years and was, at the time of its establishment, a huge step forward in the UK, providing more fast public chargers per head of the population than any other country in the union. However, further investment has been slow, and that has led to the first mover advantage being lost. Companies had, until recently, been unable to make a profit from electricity provided for mobility, and the network has been run on a free-to-charge model that disincentivises growth or maintenance.

Despite NIE's commitment to upgrading the grid where it's required, it retains an unusual charging system that discourages innovation and new connections. In many countries the connecting party pays only for the connection itself and the DNO will undertake the upgrades required to ensure the grid is robust, spreading the cost over all customers. In Northern Ireland the connecting party is expected to cover at least some of the cost of those upgrades where their connection is the tipping point that makes the upgrade necessary. You could liken it to a builder constructing a house in a field – instead of only having to lay down a lane to the nearest road, they are also required to cover work on the connecting roads leading to their property.

Once the Department for Economy's strategy document is published, policy and law can be expected to come into force in 2023. Considering the long lead times for car replacements and electricity grid work, this timetable is too long to meet the UK government's ambitious 2030 targets without significant work being done in advance of the strategy's publication.

The regulator and the DNO currently approve decisions about grid planning and charging structures based on their remit, which is ensuring value for the consumer. This emphasis on the price of domestic supply may be appropriate in normal times but current objectives aim for the electrification of heating – a major undertaking in Northern Ireland – as well as the biggest revolution in transport in a century, so it's clear that normal rules are not sufficient to do the job.

Rob Hughes of Pod Point, one of the UK's biggest suppliers of charging infrastructure, identifies five major barriers to EV adoption: choice of vehicle, range anxiety, vehicle cost, infrastructure and performance. Only one of these – infrastructure – is geographically specific.

Fifty-eight per cent of Northern Irish EV drivers are considering going back to petrol or diesel. In the rest of the world, 88 per cent said they would never even consider such a move, demonstrating just how difficult the situation in Northern Ireland is currently.



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Proposed solutions

Under the UK Government's Road to Zero strategy it will soon be law that, where possible, new houses in developments in England and Wales must have electric vehicle charging points. This shows the way forward for the future, but Northern Ireland's grid would not support such a change without comprehensive, expensive, time-consuming upgrades. Public charging points must be established.

Particularly in rural areas in NI, there are houses with wiring and grid connections from the 1950s and 1960s that simply would not support the throughput required for charging an electric car, even during the night, just as they won't support an electric oven or electric heating. Those areas must be upgraded as a matter of urgency and the cost spread among the wider population.

The Northern Ireland Energy Strategy consultation already places data and energy intelligence as one of the key requirements for achieving net zero by 2050. Currently, EV motorists are asked to inform NIE when they start charging their cars at home but there is no legal requirement, and as smart metering is rare there is no way for the DNO to harvest reliable data to target grid upgrades.

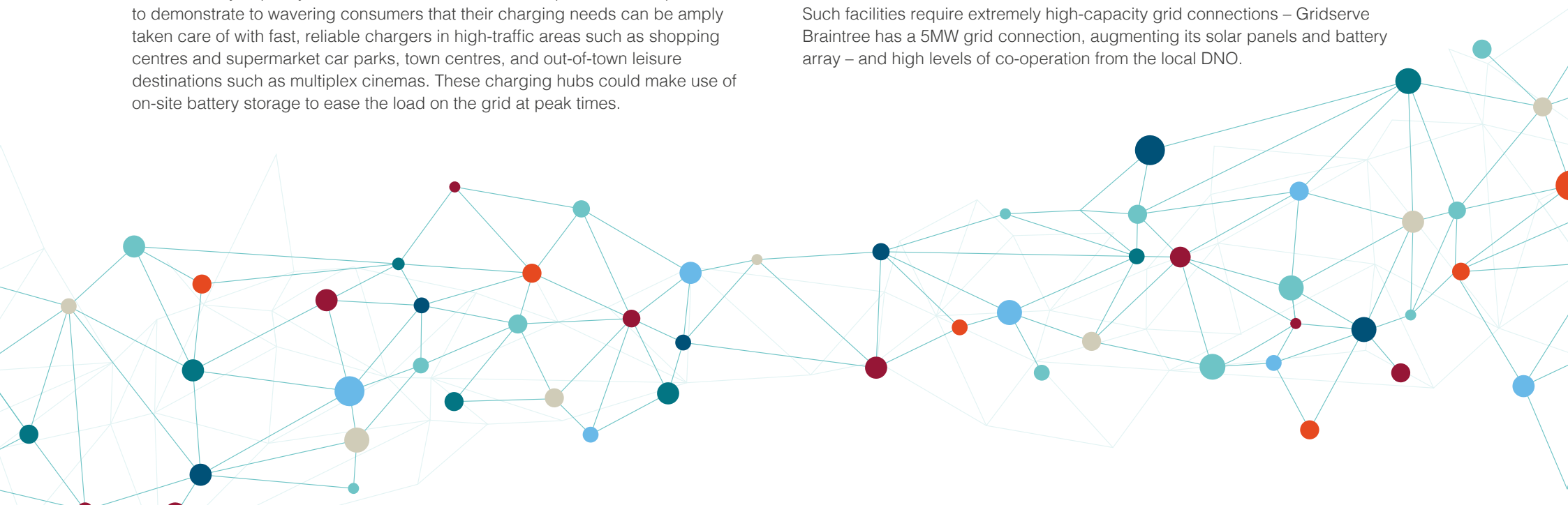
Domestic smart meters are less important for public charging schemes, which can benefit from knowing the level of EV penetration in an area when working out the necessary capacity. At the current low level of take up, it is more important to demonstrate to wavering consumers that their charging needs can be amply taken care of with fast, reliable chargers in high-traffic areas such as shopping centres and supermarket car parks, town centres, and out-of-town leisure destinations such as multiplex cinemas. These charging hubs could make use of on-site battery storage to ease the load on the grid at peak times.

The UK Government's Office for Zero Emission Vehicles [OZEV] provides funding for local authorities wishing to expand their public charging network of on-street and destination chargers. Northern Ireland councils have not yet taken up this funding, waiting instead for the Department for Economy's to-be-published strategy document. Through the Energy Saving Trust [EST], OZEV provides advice and funding for public sector organisations that wish to take action towards the Government's net zero objective.

Innovative funding schemes such as Iduna's bond in Manchester that raised £4 million in just six days show a possible route for future funding, as they demonstrate interest in EV charging from possible customers, as well as providing the money to install charge points. Pod Point and Triodos Bank have partnered to install chargers in Tesco car parks in the UK, using an advertising partner to reduce risk. None of these models have yet been tried in Northern Ireland.

The country is caught in a destructive loop where the big charging companies such as Gridserve make their plans in Great Britain because of the greater concentration of EVs, and the Northern Irish motorist sticks with diesel because of the lack of charging stations. Gridserve is planning to open at least 100 largely solar powered charging stations capable of servicing 36 cars at once at speeds of up to 350kW. Their first forecourt recently opened in Braintree, Essex, a location chosen because of its high concentration of EVs.

Such facilities require extremely high-capacity grid connections – Gridserve Braintree has a 5MW grid connection, augmenting its solar panels and battery array – and high levels of co-operation from the local DNO.



Influencing strategy

The Northern Ireland government energy consultation running now rightly places an emphasis on smart supply, but there are two definitions of smart when it comes to energy.

There's smart for the consumer, which allows them to engage with their energy consumption through scheduling and data reporting, such as when their peaks are or when their energy is cleanest and which appliances are costing them more money. Then there's smart at grid level, which provides information from the consumer back to the DNO about load, network risks and responses to load. A smart grid empowers the DNO to make better, data-driven decisions about when and where to upgrade and how best to supply electricity in a low- or zero-carbon way.

One of the difficulties for power companies is the lack of commensurability between the requirements of DNOs for smart grids so new products, potentially using different communications protocols, must be designed for use in different areas of the country. This has made it harder for industry to hand the DNOs the information that would make their jobs easier, and that sort of agreement is best reached at a legislative or at least regulatory level.

In addition, the charging structure must be remodeled to make innovation in this area possible. Fast, powerful and economical connection to the grid is going to be essential for any public charging scheme but especially electric forecourts, and Northern Ireland's expensive grid work has been a constant drag.

NIE have been supportive of electrifying transport although circumstances in Northern Ireland are difficult and complicated by current regulations and pricing structures. Evidence given to committees in Stormont has been well received and industry welcomes alignment on energy policy such as the NI Green Growth strategy. Now is the time to influence ideas to achieve the goal of net zero.

Conclusion

From a strong start, Northern Ireland's electric vehicle charging infrastructure has lost its early advantage in the UK, and adoption rates are suffering as a result. Battery-driven cars, combined with an increase in renewable and carbon-neutral generation capacity and better data on how consumers use electricity, are required to ensure that the country's ambitious climate targets are to be met in time.

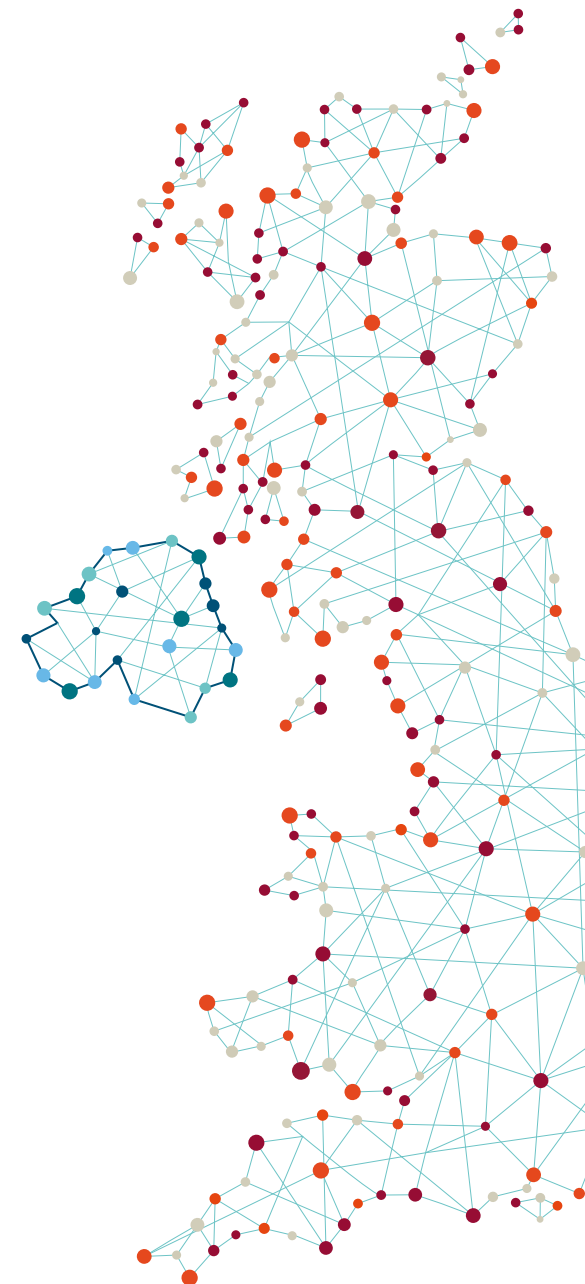
Climate action is welcomed by both the population and industry, and there is goodwill available to forge partnerships between the public and private sector to move the situation forwards. It is widely accepted that the large investment required to upgrade the grid sufficiently to move away from petrol and diesel makes the current EV charging model commercially unviable over the next decade.

Well-regulated co-operation between government, the DNO, property developers, charge point companies and vehicle manufacturers is both possible and essential if Northern Ireland is to meet its Road to Zero commitments.

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