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AN ELECTRIFYING TRIP AROUND SCOTLAND

The NC500

on pure electric power



About the Author

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Prologue

Before leaping into this tale it is probably worth explaining three things about life with an electric car that may be unfamiliar to the new reader.

So, first up, there are pure electric cars – you charge the battery, you run it down, you recharge it etc...

Then there is a dizzying array of so-called ‘hybrids’ – from the ‘mild’ or ‘self-charging’ (a car that scoops up power from its braking system but is basically a very efficient but conventionally fuelled vehicle that uses an internal combustion engine to power an electric motor), through plug-in hybrids (which draw current from the power network and can be switched to pure electric mode by the driver, but mostly have a relatively limited electric range), and on to range-extendors, like the car in this tale (where the main means of propulsion is electricity charged to a battery but tucked away there’s also a small petrol engine and fuel tank to act as a back-up generator).

Second, the rate at which a plug-in electric car can accept charge depends not just on the charger but on the car and the way it connects with the charger ¹. The BMW i3 in this tale has the ability to connect through a ‘CCS’ charging cable (the Combined Charging System, more commonly known as CCS, is the European standard plug and socket type used for connecting electric or plug-in hybrid cars to a Direct Current rapid charger), which means, in this case, it can accept a 50kw charge from a rapid charger.

¹ For more detail see www.racfoundation.org/wp-content/uploads/Development_of_the_UK_CPN_Harold_Dermott_December_2018.pdf



‘Before leaping into this tale it is probably worth explaining three things about life with an electric car that may be unfamiliar to the new reader.’

To put that in perspective, it means it can be plugged in at a charger with no charge left and pull away with an 80% charge in around 35 minutes.

But the same car using its alternative ‘Type 2’ connector can only accept up to 11kw, which means the same 0% to 80% recharge would take about four times as long.

There’s also the CHAdeMO (Charge de Move) connection which is particularly popular with some Japanese auto companies. This system is also capable of swifter charging, but our story isn’t about a CHAdeMO car, so we’ll move briskly on.

Third, there are essentially two ways to persuade a public electric car chargepoint to activate. One is to use what’s called an RFID card (a Radio-Frequency IDentification card), which essentially is a card, about the size of a credit card, with a chip in it that the chargepoint can recognise and link to your personal account (the London Oyster card is another example, as are the keycards for gyms and workplaces). The other is to use a smart phone ‘app’. Why not just have an on/off switch? Because power suppliers, generally, would like you to pay for the power you are downloading, and second, even if the network is free at the point of use the supplier might like a sense of how often and how much power is being consumed by whom. There are some public chargers that require no verification, but they are only a small proportion of the total.

Right, off we go...

Back in 2016 the Energy Saving Trust announced that the North Coast 500 – the scenic anti-clockwise route around the top of Scotland – could now be experienced comfortably in an electric car, lauding the installation of sufficient chargepoints.

Like many people, I nodded sagely at this news and moved on.

Then came 2020 and its pandemic challenges that squashed the holiday travel plans we had brewing. But, lo, was I not now the owner of a BMW i3, albeit with the range-extending petrol engine? What better to do in a week of leave than to see whether those good folks of the Energy Saving Trust were right? We would set off to drive the North Coast 500 purely on electric power.

But before the off there were two important things to do. First, I would sound out my professional chums like Andy Eastlake at the Low Carbon Vehicle Partnership for advice.

And second, I would contact ChargePlace Scotland and ask whether I should invest £20 for the annual cost of an RFID charge card.

I'm just going to say that Andy's advice stood me in good stead and it was because of him we had a rapid, 50kw connection, a fast, 3-11kw connection, and a 3-pin, 3kw connection. Oh, and a camping plug converter – for a real emergency!

We loaded up the car. Two people and enough camping gear to see us through a week's worth of Scottish summer – in other words, enough in weight to see the usual 80-ish mile range of my i3 slump to about 60.

So was the journey really do-able?

In short, yes.

Setting out from Inverness we may have experienced a few qualms, but the fact is that we did complete the North Coast 500 on pure electric power, and I'd encourage you all to give it a go, but perhaps only after you've read what follows.

Not everything was plain sailing. Remember that second thing? The RFID card? The view was that spending £20 on it for a single week's – rather than a year's – use was probably excessive. It sounded a reasonable argument, however...

We arrived into Inverness² somewhat depleted – the so-called 'Electric A9' was having a bad day, with no working rapid chargers, and because the network operator's computer network was down the chargers couldn't be activated by the call-centre or by the app. No matter, here we were at the start line, just having used more petrol than we would have liked.

We parked at the Civic Centre and tried to connect to the 22kw rapid via the app I had downloaded to my Smart phone. Nothing. We rang the call centre. Long pause. Nothing. Nothing either after we randomly found ourselves, outside the building, in conversation with a local councillor who tried his VIP hotline for us.

Eventually, after about 20 minutes we finally got someone on the phone to activate the charger. Yippee.

This was the first inkling that we'd done something that was going to cast a shadow over our North Coast 500 experience. Deciding, after speaking with ChargePlace Scotland, to save the twenty quid for a twelve month RFID card and rely on the app was possibly the biggest false economy I've ever made. With a simple RFID card the rest of the trip would have been straightforward – as the RFID card isn't hampered by IT and communications failings in the same way as the app. Perhaps I should have known, based on past research we've published on signal coverage across the road network³, but as it was we were to experience a few heart-stopping moments. Well, not exactly heart-stopping, perhaps; after all, I'm driving a range-extender, but certainly enough to make rising to the pure electric challenge all the harder.

'We strolled off for dinner, thinking that tomorrow might be better.'

² The trip from Kent to Inverness and back was done on a roughly equal mix of petrol and electricity to maximise the range between stops.

³ www.racfoundation.org/media-centre/picture-of-patchy-mobile-coverage-across-road-network

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Inverness to Dornoch

Morning beckoned and off we set for Dingwall.

But upon arrival the Dingwall Rapid charger was out of action for some reason that wasn't clear.

Aha – there's a Tesla destination charger. That'll do nicely.

Except it won't, because the business to which it is connected is shut, and so it is out of service too. Damn you Covid-19.

On we trundled; to Dornoch. Dornoch is lovely. Feeling a strong 'Monarch of the Glen' vibe we tried to connect to the Dornoch rapid charger except the app wouldn't work. So, it's another dial-up-and-hope experience with the call-centre.

Two days into the holiday and three things have already become clear.

First, if the two days we've experienced so far are anything to go by, the North Coast is going to be a spectacular trip, with jaw-dropping scenery a-plenty.

Second, the enthusiasm of the EV charging industry for apps is, frankly, inexplicable in a country (and here I mean Great Britain – I'm not picking on Scotland in particular) where the mobile signal coverage is, on a good day, somewhere between mixed and patchy. Do not talk to me about 5G.





'If the two days we've experienced so far are anything to go by, the North Coast is going to be a spectacular trip, with jaw-dropping scenery a-plenty.'



Third, what would I have given, at that point, for the option of collecting an RFID card? Certainly more than twenty quid. What I wasn't prepared to do was pay my sub for the card electronically and then drive home to Kent to pick up the card, which it seems can only be delivered by snail-mail to my home address. Why?

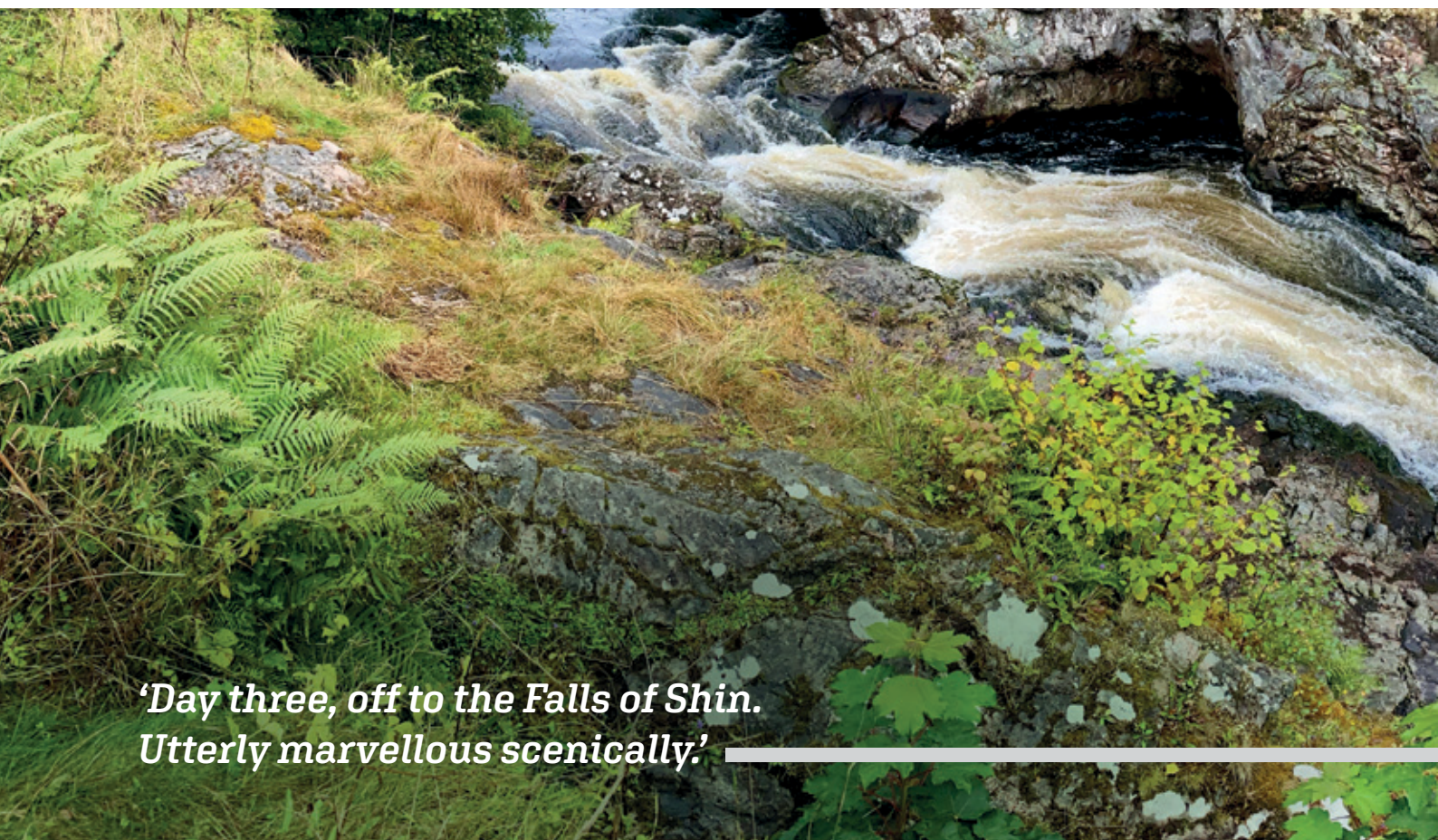
Meantime after (I timed it) 17 minutes on hold I got through to someone who could activate the Dornoch rapid charger for me. Bear in mind that this was to enable me to draw power free of charge. The hassle would almost make sense if I was trying to access some premium-rate service. Almost. But I wasn't, and it doesn't. Why make it so hard to access something that's being given away for free?

Dornoch to Helmsdale via the Falls of Shin and on to Wick

Day three and it's off to the Falls of Shin. Utterly marvellous scenically.

And there's a rapid charger. But try as I might I could not get the 22kw CCS cable to connect properly, so the call centre turned on a 22Kw Type 2 connection. Our car takes 50Kw CCS, but only up to 11Kw through the Type 2. Which meant we had double the time to kill. Twice as much as we had planned for. Happily the powers that be understand that not every visitor to the Falls of Shin car park is going to be entranced by the view, so we spent the time on the pedal go-karts provided.

With a top-up completed we set off to Helmsdale. To cut a long story short the Helmsdale rapid charger refused to play ball, and the call centre



*'Day three, off to the Falls of Shin.
Utterly marvellous scenically.'*

advice this time was to try again later. Which isn't terribly helpful. But we mooched around a while and then tried again. It still didn't work.

So we said our farewells to Helmsdale and set off for Wick. We started with barely enough charge and crept at a cautious, slow and steady pace along the 35 miles to Wick, where a local EV driver told us he wouldn't dream of relying on the app to connect his car to the charger (and nor would any other locals). He let us borrow his card to turn that charger on for us.

It was interesting to discover just how convenient electric motoring is – or at least can be – for the more remote parts of Scotland up in the highlands and islands, contrary to what might be thought. Supplying conventional fuel to sparsely populated places is an expensive business, whereas the ability to charge a vehicle at home and be able to top up at a fairly extensive public network (which, by the way, is very often free to use barring that £20 for the RFID card) makes perfect sense, particularly

when the sort of trips people are making fall well within even the more limited ranges available in early model EVs like mine.

That said, there are some issues we found with the public network run by ChargePlace Scotland beyond my travails with the app.

For example, the chargepoint in Helmsdale could only be accessed if I parked on the footway. It felt to us that many chargers had been installed in a hurry, and as a result were not always in the best or most logical places – exposed to the elements at quaysides, for example. Some had been installed but not, it seems, connected. Others were badly in need of some TLC.

After a pause to enjoy the waterfront at Wick we were on our way again.





*'Running along the
northern coast of
Scotland the landscape
continued to dazzle.'*



107 miles

Wick to Durness via John O'Groats

Full marks would have gone to the Ecotricity charger at John O'Groats on the grounds that it defaults straight to a free vend in the event of any comms breakdown, but the experience was not entirely positive because what should have been a 43kw charge was in fact only 11kw, because it didn't offer CCS charging. Free, because of a comms breakdown, but not as fast as it should have been.

Running along the northern coast of Scotland the landscape continued to dazzle – beaches that would have been positively Caribbean had the temperature nudged above 15 degrees. We even managed a rare recharge using the app at Thurso, and with another top-up at Tongue we were soon at Durness, in the top left corner of mainland Scotland.

Durness to Port a Bhaigh

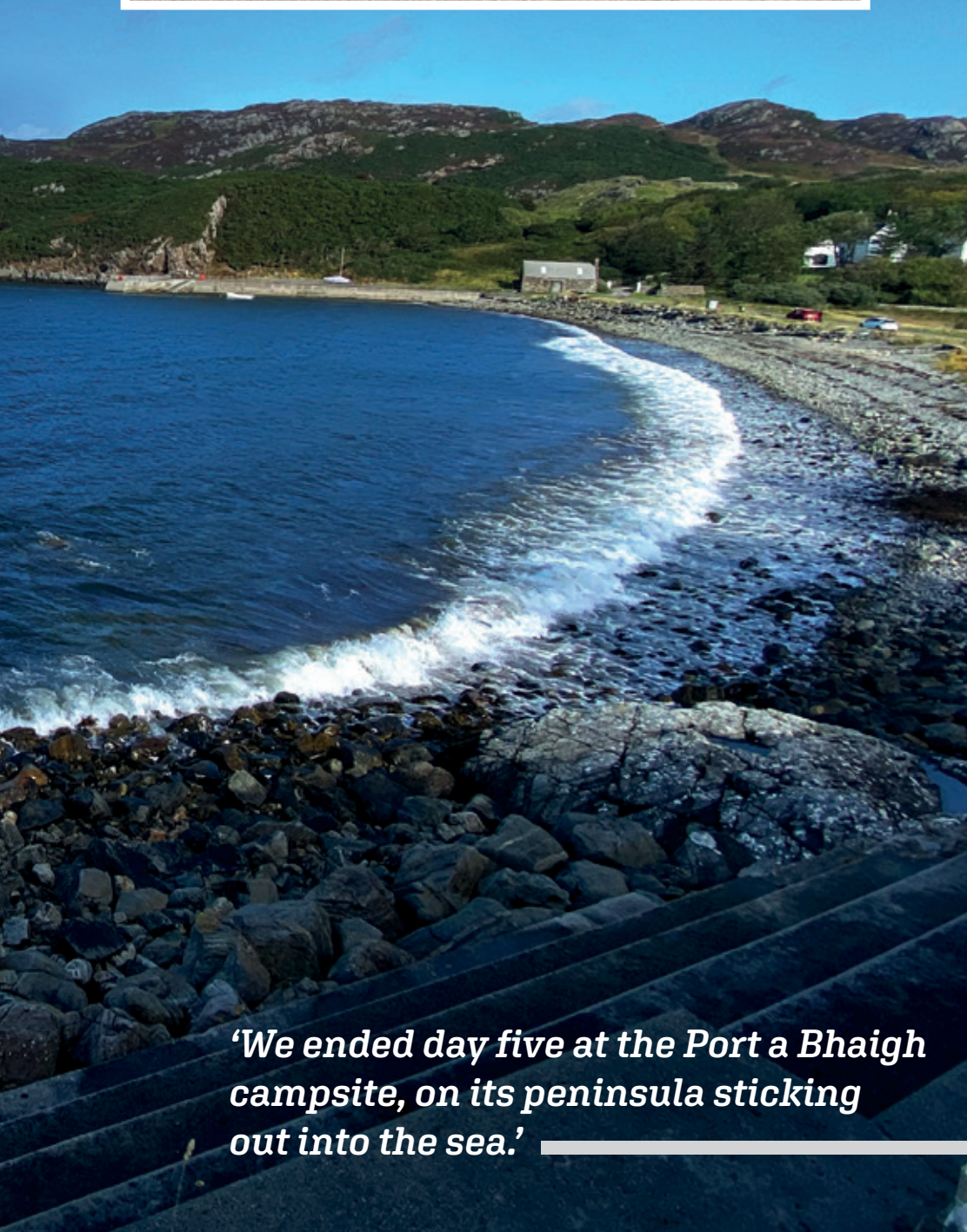
The stretch of the route south from Durness to Port a Bhaigh has the lowest, sparsest provision of chargers, so it requires a higher than average degree of forward planning. The thing about forward planning is that you really need good information, and the problem we had was that the information about where chargers were (a) located and (b) working was not up to scratch.

So, at Scourie we found that there was indeed a Tesla destination charger, but it was shut, once again because the business associated with it was closed. And there was a ChargePlace Scotland rapid charger but while the app showed it to be working try as they might the call centre couldn't get it to turn on.

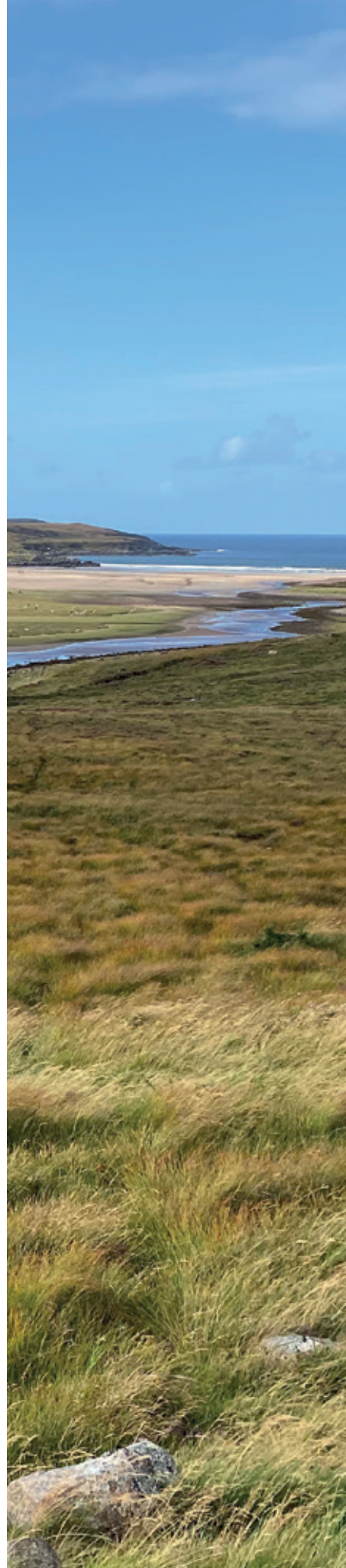
This could have been the end of our electric adventure. Indeed, in many ways it marked the very lowest point of the trip for me as, on hands and knees, I scabbled around in the nearby public toilets in the vain hope of finding a good old 13 amp socket. No luck.

Desperate times call for desperate measures, so we decided to try the welter of chargepoint RFID cards for other networks already in my wallet. For reasons best known to itself the Polar Plus card worked. It worked again at Lochinver, where we connected the BMW under the suspicious gaze of a nearby deer, grazing the hedgerow. Phew.

We ended day five at the Port a Bhaigh campsite, on its peninsula sticking out into the sea. The campsite had all the basic amenities bar one – a mobile phone signal. Luckily a local family who were at the site in their Nissan Leaf volunteered their ChargePlace Scotland RFID card for our use.



'We ended day five at the Port a Bhaigh campsite, on its peninsula sticking out into the sea.'



Port a Bhaigh to the Isle of Skye

We were up early and moving on towards Ullapool, which is a very fine place to be if you've worked up an appetite. We can thoroughly recommend the excellent seafood. And we managed to get a good charge at one of the two rapid chargers available, followed, 55 miles down the road, by a top-up at Gairloch Village Hall.

At last the fates seemed to be with us, and we decided to push on a bit further.

Until we got to Torridon that is, where all three chargers were unaccountably out of service. We crawled along to the Kyle of Lochalsh (45 scenic but very slow miles) to find a charger that was in pristine condition, presumably because it had never been used and to which the call centre could not connect.



*'At last the fates seemed to be with us,
and we decided to push on a bit further.'*

Now we were getting really low on juice, so, thankful for the absence of other traffic we crawled and coasted our way to Broadford to use the nearest Isle of Skye rapid charger. As the 11kw connection did its thing we observed a 50kw CCS charger nearby, blocked, to no discernible benefit, by a Tesla. It is utterly maddening as an EV driver to find non-EVs 'bedblocking' chargers, but how much more frustrating for the culprit to be a fellow EV user? Harrumph.

The logic of being advised to follow the route anti-clockwise became clearer with every day travelled because mile by mile the scenery became more-and-more eye-wateringly dramatic. We paused at the mobile phone blackspot of Invermoriston and, following our experience at Scourie, fished out our selection of RFID cards to find that, this time, it was an GeniePoint card that inexplicably worked for us.

Day eight dawned grey and misty. Perfectly atmospheric weather for viewing the Glenfinnan Viaduct, made famous by carrying the Hogwarts Express in the Harry Potter films.

The rapid charger at Fort William was in a poor state of repair, with bare wires on show, so we gave it a miss and cooled our heels whilst using the available fast charger instead.

We were getting back towards Inverness, but with the direct route closed because of terrible weather we were happily diverted through the Cairngorms, finding a functioning rapid charger at Kingussie along the way.

The end of day ten found us back at the Inverness Town House, revisiting the first charger we'd used at the outset of our trip.

So what did we learn?



Reflections

Well, first and foremost we learned that the North Coast 500 is an absolute delight. If you like your scenery and value your solitude then it should be right at the top of your to-do list.

As for the EV experience, we rose to the challenge and made it – not once did I trigger the range extender. But it had, at times, been very touch-and-go.

A little local knowledge would have saved us a great deal of hassle, because we'd have bought a ChargePlace Scotland RFID card and stayed well clear of the app. But if others are to be persuaded to experience the NC 500 by EV then surely the advice to all should be to shell out the £20. Having multiple cards for multiple accounts is more than a bit of a pain, so would it really be too much to ask of the industry to find a way to let us have a single card that works for all, throughout Great Britain?

Having more chargers installed might have been a help, but more important than that is for the chargers in place to be fully functional, particularly if they are going to be included in the maps of chargepoint locations. Much effort seems to be going into the creation of more accurate, real-time information about charger location and functionality, but more still should surely be going into making them work reliably? Otherwise a broken charger is practically an invitation to break down. As a bare minimum could chargers not be designed so that they default to a free, always-accessible, slow charge as a last resort?

And lastly the fact that EVs make perfect sense for rural communities in sparsely populated areas was something of a revelation.

Just do remember to pack that RFID card.





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The Royal Automobile Club Foundation for Motoring Ltd is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users. The Foundation publishes independent and authoritative research with which it promotes informed debate and advocates policy in the interest of the responsible motorist.

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