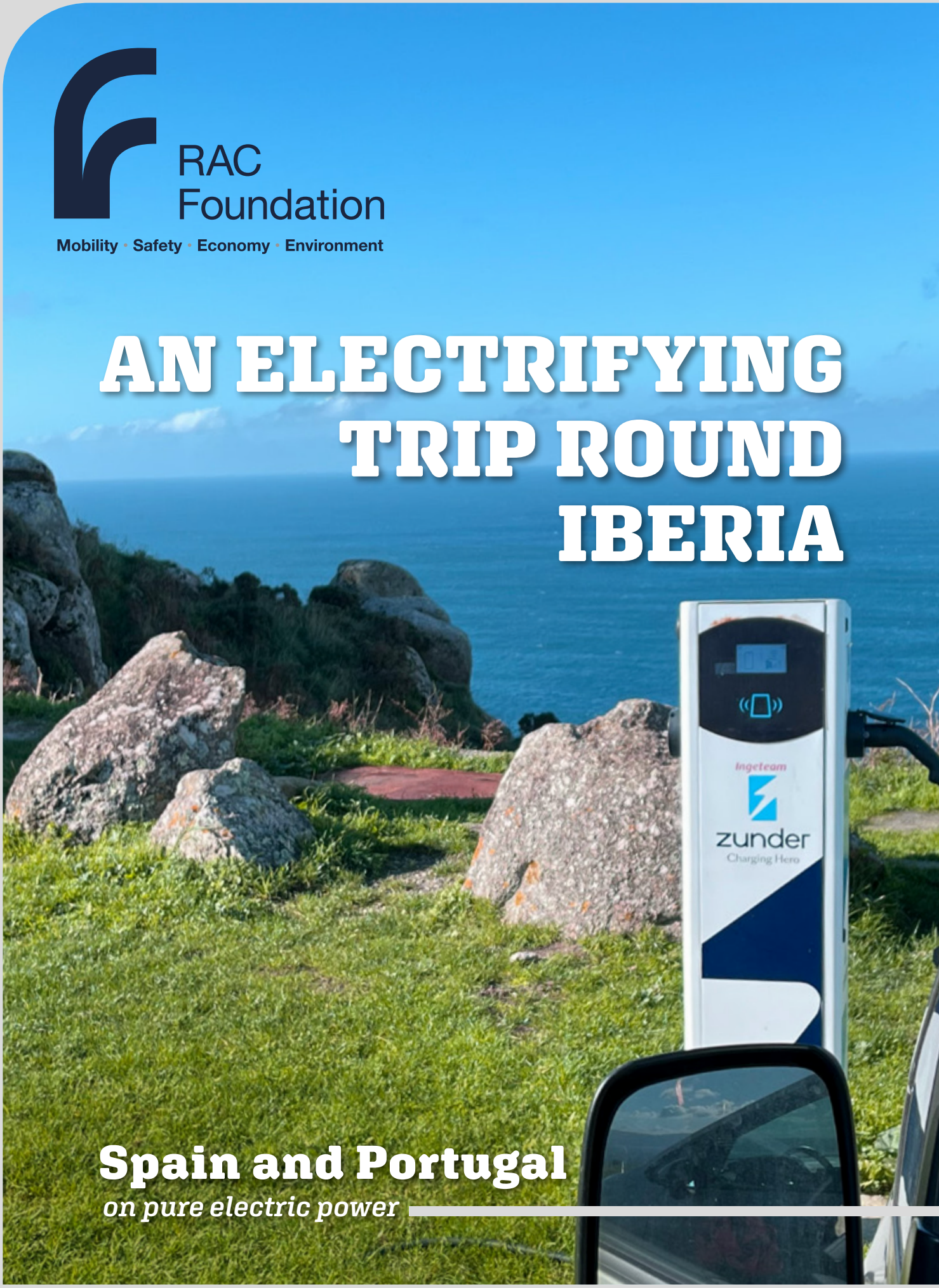
RAC Foundation

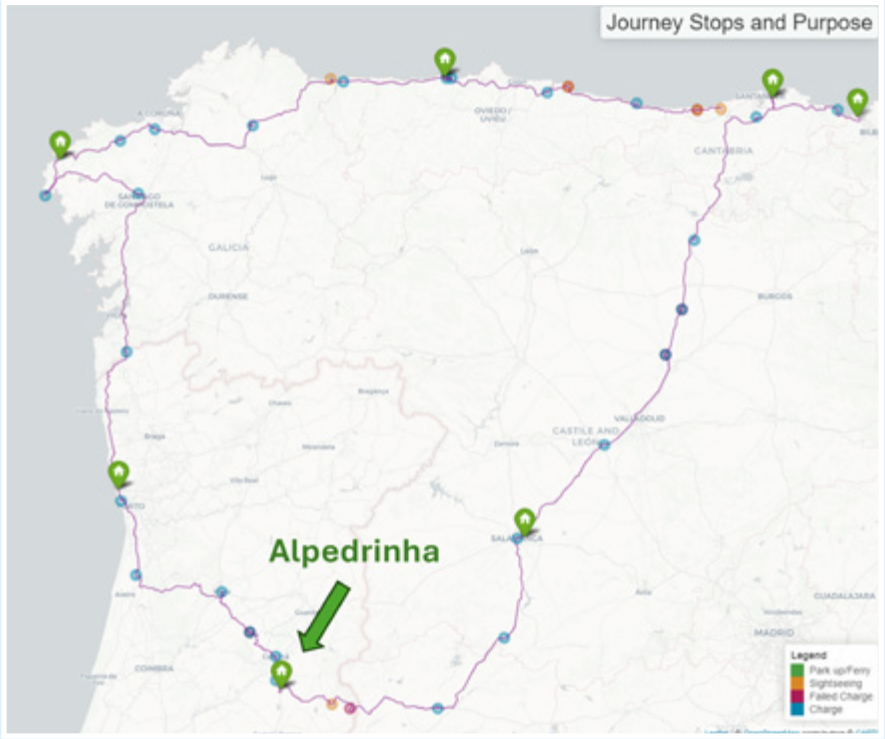
Mobility · Safety · Economy · Environment

AN ELECTRIFYING TRIP ROUND IBERIA



Spain and Portugal

on pure electric power



An electrifying trip round Iberia

The trip I am about to describe came about through a combination of two factors (climate change and COVID) which led to our chosen mode of transport, and the opportunity to visit two old friends following their move from the UK to a remote part of Portugal.

Having had summer soured by spending three weeks testing positive with the virus we were considering what might make a good holiday later in the year when I realised my reservations about visiting our friends in their new home in the rather hot and fiery heat of a Portuguese summer wouldn't apply to a visit in late October. And the weather would probably still be better.

This document complements a previous report from the RAC Foundation recording the experience of driving Scotland's North Coast 500 route in an electric car: **https://www.racfoundation.org/research/environment/an-electrifying-trip-around-scotland**

A short explanation of charging and chargers

Slow charging – uses a special power supply and cable (endearingly referred to as a 'granny lead' as it is what you end up using when you go and visit your grandparents) plugged into a normal domestic 3-pin 13 amp AC socket. This charges an EV at a speed of about 3kW (this takes about as much power as a modern domestic kettle). Cars are generally left charging overnight to fill the battery up.

Fast charging – uses a special charger, either a domestic charger or a public one, to charge the vehicle at about 7kW, just over twice the speed of a slow charger. This requires a special cable with a 'Type 2' connector. Some, usually older, vehicles have a 'Type 1' connector and so require an adapter. Increasingly, many public chargers are deploying fast chargers that are able to charge at speeds of 22kW via an AC connector should a vehicle permit this. However, ours can't and only a small percentage of EVs are currently capable of doing so. Fast chargers are usually intended to be used by people parking their vehicles at the charger for several hours or more, and where they are located for people to make use of services such as shopping, eating or sightseeing, they are often referred to as 'destination chargers'. Cars will often be connected for 4-6 hours.

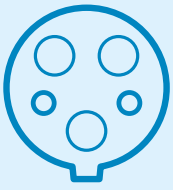
Rapid charging – uses chargers capable of a high-power output of between 50kW and 150kW. They are usually intended to be used by people mid-journey. Manufacturers often warn drivers not to overuse these chargers, either by charging batteries to over 80% or by rapid charging too frequently (especially multiple times in a day) due to the stress put on batteries. These chargers can deliver "up to" their stated speed. In practice, the charging speed is limited by three main factors:

1) The power available to the charger (i.e. if two people are plugged into the same charger it can often halve charging speeds for both vehicles).
2) The capability of the vehicle. Our van, for instance, is only ever capable of drawing 46kW via its DC connector, whatever the charger is able to supply.
3) The current state of the battery. When the battery is either nearly full (>80% charge) or nearly empty (<10% charge) many vehicles limit the charge rate. Also when a battery is cold (<10°C) or hot (>40°C) vehicles may also limit the charge rate.

Rapid chargers have two types of connector to the vehicle: CCS (Combined Charging System) or CHAdeMO (CHArge de Move). Most CHAdeMO connectors are only able to deliver around 50kW of power and consequently CCS is becoming the dominant standard for vehicle manufacturers. As a result, new rapid charging stations usually have many more CCS connectors than CHAdeMo ones. Cars are often connected for up to an hour.

Ultra-rapid charging – This is the same as rapid charging, but is able to provide over 150kW of power should the vehicle be able to take it. Cars can often be fully charged in under 30 minutes.

Charging connectors



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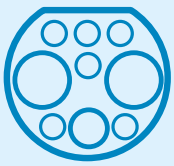

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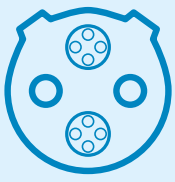
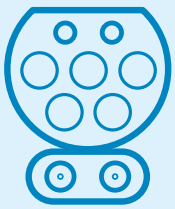


CHAdeMO



CCS

The vehicle

We chose to make the journey in our 2021 Nissan e-NV200 Tekna van, purchased new and privately converted to a camper van by a small business in Newhaven, Sussex.

We originally bought the van because we needed to travel from the Thames Valley to visit a relative in a care home in the Highlands of Scotland in times of COVID with zero (or very minimal risk) of testing positive on arrival. Consequently, we are no strangers to making multi-day journeys in a vehicle which was, we now see, designed primarily for pottering around cities making urban deliveries!

The key issues with using the van for longer journeys are that due to a widely recognised issue with the battery cooling system, rapid charging more than once in a day is not recommended (an issue known online as 'rapidgate'); its 40kW battery only reliably provides a range of 124 miles (regardless of the range dial often promising 179 miles); it only has a CHADeMo DC charging port, limiting the choice of available chargers and the charging speed to a *maximum* (but rarely and fleetingly achieved) of 46kW; and finally, unlike some vehicles which have a 22kW AC charging port, ours will only charge at a maximum of 7kW through this.

Bitter experience (and access to many apps and internet forums, including the excellent and invaluable LeafSpy) has taught us how best to minimise time spent charging and manage the battery temperature issue by charging only in the middle section of the battery (when the battery is between 20 and 70% capacity); making more frequent, shorter charging stops; using

'Fast' (7kW) chargers to get battery cooling whilst still getting (some of) those electrons whilst not heating the battery up too much; and not driving above 60mph.

In addition we have two personal self-imposed rules (which we try, but don't always succeed in complying to):

Rule #1) *We don't get fed unless the van is getting fed!* If the van is just parked whilst we stop for a meal, this is lost journey time – even a modest boost from a 'fast' charger is worth plugging in for; and

Rule #2) *Always fill the battery before bedtime!* A sound night's sleep is greatly aided by knowing that your next charge won't be needed for around 100 miles. Conversely, nothing crushes your sense of progress like setting off and driving for 30 minutes or less, only then to have to stop and spend 45 minutes charging and subsequently spending the rest of the day pushing the comfortable limits for battery temperature.

Despite all that, you don't get a fridge, two-burner hob and a sink in a saloon car, let alone a good night's sleep for two. So what we lose on the swings, we gain on the roundabouts, safe in the knowledge that if we were to run out of charge in the middle of nowhere, cold drinks, hot food and a comfortable bed would all be safely at hand. Four years on from purchasing the van and we haven't found anything better that would compete in terms or size, range and price - the electric van market is still way behind that for cars, with very little choice overall, and even fewer with ranges much greater than ours has.

Data definitions

Distance driven = *Best retrospective OpenStreetMap routing calculation*

Travel time = *Time between start of driving day to end of driving day*

Charge = *Energy put into the van that day*

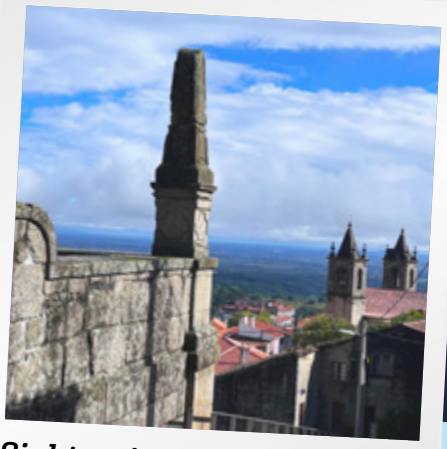
Cost = *Cost of energy put into van that day*

Time = *Time spent charging (usually start of charge to end of charge – where this is unavailable, it is the time between arrival and departure at the charging location)*

Additional sightseeing time = *time spent wantonly sightseeing without the van on charge! (see Rule #1 above)*

Contents

Porto to Alpedrinha



Sightseeing in Alpedrinha – no driving

Alpedrinha to Salamanca

Salamanca to Santander

Santander to Bilbao

Portsmouth to Reading

Day 1

Reading to Portsmouth

Distance driven = *79 miles,* **Travel time =** *4.1 hours*
Charge: *22.15kWh* **Cost:** *£14.28* **Charging time:** *80 mins*

In which the experience of getting the van recharged in Britain sets a low bar for our trip.

We set off in clear conditions under a big moonlit sky, heading to catch the midnight sailing from Portsmouth to Santander, and leaving, we hoped, plenty of time to charge the van and find a nice dinner in Portsmouth. When we got there, we found a couple of rapid Instavolt chargers in the ferry terminal carpark and swiftly got back most of the charge we had used getting there (avoiding charging it beyond 80% at this point). In order to safely top the battery up to full we were hoping to leave the van at one of the six fast chargers that Zapmap told us were at the terminal while we went for dinner. However, we searched for them and couldn't find them and no-one at the port had any idea where they might be.

So with rain incoming, we left the harbourside to find a fast charger in a residential area near to an interesting-looking East African restaurant we had spotted. It too had disappeared. On to the next nearest one where, having got all the cabling sorted and plugged in (having to use our own Type 2 to Type 1 cable) we spent a frustrating time downloading the parochial local charging app, registering for it, and adding a payment method (as it wouldn't use any of the numerous ones already stored in my phone). Then the app inexplicably failed to start the charge. With time ticking away we went back to mount a more vigorous search and eventually found the disappearing charger on the map, hidden behind a big, parked, diesel van somewhere round the corner and on the opposite side of the road from its mapped location, and shrouded in hazard tape as it had clearly been driven into, rendering it out of service. Readers of a certain age might recall the location of plans proposing the destruction of earth in Douglas Adams's classic the Hitchhiker's Guide to The Galaxy.

We now had barely enough time to find and connect to a Mer rapid charger half a mile away from the restaurant, ignore the warnings about using rapid chargers to charge over 80%, and wolf down a lovely Ethiopian curry before the app pinged to tell us the charging was done. One of us then got soaking wet on the way back to get the van, the weather having now completely turned. With the van happily at 100% charge we headed off to the ferry - all ready to roll once we hit Spanish soil.

Day 2

Portsmouth to Santander – no driving

Day 3

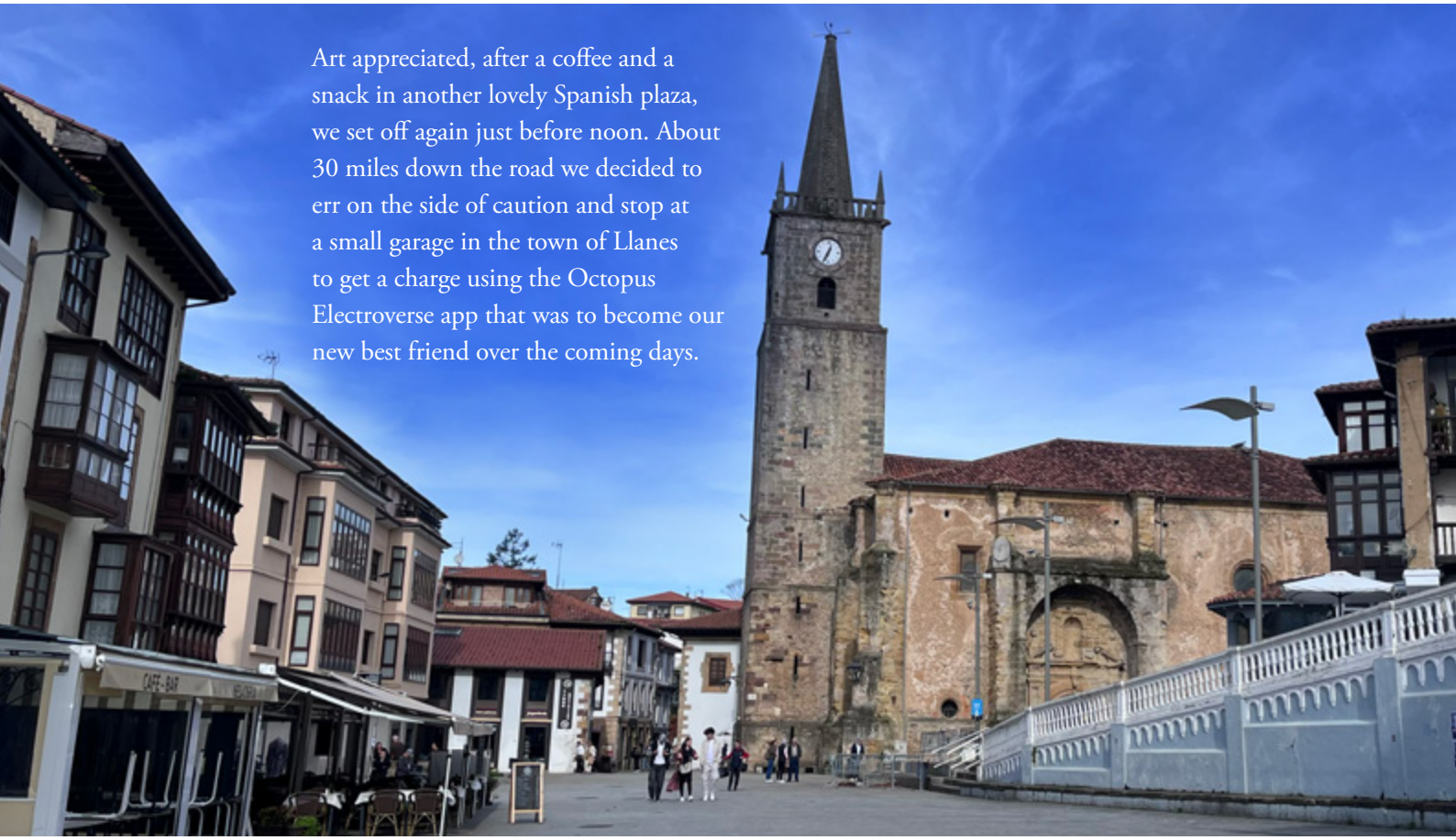
Santander to Cudillero

Distance driven = *204 miles,* **Travel time =** *12.8 hours*
Charge: *91.48kWh* **Cost:** *£40.12* **Charging time:** *440 mins*
Additional sightseeing time: *273mins*

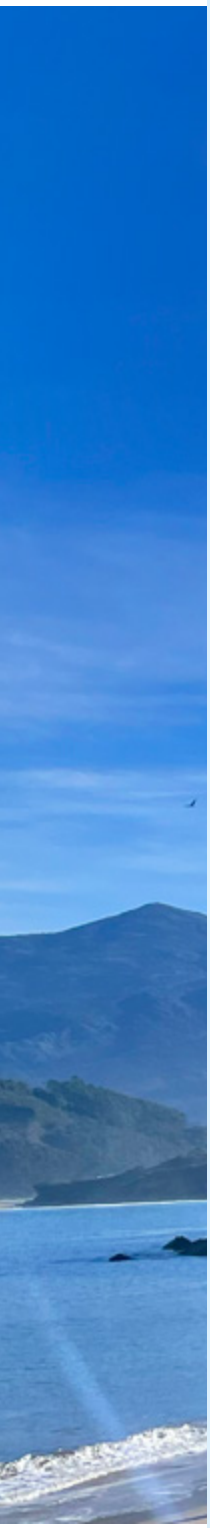
In which we learn that apps aren't the only misleading sources of on-line information.

Arriving into port before dawn we opted to skip an early, pre-docking, breakfast and headed out for a short 20-mile drive to acclimatise to driving on the right/wrong side of the road before finding breakfast in the intriguing Santillana del Mar (known as "the village of three lies"). It was still very early on a Sunday morning, so we stretched out our sea legs until breakfast options began to open up. Only half an hour into the European part of the adventure we were breaking Rule #1 by feeding ourselves but not the van, but reassured ourselves that this was a one-off, and after the palaver of charging in Portsmouth we still had a nearly fully battery.

This being a holiday and not a time trial, after breakfast we made another short hop to Comillas to visit El Capricho de Gaudí, a museum in a villa designed by the famous Spanish architect. Having spotted a fast charger about 20 minutes stroll from our destination we saw the chance to grab a few more electrons. Disappointingly, it turned out that the charger was located in the car park of a golf club/hotel which had shut for the winter (something that our apps failed to tell us). We parked across the road from the Gaudí villa in a little car park where a suite of brand-new fast chargers shone mockingly in the morning sun - freshly installed, but not yet commissioned and still wrapped in plastic. More Christo than Gaudí.



Art appreciated, after a coffee and a snack in another lovely Spanish plaza, we set off again just before noon. About 30 miles down the road we decided to err on the side of caution and stop at a small garage in the town of Llanes to get a charge using the Octopus Electroverse app that was to become our new best friend over the coming days.



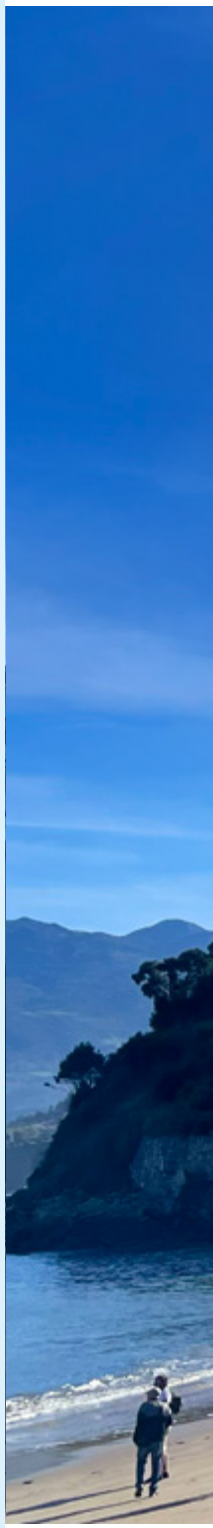
Due to ZapMap's non-existent coverage of Iberia we couldn't use this popular, but often annoying, app that so coloured our Portsmouth experience. Over the course of our first day in Spain we settled on three main tools for navigating and/or activating chargers:

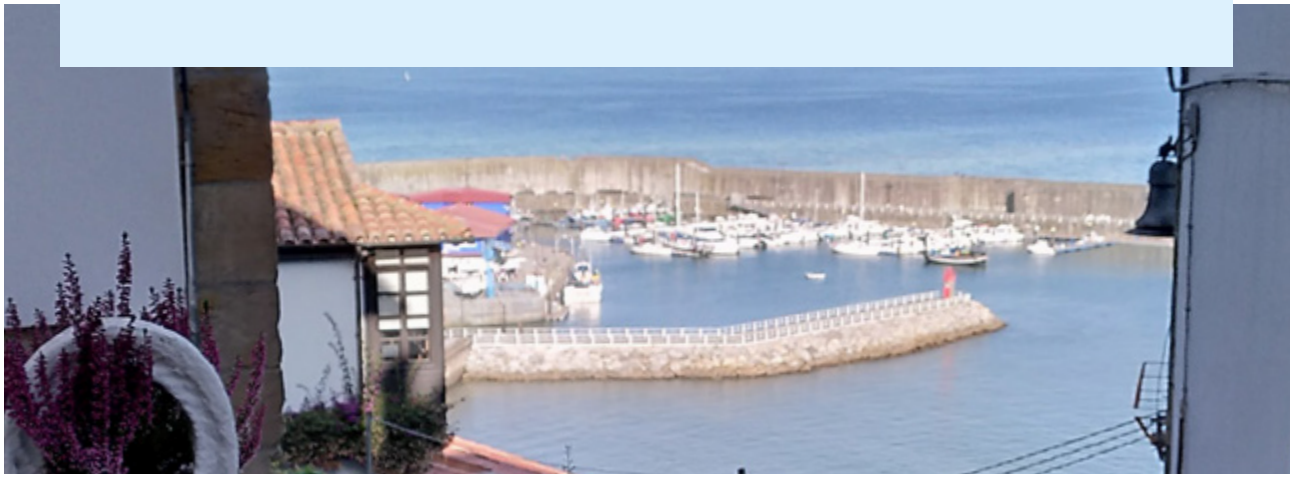
1) **Octopus Electroverse** – operated by the UK energy supply company, with which you get a smart card (to operate chargers with) and an app with a suprisingly good map, a route planner and the ability to turn on chargers and monitor the charge. If you are an Octopus customer, charging costs are automatically added to your domestic energy bill, avoiding any holiday credit card limit worries, and you get a 5% discount on the street value of the electrons you are purchasing;

2) **Chargemap** – a pan-European app with an accompanying RFID card (cost €20 and took a few days to arrive in the post – so make sure you get one before you leave). The app also has a route planner and a useful map containing charger information (including information on the availability and working condition of the chargers), but unlike Electroverse, the app can't start up chargers; and

3) **Googlemaps** – whilst not incorporating any functionality to operate chargers (at the time of writing) Google maps provides the reassurance of a specialist navigation app, revealing an often suprisingly different suite of chargers.

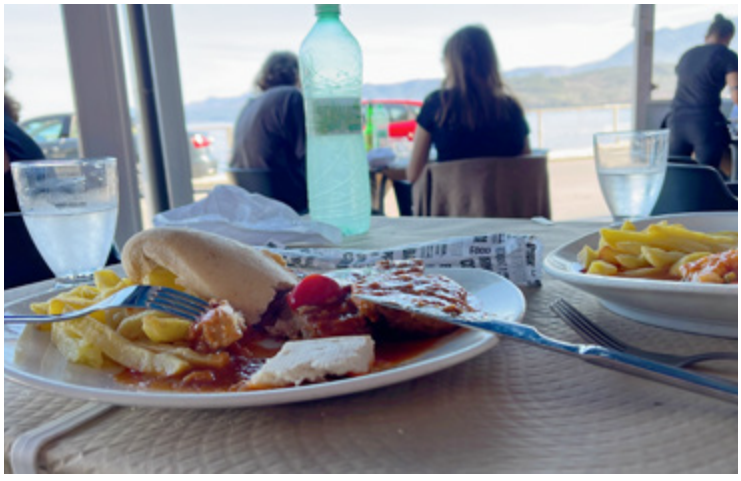
A quick note on charging with an app vs an RFID card. Whilst a RFID card may seem an ideal, simple way of starting a charge, as with contactless payment, unless you have a vehicle with an informative and useful app you can't get much information should you stroll away from the charger. Given the tendency of our van to get hot when rapid charging, controlling the charge using an app that gives live charge rate provides an indication of when a warming battery is slowing the charge and hence that it is time to unplug things and get back on the road again. Consequently, wherever possible, our preference is to control the charge using an app – and we've found that the Electroverse app often provides better information than the Charge Point Operator's own app.





Back to the road! A message from a friend arrived recommending a very nice place called Lastres on the north coast, only 30 miles away and pretty much on our route. A quick inspection of our apps determined that there was a fast charger and a high probability of lunch with a sea view. So off we went.

We arrived at the car park with the charger to find it already occupied by another Nissan e-NV200 belonging to the local water board. It was now past 2 o'clock so we threw caution to the wind, abandoned the idea of charging for the moment and headed through the steep alleyways of the fishing village to find a very tasty harbourside lunch.



Spanish Sunday lunches being what they are, we eventually got back to the van at 5pm and set off for a mere 10 mile, 20 minute journey to a rapid charger at a service station just off the A-8 near Villaviciosa. Twenty minutes of charging (plus some time getting things to work) and we were back on the road heading towards our chosen campsite near the end of the road to the beach in a little place called San Pedro de la Riberia. Despite our campsite app's claims, we arrived to find that it was closed for the season. The entire digital realm seems unreliable, not just EV charging apps!

It was now past 6:30pm and likely to get dark soon and we had very little charge left, having planned on an early morning charge the next day in the nearby town of Cudillero. With options limited we opted to run the gauntlet of Spain's restrictive wild camping rules and, as it was clearly now 'out of season' we headed down to the beach to park up for the night.

Between the van, a quirky beachside bar and a public toilet all necessary facilities were catered for. It would have been hard to find a more idyllic spot!

Day 4

Cudillero to Muxia

Distance driven = *204 miles,* **Travel time =** *12.8 hours*
Charge: *91.48kWh* **Cost:** *£40.12* **Charging time:** *440 mins*
Additional sightseeing time: *125mins*

In which we learn the value of having friends with continental phone numbers.

One of us was up before dawn to get a quick run in and see the sights! Having promised my wife that I wouldn't make her get up and leave before it was light, I was somewhat regretful to find out that in this corner of Spain sunrise was at a quarter to nine this time of year. After enjoying a fantastic sunrise from the beach, we drove 3 miles up and down some very winding roads to arrive at a curiously-sited rapid charger located at some sort of holiday apartment complex. After a bit of a struggle to get the charger to stay connected, we got the battery to about 50% in about 20 minutes and then trundled down the hill to leave the van on a harbourside fast charger whilst we went in search of breakfast and sight-seeing in Cudillero.

Just over 2 hours later, the battery completely charged and our stomachs filled to the gunnels with a somewhat disturbing local delicacy, we set off again.

A whopping 45 miles later, we stopped off for a quick (18 minute, 11kWh) charge at a car dealership in Carastur. Happily the car dealership was next to a little filling station where we sourced supplies for a picnic lunch to be enjoyed at our next stop, 11 miles down the road, at the famous Playa das Catedrales. Arriving at 2pm was perfect for lunch time (we were in Spain!) Very scenic - but not a charger in sight.

Finally getting underway again around 4pm we hoped to arrive at a campsite on the west coast at a sensible time, if not quite for sunset. Forty miles down the road we stopped in Vilalba for another quick charge. This time a Repsol charger. The charger was very smart and new but had no facility for contactless payment. Neither the Octopus or ChargeMap RFID cards would work with it. Time to battle with our first local Spanish charging app. The registration process was going smoothly (good signal in the middle of town) until the final verification stage which required a phone number – but not a UK phone number. Racking our brains we came up with a friend who lives in central France and put her number in. It then duly sent her verification code. So we rang her and, after being chastised about being on the continent but not visiting her, she graciously let us have the code. While the van filled, we strolled up the high street, did some food shopping in a nice local shop and then went and had a coffee in a café.

Back on the road with 25kW delivered over 54 minutes, we got an hour down the road (about 40 miles) before leaving the autovia to find a charger in the somewhat desolate car park of a country bistro. It wasn't clear whether the bistro was shut for the afternoon, day, season or more permanently, but using the Chargemap card got us 13kW in about 35 minutes. It was now past 8pm. Arrrival by sunset was looking decidely shaky!

Forty miles and 40 minutes later, after cruising through downtown Carballo looking for a charger which never materialised, we found one on the way out of town at a filling station. It was now definitely dinner time. The unappetising spread available in the filling station shop saw us scurrying over the road on a cross-cultural mission to get a ready-made tortilla from the Mercadona supermarket which, heated up in their public microwave, we accompanied with a big bag of chips from the next-door McDonalds (needs must when the devil charges).

This time we phoned ahead to the campsite to make sure the last leg of the day's journey would be worth it. Another three quarters of an hour took us the last 35 miles to Leis de Nemancos, our stop for the night, a beautiful beachside campsite looking over the bay to Muxia, although the sun was well and truly set – we arrived at about 10pm.

Day 5

Muxia to Porto

Distance driven = *202 miles,* **Travel time** = *7.8 hours*
Charge: *52.06kWh* **Cost:** *£18.86* **Charging time:** *219 mins*

In which a morning of sight-seeing followed by an afternoon of making up time means arriving at our camp by sunset but with very little juice.

A gentle start to the day saw us faced with a dilemma. We had a long way to go, the battery wasn't fully topped-up before bed (another of our rules broken - again) and we were right out in the distant periphery of Europe where rapid chargers are few and far between. What to prioritise? A full charge, progress on our route, or sightseeing?

We were on holiday, so sightseeing won. Not least because Fisterra/Finisterre/ The End of the World handily offered coffee, cake, AND a fast charger. Result!

The delight of 'fast' chargers is, of course, that they are quite slow, so the need to ensure we had enough juice loaded to get us off the peninsula and all the way to Santiago de Compostela meant we had plenty of time to enjoy refreshments and clamber around the rocks enjoying the sunshine and blue skies at (almost) the westernmost point of Europe.

After an hour and a half, and a measly (but invaluable) 5kWh of charge, we set off to Santiago – the end point of many a pilgramage, but not of ours. Arriving very much at lunchtime (there's a pattern here) there were no rapid chargers to be seen in the city centre, so we headed to one sited at a little restaurant on the outskirts. It wasn't working. However, a 5 minute drive round the corner took us to some very shiny new chargers at a big new conference-style hotel.

Someone had parked astonishingly badly, blocking both bays, but we managed to just squeeze in alongside to get within reach of the cable. We put the van on to charge using the Electroverse app so that we could monitor progress whilst we went off to eat. We then hit an intriguely Spanish style problem: the hotel restaurant only did a three course menu of the day, and despite our best attempt at negotiating with the waiter it was clear that dessert was compluslory – so to avoid overheating the battery, I had to slip out between courses to switch the van from the rapid charger to the fast charger in order to fill our battery to the brim without over-heating.

On getting back to the charger I found that the badly parked car had now gone, making it look to the irate owner of a very large German EV as though we were responsible for the fact that he had been unable to get his car close enough to plug in to the charger. Fortunately, my Spanish is insufficient to engage in heated debate, so I did my best to ignore him whilst realigning our van. Dessert, coffee, and another 40 minutes (3kWh) of charge later we eventually got back on the road again. Now way behind schedule, and near the autovia on the south side of the city, we abandoned all thoughts of seeing the centre of Santiago and just headed south to Portugal.

With 150 miles to go to Porto, almost entirely on motorway, this was probably one of the most serious pieces of driving we had to do – especially as the campsite webpage had very strict warnings about having to turn up before sunset. Much to our surprise, we managed to get there just before it was completely dark, having stopped for only one charge at a Lidl supermarket in the border town of Valença (38 minutes, 16kWh). However, this was achieved by breaking Rule #2 – not making another charge stop meant we had very little range left (about 8 miles) when we arrived at our campsite in Lavra, on the northern outskirts of Porto.

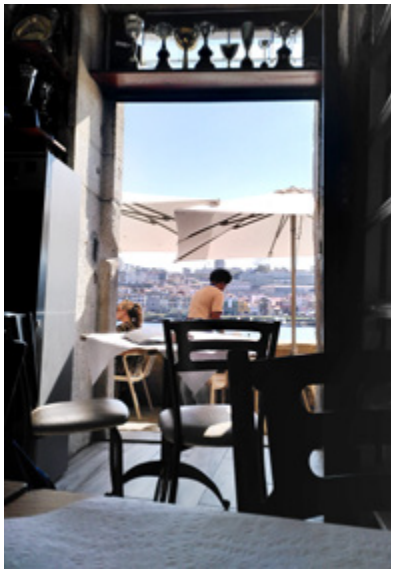
What to do? The next day would be a non-driving day – leaving the van parked whilst visiting a friend and sight-seeing in Porto. But the following day would be a long haul, travelling inland through lots of mountainous terrain – so it would be preferable to be starting that with a fully charged battery, ideally pre-cooled by the autumnal night air.

In case of an emergency like this, we had booked a pitch with an electric hookup. These are generally designed for campers to connect lights, televisions and suchlike. As our van has a solar panel, lithium leisure battery and a small inverter we generally have no need to plug in the van other than to charge the drive battery. Whilst charging the drive battery from these is not something that I rely on, unless specifically prohibited, when things are tight I will consider sneaking in a charge. I was all prepared with my kit of different size waterproof, secure commando sockets and set to work with the help of a neighbour to open the pitch's fairly impenetrable electrics box. We finally got it open to find that, this being Spain rather than Britain, the electric hookup was not via a nice safe waterproof connector, but a standard European domestic Schuko socket. As we could get 240v through a UK domestic 3-pin plug via an inverter in our van, I hadn't bothered to bring a UK-EU domestic adapter.

Enquiries revealed the site office had a Schuko to Commando convertor for loan at a price, but it now being after sunset the office was locked and I would have to wait till the next morning. Decisions were made, and as the next day had been clearly demarcated as a "No van" day, we decided to put charging on hold and face the consequences as and when they became clear.

Day 6

Sightseeing in Porto – no driving



Day 7

Porto to Alpedrinha

Distance driven = *107 miles,* **Travel time =** *9.3 hours*
Charge: *84.61kWh* **Cost:** *£31.82* **Charging time:** *204 mins*

In which we are impressed with the availability of public charging opportunities in Portugal.

One hundred and seventy miles to go to our destination, practically no charge, and no consistent info from our apps as to the existence, availability or working condition of chargers within 10 miles. Out of our three apps, only one showed a rapid charger to be directly on our route, within 6 minutes' drive and operational. Another had no information about its status, and the third didn't list it at all.

Holidays are a time for optimism, so at 8:30am we set forth, slowly pottering to conserve what charge we had. Much to our relief we found the charger, fully functional, in the corner of a supermarket car park. Plugging in and starting the charge with the Octopus app we spent the 35 minute charge time (23kWh) enjoying a breakfast of fruit, muesli and fresh coffee in the van.

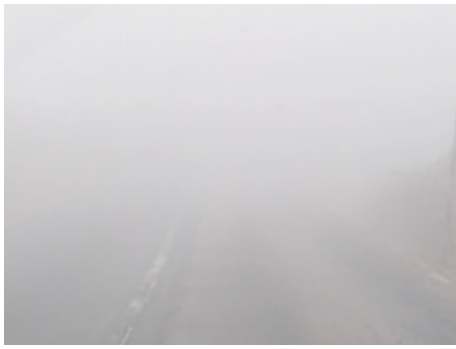
Our next stop was about 40 miles south in Estarreja. It was at this point where it started to become clear quite how well Portugal is served with chargers. With a population of just over 25,000 people, the town of Estarreja had no fewer than 7 rapid charging stations showing in our Electroverse app, and that's not even counting the ones at the services on the motorway nearby.

Deciding to have a quick look around, we dropped off the autovia and bagged a quick (22 minute, 11 kWh) charge before getting back on the road and heading inland through some very mountainous terrain. Doing mountains in a short-range electric vehicle is something of an acquired taste! Steep hills massively reduce fuel efficiency - as you go uphill the van's remaining-range reading plummets. Largely, though, that's because the van's brain follows some sort of algorithmic assumption that it will continue to be driven as it has been for the last 3 to 5 miles. Consequently the driver needs to hold their nerve, knowing that having set out with enough juice to get to the charger on the far side of the hills, the dashboard display is mistaken in predicting you will run out 30 miles short. On cresting the brow the van's estimate of its range whizzes upwards again leaving you to sail confidently and serenely on to your planned destination.

We got to the small mountain town of Viseu and found a charger in a Lidl car park where we set up camp for a long lunch (73 minutes, 23kWh) and a copious amount of shopping in preparation for (we hoped) getting to visit our friends that night.

We then drove only about 30 miles to our next stop in Seia in order to top up the van before hitting some more mountains. Our first effort, an EDP charger in a supermarket car park, failed to start charging. However, directly on our route about a mile through town we found another charger at a filling station, which happily gave us about 10kWh in 25 minutes. Then, it was off into the Serra de Estrela.

Reflecting on our general experiences with mountains, we maybe should have been patient and squeezed a few more electrons in for reassurance, especially as any set of mountains with a name emblazoned on big brown road signs are probably worth taking seriously. As it happened, once we were over the ridge (marked by a very large reservoir), our concerns about range were somewhat overshadowed by a rapid decline in visibility. Barely being able to see beyond our bonnet we very slowly descended into the small town of Covilha, taking a quick pause as soon as we were below the clouds to enjoy the view and get our breath back. Our friends had asked that we bring them some nice bread, consequently we managed, with suprising ease, to find a rapid charger located right next door to a Pasteleria and duly stocked up with bread and some of the wonderous cakes for which Portugal is rightly famed whilst the van got a quick 18 minute (6kWh) charge.



After a short 20-minute hop down the road to Fundao, we stopped again to get one final battery top-up before our destination (31 minutes, 12kWh). Whilst charging we phoned our friends to announce our imminent arrival and to arrange to be accompanied on the final off-road section of the route to their home.

For once we actually managed to get to our destination well before sunset, thereby completing the first half of the trip with a great sense of satisfaction.

Days 8 & 9

Sightseeing in Alpedrinha – no driving

In which we discovered the delights of strolling round the hills of Alpedrinha, sitting in cafes and not worrying about charging.

Day 10

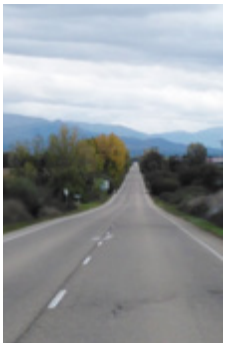
Alpedrinha to Salamanca

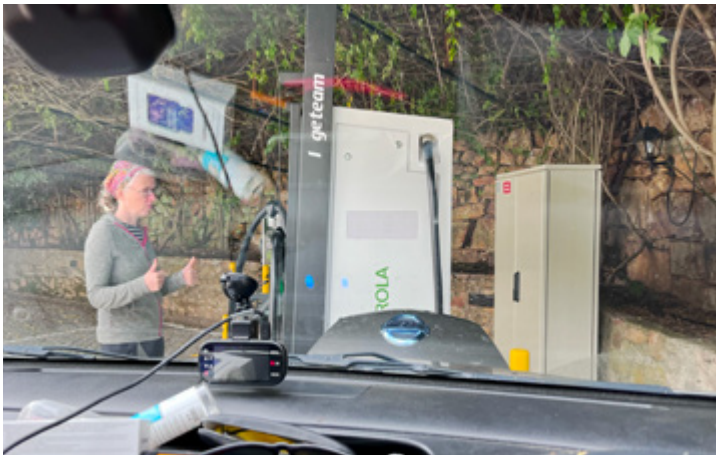
Distance driven = *181 miles,* **Travel time** = *9.1 hours*
Charge: *65.95kWh* **Cost:** *£26.73* **Charging time:** *291 mins*
Additional sightseeing time: *127mins*

In which we find that chargers can sometimes be as deceptive as apps.

Time to head on. After striking camp and saying our fond farewells we hit the road by 10:30am, heading due east for 25 miles. This was a detour from the direct route in order to see Monsanto – allegedly "the most Portuguese village of Portugal" and recent setting of a Game of Thrones spin-off.

Despite the lack of an EV charger we found ours wasn't the only electric vehicle there. Monsanto is absolutely spectacular, well worth the diversion and the two hours we invested in non-charging sightseeing time we spent looking round the town, the bouldered landscape and the remains of the old walls and defences built in the 12th Century by the Knights Templar.





Back on the road, we continued to head east for another 15 miles, aiming to get a top-up charge at a posh hotel in the border town of Monfortinho whilst quickly making some sandwiches. It was a good job we didn't just put the van on to charge and walk off to find a café since the charger made all the right sounds and displayed flashing lights but then repeatedly dropped the charge after a minute or two. After a few goes at retrying this whilst sandwiches were made we gave up and got back on the road, snacks in hand.

45 miles further down the road we pulled off the motorway into the small town of Gallisteo to find a handy roadside charger, notable for being the only charger on our tour that had any shade from the sun or protection from the rain. While we charged up for 45 minutes (a whopping 28kWh, very nearly ¾ of our battery) we made a few more sandwiches and then went on a walk around the very quiet, Sunday-afternoon town looking at the old walls (this time built by the Almohads – a Berber Muslim dynasty - in the 12th Century).

We then headed northeast, travelling another 45 miles up into the hills before stopping at the little mountain town of Bejar. It was getting late into the afternoon and was surprisingly chilly for the first time on our trip. So putting the van on to charge we sloped off into the very quiet town to find a café. Monitoring the van charge via our phone, we eventually decided to get back on our way after about 75 minutes (only 23kWh of charge this time), heading downhill now towards Salamanca and then on to our destination of Camping Don Quixote, just to the east of the city. Before getting to the campsite, we made sure we topped up the van before bedtime, and in the process struck lucky with our best charge/sightseeing combo of the trip! We spotted a roadside charger in central Salamanca just next to the Cathedral, and while the van got an extra 14kWh of electrons we enjoyed a 30-minute walk around the stunning floodlit Cathedral and University district.

With a comfortably full battery we only had 10 miles of the day's travelling to go before arriving at Camping Don Quixote just in time to squeeze in a fancy dinner before their restaurant closed.

Day 11

Salamanca to Santander

Distance driven = *235 miles,* **Travel time** = *2.4 hours*
Charge: *74.45kWh* **Cost:** *£32.10* **Charging time:** *255 mins*

In which we find Spain's charging network has its shortcomings.

A relatively relaxed start to the day still saw us on the road again before 10am. After about an hour we pulled into the little town of Tordesillas, just southwest of Valladolid and put the van on to charge at a filling station just outside the historic walls.

The town is most famous for the Treaty of Tordesillas, where the monarchs of Spain and Portugal drew the lines on the map that divided the globe between them for the purposes of colonisation.

Forty-five minutes and 26kWh later, having seen some sights, done some shopping and refuelled ourselves at a café, we got back on the road, heading northeast another 50 miles to get to Palencia. The first charger we headed to had a car already attached, with no sign of a driver. But a short hop around the corner found another charger at the back of a filling station. We plugged in for three quarters of an hour whilst having a van-side lunch in the sun, and the battery absorbed a paltry 11kWh of electricity.

After lunch, we had a bit of a frustrating drive round Palencia trying to find a parking space close to a post office in order to attend to some business. We finally got back on the highway and discovered that we were heading into an area with a dearth of chargers (the first we had really come across all trip).

The small town of Fromista looked like it would be a good bet as appeared to have one of the smart, new Repsol chargers that we could now use via their app. It did. But we couldn't get it to start the charge. We had an attempt at using the Spanish-language-only telephone helpline but rapidly gave up, finding the experience was just increasing our stress levels. It was somewhere between 24 and 30 miles to the next rapid charger on our route, and if road conditions were good, the gradients flat, and there was little in the way of headwind, we might be able to make it. Just.

However, on entering Fromista we noted tourist signs for the Canal de Castilla, an unexpected marvel of aquatic engineering in the midst of the rather barren and parched landscape of Castile and Leon. So, rather than committing to a nail-biting half hour on the autovia, uncertain of making it all the way to the next rapid charger, we chose a more relaxed option and headed the short distance across town to plug the van into a fast charger on some waste ground next to a fancy eco-hotel. That done, we had a power nap and then went off for some sight-seeing.

Seventy minutes (but only 8kWh) later we hit the road again, heading relentlessly uphill as we got into the back end of the Picos de Europa. To prepare for the gradient issue again, after about 35 miles we stopped we stopped at the attractively named Puerta de la Montaña service station. An hour of snoozing, drinking coffee and browsing an enormous discount outdoor clothing shop saw us and the van refreshed - 19kWh better off.

Sixty-six miles later, having gone through a rollercoaster of mountain passes and alarming, wholly inaccurate, remaining-range estimates from the van, we descended towards the coast to get our pre-bedtime charge. A charger at a small filling station in Sobarzo just south of Santander gave us 9kWh in just over 20 minutes, and we set off reassured that we could get to our campsite and then on to the ferry in Bilbao without needing another charge.

Arriving at our beachside campsite in Loredo well after dark, we parked the van and went in search of dinner. An out-of-season Monday evening in a surfing town was never going to be chock full of restaurant opportunities, but we eventually found a very nice bar whose staff apologetically rustled up some egg and chips for us, apparently unaware that this is tantamount to a national dish in the UK.

Day 12

Santander to Bilbao

Distance driven = *51 miles,* **Travel time** = *2.7 hours*
Charge: *10.58kWh* **Cost:** *£4.64* **Charging time:** *14 mins*

In which misreading a map very nearly catches us out.

A fairly relaxed start. A run on the beach. Plenty of time for packing up camp and getting bags ready for the ferry. And then a shocking revelation about our location. Somehow, I had got Loredo (where we stayed) confused with Laredo (another small beachside town an all-important 25 miles further east down the coast). This meant not just an extra half-an-hour drive but, more importantly, the need to find a charger en route and add some charging time to the journey.

Fortunately, we spotted that we had a choice of two chargers relatively nearby – so to be on the safe side we headed for the nearest first. A quick 14 minute, 11kWh charge saw us on our way, pretty much back on schedule. So much so that we got to Bilbao with enough time to stop at a supermarket for a last bit of Spanish shopping and still get to the ferry to sit for ages in the queue for boarding.

Everything went smoothly and we settled in for another 30 hours or so of relaxingly little to do during the sea crossing.

Day 13

Portsmouth to Reading

Distance driven = *774 miles,* **Travel time =** *2.6 hours*
Charge: *19.74kWh* **Cost:** *£15.93* **Charging time:** *32 mins*

In which we make it home with no further drama in chilly Britain.

We got off the ferry in a cold, dark Portsmouth at about 6pm and trundled over to the ferry terminal's rapid chargers (the first ones we had used almost two weeks ago) to charge for about 20 minutes (14kWh) before setting off home.

Just over an hour later we stopped for a quick comfort break and a safety charge of 10 minutes (6kWh) just to make sure that we could do the very last leg in a relaxed fashion.

Finally, at about 8:30pm and having driven about 1,400 miles in all, we made it home.

Summary

13 days holiday – 9 days of driving

39 hours of driving ~1400 miles driven

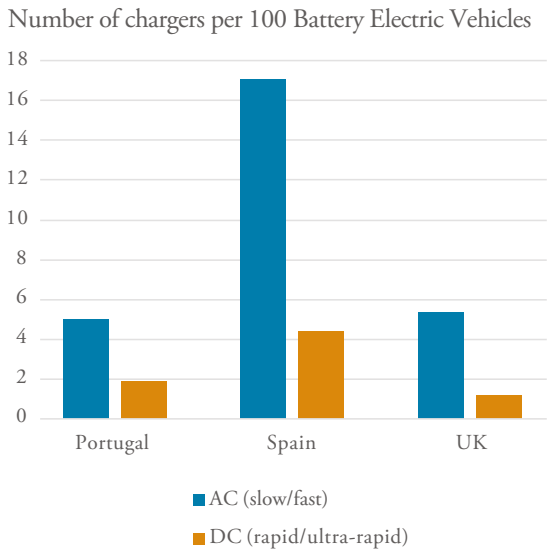
31 charges: 22 hours, ~450kWh of electricity, cost ~£196

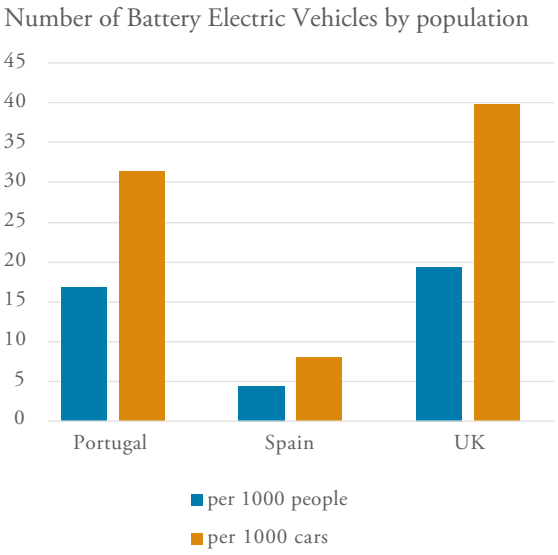
Average cost: 14.5p/mile

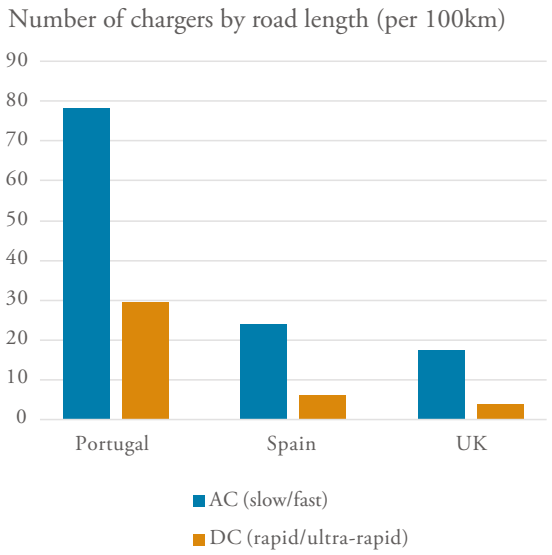
Fuel efficiency: 3.01 miles/kWh

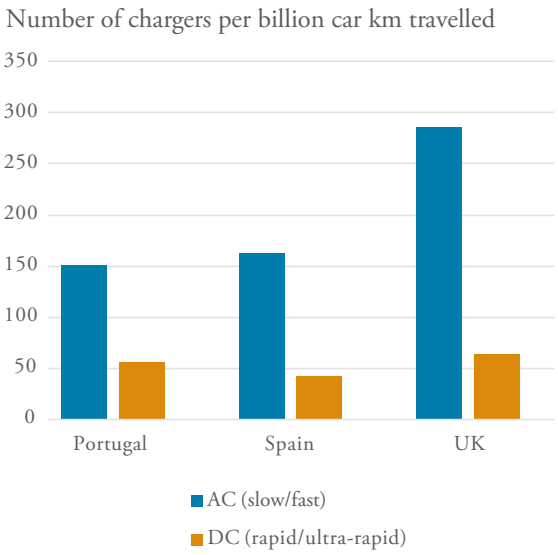
Using an average of fuel prices for Portugal, Spain and the UK for October 2024, along with specific estimates of fuel efficiency for petrol and diesel versions of our campervan, the estimated fuel costs of making the journey in a conventional ICE (internal combustion engine) camper would be £230 for petrol, and £145 for diesel.

Comparing the state of the EV transition between the UK, Spain and Portugal









The four charts above indicate different perspectives on the rate of the transition to electric vehicles in the UK, Portugal and Spain. Whilst the UK leads in terms of the number of EVs per head of population, Portugal is not far behind, with Spain a rather distant third place. The UK is also leading in terms of the number of chargers relative to the overall distance travelled annually by cars. Here the difference is greatest with respect to AC chargers, with less difference with respect to DC/ rapid and ultra-rapid chargers. In relation to the number of chargers relative to the number of EVs on the road, Spain appears to be in the lead by quite some distance. However, looking at the first graph suggests that this is due to a low number of EVs as opposed to a high number of chargers. The final chart supports our perception during the journey, that Portugal is very well catered for in terms of chargers. In relation to the length of road in each country, Portugal has over seven times as many rapid chargers per 100km as the UK.

Reflections

Looking back on the holiday we had a great time, saw some fabulous sights and enjoyed visiting our friends, but would have to characterise the trip overall as "somewhat intense". To be fair, the extent to which that is a consequence of using an electric vehicle rather than our particular electric vehicle, with its quirks and limitations, is a moot point. Also, there is no guarantee that things would have been significantly less intense had we been in a petrol or diesel vehicle, given the distances to be covered in the limited time we had given ourselves. We might have driven for longer stretches without breaks, stopped in fewer random places along the way, and so experienced less of the "real" Spain and Portugal, and avoided a handful of charging anxiety moments. However, we almost certainly would have had a better chance of arriving at our daily destinations each day before sunset.

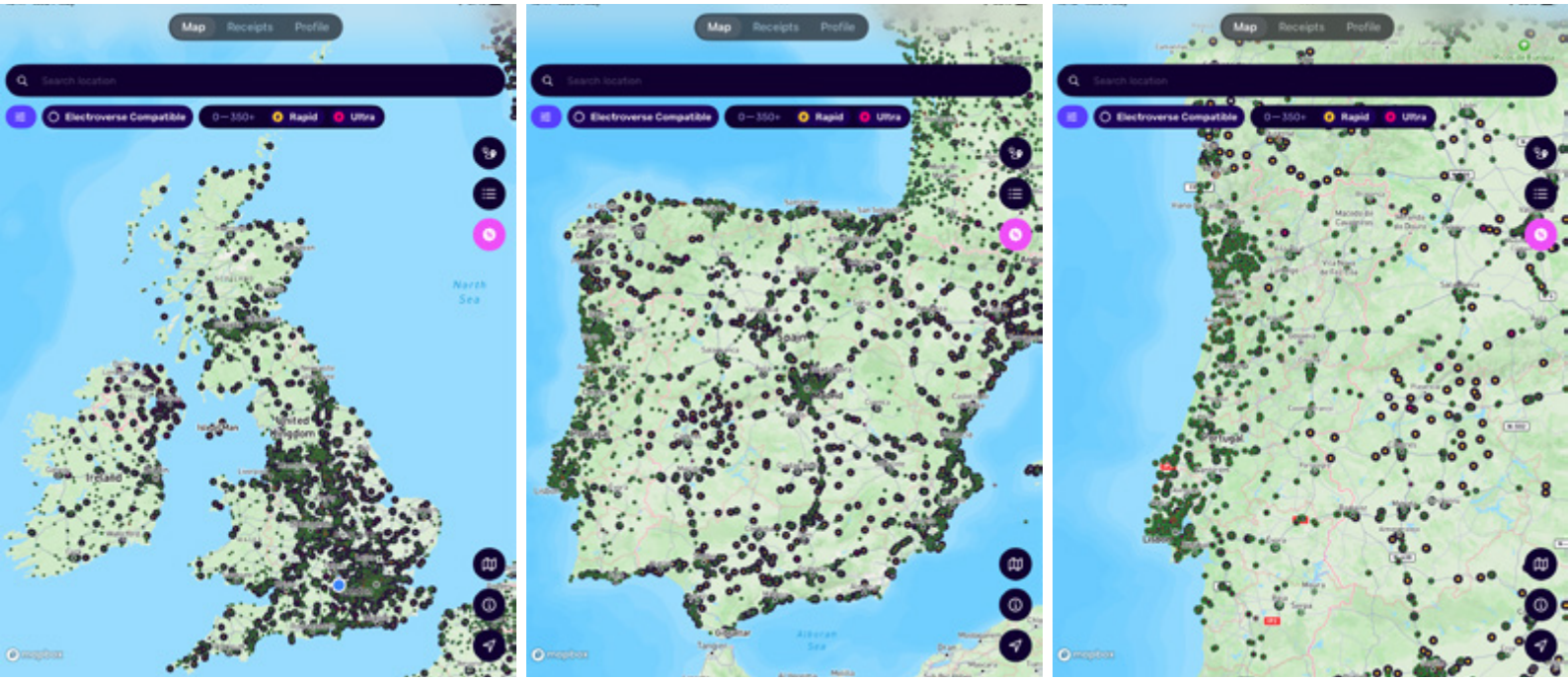
We only really had one instance (in Fromista) where issues with chargers saw frustration escalate to stress. Whilst being behind Britain in terms of the absolute number of chargers (especially rapid chargers) that they have deployed, on the whole we didn't find either Spain or Portugal particularly lacking in available chargers (though that might also say something about a lack of EV take-up locally). Even in our range limited EV we generally had no problem finding sufficient chargers for our frequent top-ups. In a couple of places in more remote areas things were a little bit more challenging, but notably we only came across other people charging in one location. As a number of our experiences showed though, the timing of our trip was definitely 'out of season'.

Our conclusion is that we felt Iberia to be in the second stage of its EV transition in terms of public chargepoints. It appears to have moved from the initial stage where simply finding a suitable charger is a challenge and might require a significant detour, to a point where it might now be in the relatively happy place of sufficient chargers to cater for most routes without significant range-anxiety. As more EVs come on to the road though the next stage will see a need to increase the number of chargers to avoid queuing, particularly at peak times. This is arguably where the UK finds itself. This will necessitate the creation of more multi-charger 'hubs' rather than the single charger locations that were by far the norm on our journey.

But absolutely top of our list of things that would improve the experience would be improving consistency of information across apps. It is, frankly, astounding that countries seeking to make the transition to electric vehicles don't have a reliable, open access national database of EV chargers, especially considering the scale of the technological transition that is underway. Second on our list, as we have done in the UK, mandating the possibility for contactless payment at all rapid chargers would be a good step.

The number, or at least the density of chargers in Spain was adequate and in Portugal it seemed to be excellent, even if available estimates suggest that they both have fewer than the UK (in terms of absolute number, and by area and population). What was really striking, however, was the price of charging, which in general seemed to be about a third to half of what one might expect to pay for rapid charging in the UK. On average, rapid charging in Spain and Portugal cost us 41p/kWh. On the UK part of our trip it was over 70p/kWh (with the majority of UK chargers we used being over 80p/kWh).

We were particularly blessed with the weather on our trip (having dodged heatwaves and wildfires, hurricanes and flash flooding by a matter of weeks or even days). It was notable that only one charger that we stopped at had any sort of roof or shelter. In more inhospitable weather we would have suffered from spending a lot of time exposed to the elements whilst charging - far more than people filling up with liquid fuels, who almost always have a roof over their heads.



Screenshots of rapid charger locations from the Octopus Electroverse app. © Octopus Energy Ltd. © Mapbox © OpenStreetMap (2025)

So, to conclude, we had an excellent holiday. Travelling in our electric van added some inconvenience compared to a conventional ICE van. However, it also meant that our cultural horizons were broadened by spending time in random places that we wouldn't necessarily have had on a schedule planned purely on the basis of tourist guides. Perhaps the most telling thing is that the experience hasn't put us off making another continental venture with the same van this year to visit our aforementioned friend with the French telephone number. Allons-y!

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