

GOOD SAMARITANS PLUG ELECTRIC CARS' CREDIBILITY GAP

Range anxiety is the biggest deterrent to going electric but a new app that puts drivers in touch with householders willing to give them a recharge may be the answer, writes Mark Harris

It is the biggest fear of all drivers of electric cars. Cruising silently along a sun-kissed A-road, you notice that the range indicator on the dashboard is flashing red. You need to recharge, and you need to do it within the next 10 miles. The question is: where?

You are too far from home to return and plug the car in, and none of the garages you have passed or are likely to pass has a recharging point. After nine miles of increasingly anxious driving, the car stops responding to the accelerator and coasts to a halt. The battery is flat and you are stranded.

Range anxiety — the fear of conking out with nowhere to recharge — is regarded as the single biggest obstacle to the widespread adoption of battery-powered vehicles. Car makers such as Nissan, Citroën and Renault may be launching a new generation of mainstream electric cars, but people won't be buying them unless they are sure they won't be left stranded with an empty battery.

In America the first signs of a solution to this problem are emerging. It doesn't require huge government subsidies or thousands of recharging points on existing garage forecourts, and it doesn't require billion-dollar investment in new "recharging infrastructure" to create electric highways. Instead, the solution makes use of the fact that millions of us already have electric sockets in our homes and that, in an age of social networking, nobody is a stranger. All you need to make it work is a smartphone and a green samaritan.

An app called PlugShare, which was launched in America last month and will be coming to Britain later this year, promises to overcome range anxiety at one fell swoop. It allows electric-car drivers to travel as far as they want, confident that whenever they run low on juice, someone will be waiting with extension cord in hand.

The app works by asking volunteers to sign up and offer their home electricity supply to passing drivers, either for a nominal payment or — if they are a genuine good samaritan — for nothing. Members provide their name, phone number and address and state whether they have a powerful high-speed charger or a conventional household socket. The idea is that when electric-car drivers no-

WHAT IS PLUGSHARE?



PlugShare is a free app for Apple devices that allows the owners of electric cars to find people who are willing to provide electricity for vehicles, free of charge or for a nominal payment. You don't have to own an electric car to offer drivers the service, but if you want to use it, you have to join the network yourself. Users are not obliged to give full contact details via the app; instead they can request that drivers get in touch with them if they need a top-up. It is believed to have around 3,000 users, all currently in America. A version of the app for Android phones is in development.

tice that they need a recharge, they can open the app and see the location of the nearest PlugSharer on a map. They can then phone the number and check that someone is at home before dropping by to recharge their car. Most existing members give out electricity free of charge, regarding the nominal cost as a small price to pay to encourage the widespread adoption of electric cars. This may change as the app becomes more popular, of course, and the take-up of electric cars increases.

The promoters of the app point out that in rural areas of America, where you are most likely to run out of juice, many people generate their own electricity through wind or solar power and so don't mind giving away their surplus. In addition, there is a growing green consensus in America in support of electric vehicles, and many people are eager to do their bit.

As evidence, the app has been a huge hit in America, where, according to the company behind it, "several thousand" people have signed up to provide home recharging points to strangers. The idea represents the coming together of two technologies that could in the long term revolutionise the way people refuel their vehicles: smartphones that allow users to stay in constant touch with other like-minded people, and battery-powered cars that, while cheap to run, need a close network of charge points to operate effectively.

But how reliable are these electric samaritans? We decided to put the app to the test, taking a Nissan Leaf on a long-distance road trip around Seattle in a hunt for free power. The Leaf is the first mass-market all-electric car and has

a lithium-ion battery pack that should give up to 100 miles of driving on a full charge. It is that "up to" proviso that has prospective owners worried: the range varies enormously depending on how fast you drive, how much weight is on board, the outside temperature and even whether you turn on the heater and radio.

It also depends on whether an overnight rainstorm trips a circuit-breaker while the Leaf is charging — instead of starting my test with a full charge, as planned, I hit the wet streets with an estimated range of just 45 miles and about twice that distance to travel that day.

Before using PlugShare, I have to agree to share my own sockets, which I do. Then I check out where my nearest PlugSharer is: someone named Tiffany Y on the app is just three miles up the road. I ring the number but there is no reply; it's Saturday morning, admittedly, so Tiffany can perhaps be forgiven for not coming to the phone.

Next on the map is Warren K, a dozen miles away in Bellevue, across the State Route 520 bridge, the longest floating bridge in the world. As I hit motorway speeds, the Leaf's predicted range lurches south. By the time I reach my exit, the Nissan's high-tech display is showing just 25 miles remaining.

Cruising silently up to a stylish mid-century house, I feel a surge of relief. In the driveway is Warren Klink, a 70-year-old landscape architect, admiring his shiny new GM Volt. "I saw the movie Who Killed the Electric Car?, and it got me thinking," he says. "When one of the very first Volts suddenly became available in Detroit, I jumped on a plane and bought it on the spot. I've just got

back from driving it home cross-country. The whole experience blew me away. In Missoula, Montana, a GM dealer even washed the car and charged it overnight."

All very heart-warming, but where's his socket? A panel in the garage folds back to reveal a curly extension cord. "I wanted to install a fast charger but this maxed out my wiring," says Klink. American 120V mains power takes about 20 hours to charge the Leaf fully — that's a sluggish 12 minutes for each mile. Unless I'm going to spend all day here, I need to find a fast charger, and fast.

A few miles down the road is Samantha Quick. A call reveals that she is heading off for the weekend with her family, but I'm welcome to use her Leaf's 220V charger until they leave. The PlugShare app gives pinpoint directions to everyone in the network and I'm pulling up at Samantha's house before she has even loaded up her other car — a 1981 Mercedes 240D running on biodiesel.

"The Leaf is fine for 99% of the driving I do: school, family and work," says Quick, a 36-year-old software engineer at nearby Microsoft. "But it can't make it to the theme park we're visiting."

Quick's high-speed charger was installed with a government grant and is packed with high-tech features such as timers, power statistics and even access to its own website, allowing Quick to manage the Leaf's charging schedule online. She downloaded the PlugShare app as soon as it was released.

"Considering that nationwide charging networks aren't in place yet, PlugShare is a good way to fill in," says Quick. "We might get people dropping in to avoid paying for the public charging stations downtown. It's also a way to meet other people. I've already met four of the seven Leaf owners in town."

The Leaf's battery is soon back up to a 40-mile range and I follow the Quicks out of their driveway. Next stop is a suburban home perched above Lake Washington and belonging to the mysterious and belonging to the mysterious named Tin H, who turns out to be Justin Hart, a college IT manager. If anyone fits the image of an electric samaritan, it's Hart. This 37-year-old previously refined his own biodiesel from used restaurant oil and now commutes to work daily on an electric bike.

What elevates him to sustainability sainthood, though, is the massive 4kW



Several thousand Americans have signed up to PlugShare, an

array of solar panels on his roof. "When my Leaf arrives next month, it will be completely powered by the sun," Hart says proudly. He is a passionate fan of the PlugShare app. "I will definitely use PlugShare when I'm out. It's already on my iPhone. Other apps don't have the grassroots appeal for you, me, anyone to share their outlets and their interest in EVs [electric vehicles]."

I take a quick spin on his Ultra Motor electric bike while the Leaf is charging. It's fun and fast, and I can feel myself filling with the spirit of goodwill towards electric vehicles. Time to move before I am fully converted. Such friendliness might be expected in Seattle's richer, greener suburbs, but how does PlugShare fare in its urban core?

I exchange texts with Syesha T, whose icon glows in the city's hip Capitol Hill neighbourhood. I am virtually pulling up to her street when Syesha lets slip that she is not actually based in the city but 15 miles further out. Apparently she gave a false location when she registered, worried about strangers knowing where she lived — which rather defeats the object of the exercise.

According to Armen Petrosian, co-founder of PlugShare, this is a common concern for people who sign up, although he says that the system relies, by its very nature, on people trusting one another. "We don't verify locations right now," he admits. "We're working on a reputation system, so you can give

people a thumbs-up or thumbs-down. If someone's abusing the system, we have their sign-up details and can lock them out."

Perhaps my final stop of the day, Louis W, can make a true believer of me. Outside a modest townhouse in Seattle's gritty Central District, an American flag flutters above a battered all-electric 1995 Ford Escort LX. Louis Webster, 56, is a blue-collar EV fan who converted the car using a dozen old-fashioned lead-acid batteries.

"Too many people in the world want to live the way America does. They want big-screen TVs and big, fast cars that can go across the country. It isn't sustainable for this country and it isn't sustainable around the world," says Webster. His home-made EV has a range of about 25 miles and Webster is thankful for apps such as PlugShare. "I don't have range anxiety, but let's just say that I'm range-conscious. I'm not expecting many people to come in. In fact, I'm flabbergasted that you're here, but it seems safe enough."

My road trip ends with 80 miles under the Leaf's belt and as much charge as I started with. It seems that it is possible to drive a battery-powered car free in America, as long as you don't mind sermons in praise of sustainable transport from born-again electric samaritans.

There's a new evangelical religion sweeping America: raise your voices and plug into the Church of EV.



THE GREEN TOUR OF SEATTLE

- Start** Depart home, 10am
- Charge 1, 20 miles** Warren Klink, 10.30am. "Electric cars are reducing dependency on fossil fuels."
- Charge 2, 25 miles** Samantha Quick, 11.30am. "I love the idea of a community who care about the planet."
- Charge 3, 40 miles** Justin Hart, 1.15pm. "With enough volunteers, drivers could make it from Seattle all the way to San Francisco."
- Charge 4, 70 miles** Louis Webster, 3pm. "The way Americans live isn't sustainable for the world."
- Finish, 80 miles** Return home, 4pm