

ORDNANCE SURVEY

SUSTAINABILITY: OPPORTUNITIES FOR SOFTWARE DEVELOPERS

How geospatial data can support
sustainability projects, including
the uptake of electric vehicles



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Methodology

This report is based on primary and secondary research exploring the role of developers in supporting sustainability projects and includes a deep dive into the electric vehicle landscape. The primary research comprises a survey of 500 developers who have worked on sustainability projects in the UK, as well as nine in-depth interviews with industry experts in transport, electric vehicle planning and geospatial data, including from the Department of Transport and Ordnance Survey. The developer survey covered those working in technology, data science and sustainability.

Within these functions, it targeted web developers, designers, backend developers, full-stack developers and programmers. We defined “sustainability projects” as the development of apps or web solutions aimed at reducing emissions including CO². For example, projects addressing mobility (electric vehicles, biking and self-driven bots), forestation (increasing greenery for CO² absorption), energy (sustainable energy sources such as solar and wind power), technology (emission absorption devices), and land usage. The report also contains analysis of publicly available sources from government and industry bodies.

Research reveals sustainability projects are driving opportunities for software developers

→ Positive perception

Our survey of 500 developers who have worked on UK-focused sustainability projects found that **90% of respondents enjoy working on sustainability projects**.

→ Key drivers

Over **50% of respondents enjoy sustainability projects** because they are:

- Technically challenging
- Creatively challenging
- Innovative
- Socially responsible
- Motivational

Plus, **82% of respondents confirm that sustainability projects come with better pay**.

→ Key challenges

Despite the high level of enjoyment, over 50% of respondents agree that the key challenges to overcome include:

- Access to relevant data
- Limited tech capabilities
- Lack of relevant skills
- Changing requirements
- Cost of data and sources

→ Developers' role

94% of developers bring their own ideas to the table for ways to develop sustainability projects, showing that they are highly engaged.

→ Top 5 focus areas

Developers anticipate that the top 5 focus areas for future sustainability projects will be:

- Sustainable development
- Energy/power
- Waste management
- Natural resources
- Industrial
- Transport/mobility

→ Role of geospatial

46% of developers working on sustainability projects use geospatial tools.

When looking for a geospatial data source, developers are swayed less by cost and more by what works.

→ EV project drivers

With the number of EVs in the UK set to increase **4,600% by 2030**:

- 66% of developers working on transport/mobility projects focused on EVs
- 87% of these respondents agreed that the UK's Zero Emission Policy was a key driver of their EV project

→ EV opportunities

Of the respondents who had worked on EV projects:

- **37%** worked on EV infrastructure development projects
- **34%** on EV projects related to user experience

Why electric vehicles are the next big thing for developers working in sustainability

As governments around the world look to their climate targets and emissions reductions, it's increasingly clear that technologists and innovators have a huge part to play in easing the transition to a decarbonised world. Ordnance Survey recently commissioned a global survey of 500 developers who have worked on UK-focused sustainability projects to find out more about who they are, what kind of work they're doing, how they work and where they see the demand for sustainability projects in the future.

Forty percent of respondents were based in the UK, with the remaining developers based in India, Hungary, Romania and Poland.

In this report, we'll summarise the findings along with presenting an exciting opportunity for sustainability developers: electric vehicles (EVs). The UK government has set a deadline of 2030 by which all new vehicles must be electric, and a 2035 target for eliminating tailpipe emissions¹.

Meanwhile, zoning laws like London's Ultra Low Emissions Zone are already incentivising the use of electric and hybrid vehicles.

Already an underserved market, EV users will become a much larger proportion of the population in coming years, and they will need a host of digital solutions to smooth the user experience. With the inevitable changes to consumer behaviour around cars, there is a huge opportunity for developers to meet the informational needs of EV owners. And with an urgent lack of infrastructure to meet demand, there is an opening available for developers to help determine the optimum locations for siting charging facilities to satisfy the needs of an ever-increasing number of people.

Accurate geospatial data is essential in supporting developers in this endeavour, helping them to understand the physical context of everything, from small land features to national infrastructure. When it comes to siting EV charge points, the relationships between different features — including the location of roads, electricity supply, homes and commercial sites — all need careful consideration.



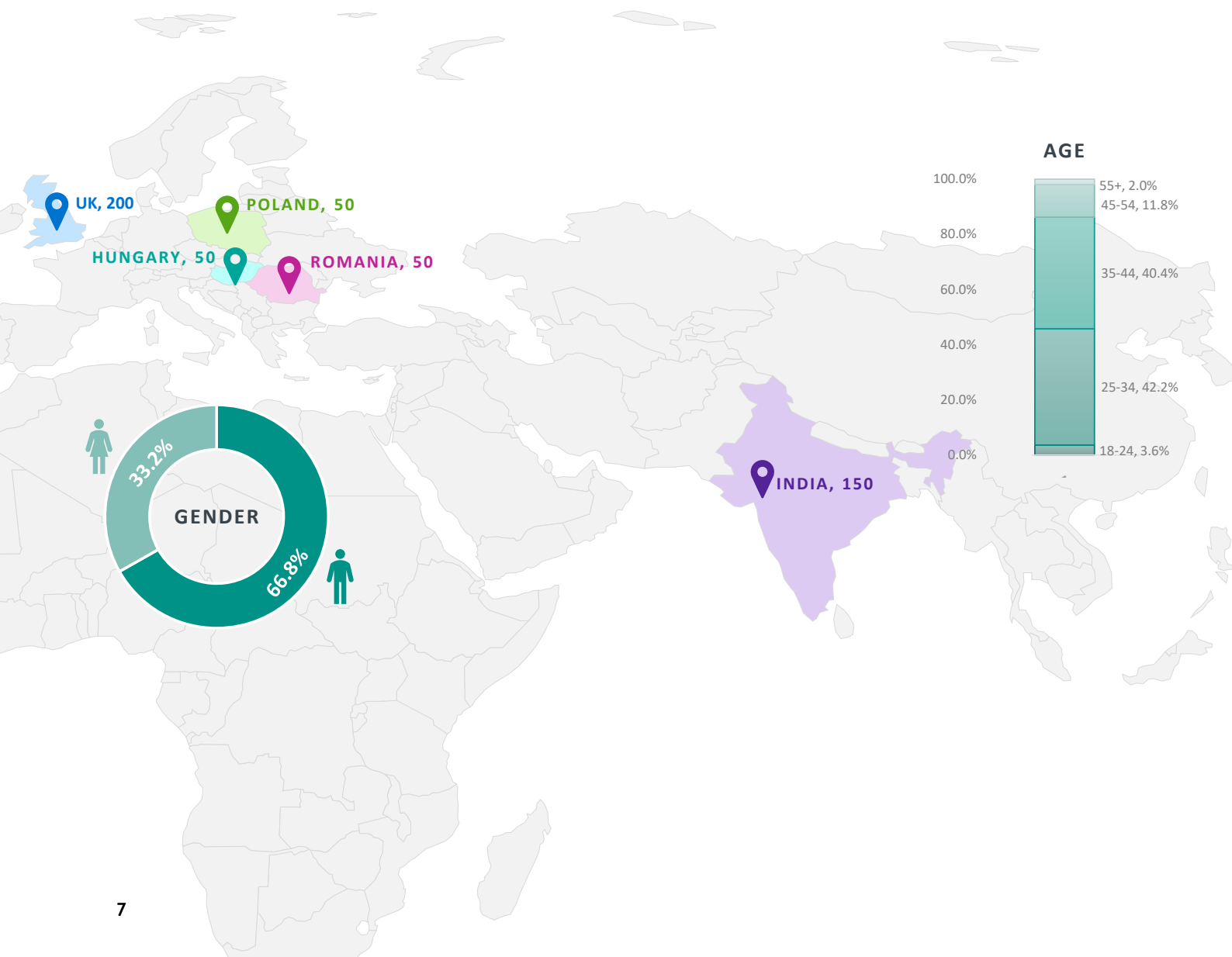
EV deadline

The UK government has set a deadline for all new vehicles to be electric by 2030.

What does a sustainability developer look like?

Who is working on sustainability projects?

Developers from around Europe and Asia are working on UK-focused sustainability projects. While the majority of those interviewed were men, women represent 33% of the sample. The age of the developers ranged from 18 to over 55, with the vast majority in the 25–44 age bracket.

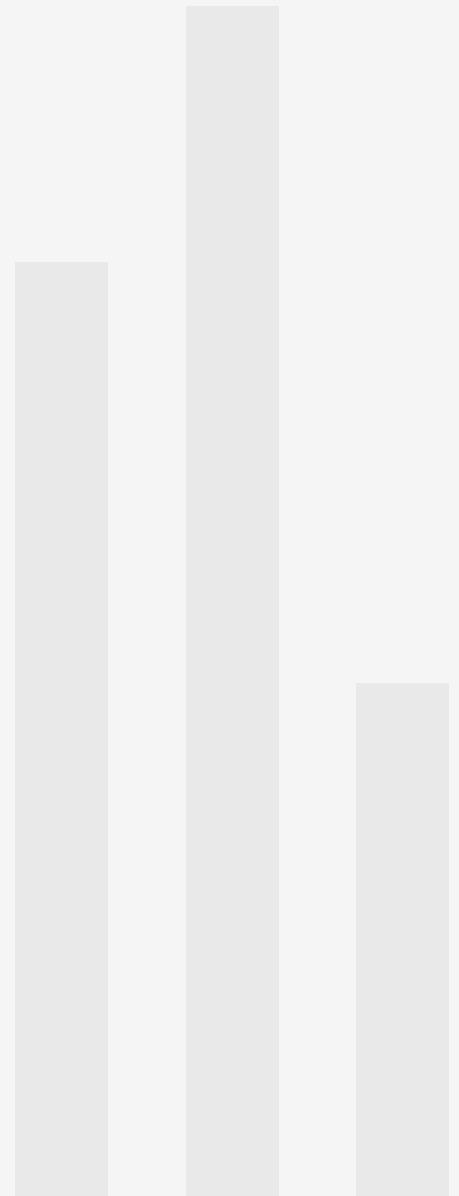


How do sustainability developers work?

- Most are in employed work. Of those interviewed, 99% were employed in full-time roles, with the remainder working part time or self-employed.
- Most work for a large developer specialist company. Overall, 71% work for organisations with more than 200 employees.
- 64% are IT/technology managers or C-level executives. Of the respondents, 74% of women were in one of these categories, as opposed to 61% of male respondents. However, sustainability-specific technical and data science roles saw equal gender distribution.
- Sustainability developers cover a range of projects across different industry sectors. An average of 59% of respondents have worked on sustainable development projects.

Survey

The survey demonstrates that developers across location, gender, age and specialism work on sustainability projects for the UK market. Success in this field doesn't come from any single demographic.



“Developing solutions that will help to tackle the climate crisis and ensure a more sustainable future must be a focus for organisations and governments across the globe. Those with technical skills and data expertise will be crucial when it comes to innovating in this area, as will access to high-quality data.

Our research and conversations with developers have revealed that use cases for the environment and national infrastructure require trusted geospatial data, which is where Ordnance Survey’s data offerings and expertise stand out above other data providers. Through the OS Data Hub, developers can quickly access the data they need through APIs to build applications and embed richer contextual features in existing offerings. We are very pleased to see that ‘ease of use’ was cited across those surveyed as being a particular strength for OS.”

Rollo Home, Head of Product, Ordnance Survey

What do developers think about working on sustainability projects?

Developers enjoy sustainability work

Over 90% of respondents reported enjoying working on sustainability projects because of the challenges involved and the motivation to do good.

Challenge	Social and environmental good
73% like solving complex technical problems	54% across the board said they like to be part of the greater good and make a difference
66% like the creative challenge of thinking outside of the box while developing new algorithms	53% said it makes them feel like their work has a bigger purpose
59% enjoy the ability to use new tools, data and services	

What are the unique features of sustainability projects?

Sustainability projects come with specific challenges

While many enjoy the work, everyone in the sample reported specific issues that come with sustainability development projects, beyond the standard deadline and budget pressure.

The main challenges for sustainability projects were access to data sources and availability of the skills required.

However, with developers now having greater accessibility to accurate geospatial information, for example, through the [OS Data Hub](#), there is no longer a need to find specialists to work on these projects. This is a game-changing opportunity for those working on sustainability projects to move quickly without being held up by the need for specialist recruitment.

Working on sustainability pays

Another perk for developers is that 82% of respondents reported that sustainability projects attract at least 5% higher remuneration than others, with British and Polish developers reporting at least 10% higher pay.

“Historically, turning geospatial data into usable information required niche skills and expertise. From challenging file formats to geographical nomenclature, geospatial datasets were among the most difficult to use. As part of Ordnance Survey’s digital transformation, and the wider evolution of the technology landscape, organisations are increasingly able to access and share data in more user-friendly formats, such as through APIs. Today, developers without geospatial expertise can quickly spin up geospatial applications and features that vastly improve their offerings. For those working on sustainability projects, the value of trusted geospatial data cannot be overstated.”

Rhoswen Hoath, Product Manager, Ordnance Survey

What role do developers play in sustainability projects?



94%

of developers are bringing their
own ideas to the table for ways
to develop sustainability projects

Sustainability projects come with specific challenges

Over half of respondents believed they played a key role in bringing sustainability concepts to life. The survey also revealed that older developers and most UK developers believed specialist expertise (like geospatial skills) were more valuable to a project, whereas younger respondents and those outside of the UK believed that generalists had more to offer.

Developers feel they are contributing to sustainability goals

The survey also found that the vast majority of developers believe their work helps achieve sustainability goals. In fact, 94% of developers are bringing their own ideas to the table for ways to develop sustainability projects, showing that they are highly engaged with the process.

What areas are sustainability projects focusing on?

Overview: The UK's current sustainability policy

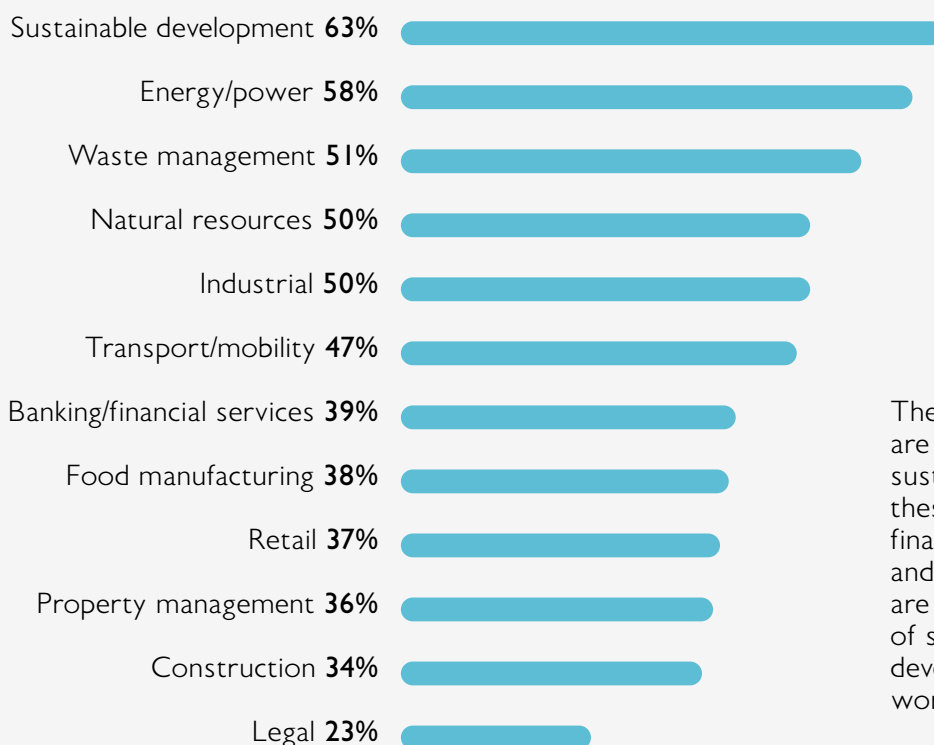
With a focus on environmental sustainability to alleviate climate change, the UK government's Green Industrial Revolution plan² tackles areas like energy sources, tree planting and transport emissions, including

phasing out the sale of standard petrol and diesel vehicles by 2030 and achieving zero tailpipe emissions by 2035.

Developers anticipate expanding their sustainability footprint in the future

Sustainability projects currently involving developers stretch across all the major areas identified by COP26, with the main focus on sustainable development (currently 70%) and energy and power (currently 57%). Although these two areas will remain the main focus, time spent in other areas is also increasing.

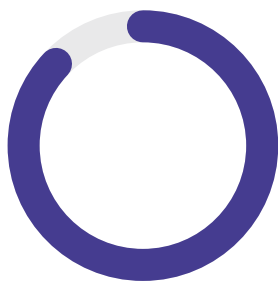
Developers anticipate future focus areas to include:



The developers we interviewed are not currently working on sustainability projects in all of these industries. Legal, retail, finance, food manufacturing and property management are all new entrants to the list of sectors that sustainability developers have previously worked in.

How do developers work and collaborate in the sustainability arena?

The nature of large-scale infrastructure and sustainability projects means that collaboration is necessary across private and public sector and between developers. Local authorities, energy providers, national departments and private sector innovators all play a role in solving sustainability challenges.



87%

of the developers we spoke to are able to choose what kind of project to work on.

Working alone. Just over 55% of those who could choose their own ideas work on their projects solo. However, this may not be out of choice: while only a small number worked with other developers, many felt that greater cross-developer collaboration would benefit their work, and some reported struggling to find appropriate developer partners to work with. Over half also found that it was difficult to bring their own ideas to market, primarily because of a lack of capital and resources.

Working for the public sector. The majority of respondents working in collaborative environments were working on their own ideas with public sector bodies. These developers report that despite bureaucracy slowing the process and some budget limitations, it was generally easy to set up projects and work with public sector clients.

Working for the private sector. While working in the private sector meant less administration and more budget than in public sector collaboration, setting up projects in the private sector was viewed as more difficult and clients were more demanding.

“Key challenges when it comes to data are reliability and consistency. For geospatial data, Ordnance Survey’s offerings are unmatched against these markers, which are particularly important for solutions relating to infrastructure.”

Adam Bricknell, Joint Head of Data Science,
Department for Transport

What key tools are developers using on sustainability projects?

Developers are using a broad range of tools

The survey found that developers are liberally using a variety of tools beyond programming languages in their sustainability work. These tools include database management, AI and machine learning, collaboration and code-sharing platforms, and UX and QA testing tools. In addition, some 46% of developers working on sustainability projects use geospatial tools.

When assessing the geospatial tools that developers use on sustainability projects, the context of use cases must also be considered. In many instances, geospatial data can relate

to basic mapping information or census data, from which geospatial insights can be quickly derived. A great many applications will use this data, but for larger-scale use cases, more detailed, verifiable and trusted data is required.

It’s clear that when looking for a data source, developers are less swayed by cost and more by what works: only 10% said that a source being free was the reason for their preference, while 40% said that they were looking for the best tool for the job. Notably, in our survey, OS was ranked highest when developers were asked which geospatial data provider offered tools that were the easiest to use for development.

The precision, currency and authority of OS data as Great Britain’s national mapping service is what sets it apart when it comes to planning the rollout of national infrastructure.

WHAT KEY TOOLS ARE DEVELOPERS USING ON SUSTAINABILITY PROJECTS?

Ordnance Survey provides a range of data types – land usage, property-level information, 3D terrain data and more – enabling developers to create best-in-class infrastructure mapping products. With the OS Data Hub providing access to OS data and APIs all in one place it's also easier for developers to connect and overlay other data sources, including transport flows, weather and data from other sensors – supercharging the benefits of geospatial data.



Above is an example of the same location, displayed in layers from different datasets, which can be combined to enable more in-depth analysis. (Clockwise from top left: OS MasterMap Imagery, OS MasterMap Highways, Vectormap local, and OS MasterMap topography.)

Ash Wheeler, Proposition and Markets Director, Ordnance Survey, says:

“Geospatial data covers a broad spectrum of information, from detailed raster data and satellite imagery to social media data. The most commonly used geospatial data harnessed across use cases, such as commercial routing, mapping, and basic geographical visualisations, is fairly rudimentary. This data serves these use cases well, but delivering more compelling applications, and meeting requirements around accuracy for the likes of industrial, public sector, and national infrastructure projects, requires more detailed and trusted data sources.”

Electric vehicles: What are the opportunities for developers?

EVs under the microscope

Over the last 30 years, despite energy supply emissions reducing steadily in the UK, tailpipe emissions have remained relatively stable. Thus, EVs are currently a significant focus of the UK Government's Net Zero Strategy and Zero Emissions Policy to continue to reduce emissions. No new petrol or diesel cars can be sold from 2030, and zero tailpipe emissions is the target for 2035 — a relatively short time frame for a significant change in the industry and consumer behaviour.

And consumers are responding. In the UK, one in four consumers intends to buy an EV in the next five years³. Manufacturers are expanding their offering and improving tech capabilities to be able to meet requirements. As innovation drives cost down and the 2030 deadline draws nearer, more consumers are likely to switch to EVs — particularly as understanding increases about the distance drivers can cover on a single charge and as other benefits such as cheaper maintenance and servicing start to filter through.

However, according to recent research from Faircharge⁴, less than three in ten councils have an electric vehicle transition plan, making it difficult to support the widespread uptake of EVs. The infrastructure is not yet in place, with just one charger currently available for every 15 cars. With the government's commitment to reaching a target of 300,000 charging points by 2030 (up from 32,312 as of May 2022⁵) the demand for apps and digital solutions serving consumers and businesses using EVs is set to accelerate rapidly.

³ <https://www.ofgem.gov.uk/publications/one-four-consumers-plan-buy-electric-car-next-five-years-according-ofgem-research>

⁴ <https://www.faircharge.co.uk/post/revealed-less-than-three-in-ten-councils-have-electric-vehicle-transition-plan>

⁵ <https://www.zap-map.com/statistics/>

The challenges developers can help resolve

- Not enough charging stations. There is currently not a significant enough density of charging stations or rapid charging stations across the UK, even for the current amount of EVs on the road. A significant increase is required to keep up with anticipated demand. By comparison the Netherlands has a greater number of charging stations per electric vehicle.



EV charging stations in the UK

15:1

NUMBER OF BATTERY-ELECTRIC VEHICLES (BEV) PER CHARGING STATION

27:1

NUMBER OF BEVS + PLUG-IN HYBRIDS PER CHARGING STATION

151:1

NUMBER OF BEVS + PLUG-IN HYBRIDS PER RAPID CHARGING STATION

EV charging stations in the Netherlands

3:1

NUMBER OF BATTERY-ELECTRIC VEHICLES (BEV) PER CHARGING STATION

4:1

NUMBER OF BEVS + PLUG-IN HYBRIDS PER CHARGING STATION

148:1

NUMBER OF BEVS + PLUG-IN HYBRIDS PER RAPID CHARGING STATION

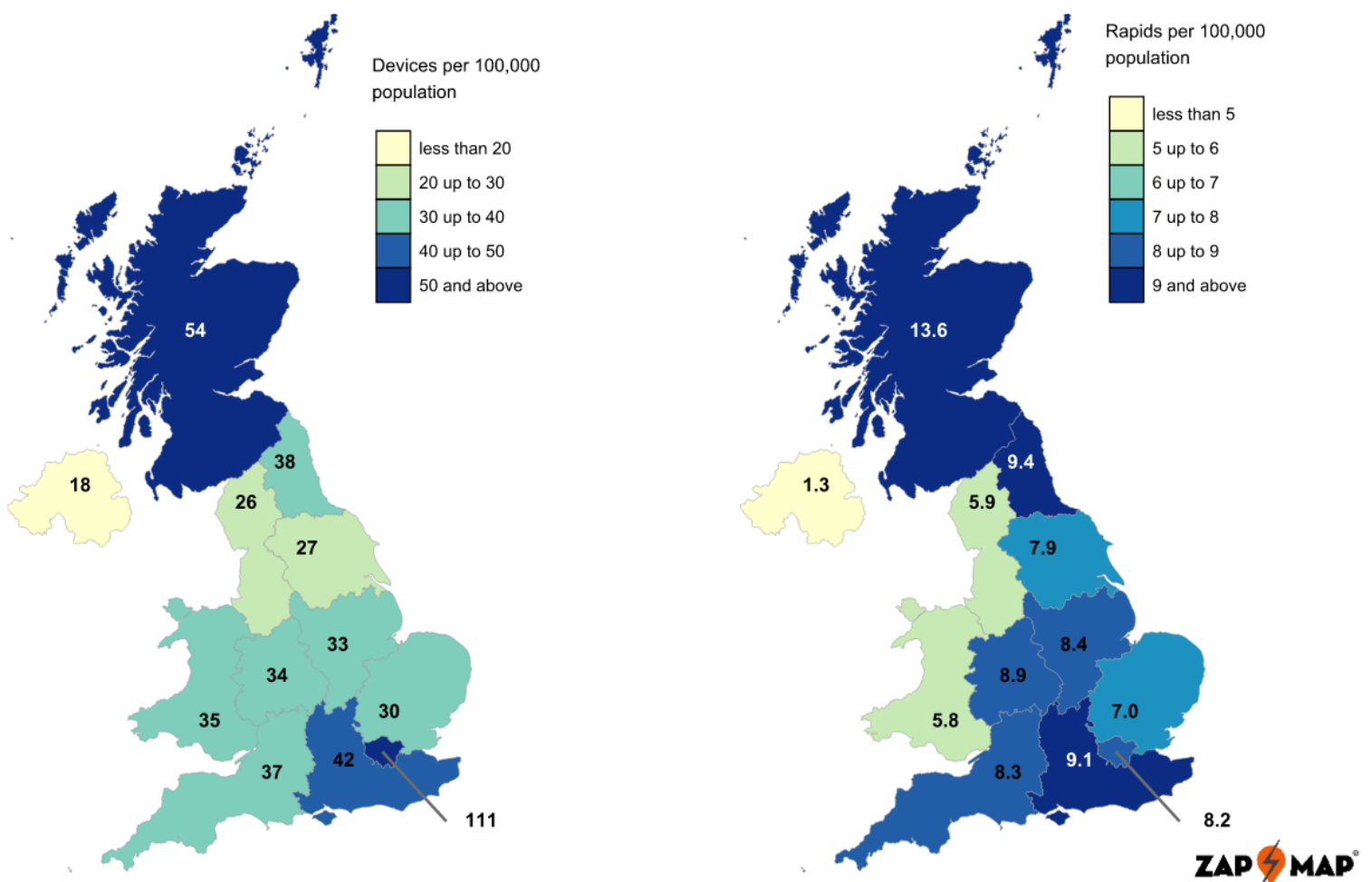
^{6,7}

⁶ <https://www.zap-map.com/ev-market-statistics/>

⁷ <https://english.rvo.nl/information/electric-transport>

- Charging stations are skewed towards London. But for widespread uptake and also to service journeys to less densely populated parts of the country, stations need to be more evenly spread out nationwide.
- The away-from-home charging experience is not ideal. Most charging stations are badly signposted and lit, creating issues with visibility and safety.
- Charging apps are not as precise as they need to be. Without accurate data, apps are struggling to keep up with live information and specific locations, leading to frustrating consumer experiences.

Maps 1 and 2: Total and rapid public charging devices per 100,000 of population by UK region | April 2022⁸



⁸ <https://www.gov.uk/government/statistics/electric-vehicle-charging-device-statistics-april-2022/electric-vehicle-charging-device-statistics-april-2022>

Public charging and access to accurate data for EV drivers: A core focus for developers

Many of these are issues that developers can help to alleviate by offering accurate and timely information to EV users, which will in turn lead to more positive consumer sentiment around EV use.

Across all respondents, there is a clear prevalence of developer projects focusing on expanding and building public EV charging infrastructure. A key focus for developers is to plan the siting of charging stations, keeping in mind the traffic routes, land usage and existing power grids.

Another equally important effort goes into creating a modern, user-friendly information and communication platform for EV adopters, such as apps informing drivers of charging point status, location, connectivity and local amenities.

- Mapping on-and off-street charging locations
- Parking locations and facilities information
- Centralising existing EV infrastructure
- Live charging and parking availability updates
- Route planning, including for delivery
- Driverless vehicle planning
- Data collection for insurance planning
- Social networking for EV drivers

“The intelligent allocation of EV-related assets, from charging points and stations, to the energy infrastructure that will support the mass rollout of EVs across countries, requires a detailed understanding of the interrelationship between surrounding infrastructure and the environment. There’s also the challenge of delivering the digital infrastructure that will support EV adopters, ultimately fostering the behavioural transition to electric over ICE vehicles. Both of these problems will require accurate and trusted geospatial data, which is where Ordnance Survey adds significant value.”

Niall Riddell, Co-Founder and CEO, Paua

David Russell, Principal Geospatial Consultant, Ordnance Survey, says:

“As we look to intelligently assess EV charging infrastructure, from on- and off-street points to larger charging stations, the democratisation of access must take precedence. EVs must be a viable option for everyone, which will require a behavioural shift, supported by accessible and user-friendly technology and infrastructure solutions. Requirements around access, and the supporting energy infrastructure, can only be assessed by understanding the unique context of a location, which is why authoritative data is so essential. With its deep experience in providing geospatial data and expertise to government departments, local authorities, the NHS, and across the private sector, Ordnance Survey’s data is the only option for supporting the sustainable revolution of transport across the nation.”

Increased demand for developers

UK efforts to reduce transport emissions has driven up the demand for EV developers.

- **87% of respondents agreed** that the EV project they worked on was spearheaded by UK Zero Emission Policy (in some cases, projects had started before the policy was announced).
- **93% of those working on user experience apps** said that this was a consequence of the policy.

Overall, a higher number of developers are involved in infrastructure projects. Of those who agreed that the Zero Emission Policy was a key driver of their EV project, 37% worked on EV infrastructure development projects, and 34% worked on EV projects related to user experience.

Between the increased demand for developers, interest in doing something positive for the world, the desire for a technical challenge and the higher remuneration attached to sustainability projects, there are a lot of reasons for developers to move into this market and ease the transition to zero emissions vehicles.

Motivations driving developer participation

Accelerate the widespread adoption and use of electric vehicles					
REASONS TO ACT NOW		PERSONAL MOTIVATIONS		COMMERCIAL MOTIVATIONS	
Need for urgency Slowing climate change requires immediate action Benefits of EVs are known and can be a proven part of the solution	Growth potential Market for EVs is set to grow at CAGR 47.2% to 2030 Early entrants can gain market advantage	Make a difference Contribute towards net-zero goals Deliver social good and be part of a bigger purpose Recognition, kudos and increased pay	Rise to challenge Use new tools and tech Extend and add skills Think outside of the box to deliver benefits Recognition and kudos for technical skills	Explore & extend Integrate your business into fast-growth EV market Add EV features for long-term relevance Benefit from government incentives	Create a startup Create a business that is 'part of the solution' Enter a growth market with low barriers to entry Be rewarded for innovation

Why choose the OS Data Hub for sustainability projects?

The combination of government policy and consumer need for high-quality digital EV products creates a significant market for developers to step in to assist in the transition. With a forecast of 10 million cars, **2.3 million charging points and £1.3 billion government spending by 2030⁹**, this is a huge market representing a significant opportunity for developers to make a difference and rise to the challenge of meeting this need.

Consumers will increasingly need accurate and reliable information to help them plan their EV journeys, and even more vitally, those responsible for planning and siting charging infrastructure need access to the highest-quality geolocation data. Ordnance Survey provides the most precise and trustworthy location data for Great Britain. By offering an exact record of the streets, buildings, land and waterways, Ordnance Survey enables developers to create best-in-class products. Here are seven ways that developers can use geospatial data from the OS Data Hub and APIs – alongside other data sources – to create the best EV products on the market.

- **Accurately mapping charging stations**, with information about traffic, energy supply, cost, routing, grid efficiency and land usage.
- **Providing live charging information**, offering live data on the status of charging stations and expanding usage to e-scooters and e-bikes.
- **Improving user experience** by providing information on the environment and local amenities close to charging points.
- **Broadcasting live parking availability** by mapping EV-designated car parking areas.
- **Offering insurance companies driving pattern data**, which can be useful for claim handling and quotation.
- **Routing last-mile delivery and food on-demand services**, including bikes and scooters.
- **Planning for driverless vehicles**, offering data to map courier and passenger drones and smart city planning.

Visit the [OS Data Hub](#) and learn more about how you can bring your solutions to life with Ordnance Survey data and APIs.