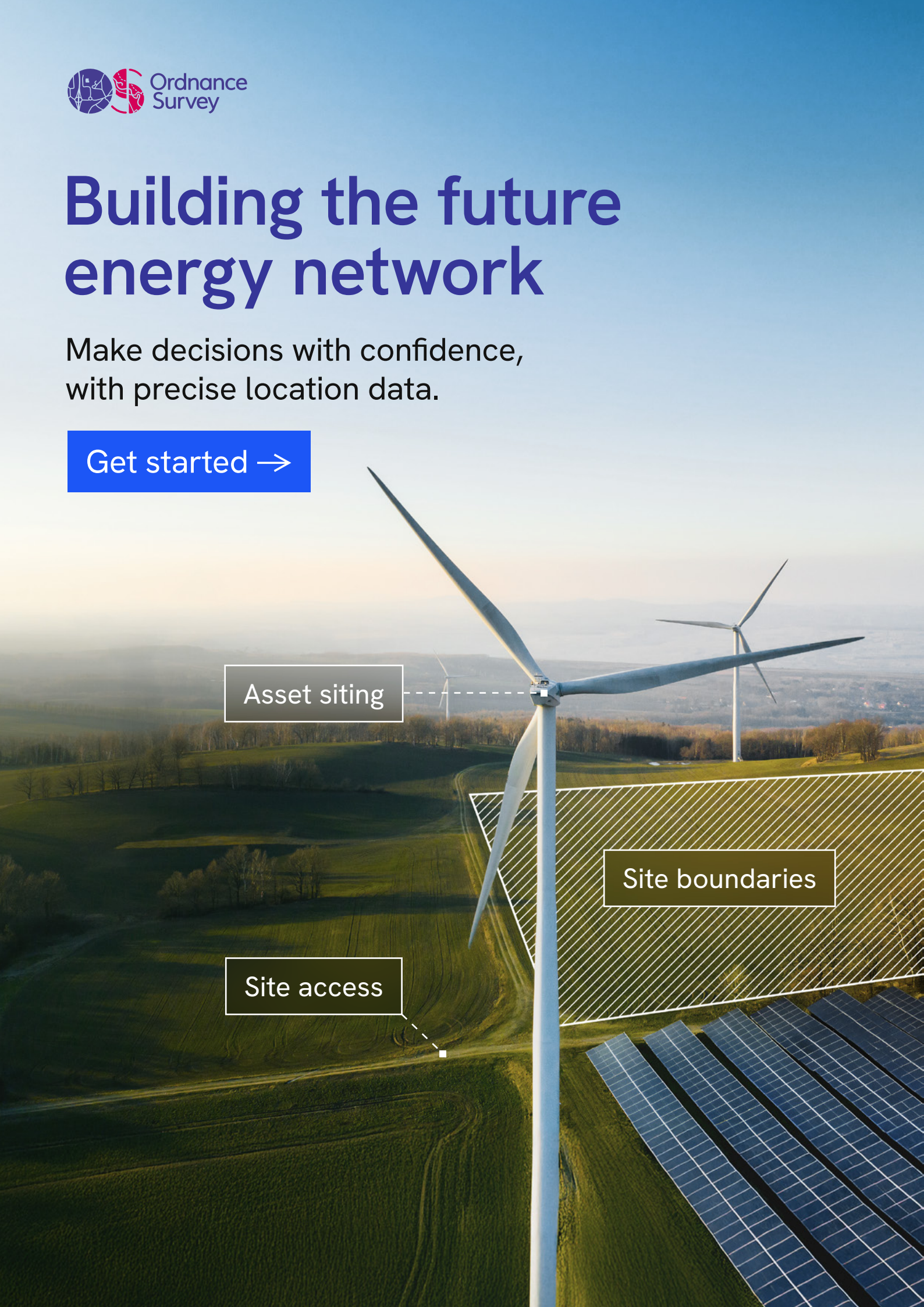
Ordnance Survey

Building the future energy network

Make decisions with confidence, with precise location data.

Get started →



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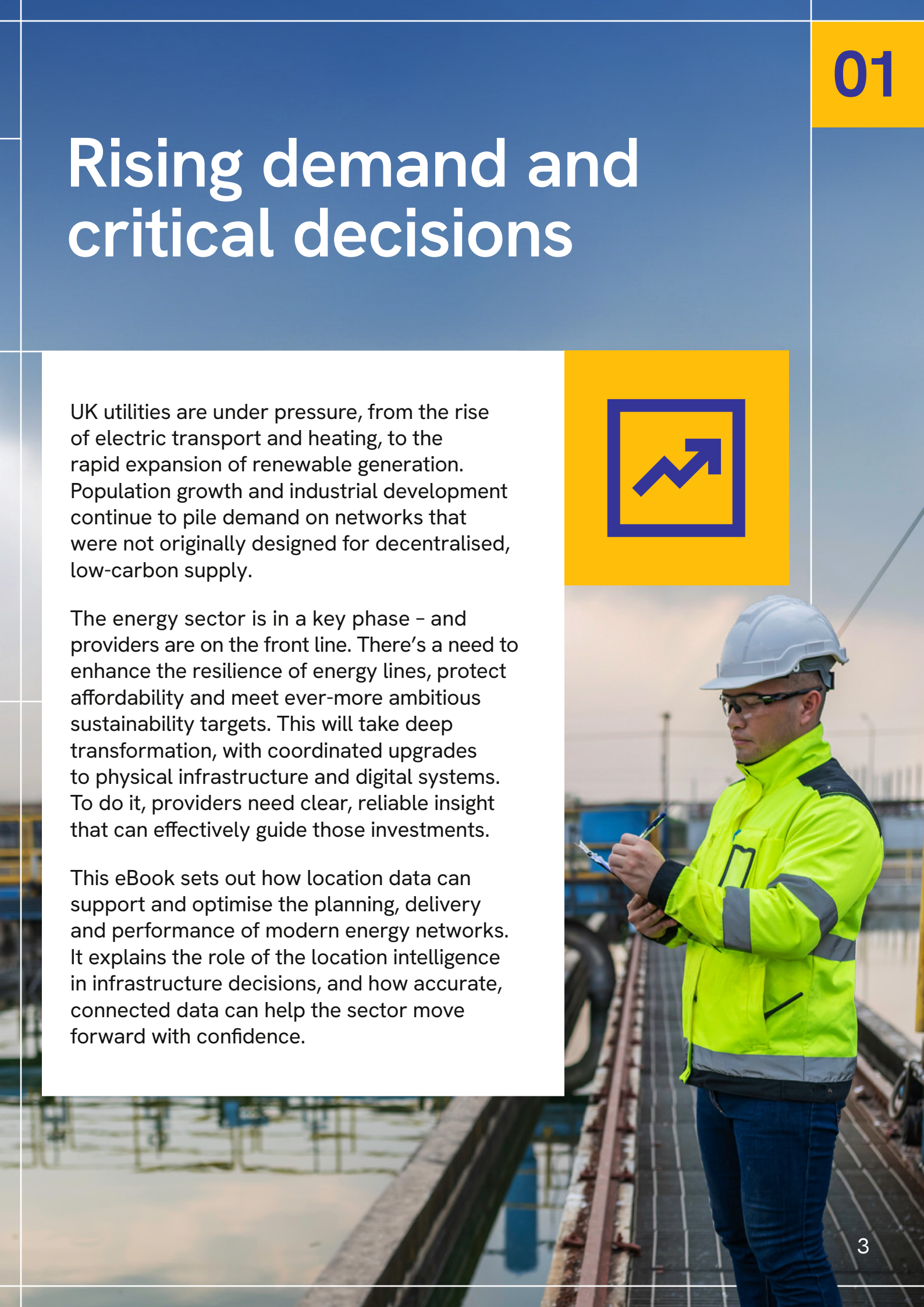
Rising demand and critical decisions

UK utilities are under pressure, from the rise of electric transport and heating, to the rapid expansion of renewable generation. Population growth and industrial development continue to pile demand on networks that were not originally designed for decentralised, low-carbon supply.

The energy sector is in a key phase – and providers are on the front line. There's a need to enhance the resilience of energy lines, protect affordability and meet ever-more ambitious sustainability targets. This will take deep transformation, with coordinated upgrades to physical infrastructure and digital systems. To do it, providers need clear, reliable insight that can effectively guide those investments.

This eBook sets out how location data can support and optimise the planning, delivery and performance of modern energy networks. It explains the role of the location intelligence in infrastructure decisions, and how accurate, connected data can help the sector move forward with confidence.



02

Balancing competing demands

The UK Government has set a target for 100% of homes to be powered by clean energy by 2030.[1]

It means network operators will need to integrate more distributed solar and wind assets into long-established grid ecosystems, creating complexity. You need scalable ways to support new housing developments and electrified transport to keep up with government housing targets. Ageing, legacy substations have to be reinforced and optimised without significantly driving up costs. And all of this must be done without damaging the UK's biodiversity.

The solution lies in data

Every one of these pressures intersects with the question of how best to understand, see, and manage the physical landscape. All infrastructure is housed on land and connected across terrain – energy demand concentrates around communities and transport nodes, while flood risk, heat exposure and environmental laws dictate what can be built and where.

Without a clear, consistent view of the geography, planning is more difficult and risks are higher. With reliable location intelligence, energy providers can align investment decisions with real-world context and maximise their opportunities.

03

Location intelligence gives you control

Every infrastructure decision requires consideration of the locations in play. Power generation assets have to be built on suitable land. Infrastructure planning must account for projected population growth and commercial developments to meet future demand.

Accurate location data fills the gaps between datasets and simplifies these decisions.
It connects asset intelligence to environmental context, enabling planners and engineers to see exactly what exists and the potential risks.

There are several essential use cases for high-quality location intelligence

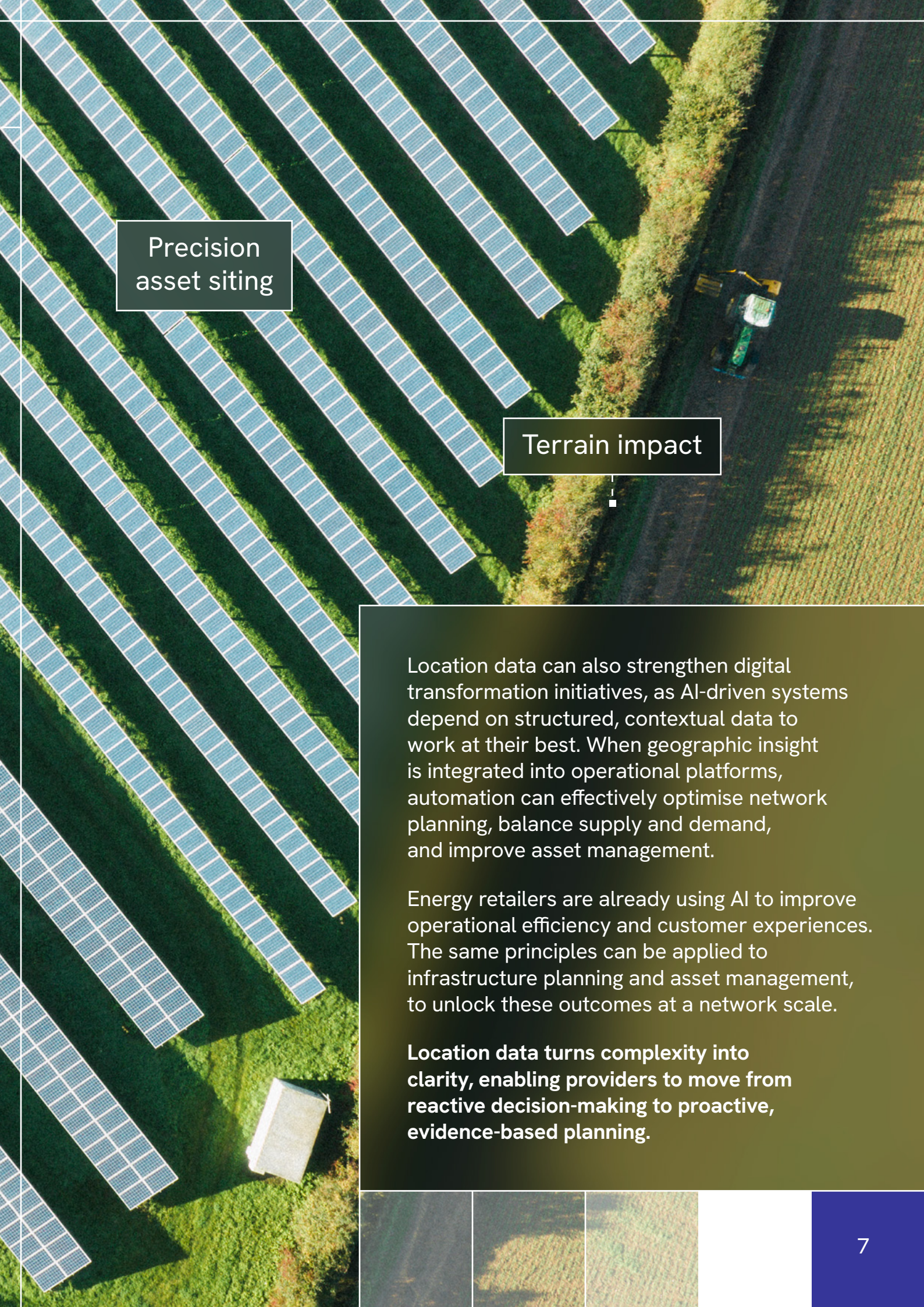
→ Infrastructure modelling and scenario planning

→ Renewable site identification and assessment

→ Demand forecasting based on development patterns

→ Risk analysis across flood, heat and environmental factors

→ Strategic regional energy planning



Location data can also strengthen digital transformation initiatives, as AI-driven systems depend on structured, contextual data to work at their best. When geographic insight is integrated into operational platforms, automation can effectively optimise network planning, balance supply and demand, and improve asset management.

Energy retailers are already using AI to improve operational efficiency and customer experiences. The same principles can be applied to infrastructure planning and asset management, to unlock these outcomes at a network scale.

Location data turns complexity into clarity, enabling providers to move from reactive decision-making to proactive, evidence-based planning.

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A closer look at the opportunity

Modernising the energy system is a case of several connected priorities: automating operations, upgrading ageing assets, accelerating decarbonisation and making environmental progress.

Location data connects these ambitions, linking physical assets to digital systems and aligning infrastructure performance to environmental context. Let's look at some of the areas where location data has the biggest impact.

Here's how:

1. Automation accuracy

By mapping infrastructure assets to geographic identifiers, it's possible to unify understanding of customer needs, and any barriers to better service. Automation can then be applied to quickly address issues, make interactions smoother and eliminate friction.

It also provides opportunities to better balance supply and demand, by incorporating real-world variables such as building density, usage patterns and network topology into models. While incorporating insights on environmental exposure (i.e. proximity to vegetation or weather exposure) and infrastructure condition enables automatic detection of issues to proactively prevent downtime. With stronger predictive models, providers can drive reliability and resilience.

What it means

A significant boost to operational efficiency, improving service stability and unlocking more competitive pricing for customers.

2. Prioritising and upgrading ageing infrastructure

Much of modern energy infrastructure isn't designed for a decentralised, renewable-led network. Location data can be used to build high-frequency, dynamic data maps, which can help energy providers to assess asset location and condition with greater precision. This accurate, real-world data can be fed into digital twin models, to enable planners to simulate upgrades, test capacity scenarios and design future-ready networks before committing investment.

Location data can also help to underpin decarbonisation projects. Insights enable upgrades to be sequenced more intelligently, to reduce disruption and the impact on customers. Improved customer experiences help to build a stronger case for cleaner energy sources.

3. Delivering sustainable and decentralised energy

Location data has a major role to play in environmental strategy. Regional energy opportunities are easier to identify when power potential, land use and infrastructure capacity are analysed as a single dataset. It's easier to map phenomena such as urban heat islands, which can be used to direct community-driven generation and micro energy initiatives.

Similarly, insight into housing patterns and off-street parking help guide EV charging deployments, ensuring investment goes to the right places.

Insight in action

Morrison Data Services (MDS) is the largest independent multi-utility metering services company in the UK. By integrating accurate addressing from Ordnance Survey[2] into intelligent routing, they overcame inaccurate and discorded address lists and inefficient meter-reading operations into optimised, data-driven workflows. The result was better routes, gains in productivity, reduced fuel costs and emissions, and improved employee wellbeing.

Rooftop solar is another opportunity[3] where OS data is already making a difference. With detailed roof attributes now available for over 40 million buildings in Great Britain – including specific insights into shape, aspect and material – it's possible to assess suitability for solar installation at previously unprecedented scale.

As Great British Energy commits significant investment to rooftop schemes across schools and hospitals, and domestic installations continue to rise, precise geographic insight will help to accelerate deployment and enhance planning.

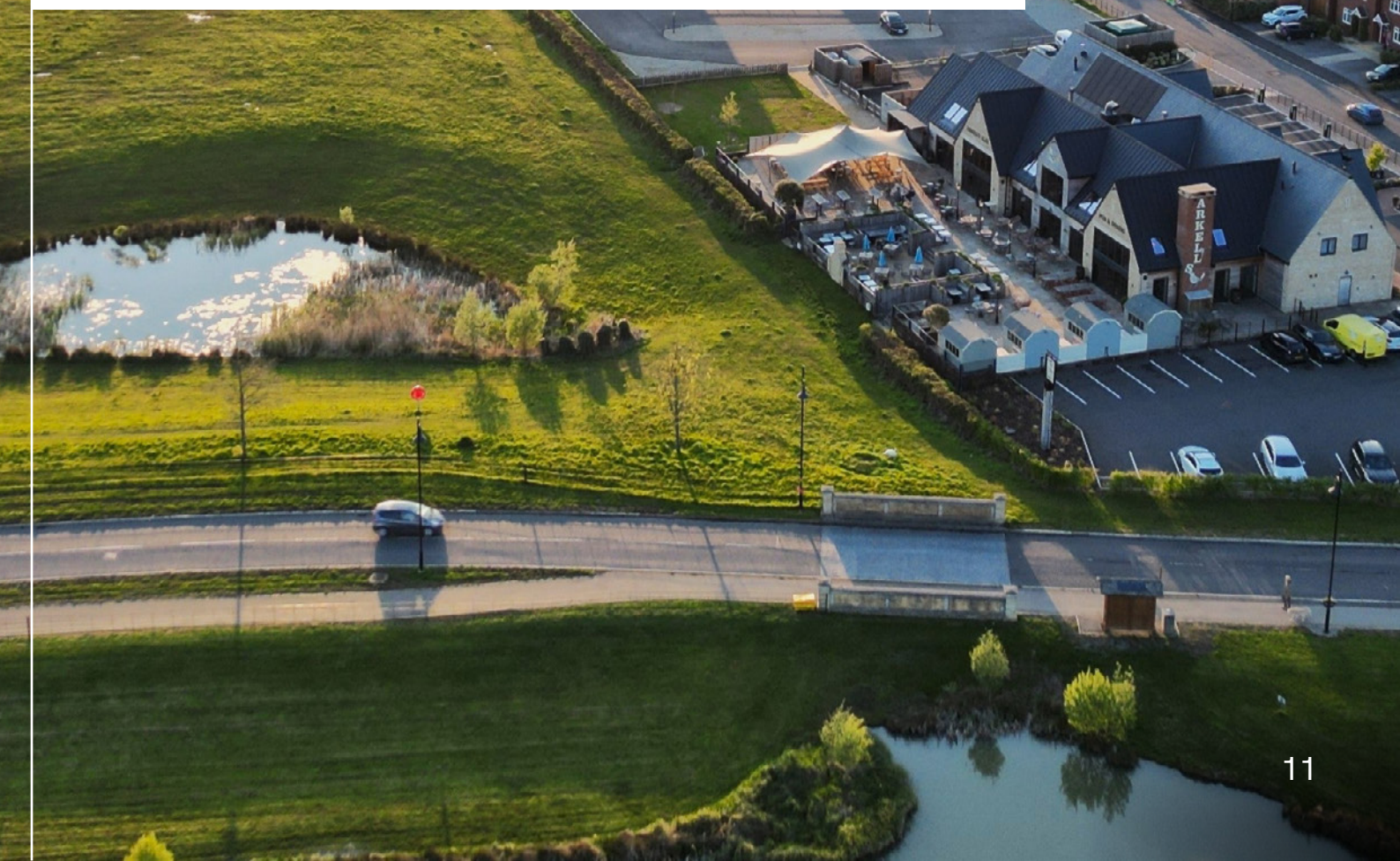
Securing affordable energy for communities

The Department of Energy and Climate Change worked with Ordnance Survey to develop the National Energy Efficiency Data-Framework (NEED), bringing together multiple datasets to inform national policy.

By assigning Unique Property Reference Numbers (UPRNs) data can be consistently cross-referenced across systems. This enabled DECC to reduce data duplication, improve collaboration and provide a robust base of base to justify and underpin policies such as the Green Deal and Energy Companies Obligation.

Better-informed decisions on insulation savings, fuel poverty and heat mapping all demonstrate the broader, compounding advantage of reliable spatial data on network and public strategy

Learn more →



05

Why energy providers rely on Ordnance Survey

The transition to a low-carbon energy system depends on modern infrastructure – digital and physical – working in unison.

From automation and predictive modelling to renewable deployment and stronger environmental stewardship, precise location data underpins decisions and leads to better commercial and social outcomes. It enables energy providers to achieve objectives faster, without compromising resilience or service quality.

OS location data provides:

- → Nationally authoritative, government-backed geographic intelligence
- → Integration-ready datasets that reduce deployment risk and cost
- → Automation-ready attributes which are updated daily
- → Detailed insight into buildings, land use, transport networks and infrastructure
- → Millions of structured data points to power modelling and analytics

As networks become more decentralised, digital and data-driven, visibility of the physical landscape where energy is generated and transported is increasingly critical. With the right geographic data foundation, modernisation becomes measurable, manageable and commercially sustainable.

Ordnance Survey

Take the next step

Explore how authoritative location intelligence and specialist support can strengthen infrastructure planning, from modelling and design through to integration and long-term optimisation, helping you build the future energy network with confidence.

Learn how OS can support →

Find out more at os.uk

Additional resources

Learn more about how OS data supports future energy →

Explore our location data products and services →

Try OS sample data for yourself →

1 https://commonslibrary.parliament.uk/research-briefings/cbp-10182

2 https://www.ordnancesurvey.co.uk/customers/case-studies/morrison-data-services-meter-reading-route-optimise

3 https://www.ordnancesurvey.co.uk/insights/supporting-the-governments-drive-for-a-rooftop-revolution