

# Manage changing demand in utilities

Meet the needs of tomorrow  
with confidence, powered by  
trusted location data.

Demand spikes

Industrial site

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# The growing challenges in utilities

Every UK utility operates in an environment of continuous change and intensifying expectations. Demand for electricity, water, and gas are growing, but also becoming more complex, less predictable and more concentrated to specific geographies. And while every utility has its own challenges, all share a need to accelerate modernisation of networks and plan ahead.

## 26–58 TWh

UK data centre energy consumption could rise to 26–58 TWh by 2045, up from approximately 7.6 TWh in 2025.<sup>1</sup>

## 3bn litres

The equivalent to 1,200 Olympic pools of water is lost each day to leaks.<sup>2</sup>

## ~9%

Up to 9% of electricity production is lost in day-to-day grid operations in the UK, with transmission and distribution (T&D) losses expected to rise to ~8.74% by 2028.<sup>3</sup>

## +18%

Increase in demand for natural gas for power compared with 23/24.<sup>4</sup>



## **Water – rising populations and ageing assets**

Population growth and housing development continue to drive water demand, particularly in urban centres. At the same time, parts of the UK water network are made up of ageing assets, increasing the risk of leakage and supply disruption.

With the sector losing billions of litres of water through leaks every day, visibility to accelerate maintenance is essential to improve customer perception and regulatory compliance.

## **Gas – maintaining reliability while transitioning to low carbon**

Gas suppliers face a dual challenge, in both maintaining consistent, reliable supply and preparing networks to accommodate biogas, hydrogen and other lower-carbon alternatives.

More visibility is essential, not only of pipelines and assets, but also how these intersect with surrounding land use, population density, environmental factors and future development plans.

## **Energy – meeting the demands of green energy**

Electrification of vehicles, heat pumps and industrial processes are creating new, structural demand pressures. At the same time, decentralised renewables are introducing more variability in supply, further complicated by the rapid growth of digital infrastructure.

Addressing these challenges demands the insight to help suppliers prioritise, invest and operate more intelligently. In this eBook, we explore the role of location data in helping water, gas and energy providers respond to growing demand – enabling smarter planning, modernisation and resilience to deliver reliable services that are fit for the future.



Population density

# The role of location data

The utilities sector is investing heavily in digitalisation, automation, AI and advanced analytics to support resilience, efficiency and growth. But success relies on quality data.

Without location data, advanced systems operate with only a partial view, lacking the contextual awareness of terrain, infrastructure, environmental risks and population dynamics.

**Location data fills in the blanks, with a definitive picture of:**

- Address data
- Building features
- Assets and infrastructure
- Land use and boundaries
- Vegetation and environmental features
- Water features and networks
- Transport networks and access routes

When data is nationally consistent and updated regularly, it removes uncertainty from operational and investment decisions.




## Bringing greater forecasting capabilities to utilities

Demand is never static – shifting with seasons, weather, urban development, behaviours, and habits. By integrating location intelligence with historical usage data and environmental insights, utilities can model and forecast change with confidence, to better target infrastructure investment and strategically plan capacity.

Maintenance is another workload where such data can have a big impact. Advanced asset mapping, combined with sensor data and automation, enables identification of risks before they lead to downtime or safety failures. Utilities can be more proactive, prioritising maintenance work based on exposure and criticality. Crews work with visibility of access limits and environmental conditions, extending asset life and driving resilience.

Location intelligence also strengthens sustainability and regulatory performance. It enables utilities to monitor emissions, track leakage, assess environmental impact and protect sensitive ecosystems. This provides the basis for transparent reporting and informed decision-making as organisations work towards net-zero.

A photograph showing two utility workers in safety gear (hard hats, high-visibility jackets) working at a large industrial pipe system. One worker is standing and pointing at a valve, while the other is kneeling and looking at a laptop. The scene is outdoors with a clear sky.

Maintenance  
access

# A closer look at the opportunity

## Enabling gas networks to ensure resilience through transition

Gas networks are tasked with maintaining reliable supply across ageing infrastructure, while preparing networks for a lower-carbon future. As domestic production gets less reliable and renewables have to be integrated at scale, visibility is key.

Location data is a foundation to connect pipelines, assets, land use, population density and environmental insight within a single framework, giving gas operators what they need to optimise performance and plan ahead.



### By integrating location data into automation systems, gas operators can:

- Predict supply fluctuations using seasonal and weather insights
- Optimise flow and reduce losses
- Improve demand forecasting by combining usage data with urban expansion patterns
- Identify risks and leaks through precise digital mapping
- Accelerate integration of hydrogen, biogas or synthetic methane
- Plan sites for new facilities using spatial analysis of pipelines, land use and environments
- Improve regulatory transparency with verifiable geospatial data

Location intelligence also strengthens incident response, helping to guide crews directly to the point of failure, reducing downtime, protecting revenue and maintaining customer confidence.

Northern Gas Networks uses OS data to automate the creation of traffic management plans for street works. By embedding accurate road geometry, speed limits and address data into the system, they can generate plans more quickly and in line with industry regulations.

This reduces the need for multiple site visits, cuts planning time and costs, and improves consistency and communication with local authorities and affected residents.

[Learn more →](#)



# Enabling proactive management in water supply

Rising demand, ageing networks, and a volatile climate all put strain on national water suppliers. Providers work under intense regulatory scrutiny, with imperatives to reduce leaks, demonstrate resilience and protect the environment.

Location data enables a shift to proactive management. By bringing together asset mapping, environmental intelligence and real-time operational data, water companies can build a comprehensive understanding of network condition, risk exposure and future demand.

## With this foundation, providers can:

- Map assets comprehensively from pipes to pumping stations
- Combine sensor data, satellite imagery, soil types and flood-risk information to identify weak points
- More accurately prioritise leak repairs to reduce water loss
- Model neighbourhood-level demand based on property type, density and weather patterns
- Plan sourcing by mapping aquifer depletion alongside agricultural, urban and environmental needs
- Build digital twins to simulate network stress and test investment scenarios



This intelligence-led approach strengthens compliance, reduces operational costs and builds long-term supply security.

Ordnance Survey (OS) supported Northumbrian Water and its partners to build a shared utilities Data Hub, allowing underground and above-ground asset information to be accessed easily through existing systems. OS helped design the data-sharing framework and ensure different GIS platforms could use the combined data seamlessly.

This supports an efficient, joined-up approach to excavation planning, reducing back-office effort, lowering the risk of utility strikes and avoiding unnecessary disruption for customers.

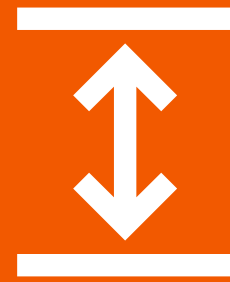
[Learn more →](#)



# Building a more resilient energy sector

Electrification of transport and heating is driving sustained growth in energy demand, while decentralised renewables are reshaping how power flows across the grid. However, much of the infrastructure supporting this transition wasn't built for the task.

To accelerate modernisation, energy providers require precise geographic insight into assets, load patterns and environmental conditions. Location data provides the contextual layer that enables smarter balancing, planning and modernisation.





### With integrated geospatial intelligence, energy providers can:

- Enable real-time monitoring and better management of voltage, load and frequency
- Create digital twins of power lines, substations, transformers and connections to better model outputs
- Improve load balancing across decentralised renewable sources
- Strengthen forecasting, combining historical energy use with population growth and weather changes
- Identify optimal sites for solar, wind and other renewable assets
- Move to predictive maintenance through precise infrastructure mapping

As electrification accelerates, location data is key to maintaining reliability, controlling costs and delivering on net-zero commitments.

Scottish and Southern Energy (SSE) uses OS MasterMap Imagery Layer to build an accurate, up-to-date visual understanding of its network, enabling detailed desk-based analysis of power lines and surrounding land. The high-quality, orthorectified imagery provides the context needed to identify risks, plan works and monitor vegetation and assets.

We enabled SSE to reduce the number of field visits and flying inspections, lower their costs, improve maintenance prioritisation and strengthen compliance - while identifying risks to poles and cables earlier and more efficiently.

[Learn more →](#)

# Tackle changing demand with confidence

Utilities cannot control the pace of electrification, the increasing volatility of climate patterns or the steady growth of population and digital demand. These forces are structural, accelerating, and external. What providers can control is the quality of the insight they use to respond.

When decisions are grounded in accurate, authoritative location intelligence, providers get clarity across assets, environments and demand patterns, and can move from reactive intervention to proactive management.

Predictive intelligence underpins true operational efficiency, by reducing wasted site visits, avoiding unnecessary disruption and optimising resource deployment. It also strengthens compliance, supporting regulatory reporting and ESG performance with verifiable, evidence-based insight.

Most importantly, it enables utilities to deliver what customers expect – reliable, high-quality service, even through periods of change.



## Why OS?

OS location data provides utilities with:

- Nationally authoritative, government-backed data
- Unmatched detail on vegetation, land cover, infrastructure and boundaries
- Ready-to-integrate datasets that reduce deployment risk and cost
- Automation-ready data, updated daily
- Millions of attributes that can be modelled and analysed at scale

## Transforming underground asset visibility

The National Underground Asset Register (NUAR) is a government digital service providing secure, instant access to a standardised map of underground pipes and cables across England, Wales and Northern Ireland.

Powered by OS location data, NUAR brings together asset information from hundreds of public and private sector organisations into a single, integrated view – transforming how buried infrastructure is installed, maintained and repaired.





### Why it matters

→ **Safer excavation:**

With around 60,000 accidental utility strikes every year, NUAR gives authorised users access to richer, more complete data - reducing the risk to workers and the public.

→ **One integrated map:**

A secure, standardised platform simplifies requests across asset owners, aligning formats into a consistent view.

→ **Faster decisions:**

Instant digital access reduces the average six-day wait for asset information, accelerating planning and on-site work.

→ **Compliance:**

A nationally recognised register supports regulatory standards and dig best practice.

# Get started

Explore how precise location intelligence can support your network. From planning and modelling through to integration and operational delivery, manage changing demand with confidence.

Find out more at [os.uk](https://os.uk)

## Additional resources

[Learn more about how OS Data supports changing demand →](#)

[Explore our location data products and services →](#)

[Try OS sample data for yourself →](#)

1 National Energy System Operator (NESO), 2025

2 House of Commons Library, Apr25

3 Reportlinker Forecast

4 NG Winter Review 24/25