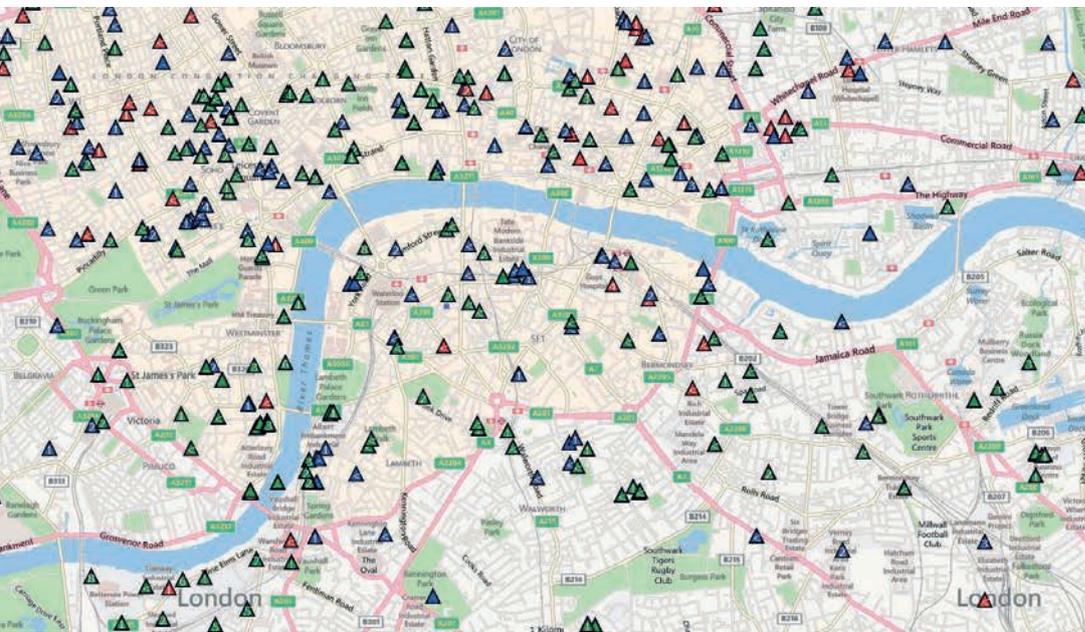


# Distribution Network Visibility Project for UK Power Networks



## Business Benefits

- Enabling proactive maintenance

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- Greater visibility of spare capacity in existing network

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- Real-time information

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- Improved network performance

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- Enabling detection of faults

## Business challenges

The main objective of the project was to demonstrate the business benefits of improved collection, utilisation and visualisation of network data, in the areas of: low carbon, asset management, planning, network operations and control.

Data sources held by UK Power Networks, such as external temperature data, asset data, fault record data, customer load referral data and connected generation data, were included in the project to enhance the business benefits.

The project was intended to inform UK Power Networks' telemetry and IT strategies to determine optimum levels of network monitoring and frequency of sampling considering specific scenarios and applications for data in UK Power Networks' OSIsoft PI system.

## How we helped

Capula developed a central repository for data from existing operational and business systems based on the OSIsoft PI System and created a series of models, analytical approaches and visualisation solutions, working with UK Power Networks and Power Planning Associates Ltd (PPA Energy), that allow raw data to be turned into meaningful operational information.

The UK Power Networks OSIsoft PI server was upgraded to PI2010 and a new PI AF/SQL/application server and web server added to the system. The AF server was populated initially with a 7-level asset hierarchy holding 200,000 individual AF elements.

After carrying out extensive market review of COTS visualisation

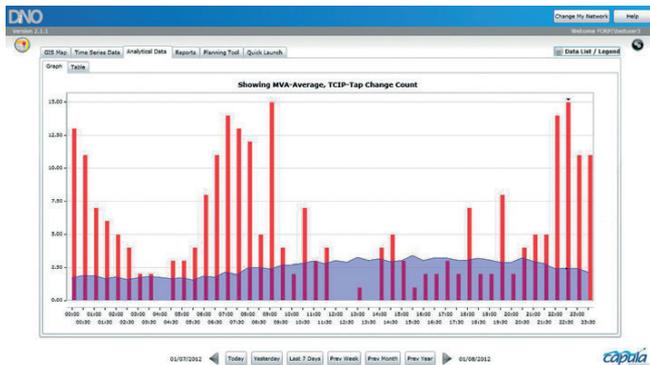


Capula developed a custom web application using MS Silverlight and benefiting from the GIS abilities of Bing Maps and the graphing features of the Visiblox charting tool to allow UK Power Networks to have greater access to and flexibility to manipulate and visualise this data.

Reporting features allow analysis of assets requiring attention and link into other areas of the application.

The development of analysis and visualisation approaches included:

- Producing a 'cleansed' version of the raw OSIsoft PI system data, since the raw data is susceptible to dropouts, spikes, flat lines etc. These data quality profiles (DQPs) were identified by a daily process and stored in a SQL database and a PI AF custom data reference then used the DQP records to provide a cleansed version of the raw data for further analysis.
- Calculating various summaries of the raw/cleansed data using collation methods such as day of week, time of day, allowing 'typical' usage patterns to be studied



This insight led to improved visibility of network performance and delivered benefits in operational performance and management. The project also helped establish optimum levels of distribution network monitoring and frequency of sampling for specific scenarios and applications.

**UK Power Networks** is a distribution network operator that maintains underground electricity cables, overhead lines and substations covering a 29,000km<sup>2</sup> area that bring electricity to homes and businesses in London, the East and South East of England.

The UK Power Networks DNV Project was part-funded by the UK Electricity Sector Regulator (OFGEM) and the UK Government Department of Energy and Climate Change (DECC) as part of its Low Carbon Network Fund (LCNF) innovation initiative.