

A new 'live wire' for UK Power Networks

UK Power Networks faced a serious challenge. It needed to quickly replace its existing Distributed Generation (DG) Mapping Tool when the current supplier was unable to provide continuing technical support. **Stephen Harper** explains how new technology helped it meet the challenge and build for the future

As a Distribution Network Operator (DNO), UK Power Networks (www.ukpowernetworks.co.uk) owns and maintains the overhead lines, underground cables and substations distributing electricity to 8.3 million customers across the East of England, London and the South-East.

The company's DG Mapping Tool allows customers operating renewable energy assets to 'see' where it would be most easy and cost-effective to connect to its electricity network.

With only 10 weeks to find a new mapping tool - and to take the opportunity to continuously improve its features and functionality - UK Power Networks conducted a rigorous tender process and chose Cartosys, the recently launched location-based services toolkit from SCISYS (www.scisys.co.uk), on which to build a replacement.

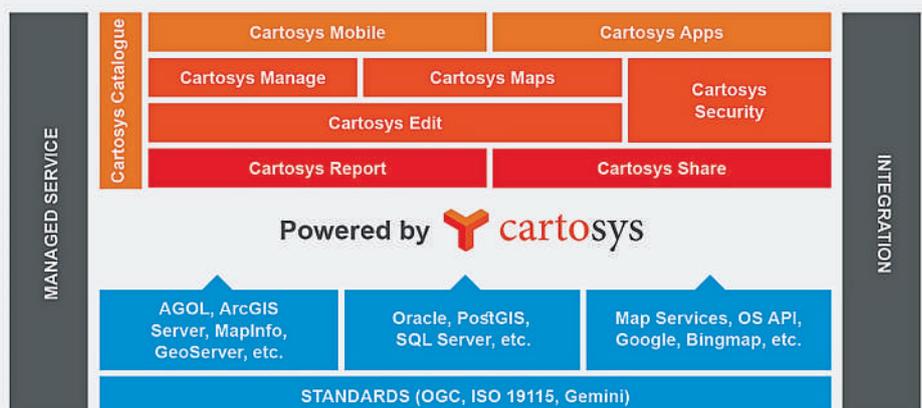
Key component

With the UK's transition to a low-carbon economy ... one that is revolutionising electricity production, distribution and consumption ... UK Power Networks' DG Mapping Tool is a key component in helping it transition from being a DNO that simply manages its electricity network, to a Distribution System Operator (DSO) that provides a smart and flexible electricity network.

"A fit-for-purpose DG Mapping Tool is imperative in helping us prepare for the future low-carbon economy. It will help to ensure that our network is able to accommodate the requirements of our customers, who we predict will be generating more and more renewable energy," explains Steve Halsey, Distributed Energy Resources Development Manager for UK Power Networks.

Consumers are already beginning to understand the benefits they can gain by managing their energy consumption through the installation of smart meters. In the coming years, more and more people will own electric and driverless cars, use smart appliances in their homes and generate, store and sell their own electricity.

UK Power Networks' transition to a DSO will mean that it provides an electricity network that accommodates two-way power



flows and enables customers to benefit from new and emerging technologies. "Our DG Mapping tool is crucial in helping our customers determine exactly where it is best for them to connect their renewable-energy assets to our network," says Halsey.

Flexible and Open architecture

The flexibility and Open architecture of the cloud-based Cartosys toolkit meant that UK Power Networks could quickly build an improved mapping tool that allowed customers to see the best connection points to its network as green, amber and red colour-coded areas.

The new UK Power Networks' DG Mapping Tool now displays complex data around the location of its assets, including its substations and overhead powerlines. This data is displayed in a simple geographical presentation that is easily accessible via a web-browser and, importantly, is easily understood by non-technical and non-specialist users.

Cartosys presents the location data as a series of dynamic map clusters allowing users to quickly and easily access large volumes of data. The capability to zoom into the map enables more detailed data to be presented.

To accommodate the vast volumes of data that can be accessed, the data clustering functionality is implemented on the server-side using GeoServer Web Process Service (WPS) capabilities. This approach helps the publication of much larger volumes of map clusters than the traditional client-side technology.

Importantly, the underlying technology of the new mapping tool can support over 80 different Geographic Information (GI) formats, including file geodatabase, ESRI Shapefile and MapInfo File.

The Cartosys toolkit also supports multiple languages. The internationalisation and localisation capability allow a single web application to offer its content in languages



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and formats tailored to the audience.

Support for Geographic Information (GI) data editing is also provided. This includes versioning data editing without the need to deploy expensive commercial products. This functionality is important as it tracks content that is changed on a data set and provides an audit of who has done what, and when. Changes can then be rejected or accepted by the authorised user.

The Mapping Tool supports various coordinate systems allowing users to display data from additional internal and external sources, without any pre-processing.

The increasing need for federation capabilities - enabling external stakeholders to connect to the Mapping Tool and use the data without the need to download it to their own servers - is also met. This ensures that external users are able to quickly access and digest the data they need.

Seamless transition

SCISYS was chosen as UK Power Network's preferred supplier because of its proven experience in rapidly deploying innovative software solutions and its ability to seamlessly transition a replacement system in a 'business as usual environment'.

In order to ensure that UK Power Network's customers continued to have access to live services during development of the replacement DG Mapping Tool, it was important that there was as little disruption as possible throughout the initial deployment.

“Close liaison with our supplier, our project manager and myself meant the implementation was 'spot on' and helped us set specific timelines. This ensured that the deployment met our very tight delivery schedule,” adds Halsey.

Initial deployment of the toolkit gave customers accessing the Mapping Tool the ability to export power from their solar panels or wind turbine renewable energy assets to the electricity network.

The open architecture and integration with UK Power Networks' back office systems, which the location-based services toolkit delivers, enabled the further development of the mapping tool.

The DG Mapping Tool now also accommodates two-way (import and export) connections and provides visibility of import availability using a similar red, amber, green arrangement. This is particularly beneficial to newer technologies such as storage and electric vehicles that utilise two-way energy flows. The stored energy will be easily transferred to and from UK Power Networks' electricity network.

“With the toolkit's Open APIs we have been able to make enhancements to the DG Mapping Tool as and when we need to,” says Halsey.

Further developments mean that UK Power Networks has real-time and, most importantly, accurate visibility of the performance of its network, the overall connections and its entire enquiry process.

“The updated DG Mapping Tool now provides a single view of our entire connection enquiry process, which is crucial in ensuring that we meet our regulatory obligations around providing consistency of quotes to our customers as they request connections to our network,” adds Halsey.

Out-of-the-box solution

Built on Open Standards, and providing integration with proven OSGeo open products (GeoNode, GeoServer, GeoGig, PostGIS), the Cartosys toolkit from SCISYS provides a single, out-of-the box solution that is quick and easy to deploy, configure and manage without the need for software coding.

The solution also offers the capability for users to configure the map display they want to see and to add overlays from different data sources stored locally or from external stakeholders.

As a Managed Service with a pay-as-you-go (PAYG) model, the toolkit offers a cost-effective, scalable, extensible, flexible and secure alternative for how organisations discover, create and share location-based data.

Organisations no longer have to deploy traditional proprietary software with the risk of vendor lock-in. Nor do they have to make large investments in implementing and integrating disparate software solutions, which is often a resource-, time- and cost-hungry route.

“The ease of configuration, integration and interaction of software components within the toolkit delivers much greater flexibility and increased speed of deployment than that delivered by bespoke development,” says Halsey, who adds, “Another important benefit of this alternative approach to deploying location-based services is that the Cartosys toolkit provides the ability to see how its different components can be reused to fit with similar business applications.”

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