Be Empowered by Data

The Future of Utilities

CGI

Digitalisation Strategy

Implementing Innovation

Data Opportunity

RIIO-2 Business Plan

cgi-group.co.uk/utilities

Data challenges in the GB electricity market

Data are at the heart of the net zero transition of the electricity system. The move towards a more intelligent electricity infrastructure is significantly increasing the amount of data available across the electricity system. What is more, all these data enable decisions to be made more intelligently in an increasingly complex system. Accurate, accessible and timely data are becoming vital to the safe and secure operation of a decarbonised energy system.

Swift transformation and the transition from DNO to DSO is driving a need to access data from a variety of sources, both existing and new. The challenge is to generate a return on investment from these ever-growing volumes of available data. This will involve aligning investment in smart assets and new data systems with the ability to generate value from the data available.

Confidence in the accuracy, completeness and timeliness of the data is crucial for utilities to make full use of the data.

The challenge is to ensure that the data can be used to create a true picture of the utilities' networks, and that decisions based on these data can be trusted.

The Energy Data Taskforce's 2019 recommendations, embedded in RIIO-2 business plan guidance from the regulator, create a need for appropriate access to data held across a multitude of systems. As part of the RIIO business plan submissions, network businesses need to publish their "Digitalisation Strategies", including how they will enable current and future users of energy system data to access, understand and challenge their digitalisation strategies.

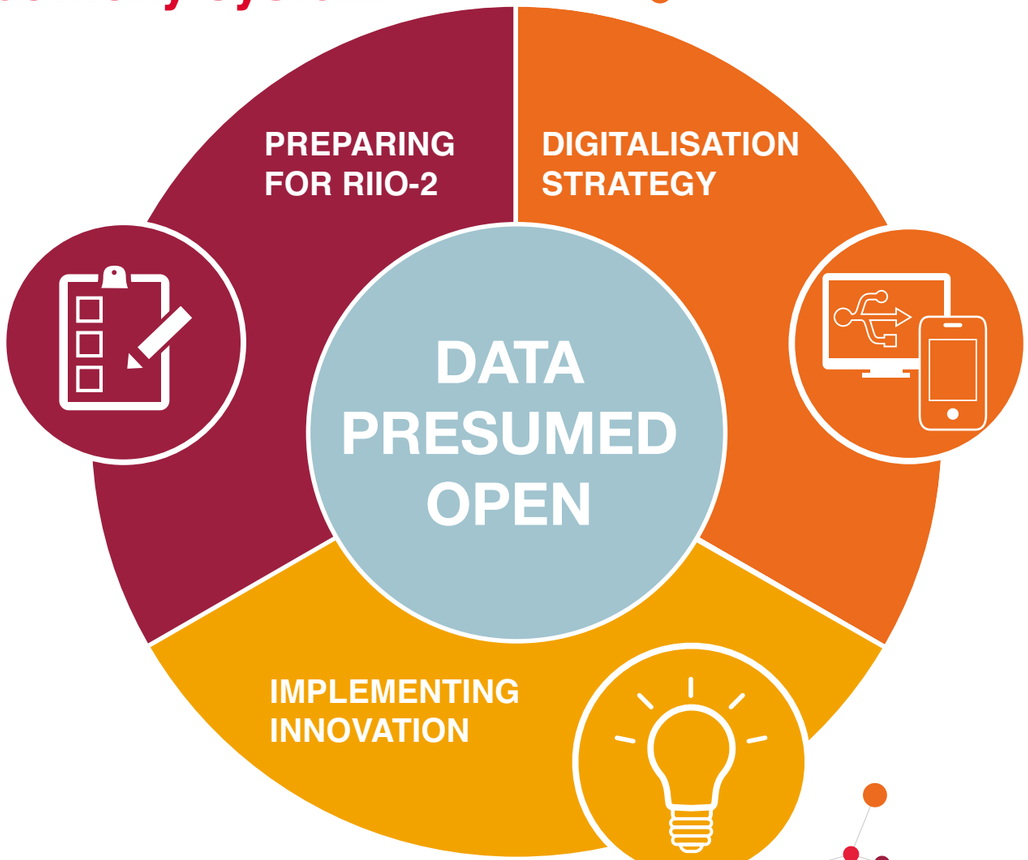
The capability to make accurate, complete and timely data accessible will not only deliver system benefits but also enhance the reputations of those companies that do it successfully.

To make sure they can meet these growing data requirements, operators must answer four key questions:

1. What are the **implications of the regulator's RIIO-2 business plan guidance** for your approach to data?
2. Does your **digitalisation strategy** support your transition from DNO to DSO?
3. What are the **benefits to your business** of improving the accuracy, completeness and timeliness of **data**?
4. What's your approach to **delivering operational benefits** from your **innovation** portfolio?

As a trusted innovation partner in the electricity sector, we have used our resources and experience to create a suite of solutions that support network operators in creating value from their data.

Putting data at the heart of the electricity system



Demonstrating success in RIIO-2

The Energy Data Taskforce's recommendations on data being presumed to be open are creating a change in mind-set and raising expectations across the sector. This requires new organisational capabilities to support and service the greater demand for access to network data. Implementing a digitalisation strategy now must address these requirements in order to provide easier access to accurate, complete and timely data. Moreover, controlled access to data, which is set to be linked to revenues in RIIO-2, will enhance business reputation.

Timely access to better data

As data increasingly become one of the most valuable assets in any business, data quality needs to be at the heart of operations, underpinned by appropriate data governance. Companies need to start regularly reviewing, inspecting and maintaining data assets with the same focus physical assets receive. The quality and integrity of data will become an intrinsic part of business operations. The management of digital assets is becoming as important as the management of physical assets.

Delivering the digitalisation strategy

The successful implementation of a digitalisation strategy will require a coherent digital model of the electricity infrastructure. This is a vital component in the transition from DNO to DSO. Implementing a digital model will: enable adoption of new systems and technologies to be accelerated; continually improve data quality; and support sharing of data in an efficient, controlled and cost-effective manner. With the right systems and processes in place to support the digitalisation strategy, network companies will be positioned to generate a return on investment from the increasing volumes of data.

Leveraging innovation to benefit customers

Businesses need to find ways to integrate the successful outcomes of innovation projects into their standard ways of operating. However, the cost of implementing innovation projects on a large scale is challenging, so very few projects have moved to business as usual. In close collaboration with the industry, CGI has created and evolved a digital model through various innovation projects, which is being adopted into business as usual. This digital model is a fundamental component in implementing an effective digitalisation strategy and facilitating the transition to DSO.

Turning your digitalisation strategy into an actionable roadmap

CGI's approach to turning a digitalisation strategy into an actionable digitalisation roadmap is helping organisations understand what they need to do, and by when, to transition from being a DNO to becoming a DSO.

Our Digitalisation Strategy Framework focuses on aligning investment in smart assets and new data systems with the ability to generate value from the data available. We work with our clients to identify, quantify and prioritise tactical (quick wins) and strategic (long-term) initiatives that maximise value for their organisation in a data-driven and customer-centric, operationally excellent environment.

For the digitalisation strategy and implementation roadmap to generate value, leaders across the organisation must understand the benefits to their parts of the company and how it addresses their business imperatives. That is why a vital element of our approach is early engagement to ensure leadership alignment across the organisation.

Implementing your roadmap

CGI's OpenGrid360 architectural framework supports utility infrastructure and system operators' end-to-end value chain. It helps our utility networks clients to transition from being a DNO to becoming a DSO by breaking down data silos and enabling data to be securely shared across OT, IT and business systems.

This data centric approach simplifies the integration of the new OT and IT components required to operate effectively as a DSO. It enables existing and new systems to coexist, allowing utility network businesses to leverage the competitive supply chain for DSO solutions. It also enables new systems to be implemented and existing components to be replaced or upgraded at the appropriate time to align investment in smart assets and new data systems with the ability to generate value from the data available.

CGI's OpenGrid360 approach facilitates the integration of existing client solutions with new, third-party systems, mitigating the risk of stranding investment in digital assets. CGI's OpenGrid360 Foundation is at the heart of the approach and is based upon CGI's OpenGrid360 Integrated Network Model (INM), developed in close collaboration with the British DNOs as part of Ofgem funded network innovation projects, is making the leap from innovation project into business as usual.

CGI OpenGrid360

Improve data accuracy, completeness and timeliness with CGI's OpenGrid360

Integrated Network Model

CGI's OpenGrid360 Integrated Network Model (INM) draws data from existing operational systems. It generates a reconciled version of the network master data to create a single view of the electricity network.

This forms the foundation of an integrated DSO systems architecture, which will facilitate the transition towards operation of the distribution system.

As new, smart systems are added to support the transition to DSO, INM acts as an innovation accelerator. It makes integration of new systems smooth, cost effective and more rapid when compared with traditional approaches that require significant effort in reconciling data across a multitude of systems.

INM also provides a mechanism to continually improve the quality of data that need sharing. Internally, this means that business decisions are made with greater confidence and better data are available across the organisation. Externally, it will safe-guard company reputation as the Energy Data Taskforce's recommendations for data to be presumed open are implemented.

CGI's OpenGrid360 Integrated Network Model is already being delivered into the Business As Usual operations of Western Power Distribution and SP Energy Networks, where CGI is building a digital model of their energy network.

Model an effective future network with DPlan

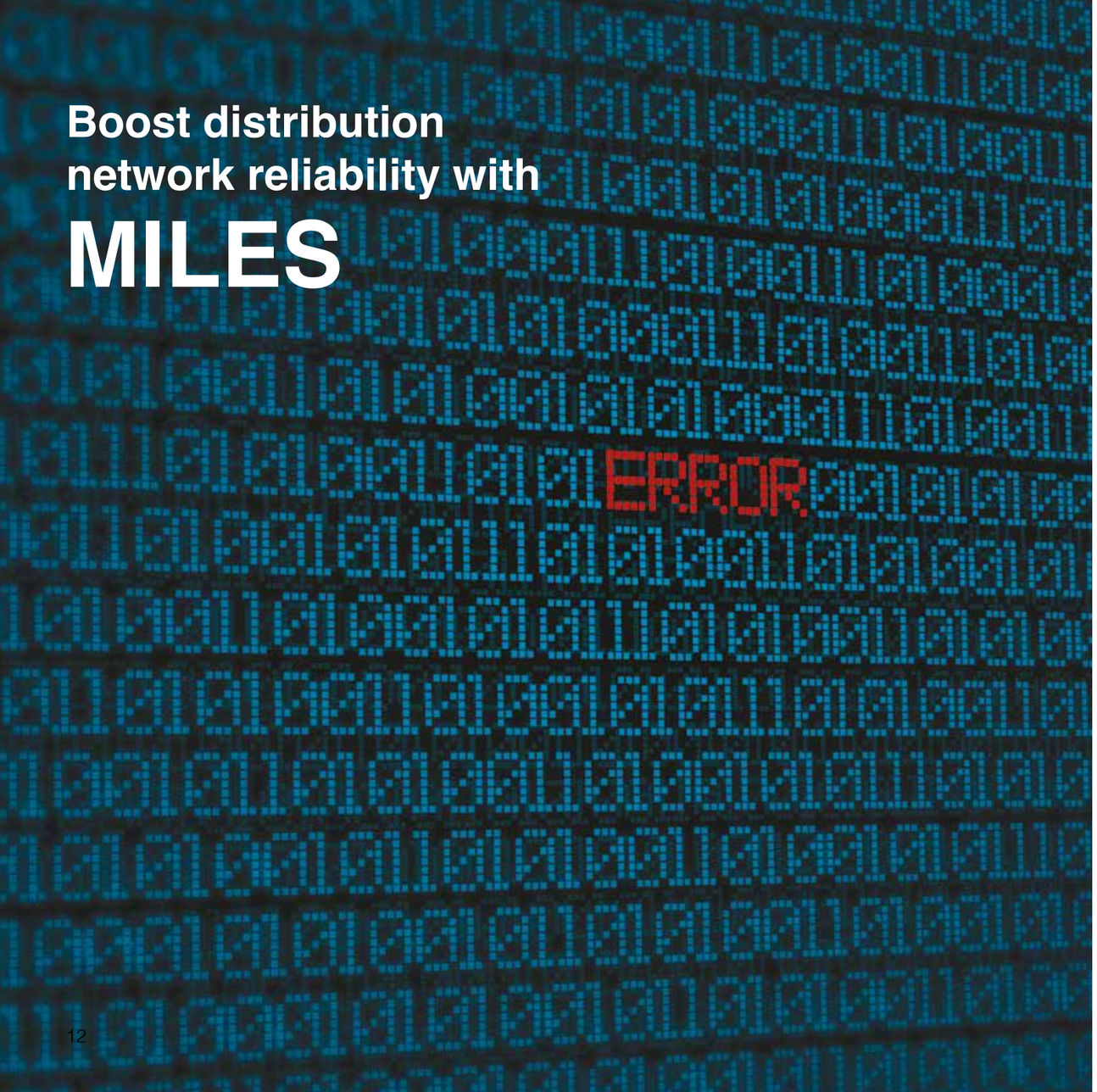
DPlan, from our partners AmberTREE, is a next generation network planning tool proven to model innovative smart grids techniques on a number of Network Innovation Competition (NIC) and Network Innovation Allowance (NIA) projects in the UK.

It bridges the gap between what legacy planning tools can achieve and the planning requirements of an infrastructure that enables a smart, flexible electricity system. Drawing on core data, it enables utilities to rapidly and easily model planning scenarios and generate accurate costs and detailed work specifications.

DPlan is particularly relevant for modelling smart grid interventions and the integration of low-carbon technologies. It helps optimise network investments, mitigate constraints and provide customer connections and reinforcements in the most cost-effective and efficient way. Basing planning decisions on a single, master set of data via CGI's OpenGrid360 Integrated Network Model enhances the productivity of any planning team and delivers consistent, reliable analysis and visualisations.

It provides a robust and easy-to-use tool for all planning needs, from investment planners to connections users, from EHV (Extra High Voltage) down to LV (Low Voltage).

Boost distribution network reliability with MILES



CGI's OpenGrid360 Integrated Network Model can provide data to support advanced analytics designed to generate new insights, recognise patterns and help operators make better business decisions by predicting events and outcomes.

MILES is CGI's advanced analytics solution, developed in collaboration with Hydro Quebec, for improving the reliability of the distribution network.

It uses a proprietary and innovative combination of sensors, voltage drop fault location algorithms and cloud computing capabilities to identify the likely cause and the precise location of both permanent and transient faults, preventing outages.

Transient faults represent up to 70 per cent of distribution system faults and often deteriorate into repetitive, unresolved outages. By identifying the location of the fault, network companies can get to the issue and restore power to their customers faster, thereby reducing customer minutes lost and improving service. This, in turn, boosts staff productivity and holds down costs, since equipment can be replaced in a much more efficient, planned way.

Leading innovation at the heart of the energy sector for over 30 years

1990

Pool system
ESIS develops central systems for the Pool

1MW
5,000 customers with peak loads greater than 1MW are able to procure energy competitively

Vesting
Privatisation begins: CEGB assets are broken up into four new companies

1999

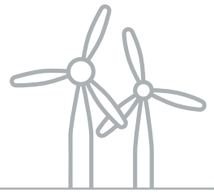
NETA
CGI secures the contract to design, build, finance and operate the systems to support NETA in England and Wales

2001

NETA
The New Electricity Trading Arrangements (NETA) go live, enabled by CGI's systems

2004

BETTA
CGI is appointed as Design Authority for the British Electricity Transmission and Trading Arrangements (BETTA)



2005

CGI Renewable Management System
Is used to monitor and control around 15GW of renewable energy production in 11 countries across three continents

BETTA
Becomes the single Great Britain electricity market of England, Wales and Scotland

2010

Low Carbon London (UKPN)
CGI becomes a partner of Low Carbon London, one of the first Ofgem LCN funded programmes

LCN Fund
The Low Carbon Network (LCN) Fund is established as part of the electricity distribution price control running until 31 March 2015

2011

Project FALCON (WPD)
CGI becomes a partner on Project FALCON, investigating how new 11KV network techniques work in practice

2014

DCC Adapter
CGI launches its DCC Adapter solution to provide connectivity to the DCC smart metering network for five of the traditional 'big six' suppliers, a network operator and a shared-resource provider

DINO (SPEN) project
CGI becomes a partner on Project DINO, utilising network characteristic data to help identify and predict faults

EMR
The Electricity Market Reform (EMR) allows the first capacity auctions for capacity delivery in 2019

2015

RIIO-ED1
Includes innovation within the network price control regime. LCNF becomes NIC (Network Innovation Competition) and NIA (Network Innovation Allowance)

2016

FUN-LV project close-down
CGI as a project partner has demonstrated the flexibility of DPlan in modelling the future network to identify trial sites, and model expected results

WPD Common Information Model NIA Project
CGI partners with WPD to create a digital model of the network to explore how data can be shared

2017

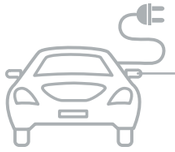
TRANSITION (SSEN)
SSEN secures electricity Network Innovation Competition (NIC) funding for its TRANSITION Project with CGI as a partner

Coal free
First coal free day in Britain since the1880's

BEIS
The Department for Business, Energy and Industrial Strategy (BEIS) publishes the 'Upgrading our energy system: smart systems and flexibility plan' policy paper

2018

Active Response (UKPN) NIC project
CGI becomes project partner on UKPN's Active Response NIC project



2019

Ofgem publishes RIIO-2 guidance
Incorporating Energy Data Taskforce recommendations

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The Future of Utilities

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About CGI

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world, helping clients achieve their goals, including becoming customer-centric digital enterprises.

CGI is a pioneer of innovative technology in the utilities sector. With 6,000 consultants around the globe, we bring decades of experience in the electricity, downstream natural gas, water and waste water sectors. We work collaboratively with our clients to create and deliver solutions to their most complex business challenges, partnering for the long term to enable them to succeed in their chosen markets.

In the UK, CGI has been a leading information technology partner on a number of innovation projects, including Low Carbon London and FALCON, making us the partner of choice to enable the DNO to DSO transition and deliver Britain's smart, flexible and sustainable energy future.

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