

## ESO RIIO-2 Business Plan Annex 7

### Glossary

1 October 2019

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This glossary supports the ESO RIIO-2 business plan to define some of the terminology, references and acronyms used throughout the documents.

Term	Acronym	Description
2050 carbon reduction target		A target to reduce carbon emissions by at least 80 per cent of 1990 levels by 2050. This is the original carbon reduction target from the UK's 2008 Climate Change Act. In June 2019, this target was revised such that the Act now requires net zero carbon emissions by 2050.
AA1000 Stakeholder Engagement Standard	SES	A recognised benchmarking framework for assessing, designing, implementing and communicating an integrated approach to stakeholder engagement.
	ADAM	Our technology partners who support application development (AD) and application maintenance (AM).
Application Programming Interfaces	API	This enables software to interact with other software either within or between companies.
Balancing Mechanism	BM	A platform used to make sure electricity supply and demand is balanced. From one hour prior to real time until the end of a settlement period, the ESO can instruct (or dispatch) parties to increase or decrease their generation or consumption.
Balancing services		Services procured by a System Operator to balance demand and supply, and to ensure the security and quality of electricity supply across the transmission system. These services include reserve, frequency control and voltage control. Each service has different parameters that a provider must meet.
Balancing Services Use of System charges	BSUoS	This charge recovers the cost of day-to-day operation of the transmission system from generators and suppliers. BSUoS charges are calculated daily, depending on the balancing actions that the ESO takes. We also provide a monthly forecast of expected BSUoS charges.
Balancing and Settlement Code	BSC	This is a legal document which defines the rules and governance for the balancing

Term	Acronym	Description
		mechanism and imbalance settlement processes of electricity in Great Britain.
Big data		Extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.
Black Start		Black Start is the procedure we use to restore power in the event of a total or partial shutdown of the national electricity transmission system.
Capacity Market	CM	Introduced by the UK Government as part of the Electricity Market Reform Programme to ensure the future security of our electricity supply. This is achieved by providing a payment for reliable sources of capacity, alongside their electricity revenues, ensuring they deliver energy when needed.
Capex		Capital expenditures are funds used by a company to acquire, upgrade, maintain and create assets such as IS systems, property, or equipment.
Carbon Capture Use and Storage	CCUS	A process by which the carbon dioxide (CO <sub>2</sub> ) produced in the combustion of fossil fuels is captured, transported to a storage location and isolated from the atmosphere.
Challenge Group		As part of Ofgem's Enhanced Stakeholder Engagement approach, they have set up an independent RII0-2 Challenge Group whose purpose is to assess, scrutinise and challenge companies' business plans in parallel to the companies' user groups.
Combined cycle gas turbine	CCGT	A power station that uses the combustion of natural gas or liquid fuel to drive a gas turbine generator to produce electricity.
Committee on Climate Change	CCC	This is an independent, statutory body established under the Climate Change Act 2008. Its purpose is to advise the UK Government and Devolved Administrations on emissions targets and report to Parliament on progress made in reducing greenhouse gas emissions and preparing for climate change.
Competitively Appointed Transmission Owner regime	CATO	In January 2018, Ofgem announced their intention to introduce competition into

Term	Acronym	Description
		onshore electricity transmission build and this is the process that grants licences based on that competitive tendering.
Competition Markets Authority	CMA	A non-ministerial government department in the United Kingdom, responsible for strengthening business competition and preventing and reducing anti-competitive activities.
Community Renewables	CR	Community Renewables scenario from <i>FES</i> . In this scenario, both the level of decentralisation and speed of decarbonisation is high. The 2050 carbon reduction target is met.
Connection and Use of System Code	CUSC	The CUSC is the contractual framework for connection to, and use of, the National Electricity Transmission System (NETS).
Connections Portal		An IT platform that serves as the single interface between the ESO and transmission connected parties.
Consumer		The end-user of the products and services we provide, including domestic households, with whom we have no direct relationships.
Consumer Evolution	CE	One of the <i>FES</i> scenarios, where the level of decentralisation are high, but the speed of decarbonisation is not. In this scenario, the 2050 carbon reduction target is not met.
Control Centre Architecture and Systems		The suite of IT tools used by the control room to monitor and balance the electricity network.
Cost benefit analysis	CBA	This is an options appraisal process, where the cost of a proposed process or action is calculated, then subtracted from the costs associated with taking that action.
Critical National Infrastructure	CNI	Assets that are considered vitally important to daily life and the economy. This includes infrastructure associated with the generation and transportation of electricity.
Customer		Organisations or individuals who pay us for the products and services we provide.
Data centre		A location used to house computer systems and associated components.

<b>Term</b>	<b>Acronym</b>	<b>Description</b>
Demand side response	DSR	A deliberate change to an energy user's natural pattern of metered electricity or gas consumption, brought about by a signal from another party.
Department for Business, Energy and Industrial Strategy	BEIS	A UK Government department with responsibilities for business, industrial strategy, science, innovation, energy, and climate change.
Design authority		The ESO design authority will give stakeholders the opportunity to inform the direction of the ESO, and provide input into the design of services and capabilities. It will also provide transparency of the decision-making process and prioritisation of investments. At a more detailed level, it will allow us to consult and engage on the experience of interacting with the ESO and invite input into key design, development and testing phases of our solutions development. It will also provide transparency of the decision-making logic behind our systems.
Digital twin		A digital twin uses software to replicate physical assets, processes, people, places, systems or devices for simulation, modelling and forecasting.
Digitisation		Process of converting information from a physical format into a digital one.
Dispatch		The operation of generation facilities to produce energy at the lowest cost to reliably serve consumers, recognising any operational limits of generation and transmission facilities.
Distribution Connection and Use of System Agreement	DCUSA	This is a multi-party contract between licensed electricity distributors, suppliers and generators in Great Britain concerned with the use of the electricity distribution system.
Distributed energy resource	DER	Resources connected to electricity distribution networks, which system operators can use to efficiently manage energy grids. These resources include flexible generation, flexible demand and storage.
Distributed generation	DG	Any generation that is connected directly to the local distribution network, as opposed to the high voltage transmission network.

<b>Term</b>	<b>Acronym</b>	<b>Description</b>
Distributed Restoration project		A three-year Ofgem funded partnership aimed to lead the way in finding a technical solution to utilising the power of distributed energy resources (DER) in a Black Start event.
Distribution Network Operator	DNO	Own and operate networks for the distribution of electricity.
Distribution System Operator	DSO	A DSO is the entity which monitors, controls and actively manages the electricity flow on the lower voltage distribution system to maintain a safe, secure and reliable electricity supply.
Embedded customers		Users connected to the distribution networks.
Enhanced Frequency Control Capability project	EFCC	Completed on 30th April 2019, National Grid Electricity System Operator (NGESO) teamed up with industry and academia in this project to find new ways to stabilise the Great Britain's (GB) electricity transmission system as the nation's energy becomes greener.
Electricity Balancing System	EBS	The EBS was implemented to replace the suite of systems used to execute the Balancing Mechanism.
Electricity Market Reform	EMR	A Government policy to incentivise investment in secure, low carbon electricity, improve the security of Great Britain's electricity supply, and improve affordability for consumers.
Electricity System Operator	ESO	An entity entrusted with transporting electric energy on a regional or national level, using fixed infrastructure. The ESO may not necessarily own the assets concerned. For example, National Grid ESO operates the electricity transmission system in Scotland, which is owned by Scottish Hydro Electricity Transmission and Scottish Power Transmission.
Energy Codes Review		A joint comprehensive review of the energy codes, by BEIS and Ofgem, to help govern the energy system. The aim of the review is to consider options for improving the existing arrangements, including scope for fundamental reform.

<b>Term</b>	<b>Acronym</b>	<b>Description</b>
Enterprise Resource Planning	ERP	The ability to deliver an integrated suite of business applications. ERP tools share a common process and data model, covering broad and deep operational end-to-end processes.
Electricity Market Reform	EMR	A government policy to incentivise investment in secure, low-carbon electricity, improve the security of Great Britain's electricity supply, and improve affordability for consumers.
Electric vehicle	EV	A vehicle driven by an electric motor. It can either be driven solely using a battery, as part of a hybrid system, or have a generator that can recharge the battery but does not drive the wheels.
ESO Board		Setup in advance of the ESO beginning to operate as a legally separate business (within the National Grid Group) from 1st April 2019, this new Board has a crucial role in overseeing the ESO as it evolves and engages in the transformation of the energy market.
ESO portal		An IT platform that serves as the single interface between the ESO and market participants.
ESO RIIO-2 Stakeholder Group	ERSG	An independently chaired group set up to scrutinise and challenge our business plan, making sure it reflects our stakeholders' priorities, as well as driving value for consumers. Its members are drawn from a cross-section of customers, service providers and public interest groups.
European network code	ENC	The Third Energy Package of European legislation created a requirement for European network codes (ENC), covering grid connections, markets, and system operation. The codes are designed to provide a sustainable, secure and competitive electricity market across Europe.
Federal Energy Regulatory Commission Form 1	FERC Form 1	This is a comprehensive financial and operating report submitted for electric rate regulation and financial audits in the United States of America.

Term	Acronym	Description
Flexible generation		Types of generation that can respond quickly to requests to change their output.
<i>Forward Plan</i>		Published each financial year, our Forward Plan describes what the ESO is planning to do to deliver benefits for our customers and stakeholders. It includes a set of criteria for our performance to be measured against.
<i>Future Energy Scenarios</i>	<i>FES</i>	The FES is a range of credible pathways for the future of energy out to 2050. They form the starting point for our transmission network and investment planning, and are used to identify future operability challenges and potential solutions.
Future Worlds consultation		A consultation on electricity networks' plans to deliver a smarter, more flexible and more decentralised energy system, launched by Energy Networks Association's Open Networks Project on August 2018.
Full time equivalent	FTE	Full time equivalent staff in employment.
Gigawatt	GW	A unit of power. 1 GW = 1,000,000,000 watts.
Gigavolt-ampere	GVA	One billion volt-ampere - the unit of apparent power.
Great Britain	GB	A geographical, social and economic grouping of countries that contains England, Scotland and Wales.
Grid Code		Specifies the technical requirements for connection to, and use of, the national electricity transmission system.
Grid Supply Point	GSP	A point at which a transmission system is connected to a distribution system.
Human factors		How humans react physically and psychologically in relation to specific environments and situations.
Inflexible generation		Types of generation that require long notice periods to change their output or have obligations that influence when they can generate.
Integrated Energy Management System	iEMS	The core control system which enables the real-time operation and monitoring of the



Term	Acronym	Description
		transmission system. It is categorised as Critical National Infrastructure.
Intermittent generation		Types of generation that can only produce electricity when their primary energy source is available. For example, wind turbines can only generate when the wind is blowing.
Intertrip		Automatic control arrangements where generation may be reduced or disconnected following a system fault.
Key performance indicator	KPI	A measure of performance.
Loss of load expectation	LOLE	Used to describe electricity security of supply. It is an approach based on probability and is measured in hours per year. It measures the risk, across the whole winter, of demand exceeding supply under normal operation. This does not mean there will be loss of supply for 3 hours per year. It gives an indication of the amount of time, across the whole winter, which the System Operator (SO) will need to call on balancing tools such as voltage reduction, maximum generation or emergency assistance from interconnectors. In most cases, loss of load would be managed without significant impact on end consumers.
Machine learning		An application of artificial intelligence that enables software solutions to automatically learn and improve.
Market platform		The Market Platform will provide a portal to participate in all our ESO balancing service markets, the Capacity Market and the Contracts for Difference (CfD) auctions. It will allow market participants to perform a range of tasks online including registration, contracting, participation in procurement events, access performance reporting and portfolio management.
Megavolt ampere reactive	MVA <sub>r</sub>	One million volt-ampere reactive, the unit of reactive power.
Megawatt	MW	A unit of power. 1 MW = 1,000,000 watts.
National Electricity Transmission System	NETS	The network and assets infrastructure that supports the electricity transmission system in

Term	Acronym	Description
		England and Wales. This consists of approximately 7,200 kilometres (4,474 miles) of overhead line, 1,500 kilometres (932 miles) of underground cable and 342 substations.
National Grid Electricity Transmission	NGET	Owns the electricity transmission network in England and Wales, helping to connect large or small energy projects.
National Infrastructure Commission	NIC	The National Infrastructure Commission, provides the government with impartial, expert advice on major long-term infrastructure challenges. National Infrastructure Commission works with HM Treasury.
Network Access Policy	NAP	National Grid Electricity Transmission's Network Access Policy is written to facilitate collaboration between the National Grid Electricity System Operator and National Grid Electricity Transmission Ltd.
<i>Network Development Roadmap</i>		Published in 2018, this report confirms the direction of travel for the Electricity System Operator's network planning activities over the next three years.
Network Innovation Allowance	NIA	This provides an annual allowance to fund innovation projects that create value for our customers.
Network Innovation Competition	NIC	An annual competition that funds flagship innovative projects to deliver financial and environmental benefits for gas customers.
<i>Network Options Assessment</i>	NOA	A process for assessing other options for reinforcing the national electricity transmission system.
New Electricity Trading Agreement	NETA	A report that summaries Ofgem's conclusions following consultation on the new electricity arrangements in England and Wales.
Non-Synchronous Generators (also called non-synchronous generation technology)	NSG	Non-synchronous generators either produce DC power (like solar PV cells, wind turbines and HDVC convertors) or their output voltage waveform phase and frequency is different from the grid frequency, therefore DC converters are needed to connect these generators to the grid.

Term	Acronym	Description
Office of Gas and Electricity Markets	Ofgem	The UK's independent National Regulatory Authority, a non-ministerial government department. Their principal objective is to protect the interests of existing and future electricity and gas consumers.
Off Shore Transmission Owner	OFTO	A transmission owner who assumes responsibility for offshore transmission assets.
Open data		Refers to the adoption of the principle that we will consider all of the data that we hold shareable, as long as it is not subject to consumer privacy, security, commercial sensitivity or negative consumer impact restrictions.
Opex		Operational expenditure which is an ongoing cost for running a product, business, or system.
<i>Our RIIO-2 Ambition</i>		Released in April 2019, this document sets out the mission for the legally separated Electricity System Operator which informs the basis of the RIIO-2 business plan.
Paris Agreement		An agreement within the United Nations Framework Convention on Climate Change, dealing with greenhouse-gas-emissions mitigation, adaptation, and finance, signed in 2016.
Pathfinder projects		Pilot projects to develop the regional options assessment process for voltage requirements focusing only on high voltage system issues.
Peer-to-peer trading		Where individuals can buy and sell energy with each other.
Platform for Ancillary Services	PAS	A web-based platform used by the ESO to dispatch ancillary services.
Power Responsive		A stakeholder led programme, facilitated by National Grid, to stimulate increased participation in different forms of flexible technology, such as demand side response and storage.
Project SIM		An innovation project led by National Grid and Reactive Technologies which measured grid stability and system inertia around the clock in

Term	Acronym	Description
Reactive demand		real time in order to help stabilise the electricity network.
RecorDER project		This represents the local need for reactive power used to facilitate the economic transfer of active power across the network by ensuring local voltage levels remain within the normal operating ranges. The voltage depends on the localised balance of reactive power supply and demand. Reactive power generation increases voltage, while reactive power absorption decreases it.
Regulatory asset value	RAV	The value of capital employed in the business.
Regional Development Programmes	RDPs	A programme set up to provide detailed analysis of areas of the network with large amounts of distributed generation and known network issues in accommodating this. RDPs adopt a whole system approach to push the boundaries of current thinking and optimise operations and investment across distribution and transmission networks.
Renewable generation		Renewable generation creates electricity from natural resources that are quickly replaced. For example: wind, solar or biomass generation.
Residual balancer		An entity with overall responsibility for ensuring that electricity supply and demand match on a second-by-second basis.
Revenue = incentives + innovation + outputs.	RIIO	Ofgem's regulatory framework that sets price controls to determine the amount network companies can earn from the services they provide.

Term	Acronym	Description
	RIIO-2	The next regulatory price control period, which starts in April 2021.
	RIIO-ED2	Price control for Electricity Distribution Network Owners, scheduled to commence in April 2023.
	RIIO-1	The current regulatory price control period, which runs from 2013 to 2021.
Rate of Change of Frequency	RoCoF	The measure of how quickly frequency changes over time.
Retail Price Index	RPI index	This is a measure of inflation published monthly by the Office for National Statistics which measures the change in the cost of a representative sample of retail goods and services.
Sandbox		The ability to rapidly trial new products. One of the lessons of the FFR auction trial is that integration with our core systems needs bespoke development and takes a long time. This option would provide a scalable means of integrating with the core systems to make trialling of new products quicker and cheaper. For example, by providing a 'trial mode' in the markets portal.
Security and Quality of Supply Standard	SQSS	A set of standards used in the planning and operation of GB's national electricity transmission system, including both onshore and offshore.
Situational awareness		The ability to monitor and understand the status of the network and evolving operational limits.
Steady Progression	SP	One of the scenarios from <i>FES</i> , where both the level of decentralisation and speed of decarbonisation is low. In this scenario, the 2050 carbon target is not met.
Stakeholder		All people, groups or organisations that either have an influence over our licence to operate or have an interest or concern in our activities.
Status quo		The state of play as is, also referred to as business as usual.

Term	Acronym	Description
Stranded assets		Capital investments that have unexpectedly become non-performing or obsolete, but must be recorded on balance sheets as loss of profit.
	STEM	Science, Technology, Engineering and Mathematics.
Synchronous Generators		Synchronous generators produce voltage waveform that is synchronised with the rotor synchronous speed and that has the same frequency as the system they are connected to (50Hz in GB). These generators are usually directly connected to the AC power system without the use of converters.
System inertia		The quality of kinetic energy stored in the rotating parts of the machines that are coupled to the power system. This relatively small store of usable energy inherently helps to regulate the balance between generation and demand.
System operability		The ability to maintain system stability and all the asset ratings and operational parameters within pre-defined limits safely, economically and sustainably.
System Operator	SO	An entity entrusted with transporting energy in the form of natural gas or electricity on a regional or national level, using fixed infrastructure. The SO may not necessarily own the assets concerned. For example, National Grid ESO operates the electricity transmission system in Scotland, which is owned by Scottish Hydro Electricity Transmission and Scottish Power.
Technology Readiness Level	TRL	This is a scale for measuring the maturity of technology, from basic research through test, launch and operations. It indicates where a system is on development lifecycle and its readiness for operational use.
Thermal needs		Where the amount of power that would flow exceeds the design rating (or capacity) of any network components for example, overhead lines, cable circuits, transformers and circuit breakers.

<b>Term</b>	<b>Acronym</b>	<b>Description</b>
Transmission Outage and Generator Availability	TOGA	National Grid's system for receiving submissions of generator availability and outage dates. The system also provides reports of transmission outages.
Total expenditure	Totex	Total cost of expenditure relating to licensees regulated activities.
Transformational activities		These are activities that go beyond business-as-usual.
Transmission Network Use of System Charges	TNUoS	Charges made by the System Operator for the use of the National Electricity Transmission System designed to cover the cost of installing and maintaining transmission system infrastructure.
Transmission Owner	TO	A collective term used to describe the three transmission asset owners within Great Britain, namely National Grid Electricity Transmission, Scottish Hydro Electric Transmission Limited and Scottish Power Transmission Limited.
Two Degrees	TW	Two Degrees scenario from <i>FES</i> , where the speed of decarbonisation is high but the level of decentralisation is low. In this scenario, the 2050 carbon target is met.
UK Climate Change Act		Launched in 2018, this act outlines the Government targets to reduce carbon emissions by the year 2050.
United Kingdom of Great Britain and Northern Ireland	UK	A geographical, social and economic grouping of countries that contains England, Scotland, Wales and Northern Ireland.
Value of Lost Load	VoLL	This is a monetary indicator expressing the costs associated with an interruption of electricity supply.
(Connections) wider works		This refers to extending network planning at distribution level to support DNOs to have effective processes.
Weighted average cost of capital	WACC	Average expected return to debt and equity investors.
Zero carbon		Achieving net zero carbon dioxide emissions by balancing carbon emissions with carbon

Term	Acronym	Description
		removal or simply eliminating carbon emissions altogether.



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