

European Electricity and Gas Network Codes - Update

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Welcome

What are the European network codes and why have they been developed?

The European network codes are intended to provide a set of harmonized rules for the operation of the gas and electricity sector in Europe. They will apply to parties operating in the European energy sector and govern all electricity and gas market transactions with a cross-border impact. The rationale for the codes is that wholesale market and network access arrangements need to be aligned across the 28 Member States if an integrated and competitive European market in electricity and gas is to emerge.

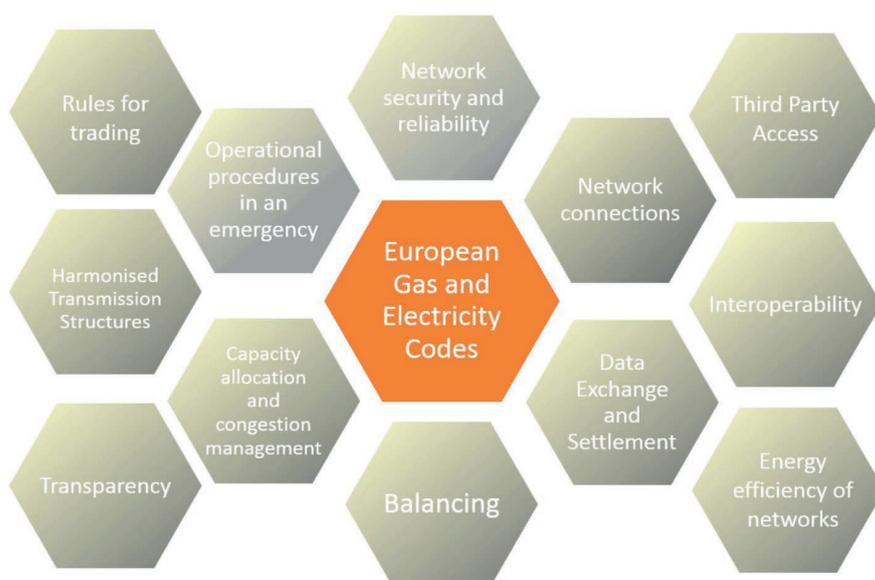


Diagram 1.

The Regulations on conditions for access to the network for cross-border exchange of electricity (EC714/2009) and to the natural gas transmission networks (EC715/2009) identified in Article 8 twelve areas that the network codes should cover across both gas and electricity which are highlighted in diagram 1.

Market Codes	System Operation Codes	Connection Codes
Capacity Allocation Mechanisms	Interoperability and Data Exchange Rules	Requirements for Generators
Congestion Management Procedures	Emergency and Restoration*	Demand Connection Code
Harmonized Transmission Tariffs	Transmission and System Operability Guideline	High Voltage and Demand Current
Gas Balancing		
The Balancing Guideline*		
Capacity Allocation and Congestion Management		
Forward Capacity Allocation		

Diagram 2.

There are twelve European Network Codes to date; eight electricity codes and four gas codes. We can broadly separate the codes out into three categories; Market Codes, System Operation Codes and Connection Codes (see diagram 2 – gas codes in grey, electricity codes in turquoise).

All codes have received a positive vote at the European Commission by the Member States and by the Parliament. However two codes are being translated into Member State languages and have not received final Member State and Parliamentary approval so have not yet entered into force. The codes still waiting to be adopted are marked with an * on diagram 2.

The UK energy industry is busy implementing these codes which will have an impact on both existing and new plant.

Gas Balancing - 312/2014

The gas markets across the EU were highly fragmented and had inefficient balancing regimes which did not enable users to exploit arbitrage opportunities and support development of wholesale markets.

This code introduced market based balancing rules and daily balancing regimes with incentives for users to balance their own positions via cost reflective imbalance charges. The code also introduced rules on TSO revenue neutrality with respect to all related costs and revenues, harmonisation of (re-)nominations procedures, within-day obligations and operational balancing between transmission systems and accurate and timely provision of information on balancing related matters.

The regime was broadly similar to the existing regime in GB so the changes required were fairly minor.

The impact on GB is minimal. More standardization of balancing regimes across the EU.

Harmonised Tariff Structures 2017/460

There are a wide range of tariff structures across the EU, which may lack objectivity and not reflect system costs. This makes using EU gas transmission networks more complex for network users, can lead to inefficient use and development of the transmission networks, and, potentially, to inefficient gas trades. This code sets out common rules on transparency of data in the charge setting process and the key aspects of charging including the methodologies for setting reserve prices, revenue recovery, payable prices, rules for storage products and interruptible charging. The ambition is to improve the efficiency of cross border gas trade and competition, which is a key objective of the Third Package. Some of the rules apply only at Interconnection Points whilst others apply at all points on the transmission networks, but there remains some flexibility in how the rules are applied.

In GB, development of the charging regime to achieve compliance with the TAR code is being progressed in parallel to the Ofgem gas transmission charging review. This is currently a hot topic as there are diverse views on how the codes should be implemented.

TAR code implantation is now being progressed through the UNC modification process.

Forward Capacity Allocation 2016/1779

The Forward Capacity Allocation (FCA) sets out the rules for calculating and buying electricity interconnector capacity in forward markets (any time before day ahead). It also sets rules for hedging price risk between bidding zones in these markets. Many of the market design aspects under FCA have already been implemented in GB, and many aspects are not addressed directly within Great Britain codes but described in Great Britain interconnector access rules. The bulk of the changes introduced by FCA are anticipated to be introduced through changes to the interconnector access rules, most crucially the

move to European Harmonised Allocation Rules (HAR). Some GB code changes to the Grid Code and Balancing Services Code (BSC) may be required; however these are not anticipated to be substantive (mainly removing inconsistencies with EU definitions). One such change to the Grid Code has been proposed in the last couple of months - GC0099.

This code is a key market enabling code for cross border future trade.

Capacity Allocation and Congestion Management- 2015/1222

The Capacity Allocation and Congestion Management Guideline (CACM) regulation lays down the rules for operating pan-European day ahead and intraday electricity markets. CACM will set out new processes for determining how interconnector capacity is calculated, network congestion is managed and the criteria and process for reviewing bidding zones. A major part of the CACM delivery is for Transmission System Operators (TSOs) and power exchanges – now formally known as Nominated Electricity Market Operators (NEMOs) – to produce proposals on the details of the market rules. CACM introduces market coupling for the intraday market, building on the day ahead market coupling which has already been implemented within GB.

Key market enabling code for cross border trade intra-day and day ahead.

Balancing Guideline 2017/draft

The Balancing Guideline aims to harmonise the electricity balancing rules and facilitate the exchange of balancing resources between European TSOs.

While other codes are largely aligned with the GB arrangements, the balancing guideline is anticipated to cause some of the bigger changes to GB arrangements. Having said that, these changes are, in many cases, in line with the general direction of travel in terms of: increasing use of demand side and renewables participation in the provision of balancing services, improving pricing signals and creating a level playing field.

The Balancing Guideline has defined a set of “Standard Products” to be exchanged using pan-European platforms. The Standard Products are: Replacement Reserves, Manual Frequency Restoration Reserves, and Automatic Frequency Restoration Reserves.

The first obligations for standard products to come into force will be for the sharing of Replacement Reserves and TSOs are currently working on the development and implementation of a platform to facilitate this through Project TERRE (Trans European Replacement Reserves Exchange). Both the Grid Code and the BSC have working groups established to look at what changes are needed – BSC P344 and Grid Code GC0097.

Creates European balancing products which are tradable cross border.

Update on the network codes – Market Arrangement Codes

Capacity Allocation Mechanism - 2017/459

The lack of equal and transparent access to gas infrastructure for market users hampers market integration. This Code requires gas grid operators to use harmonised auctions when selling access to pipelines. These auctions sell the same set of standardised (yearly, quarterly, monthly, daily, within-day) bundled capacity products at Interconnection Points at the same time and according to the same rules across the EU. This code introduced the concept of bundled capacity, whereby exit capacity from one system is sold ‘bundled’ with entry capacity to the adjacent system. However there are many existing contracts where users hold capacity on one side of an Interconnection Point to address this an amendment to CAM was adopted in March 17 which requires grid operators to develop a conversion mechanism. The same amendment also introduced rules for the allocation of incremental or new capacity. The original CAM code defined the gas day as being from 05:00 rather than 0600 as was then the case in Great Britain (GB), requiring this to be implemented across the GB system.

Significantly, redefined the gas day from 05:00 to 06:00.

Congestion Management Procedures - 2017/715

These are included for completeness since the topic is included in the original gas network access regulation (715/2009) but the rules were implemented by being incorporated into the Regulation itself rather than as a standalone code. Contractual congestion is where users cannot access capacity, due to others holding contracts for it, but capacity being physically available. This is a barrier to efficient integration of markets. These procedures are applied at Interconnection Points to facilitate the efficient use and maximisation of capacity in the networks. The procedures introduce incentivised over-subscription and buy-back scheme to allow the offer of additional firm capacity, a firm day ahead use-it-or-lose-it mechanism and a long term use-it-or-lose-it mechanism both aimed at reducing hoarding of capacity.

The procedures introduce a firm day ahead use-it-or-lose-it mechanism and a long term use-it-or-lose-it mechanism.



Update on the network codes – System Operation Codes

Interoperability and Data Exchange Rules - 2015/703

The lack of harmonisation of basic interoperability and data exchange rules can create barriers to cross border gas transport and hinder market integration. This code is quite technical in nature and mostly impacts grid operators rather than market participants. It introduces Interconnection Agreements (including default rules on e.g. flow control, measurement principles, matching processes & allocation of gas quantities, exceptional events and amendment procedures for the Interconnection Agreements); a common set of units and reference conditions to be applied; along with rules on the management of gas quality differences and monitoring of gas quality, odourisation, common data exchange solutions and dispute resolution.

Mostly technical – also includes monitoring and information provision on gas quality.

Transmission System Operator Guideline - 2016 draft

The electricity Transmission System Operator Guideline (TSOG) sets minimum system security, operational planning and frequency management standards to ensure safe and coordinated system operation across Europe, creating a standardised framework on which regional cooperation including balancing markets can be implemented. It sits alongside the emergency and restoration code, and covers operational security, operational planning and load frequency, control and reserves.

TSOG provisions are mostly based on existing system operation practiced in both GB and across Europe. Some new concepts and initiatives that will be introduced are anticipated to effect the Grid Code, the Distribution Code and the System Security and Quality of Supply Standards (SQSS).

Key changes include data exchange, synchronous area operational agreement and outage co-ordination. There is a joint Grid Code and Distribution Code working group looking at TSO implementation – GC0095. A new Grid Code change proposal – GC0106 – has also been developed to implement some data exchange specific aspects of TSO. GC106 could have big implications for

some smaller parties who are not required to provide as much data as is proposed in the modification.

Will impact on data exchange between Transmission Operators and stakeholders.

Emergency and Restoration - 2016/draft

This code deals with the procedures and remedial actions to be applied in the event of an electricity Emergency, Blackout and Restoration situation. This involves preparation of system defence, system restoration and re-synchronisation plans in advance, dealing with information exchange, procedures for operating when a system enters into one of these states and ad-hoc analysis of the incidents.

Emergency and Restoration (ER) sits alongside the TSOG which sets out harmonised rules on system operation. TSOG identifies different critical system states (normal state, alert state, emergency state, blackout state and restoration). The ER code in turn requires the development of a common set of minimum requirements and principles for the procedures and actions to be carried out specifically in the emergency, blackout and restoration states. The ER is yet to enter into force; which is expected to by winter 2017.

Will likely require Grid Code, Distribution code and Balance and Settlement Code changes to implement.



Update on the network codes – Connection Codes

Requirements for Generators 2016/1719

The purpose of the code is to bring forward a set of coherent requirements across the whole of Europe in order to drive harmonised solutions and products necessary for enhancing the electricity market. The requirements under RfG are similar to the existing Great Britain Grid Code for larger generators. For generators below 75MW-100MW there are differences; and the requirements will apply to



new generation assets as small as 800W. Assets will not be considered new, so long as they have made significant investments by May 2018.

The technical requirements in RfG are arranged in four types, A to D based on a user's connection voltage and MW capacity as shown in the illustration below (Diagram 3). Type A being a basic level of technical requirements necessary to ensure capability of generation over operational ranges and type D being requirements specific to higher voltage connected generation with an impact on entire system control and operation.

Joint working groups under the Grid Code and the Distribution Code have done significant work on implementing the RfG, however in June 2017, these working groups were largely withdrawn and the proposed changes have been repackaged. Proposed changes related to the RfG are now being processed by working groups GC0100 – GC0102.

Creates new categories of generators; Types A to D. Generators as small as 800Ws will have to be compliant.

Type	A	B	C	D
Connection Voltage	<110kV	<110	<110kV	≥110kV
Capacity	800W-0.99MW	1 – 9.99MW	10-49.99MW	≥50MW

(Diagram 3) – Latest proposal from National Grid on how to separate Types A to D.

Demand Connection Code - 2016/1388

The Demand Connection Code is seen as one of the main drivers for creating harmonised solutions and products necessary for an efficient pan-European electricity market. The requirements under DCC are similar to the existing Great Britain Grid Code for Transmission-connected Demand Units and new Distribution Systems. The code also introduces specific requirements for new equipment capable of providing Demand Side Response.

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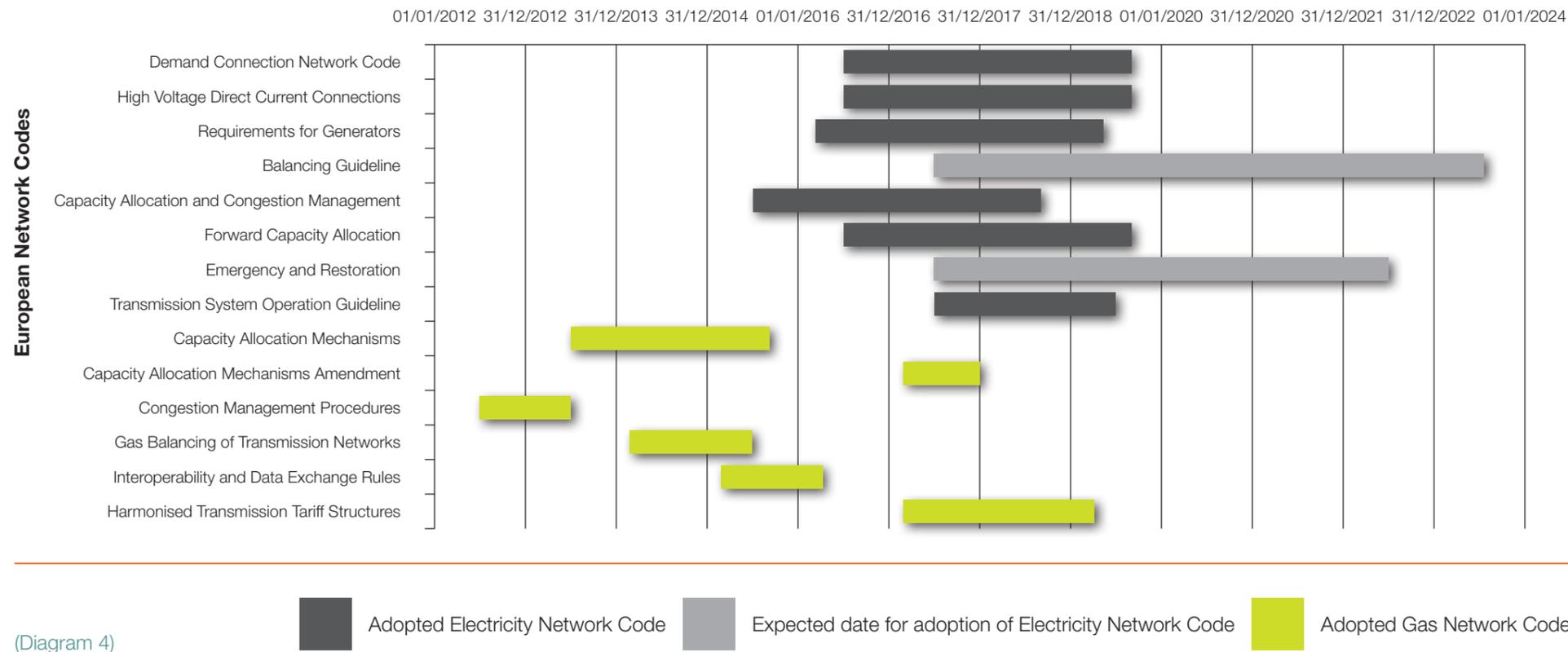
High Voltage Direct Current - 2016/1447

High Voltage Direct Current (HVDC) is seen as one of the main drivers for creating harmonised solutions and products necessary for an efficient pan-European electricity market in mainly offshore generator and interconnector technologies. The requirements under HVDC are similar to the existing Great Britain Grid Code for HVDC converters and HVDC systems. The code also introduces specific requirements for Direct Current-connected Power Park Modules.

Implementation of the European Network Codes

European Network Code Implementation

Date of adoption until requirement for Member States to implement



How to be more involved and/or get more information

In the UK, the Joint European Stakeholder Group (JESG) has been established to look at the implementation of the electricity network codes and an EU stakeholder group for the gas codes.

Monitoring the development of network codes and anticipating their outcome is an important, if challenging, task. Energy UK and its member companies are taking an active role in the development and subsequent implementation of the codes.

The content of this note has been developed based on publicly available information provided by ENTSO-E, ENTSO-G, ACER, the European Commission, National Grid and Ofgem.

Useful links are below:

- **ENTSO-E website**
<https://www.entsoe.eu/major-projects/network-code-development/Pages/default.aspx>
- **ENTSO-G website**
<https://www.entsog.eu/>
- **EC website**
http://ec.europa.eu/energy/gas_electricity/codes/codes_en.htm
- **ACER website electricity**
http://www.acer.europa.eu/Electricity/FG_and_network_codes/Pages/default.aspx
- **ACER website gas**
http://www.acer.europa.eu/en/Gas/Framework%20guidelines_and_network%20codes/Pages/default.aspx
- **JESG dedicated website**
<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/European-network-code/Joint-European-Stakeholder-Group/>
- **Ofgem/ BEIS EU Stakeholder group**
<https://www.ofgem.gov.uk/gas/wholesale-market/forums-seminars-and-working-groups/european-forums-deccbeis-and-ofgem-stakeholder-group>
- **National Grid website**
<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/European-network-code/Development-process-and-code-information/>

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