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European level legal requirements to energy data exchange

Task 5.1 Data exchange conceptual model

EU-SysFlex

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EU-SysFlex

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ABBREVIATIONS AND ACRONYMS

BUC	Business use case
CGMES	Common Grid Model Exchange Standard
DEP	Data exchange platform
DSO	Distribution system operator
EC	European Commission
ECCo SP	ENTSO-E Communication & Connectivity Service Platform
ENTSO-E	European Network of Transmission System Operators for Electricity
EU	European Union
EU-SYSFLEX	Pan-European System with an efficient coordinated use of flexibilities for the integration of a large share of Renewable Energy Sources (RES)
FSP	Flexibility service provider
SGU	Significant grid user
SUC	System use case
TSO	Transmission system operator
WP	Work package

1. INTRODUCTION

This is a public working document of the Horizon2020 project EU-SysFlex. The document summarizes the work done in subtask 5.1.5 of the task 5.1 “Data exchange model” of Work Package 5 “Data management for facilitation of new flexibility solutions”. The document will serve as one input to the task 5.1 final deliverable.

According to the DoA the outcome of task 5.1 is conceptual data exchange model for the pan-European system with descriptions, including functionalities, processes, roles and services. The model does not imply a single data exchange platform but rather allows for interoperability of different platforms across Europe.

Data regarding electricity consumption has never before been as abundantly generated as it is now in the era of Big Data and therefore can be a valuable source of information to balance supply with demand or manage network congestions. While the topic of metering data processing has been addressed and regulated, this is not the case with access and sharing (including across the borders) of end user electricity consumption data. The situation regarding collecting and processing consumption data varies across states in terms of regulation and across energy providers in terms of advancement in adoption of information technology. It is a challenge to develop a single homogenous model or a set of rules to fit all. Requirements of network codes and new market design legislation need to be considered when developing data exchange model.

The objective of subtask 5.1.5 is to understand the legal requirements regarding data access and data exchange in more general which might be facilitated inter alia by data exchange platforms (DEP). The major aim of task 5.1 is to propose a conceptual model for data exchange model in the electricity sector applicable on pan-European level. Therefore, this document identifies and summarizes relevant legal aspects related to data management and serves as background information for developing European data exchange model. Also, more specifically the attempt has been made to link these legal requirements to EU-SysFlex use cases and demonstrators.

The document does not analyse to which extent (for which use cases, for which countries, etc.) new data exchange platforms or models are needed to fulfil the legal requirements to energy data access. It therefore neither analyses the benefit of a DEP compared to other solutions or does it consider the costs or risks of such a solution. A ‘single’ or nationwide data exchange platform that routes all data is one solution but other data exchange models are also feasible, such as bi- or multilateral communication via standardized protocols. It also contains no recommendation on how to organise the governance of data access and exchange, e.g. the task might be allocated to existing actors or be performed by a new entity.

It should be noticed that data exchange is a multi-dimensional problem, i.e. there are numerous questions to be answered such as which syntax and data format to use, which use cases to serve etc. It should also be kept in mind that a new use case might involve “new data” which need to be exchanged and which therefore need to be described and structured again in order to be exchangeable between market actors.

Scope of the report is to present in a summarized way the articles associated to data management (referring to specific paragraphs). Focus is on key EU directives and regulations, including network codes and taking into account the amended texts resulting from Clean Energy Package. GDPR, eIDAS, NIS and other regulations related to data economy, cyber security and data protection will be addressed in task 5.4.

While the major content is provided in a way of a table here is some guidance how to read the document:

- The title of the article is exact text from the regulation but occasionally extensions in parenthesis have been added for better understanding of the scope of the respective article.
- The content provided is not always the full quote in order to simplify the reading by leaving out less relevant parts of the text (like references to other articles or paragraphs not focusing on data management).
- Second column of the table answers to question whether the requirements in respective article could be supported by a DEP.
- Third column includes references to EU-SysFlex data exchange system use cases (SUCs) identified and described in task 5.2 and data exchange business use cases (BUCs) to be demonstrated in Work Package 9. It refers to the BUC only if the respective article would be at least partially demonstrated.

Definition of DEP has been discussed between EU-SysFlex partners and agreed in EU-SysFlex milestone 8 report: Data exchange platform (DEP) is a communication platform the basic functionality of which is to secure data transfer (routing) from data providers (e.g. data hubs, flexibility service providers, TSOs, DSOs) to the data users (e.g. TSOs, DSOs, consumers, suppliers, energy service providers). DEP stores data related to its services (e.g. information about security logs, cryptographic hash of the data requested). The DEP does not store core energy data (e.g. meter data, grid data, market data) while these data can be stored by data hubs. Several DEPs may exist in different countries and inside one country.

2. REVIEW OF LEGAL REQUIREMENTS

Legal texts reviewed:

- Directive on Common Rules for the Internal Market in Electricity, http://data.europa.eu/eli/dir/2019/944/oj
- Regulation on the Internal Market for Electricity, http://data.europa.eu/eli/reg/2019/943/oj
- Directive on Energy Efficiency, https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1565862934624&uri=CELEX:02012L0027-20190612
- Guideline on Electricity Balancing, http://data.europa.eu/eli/reg/2017/2195/oj
- Guideline on System Operation, http://data.europa.eu/eli/reg/2017/1485/oj
- Network Code on Demand Connection, http://data.europa.eu/eli/reg/2016/1388/oj
- Network Code on Requirements for Grid Connection of Generators, http://data.europa.eu/eli/reg/2016/631/oj
- Network Code on Electricity Emergency and Restoration, http://data.europa.eu/eli/reg/2017/2196/2017-11-28
- Guideline on Capacity Allocation and Congestion Management, http://data.europa.eu/eli/reg/2015/1222/oj
- Regulation on Submission and Publication of Data in Electricity Markets, http://data.europa.eu/eli/reg/2013/543/oj

2.1 DIRECTIVE ON COMMON RULES FOR THE INTERNAL MARKET IN ELECTRICITY

	Can a DEP support fulfilling the requirement?	EU-SysFlex WP5 and WP9 use cases
Article 3 – Competitive, consumer-centred, flexible and non-discriminatory electricity markets - Paragraph 4: Member States shall ensure a level playing field where electricity undertakings are subject to transparent, proportionate and non-discriminatory rules, fees and treatment, in particular with respect to balancing responsibility, access to wholesale markets, access to data, switching processes and billing regimes and, where applicable, licensing.	DEP can ensure easy access to data and via DEP to different energy services	All SUCs and BUCs
Article 13 – Aggregation contract - Paragraph 3: Member States shall ensure that final customers are entitled to receive all relevant demand response data or data on supplied and sold electricity free of charge at least once every billing period if requested by the customer.	DEP can facilitate access to meter data from both certified meters and sub-meters	Data collection, data transfer, sub-meter SUCs. Affordable Tool BUC

	necessary for demand response	
Article 14 – Comparison tools - Paragraph 1: Member States shall ensure that at least household customers, and microenterprises with an expected yearly consumption of below 100 000 kWh, have access, free of charge, to at least one tool comparing the offers of suppliers, including offers for dynamic electricity price contracts. Tools shall be independent from market participants and ensure that electricity undertakings are given equal treatment in search results. Member States shall ensure that at least one tool covers the entire market.	Comparison tools can be connected with DEP thereby providing them necessary data and enabling consumers to find and choose between tools	SUC on list of ESCOs
Article 17 – Demand response through aggregation - Paragraph 3(c): Non-discriminatory and transparent rules and procedures for the exchange of data between market participants engaged in aggregation and other electricity undertakings that ensure easy access to data on equal and non-discriminatory terms while fully protecting commercially sensitive information and customers' personal data	DEP can ensure secure exchange of personal and commercially sensitive data between any market parties	All SUCs. Affordable Tool BUC, Flexibility Platform BUC, ENTSO-E BUC
Article 19 – Smart metering systems - Paragraph 1: In order to promote energy efficiency and to empower final customers, Member States or, where a Member State has so provided, the regulatory authority shall strongly recommend that electricity undertakings and other market participants optimise the use of electricity, inter alia, by providing energy management services, developing innovative pricing formulas, and introducing smart metering systems that are interoperable, in particular with consumer energy management systems and with smart grids, in accordance with the applicable Union data protection rules. - Paragraph 3: Member States shall ensure the interoperability of those smart metering systems, as well as their ability to provide output for consumer energy management systems. In that respect, Member States shall have due regard to the use of the relevant available standards, including those enabling interoperability, to best practices and to the importance of the development of smart grids and the development of the internal market for electricity.	DEP can link 'consumer energy management systems' to data from certified meters. DEP enables secure data exchange in accordance with data protection requirements	Data source and application integration SUCs, data collection, data transfer and sub-metering SUCs, data protection related (authentication, access permissions, security logs, data breaches). Affordable Tool BUC
Article 20 – Functionalities of smart metering systems - Paragraph (a): Validated historical consumption data shall be made easily and securely available and visualised to final	DEP can enable secure transfer of personal data, both 'validated'	Data transfer SUC, authentication SUC, access

customers on request and at no additional cost. Non-validated near real-time consumption data shall also be made easily and securely available to final customers at no additional cost, through a standardised interface or through remote access, in order to support automated energy efficiency programmes, demand response and other services. - Paragraph (b): The security of the smart metering systems and data communication shall comply with relevant Union security rules, having due regard of the best available techniques for ensuring the highest level of cybersecurity protection while bearing in mind the costs and the principle of proportionality. - Paragraph (c): The privacy of final customers and the protection of their data shall comply with relevant Union data protection and privacy rules. - Paragraph (e):If final customers request it, data on the electricity they fed into the grid and their electricity consumption data shall be made available to them, in accordance with the implementing acts adopted pursuant to Article 24, through a standardised communication interface or through remote access, or to a third party acting on their behalf, in an easily understandable format allowing them to compare offers on a like-for-like basis. - It shall be possible for final customers to retrieve their metering data or transmit them to another party at no additional cost and in accordance with their right to data portability under Union data protection rules.	and 'non-validated' data. DEP customer interface enables access to data and managing access permissions	permissions SUC. All BUCs
Article 22 – Conventional meters - Paragraph 2: Member States shall ensure that final customers are able to easily read their conventional meters, either directly or indirectly through an online interface or through another appropriate interface.	DEP can provide access to data from conventional meters similarly to smart meter data	Data collection SUC, data transfer SUC, authentication SUC. All BUCs
Article 23 – Data management - Paragraph 1: Authorities shall specify the rules on the access to data of the final customer by eligible parties in accordance with applicable Union legal framework. Data shall be understood to include metering and consumption data as well as data required for customer switching, demand response and other services. - Paragraph 2: Member States shall organise the management of data in order to ensure efficient and secure data access and exchange, as well as data protection and data security. Independently of the data management model applied in each Member State, the parties responsible for data management shall provide access to the data of the final customer to any eligible party. Eligible parties shall have the requested data at	DEP can provide in compliance to GDPR different types of data easily and simultaneously to different types of stakeholders, incl. final customers themselves.	All SUCs and BUCs

their disposal in a non-discriminatory manner and simultaneously. Access to data shall be easy and the relevant procedures for obtaining access to data shall be made publicly available. - Paragraph 3: The processing of personal data shall be carried out in accordance with Regulation (EU) 2016/679. - Paragraph 4: Competent authorities, shall authorise and certify or, where applicable, supervise the parties responsible for the data management, in order to ensure that they comply with the requirements of the Directive. Member States may decide to require that parties responsible for the data management appoint compliance officers who are to be responsible for monitoring the implementation of measures taken by those parties to ensure non-discriminatory access to data and compliance with the requirements of the Directive. - Paragraph 5: No additional costs shall be charged to final customers for access to their data or for a request to make their data available. Member States shall be responsible for setting the relevant charges for access to data by eligible parties.		
Article 24 – Interoperability requirements and procedures for access to data - Paragraph 1: In order to promote competition in the retail market and to avoid excessive administrative costs for the eligible parties, Member States shall facilitate the full interoperability of energy services within the Union. - Paragraph 2: The Commission shall adopt, by means of implementing acts, interoperability requirements and non-discriminatory and transparent procedures for access to metering data. - Paragraph 3: Member States shall ensure that electricity undertakings apply the interoperability requirements and procedures for access to metering data. Those requirements and procedures shall be based on existing national practices.	DEP can be designed in the way that different data sources and data users can be connected to this. Different DEPs should be able to communicate with each other. It makes possible cross-border data exchange respecting different countries legal restrictions	All SUCs and BUCs
Article 34 – Tasks of distribution system operators in data management - Member States shall ensure that all eligible parties have non-discriminatory access to data under clear and equal terms, in accordance with the relevant data protection rules. In Member States where smart metering systems have been deployed and where distribution system operators are involved in data management, the compliance programmes shall include specific measures in order to exclude discriminatory access to data from eligible parties. Where distribution system operators are not subject to unbundling, Member States shall take all necessary measures to ensure that vertically integrated	DEP if properly managed can ensure non-discriminatory access to data	SUCs on data transfer, access permissions, security logs, application integration. All BUCs

undertakings do not have privileged access to data for the conduct of their supply activities.		
Article 40 – Tasks of transmission system operators - Paragraph 1(l): Digitalisation of transmission systems. - Paragraph 1(m): Data management, including the development of data management systems, cybersecurity and data protection, subject to the applicable rules, and without prejudice to the competence of other authorities.	DEP can facilitate TSO tasks on data management and digitalization	All SUCs and BUCs
Article 41 – Confidentiality and transparency requirements for transmission system operators and transmission system owners - Paragraph 3: Information necessary for effective competition and the efficient functioning of the market shall be made public. That obligation shall be without prejudice to preserving the confidentiality of commercially sensitive information.	DEP can be used for transferring data for publication	SUC on data transfer. Flexibility Platform BUC

2.2 REGULATION ON THE INTERNAL MARKET FOR ELECTRICITY

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 6 – Balancing market - Paragraph 13: Transmission system operators or their delegated operators shall publish, as close to real time as possible but with a delay after delivery of no more than 30 minutes, the current system balance of their scheduling areas, the estimated imbalance prices and the estimated balancing energy prices.	DEP can be used for transferring data for publication	SUC on data transfer. Flexibility Platform BUC
Article 30 – Tasks of the ENTSO for Electricity - Paragraph 1(h): The ENTSO for Electricity shall promote the digitalisation of transmission networks including deployment of smart grids, efficient real time data acquisition and intelligent metering systems. - Paragraph 1(k): The ENTSO for Electricity shall contribute to the establishment of interoperability requirements and non-discriminatory and transparent procedures for accessing data.	DEP can facilitate TSO tasks on data management and digitalization	All SUCs and BUCs

- Paragraph 1(n): The ENTSO for Electricity shall promote cyber security and data protection in cooperation with relevant authorities and regulated entities.		
Article 50 – Provision of information - Paragraph 4: TSOs shall publish relevant data on aggregated forecast and actual demand, on availability and actual use of generation and load assets, on availability and use of the networks and interconnections, on balancing power and reserve capacity and on the availability of flexibility. For the availability and actual use of small generation and load assets, aggregated estimate data may be used. - Paragraph 5: The market participants concerned shall provide the TSOs with the relevant data. - Paragraph 6: Generation undertakings which own or operate generation assets, where at least one generation asset has an installed capacity of at least 250 MW, or which have a portfolio comprising at least 400 MW of generation assets, shall keep at the disposal of the regulatory authority, the national competition authority and the Commission, for five years all hourly data per plant that is necessary to verify all operational dispatching decisions and the bidding behaviour at power exchanges, interconnection auctions, reserve markets and over-the-counter-markets. - Paragraph 7: TSOs shall exchange regularly a set of sufficiently accurate network and load flow data in order to enable load flow calculations for each TSO in its relevant area. The same set of data shall be made available to the regulatory authorities, and to the Commission and Member States upon request.	TSOs can use DEP to receive data collected in data hubs (incl. historical data from data hubs) from different stakeholders, share theses data for publication (incl. to Transparency Platform), and exchange these data with other TSOs	SUCs on data collection, data transfer, data source integration, sub-meter data. Flexibility Platform BUC, ENTSO-E BUC
Article 55 – Tasks of the EU DSO entity - Paragraph 1(d): The tasks of the EU DSO entity shall be contributing to the digitalisation of distribution systems including deployment of smart grids and intelligent metering systems. - Paragraph 1(e): The tasks of the EU DSO entity shall be supporting the development of data management, cyber security and data protection in cooperation with relevant authorities and regulated entities.	DEP can be used to facilitate DSO tasks on data management and digitalization	All SUCs and BUCs
Article 57 – Cooperation between distribution system operators and transmission system operators - Paragraph 1: DSOs and TSOs shall cooperate with each other in planning and operating their networks. In particular, distribution system operators and transmission system	DEP can facilitate TSO-DSO cooperation	All SUCs. Flexibility Platform BUC

operators shall exchange all necessary information and data regarding, the performance of generation assets and demand side response, the daily operation of their networks and the long-term planning of network investments, with the view to ensure the cost-efficient, secure and reliable development and operation of their networks.		
Article 59 – Establishment of network codes - Paragraph 2(b): data exchange, settlement and transparency rules, including in particular rules on transfer capacities for relevant time horizons, estimates and actual values on the allocation and use of transfer capacities, forecast and actual demand of facilities and aggregation thereof including unavailability of facilities, forecast and actual generation of generation units and aggregation thereof including unavailability of units, availability and use of networks, congestion management measures and balancing market data. Rules should include ways in which the information is published, the timing of publication, the entities responsible for handling.	Potential network code in the area of data exchange could consider the relevance of DEP as a possible solution, incl. for cross-border data exchange	All SUCs and BUCs

2.3 DIRECTIVE ON ENERGY EFFICIENCY

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases

Article 9 – Metering for gas and electricity
 	
- Paragraph 2: Where, and to the extent that, Member States implement intelligent metering systems and roll out smart meters:
  ○ they shall ensure that the metering systems provide to final customers information on actual time of use and that the objectives of energy efficiency and benefits for final customers are fully taken into account when establishing the minimum functionalities of the meters and the obligations imposed on market participants;
  ○ they shall ensure the security of the smart meters and data communication, and the privacy of final customers, in compliance with relevant Union data protection and privacy legislation;
  ○ they shall ensure that if final customers request it, metering data on their electricity input and off-take is made available to them or to a third party acting on behalf of the final customer in an easily understandable
	DEP can enable consent management (access permissions), secure data exchange and access	All SUCs and BUCs

format that they can use to compare deals on a like-for-like basis.		
Article 11 – Cost of access to metering and billing information for electricity and gas - Member States shall ensure that final customers receive all their bills and billing information for energy consumption free of charge and that final customers have access to their consumption data in an appropriate way and free of charge.	DEP can provide access to consumption and billing information	Data transfer SUC. All BUCs

2.4 GUIDELINE ON ELECTRICITY BALANCING

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 11 – Confidentiality obligations - Paragraph 3: Confidential information received by the persons or regulatory authorities in the course of their duties may not be divulged to any other person or authority, without prejudice to cases covered by national law, the other provisions of this Regulation or other relevant Union legislation	DEP can enable secure data exchange. Data may be exchanged with consent of the person	Several SUCs and BUCs related to exchange of personal data
Article 12 – Publication of information - Paragraph 2: All entities shall ensure that information is published at a time and in a format that does not create an actual or potential competitive advantage or disadvantage to any individual or companies - Paragraph 3(a)-(i): TSOs shall publish the information as soon as it becomes available, incl. information on system balance, information related to individual balancing bids – volumes and prices (anonymized where necessary), aggregated information on offered and activated bids, information related to allocation of cross-zonal capacity	Through DEP stakeholders have simultaneous and non-discriminatory access to data. DEP can have its customer portal to enable access to data or forward data to other portals for publication, incl. Transparency Platform	SUCs related to flexibility processes, data transfer, aggregation, anonymization. “Flexibility Platform” BUC, “ENTSO-E” BUC
Article 15 – Cooperation with DSOs - Paragraph 1: DSOs, TSOs, balancing service providers and balance responsible parties shall cooperate in order to ensure efficient and effective balancing	DEP can facilitate coordinated TSO-DSO data exchange. DEP can facilitate easy	Flexibility baseline SUC, flexibility verification SUC. “Affordable Tool” BUC,

- Paragraph 2: Each DSO provides all necessary information to perform the imbalance settlement to the connecting TSO	access to flexibility market	"Flexibility Platform BUC"
Article 16 – Role of balancing service providers - Paragraph 1: Successful completion of the prequalification, ensured by the connecting TSO as a prerequisite for the successful completion of the qualification process to become a balancing service provider - Paragraphs 2-5: Each balancing service provider shall submit to the connecting TSO information related to its balancing bids	DEP can facilitate data exchange between FSP, market operator and system operator	Flexibility bidding SUC. "Affordable Tool" BUC, "Flexibility Platform BUC"
Article 18 – Terms and conditions related to balancing - Paragraph 4(b),(c): Allow the participation of the demand/ aggregated demand, aggregated distributed energy sources, storage to balancing (be balancing service provider) - Paragraph 5(d),(f),(g): Requirement on data for DSO-connected reserves should be defined in terms and condition of BSP (Terms and conditions of balancing service provider should contain the requirements on data and information to be delivered to the connecting TSO and where relevant the reserve connecting DSO during prequalification and operation; the requirements on data and information to be delivered to the connecting TSO and where relevant the reserve connecting DSO to evaluate the provision of balancing services and to calculate imbalance; the definition of a location for each product) - Paragraph 6(d): Requirement on data and information to be delivered to the connecting TSO to calculate the imbalance is defined in terms and condition of BRP	Through DEP all technologies providing flexibility can provide and receive data necessary to participate in the flexibility market	Flexibility bidding SUC, flexibility activation SUC, flexibility baseline SUC, flexibility verification SUC. "Flexibility Platform" BUC
Article 19 – European platform for the exchange of balancing energy from replacement reserves - Paragraph 2: Shall consist of at least the activation optimisation function and the TSO-TSO settlement function - Paragraph 5(a),(b): Submit and exchange all balancing energy bids from all standard products for replacement reserves	DEP can be used to integrate different market platforms	n/a
Article 20 – European platform for the exchange of balancing energy from frequency restoration reserves with manual activation - Paragraph 2: Shall consist of at least the activation optimisation function and the TSO-TSO settlement function	DEP can be used to integrate different market platforms	DEP shall be used to exchange data with Baltic mFRR platform CoBA (analogue to 'MARI') in

- Paragraph 6(a),(b): Submit and exchange all balancing energy bids from all standard products for frequency restoration reserves with manual activation -		"Flexibility Platform"BUC
Article 21 – European platform for the exchange of balancing energy from frequency restoration reserves with automatic activation - Paragraph 2: Shall consist of at least the activation optimisation function and the TSO-TSO settlement function - Paragraph 6(a),(b): Submit and exchange all balancing energy bids from all standard products for frequency restoration reserves with automatic activation -	DEP can be used to integrate different market platforms	n/a
Article 22 – European platform for imbalance netting process - Paragraph 2: Shall consist of at least the imbalance netting process function and the TSO-TSO settlement function - Paragraph 5: For TSOs performing the automatic frequency restoration process; at least for the Continental Europe synchronous area	DEP can be used to integrate different market platforms	n/a
Article 27 – Conversion of bids in a central dispatching model - Paragraph 2: TSOs to use bids to provide balancing services to other TSOs	Bids can be forwarded (e.g. to a flexibility platform) via DEP	Flexibility bidding SUC. "Flexibility Platform" BUC

2.5 GUIDELINE ON SYSTEM OPERATION

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 12 – Confidentiality obligations - Paragraph 3: Confidential information received by the persons or regulatory authorities in the course of their duties may not be divulged to any other person or authority, without prejudice to cases covered by national law, the other provisions of this Regulation or other relevant Union legislation.	DEP can enable secure data exchange. Data may be exchanged with consent of the person	Several SUCs and BUCs related to exchange of personal data
Article 40 – Organisation, roles, responsibilities and quality of data exchange	DEP can be used for data	Data transfer SUC, sub-meter

- Paragraph 1: The exchange and provision of data and information shall reflect, to the extent possible, the real and forecasted situation of the transmission system - Paragraph 3: TSOs shall gather the following information about its observability area and shall exchange this data with all other TSOs to the extent that it is necessary for carrying out the operational security analysis in accordance with Article 72: (a) generation; (b) consumption; c) schedules; (d) balance positions; (e) planned outages and substation topologies; and (f) forecasts - Paragraph 6: TSOs shall jointly agree on key organisational requirements, roles and responsibilities (KORRR) in relation to exchange of structural data, scheduling and forecast data, real-time data between TSOs, DSOs and SGUs, incl. frequency of information exchange, format for the reporting of the data and information - Paragraph 9: Each TSO shall agree with the relevant DSOs on processes for providing and managing data exchanges between them, including the provision of data related to distribution systems and SGUs	exchanges between TSOs, DSOs and SGUs	data SUC, DER-SCADA data exchange SUC. "ENTSO-E" BUC, "Flexibility Platform" BUC
Article 41 – Structural and forecast data exchange (between TSOs) - Paragraph 1: Structural data to be exchanged between neighbouring TSOs includes topology of substations, technical data on transmission lines, technical data on transformers connecting the DSOs and SGUs, maximum and minimum active and reactive power of SGUs which are power generating modules, etc - Paragraphs 3-4: Data exchange necessary to coordinate operational security analysis and to establish the common grid model, to coordinate the dynamic stability assessments	Addressed in ENTSO-E's ECCo SP DEP but same data could be forwarded from ECCo SP to other DEP to facilitate access to data by third parties	Interoperability of two DEPs to be demonstrated in "ENTSO-E" BUC
Article 42 – Real-time data exchange (between TSOs) - Paragraph 1: TSOs of the same synchronous area exchange the following data on the system state of its transmission system using the IT tool for real-time data exchange at pan-European level as provided by ENTSO-E: frequency, frequency restoration control error, measured active power interchanges between LFC areas, aggregated generation infeed, system state, etc - Paragraph 2:TSOs in the same observability area exchange the following data about its transmission system using SCADA systems and energy management systems: actual substation topology, active and reactive power, etc	Addressed in ENTSO-E ECCo SP DEP and in SCADA-to-SCADA data exchange but same data could be forwarded from ECCo SP and SCADA to other DEP to facilitate access to data	Interoperability of two DEPs to be demonstrated in "ENTSO-E" BUC
Article 43 – Structural data exchange (between TSOs and DSOs)	DEP can be used for data	n/a

- Paragraphs 1-2: Applies to transmission-connected DSOs in the TSO observability area and to non-transmission-connected distribution system which has a significant influence in terms of voltage, power flows or other electrical parameters - Paragraph 3: Structural information provided by DSO to the TSO includes: substations by voltage, lines that connect the substations, transformers from the substations, SGUs, reactors and capacitors connected to the substations	exchanges between TSOs and DSOs, would facilitate access to the same data by third parties	
Article 44 – Real-time data exchange (between TSOs and DSOs) - DSO shall provide its TSO, in real-time, the information related to the observability area of the TSO, including: actual substation topology, active and reactive power, best available data for aggregated generation per primary energy source in the DSO area, the best available data for aggregated demand in the DSO area, etc	DEP can be used for data exchanges between TSOs and DSOs, would facilitate access to the same data by third parties. Applicability of DEP for TSO-DSO real-time data exchanges needs to be studied further	n/a
Article 45 – Structural data exchange (between TSOs and SGUs, line owners) - Paragraphs 1-5: Applies to SGUs which are power generating facility owners of a type B, C and D power generating module connected to the transmission system, AC interconnector owners, HVDC system owners and interconnector owners - Paragraphs 1-2: Data to be provided by generators includes: general data of the power generating module (including installed capacity and primary energy source), FCR, FRR and RR data, protection data, reactive power control capability, etc	DEP can be used for data exchanges between TSOs and SGUs, would facilitate access to the same data by third parties and would facilitate data provision by SGUs	Flexibility bidding (incl. prequalification) SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC
Article 46 – Scheduled data exchange (between TSOs and SGUs, line owners) - Paragraph 1: Type B, C and D power generating module owner connected to the transmission system shall provide the TSO with at least the following data: active power output and active power reserves amount and availability, on a day-ahead and intra-day basis; scheduled unavailability or active power restriction; forecasted restriction in the reactive power control capability - Paragraph 2: HVDC system operator shall provide the TSOs with at least the following data: active power schedule and	DEP can be used for data exchanges between TSOs and SGUs, would facilitate access to same data by third parties and would facilitate data provision by SGUs	Flexibility bidding SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC

availability on a day-ahead and intra-day basis; scheduled unavailability or active power restriction; forecast restriction in the reactive power or voltage control capability - Paragraph 3: AC interconnector and line operators shall provide scheduled unavailability or active power restriction data to the TSOs		
Article 47 – Real-time data exchange (between TSOs and SGUs, line owners) - Paragraph 1: Type B, C or D power generating module owner shall provide the TSO, in real-time, at least the following data: position of the circuit breakers, active and reactive power, in case of power generating facility with consumption other than auxiliary consumption net active and reactive power - Paragraph 2: HVDC system or AC interconnector owner shall provide, in real-time, at least the following data to the TSOs: position of the circuit breakers, operational status, active and reactive power	DEP can be used for data exchanges between TSOs and SGUs, would facilitate access to the same data by third parties and would facilitate data provision by SGUs. Applicability of DEP for TSO-DSO real-time data exchanges needs to be studied further	DER-SCADA data exchange SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC
Article 48 – Structural data exchange (between TSOs, DSOs and distribution-connected power generating modules) - Paragraph 1: Power generating facility owner of a power generating module which is a SGU and by aggregation of the SGUs connected to the distribution system shall provide at least the following data to the TSO and to the DSO to which it has a connection point: general data of the power generating module, including installed capacity and primary energy source or fuel type; FCR, FRR and RR data; protection data; reactive power control capability; capability of remote access to the circuit breaker; data necessary for performing dynamic simulation; voltage level and location of each power generating module	DEP can be used for data exchanges between TSOs, DSOs and SGUs, would facilitate access to same data by third parties and would facilitate data provision by SGUs	Flexibility bidding (incl. prequalification) SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC
Article 49 – Scheduled data exchange (between TSOs, DSOs and distribution-connected power generating modules) - Power generating facility owner of a power generating module which is a SGU connected to the distribution system shall provide the TSO and the DSO to which it has the connection point, with at least the following data: its scheduled unavailability, scheduled active power restriction and its forecasted scheduled active power output at the connection	DEP can be used for data exchanges between TSOs, DSOs and SGUs, would facilitate access to same data by third parties and would	Flexibility bidding SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC

point; any forecasted restriction in the reactive power control capability	facilitate data provision by SGUs	
Article 50 – Real-time data exchange (between TSOs, DSOs and distribution-connected power generating modules) - Paragraph 1: Power generating facility owner of a power generating module which is a SGU connected to the distribution system shall provide the TSO and the DSO to which it has the connection point, in real-time, at least the following data: status of the switching devices and circuit breakers at the connection point; active and reactive power flows, current, and voltage at the connection point. - Paragraph 2: Each TSO shall define in coordination with the responsible DSOs which SGUs may be exempted from providing the real-time data. In such cases, the responsible TSOs and DSOs shall agree on the aggregated real-time data of the SGUs concerned to be delivered to the TSO.	DEP can be used for data exchanges between TSOs, DSOs and SGUs, would facilitate access to same data by third parties and would facilitate data provision by SGUs	DER-SCADA data exchange SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC
Article 51 – Data exchange between TSOs and DSOs concerning significant power generating modules - Paragraph 1: Each DSO shall provide to its TSO the information specified in Articles 48, 49 and 50 with the frequency and level of detail requested by the TSO. - Paragraph 2: Each TSO shall make available to the DSO, to whose distribution system SGUs are connected, the information specified in Articles 48, 49 and 50 as requested by the DSO. - Paragraph 3: A TSO may request further data from a power generating facility owner of a power generating module which is a SGU connected to the distribution system, if it is necessary for the operational security analysis and for the validation of models.	DEP can be used for data exchanges between TSOs, DSOs and SGUs, would facilitate access to same data by third parties and would facilitate data provision by SGUs	Flexibility bidding (incl. prequalification) SUC, DER-SCADA data exchange SUC, data transfer SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC
Article 52 – Data exchange between TSOs and transmission-connected demand facilities - Paragraph 1: Transmission-connected demand facility owner shall provide the following structural data to the TSO: electrical data of the transformers connected to the transmission system; characteristics of the load of the demand facility; characteristics of the reactive power control. - Paragraph 2: Transmission-connected demand facility owner shall provide the following data to the TSO: scheduled active and forecasted reactive power consumption on a day-ahead and intraday basis, including any changes of those schedules or forecast; any forecasted restriction in the reactive power	DEP can be used for data exchanges between TSOs and demand facility, would facilitate access to same data by third parties and would facilitate data provision by demand facilities	Flexibility bidding (incl. prequalification) SUC, DER-SCADA data exchange SUC, data transfer SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC, "ENTSO-E" BUC

control capability; in case of participation in demand response, a schedule of its structural minimum and maximum power range to be curtailed. - Paragraph 3: Transmission-connected demand facility owner shall provide the following data to the TSO in real-time: active and reactive power at the connection point; the minimum and maximum power range to be curtailed. - Paragraph 4: Each transmission-connected demand facility owner shall describe to its TSO its behaviour at the voltage ranges referred to in Article 27.		
Article 53 – Data exchange between TSOs and distribution-connected demand facilities or third parties participating in demand response - Paragraph 1: SGU which is a distribution-connected demand facility and which participates in demand response other than through a third party shall provide the following scheduled and real-time data to the TSO and to the DSO: structural minimum and maximum active power available for demand response and the maximum and minimum duration of any potential usage of this power for demand response; a forecast of unrestricted active power available for demand response and any planned demand response; real-time active and reactive power at the connection point; a confirmation that the estimations of the actual values of demand response are applied. - Paragraph 2: SGU which is a third party participating in demand response shall provide the TSO and the DSO at the day-ahead and close to real-time and on behalf of all of its distribution-connected demand facilities, with the following data: structural minimum and maximum active power available for demand response and the maximum and minimum duration of any potential activation of demand response in a specific geographical area defined by the TSO and DSO; a forecast of unrestricted active power available for the demand response and any planned level of demand response in a specific geographical area defined by the TSO and DSO; real-time active and reactive power; a confirmation that the estimations of the actual values of demand response are applied.	DEP can be used for data exchanges between DSOs and demand facilities, would facilitate access to same data by third parties and would facilitate data provision by demand facilities	Flexibility bidding (incl. prequalification) SUC, DER-SCADA data exchange SUC, data transfer SUC. "Flexibility Platform" BUC, "Affordable Tool" BUC, "ENTSO-E" BUC
Article 108 – Ancillary services - Paragraph 1: Each TSO shall monitor the availability of ancillary services. - Paragraph 3: Each TSO shall publish the levels of reserve capacity necessary to maintain operational security. - Paragraph 4: Each TSO shall communicate the available level of active power reserves to other TSOs upon request.	Through DEP TSO and/or flexibility market operator can communicate the flexibility needs	Flexibility bidding (incl. prequalification) SUC. "Flexibility Platform" BUC

Article 111 – Notification of schedules within scheduling areas - Paragraph 1: Obligation for scheduling agents to submit to the TSO operating the scheduling area, if requested by the TSO, and, where applicable, to third party, the following schedules: generation schedules; consumption schedules; internal commercial trade schedules; external commercial trade schedules.	DEP can be used for exchanging schedules	n/a
Article 113 – Provision of information to other TSOs (schedules) - Paragraph 1: At the request of another TSO, the requested TSO shall calculate and provide: aggregated netted external schedules; netted area AC position, where the scheduling area is interconnected to other scheduling areas via AC transmission links. - Paragraph 2: When required for the creation of common grid models each TSO operating a scheduling area shall provide any requesting TSO with: generation schedules; consumption schedules.	DEP can be used for exchanging schedules	n/a
Article 114 – General provisions for ENTSO for Electricity operational planning data environment - Paragraph 1: By 24 months after entry into force of this Regulation, ENTSO for Electricity shall implement and operate an ENTSO for Electricity operational planning data environment for the storage, exchange and management of all relevant information. - Paragraph 2: By 6 months after entry into force of this Regulation, all TSOs shall define a harmonised data format for data exchange, which shall be an integral part of the ENTSO for Electricity operational planning data environment. - Paragraph 3: All TSOs and regional security coordinators shall have access to all information contained on the ENTSO for Electricity operational planning data environment.	DEP can be used to make data from ENTSO-E's operational planning data environment available to interested parties	SUCs on data collection, data transfer, data aggregation. ENTSO-E" BUC
Article 147 – Cross-border FRR activation process - Paragraph 2: Each TSO shall have the right to implement the cross-border FRR activation process for LFC areas within the same LFC block, between different LFC blocks or between different synchronous areas by concluding a cross-border FRR activation agreement.	DEP can enable forwarding the activation requests, incl. cross-border	Flexibility activation SUC. "Affordable Tool" BUC, "Flexibility Platform" BUC
Article 148 – Cross-border RR activation process	DEP can enable forwarding the	Flexibility activation SUC.

- Paragraph 2: Each TSO shall have the right to implement the cross-border RR activation process for LFC areas within the same LFC block, between different LFC blocks or between different synchronous areas by concluding a cross-border RR activation agreement.	activation requests, incl. cross-border	"Affordable Tool" BUC, "Flexibility Platform" BUC
Article 149 – General requirements for cross-border control processes - Paragraph 1: All TSOs participating in an exchange or sharing of FRR or RR shall implement a cross-border FRR or RR activation process, as appropriate. - Paragraph 3: All TSOs participating in the same imbalance netting process, in the same cross-border FRR activation process or in the same cross-border RR activation process shall specify in the respective agreements, the roles and responsibilities of all TSOs including the provision of all input data necessary for: (i) the calculation of the power interchange with respect to the operational security limits; and (ii) the performance of real-time operational security analysis by participating and affected TSOs.	DEP can enable forwarding the activation requests, incl. cross-border	Flexibility activation SUC. "Affordable Tool" BUC, "Flexibility Platform" BUC
Article 154 – FCR technical minimum requirements - Paragraph 1: Each reserve connecting TSO shall ensure that the FCR fulfils the properties listed for its synchronous area in the Table of Annex V of the regulation. - Paragraph 8: Each FCR provider shall make available to the reserve connecting TSO, for each of its FCR providing units and FCR providing groups, at least the following information: (a) time-stamped status indicating if FCR is on or off; (b) time-stamped active power data needed to verify FCR activation, including time-stamped instantaneous active power; (c) droop of the governor for type C and type D power generating modules acting as FCR providing units, or its equivalent parameter for FCR providing groups consisting of type A and/or type B power generating modules, and/or demand units with demand response active power control. - Paragraphs 9-11: Each FCR provider shall have the right to aggregate the respective data for more than one FCR providing unit if the maximum power of the aggregated units is below 1,5 MW and a clear verification of activation of FCR is possible. At the request of the reserve connecting TSO, the FCR provider shall make the information listed in paragraph 9 available in real-time, with a time resolution of at least 10 seconds. At the request of the reserve connecting TSO and where necessary for the verification of the activation of FCR, a FCR provider shall make available the data concerning technical installations that are part of the same FCR providing unit.	DEP can be used to exchange data necessary for verification of flexibility activations	Flexibility activation SUC, flexibility baseline SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC

Article 155 – FCR prequalification process - Paragraph 2: A potential FCR provider shall demonstrate to the reserve connecting TSO that it complies with the technical and the additional requirements set out in Article 154 by completing successfully the prequalification process. - Paragraph 3: A potential FCR provider shall submit a formal application to the reserve connecting TSO together with the required information of potential FCR providing units or FCR providing groups. - Paragraph 6: The qualification of FCR providing units or FCR providing groups shall be re-assessed: (a) at least once every 5 years; (b) in case the technical or availability requirements or the equipment have changed; and (c) in case of modernisation of the equipment related to FCR activation.	DEP can be used to exchange data necessary for prequalification of flexibility providers	Flexibility bidding (incl. prequalification) SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC
Article – 156 FCR provision - Paragraph 5: Each FCR provider shall inform its reserve connecting TSO, as soon as possible, about any changes in the actual availability of its FCR providing unit and/or its FCR providing group, in whole or in part, relevant for the results of prequalification.	DEP can be used to exchange data for flexibility availability	Flexibility bidding (incl. prequalification) SUC, DER-SCADA data exchange SUC. "Affordable Tool" BUC, "Flexibility Platform BUC
Article 158 – FRR minimum technical requirements - Paragraph 1(b): A FRR providing unit or FRR providing group shall activate FRR in accordance with the setpoint received from the reserve instructing TSO. - Paragraph 1(e): A FRR provider shall ensure that the FRR activation of the FRR providing units within a reserve providing group can be monitored. For that purpose, the FRR provider shall be capable of supplying to the reserve connecting TSO and the reserve instructing TSO real-time measurements of the connection point or another point of interaction agreed with the reserve connecting TSO concerning: (i) time-stamped scheduled active power output; (ii) time-stamped instantaneous active power for each FRR providing unit, for each FRR providing group, and for each power generating module or demand unit of a FRR providing group with a maximum active power output larger than or equal to 1,5 MW. - Paragraph 4(b): Each FRR provider shall inform its reserve instructing TSO about a reduction of the actual availability of its FRR providing unit or its FRR providing group or a part of its FRR providing group as soon as possible.	DEP can be used to exchange data necessary for verification of flexibility activations	Flexibility activation SUC, flexibility baseline SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC

Article 159 – FRR prequalification process - Paragraph 2: A potential FRR provider shall demonstrate to the reserve connecting TSO or the TSO designated by the reserve connecting TSO in the FRR exchange agreement that it complies with the FRR minimum technical requirements, the FRR availability requirements, the ramping rate requirements and the connection requirements in Article 158 by completing successfully the prequalification process of potential FRR providing units or FRR providing groups. - Paragraph 3: A potential FRR provider shall submit a formal application to the relevant reserve connecting TSO or the designated TSO together with the required information of potential FRR providing units or FRR providing groups. - Paragraph 6: The qualification of FRR providing units or FRR providing groups shall be re-assessed: (a) at least once every 5 years; and (b) where the technical or availability requirements or the equipment have changed.	DEP can be used to exchange data necessary for prequalification of flexibility providers	Flexibility bidding (incl. prequalification) SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC
Article 161 – RR minimum technical requirements - Paragraph 1(f): A RR provider shall ensure that the RR activation of the RR providing units within a reserve providing group can be monitored. For that purpose, the RR provider shall be capable of supplying to the reserve connecting TSO and the reserve instructing TSO real-time measurements of the connection point or another point of interaction agreed with the reserve connecting TSO concerning: (i) the time-stamped scheduled active power output, for each RR providing unit and group and for each power generating module or demand unit of a RR providing group with a maximum active power output larger than or equal to 1,5 MW; (ii) the time-stamped instantaneous active power, for each RR providing unit and group, and for each power generating module or demand unit of a RR providing group with a maximum active power output larger than or equal to 1,5 MW.	DEP can be used to exchange data necessary for verification of flexibility activations	Flexibility activation SUC, flexibility baseline SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC
Article 162 – RR prequalification process - Paragraph 2: A potential RR provider shall demonstrate to the reserve connecting TSO or the TSO designated by the reserve connecting TSO in the RR exchange agreement that it complies with the RR technical minimum requirements, the RR availability requirements and the connection requirements referred to in Article 161 by completing successfully the prequalification process of potential RR providing units or RR providing groups - Paragraph 3: A potential RR provider shall submit a formal application to the relevant reserve connecting TSO or the	DEP can be used to exchange data necessary for prequalification of flexibility providers	Flexibility bidding (incl. prequalification) SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC

designated TSO together with the required information of potential RR providing units or RR providing groups. - Paragraph 5: The qualification of RR providing units or RR providing groups shall be reassessed: (a) at least once every 5 years; and (b) where the technical or availability requirements or the equipment have changed.		
Article 182 – Reserve providing groups or units connected to the DSO grid - Paragraph 1: TSOs and DSOs shall cooperate in order to facilitate and enable the delivery of active power reserves by reserve providing groups or reserve providing units located in the distribution systems. - Paragraph 2: For the purposes of the prequalification processes for FCR, FRR and RR, each TSO shall develop and specify, in an agreement with its reserve connecting DSOs and intermediate DSOs, the terms of the exchange of information required for these prequalification processes for reserve providing units or groups located in the distribution systems and for the delivery of active power reserves. - Paragraph 2(a)-(d): The prequalification processes for FCR in Article 155, FRR in Article 159 and RR in Article 162 shall specify the information to be provided by the potential reserve providing units or groups, which shall include: voltage levels and connection points of the reserve providing units or groups; the type of active power reserves; the maximum reserve capacity provided by the reserve providing units or groups at each connection point; the maximum rate of change of active power for the reserve providing units or groups. - Paragraph 4: During the prequalification of a reserve providing unit or group connected to its distribution system, each reserve connecting DSO and each intermediate DSO, in cooperation with the TSO, shall have the right to set limits to or exclude the delivery of active power reserves located in its distribution system, based on technical reasons such as the geographical location of the reserve providing units and reserve providing groups. - Paragraph 5: Each reserve connecting DSO and each intermediate DSO shall have the right, in cooperation with the TSO, to set, before the activation of reserves, temporary limits to the delivery of active power reserves located in its distribution system. The respective TSOs shall agree with their reserve connecting DSOs and intermediate DSOs on the applicable procedures.	DEP can be used to exchange data necessary for prequalification of flexibility providers, for activation of flexibilities, for identifying congestions in the grid and setting limits	Flexibility bidding (incl. prequalification) SUC, flexibility activation SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC

2.6 NETWORK CODE ON DEMAND CONNECTION

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 11 – Confidentiality obligations - Paragraph 3: Confidential information received by the persons or regulatory authorities in the course of their duties may not be divulged to any other person or authority, without prejudice to cases covered by national law, the other provisions of this Regulation or other relevant Union legislation.	DEP can enable secure data exchange. Data may be exchanged with consent of the person	Several SUCs and BUCs related to exchange of personal data
Article 18 – Information exchange - Paragraphs 1-2: Transmission-connected demand facilities and transmission-connected distribution systems shall be equipped in order to exchange information with the relevant TSO with the specified time stamping. - Paragraph 3: The relevant TSO shall specify the information exchange standards. The relevant TSO shall make publicly available the precise list of data required.	Through DEP the demand facilities and DSOs can exchange required data with TSOs	SUCs related to flexibility processes, DER-SCADA data exchange, data transfer, sub-metering. "Affordable Tool" BUC, "Flexibility Platform" BUC, "ENTSO-E" BUC
Article 28 – Specific provisions for demand units with demand response active power control, reactive power control and transmission constraint management - Paragraph 2(e): Demand units with demand response active power control, demand response reactive power control, or demand response transmission constraint management, either individually or, where it is not part of a transmission-connected demand facility, collectively as part of demand aggregation through a third party shall be equipped to receive instructions, directly or indirectly through a third party, from the relevant system operator or the relevant TSO to modify their demand and to transfer the necessary information. The relevant system operator shall make publicly available the technical specifications approved to enable this transfer of information.	DEP can be used to exchange data necessary for activation of flexibilities and for verification of the activated flexibilities	Flexibility activation SUC, flexibility verification SUC, DER-SCADA data exchange SUC, sub-metering SUC. "Affordable Tool" BUC, "Flexibility Platform BUC

2.7 NETWORK CODE ON REQUIREMENTS FOR GRID CONNECTION OF GENERATORS

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 12 – Confidentiality obligations - Paragraph 3: Confidential information received by the persons or regulatory authorities in the course of their duties may not be divulged to any other person or authority, without prejudice to cases covered by national law, the other provisions of this Regulation or other relevant Union legislation.	DEP can enable secure data exchange. Data may be exchanged with consent of the person	Several SUCs and BUCs related to exchange of personal data
Article 14 – General requirements for type B power-generating modules - Paragraph 5(d)(i): Power-generating facilities shall be capable of exchanging information with the relevant system operator or the relevant TSO in real time or periodically with time stamping, as specified by the relevant system operator or the relevant TSO. - Paragraph 5(d)(ii): The relevant system operator, in coordination with the relevant TSO, shall specify the content of information exchanges including a precise list of data to be provided by the power-generating facility.	Through DEP the generators can exchange required data with system operators	SUCs related to flexibility processes, DER-SCADA data exchange, data transfer, sub-metering. "Flexibility Platform" BUC
Article 15 – General requirements for type C power-generating modules - Paragraph 6(b)(iv): The facilities for quality of supply and dynamic system behaviour monitoring shall include arrangements for the power-generating facility owner, and the relevant system operator and the relevant TSO to access the information. The communications protocols for recorded data shall be agreed between the power-generating facility owner, the relevant system operator and the relevant TSO.	Through DEP the generators can exchange required data with system operators	SUCs related to flexibility processes, DER-SCADA data exchange, data transfer, sub-metering. "Flexibility Platform" BUC

2.8 NETWORK CODE ON ELECTRICITY EMERGENCY AND RESTORATION

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 9 – Confidentiality obligations	DEP can enable secure data exchange.	Several SUCs and BUCs related to

- Paragraph 3: Confidential information received by the persons or regulatory authorities in the course of their duties may not be divulged to any other person or authority, without prejudice to cases covered by national law, the other provisions of this Regulation or other relevant Union legislation.	Data may be exchanged with consent of the person	exchange of personal data
Article 40 – Information exchange - Paragraph 1: Each TSO, when in the emergency, blackout or restoration states, shall be entitled to gather information from DSOs and SGUs. - Paragraph 2: During the emergency, blackout or restoration states, each TSO shall provide in due time and for the purposes of system defence plan procedures and restoration plan procedures information to neighbouring TSOs, to the frequency leader of its synchronised region, to defence service providers, to DSOs and SGUs and to restoration service providers. - Paragraph 3: TSOs in emergency, blackout or restoration state shall exchange among themselves information. - Paragraph 4: A TSO in emergency, blackout or restoration state shall provide, in due time, information about the system state of its transmission system and, where available, additional information explaining the situation on the transmission system: (a) to the NEMO(s), who shall make this information available to their market participants; (b) to its relevant regulatory authority; and (c) to any other relevant party, as appropriate.	DEP could be used for some data exchanges in emergency, blackout or restoration states. (According to art. 41 voice communication system is required. DEP could be used in addition.)	n/a

2.9 GUIDELINE ON CAPACITY ALLOCATION AND CONGESTION MANAGEMENT

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 7 – NEMO tasks - Paragraph 1: NEMOs shall act as market operators in national or regional markets to perform in cooperation with TSOs single day-ahead and intraday coupling. Their tasks shall include receiving orders from market participants, having overall responsibility for matching and allocating orders in accordance with the single day-ahead and intraday coupling results, publishing prices and settling and clearing the contracts resulting from the trades according to relevant participant agreements and regulations.	DEP can be used for exchange of relevant market data between relevant stakeholders	Data collection SUC, data transfer SUC. Not to be demonstrated in EU-SysFlex

Article 13 – Confidentiality obligations - Paragraph 3: Confidential information received by the persons or regulatory authorities in the course of their duties may not be divulged to any other person or authority, without prejudice to cases covered by national law, the other provisions of this Regulation or other relevant Union legislation.	DEP can enable secure data exchange. Data may be exchanged with consent of the person	Several SUCs related to exchange of personal data. Not to be demonstrated in EU-SysFlex
Article 16 – Generation and load data provision methodology - Paragraph 1: All TSOs shall jointly develop a proposal for a single methodology for the delivery of the generation and load data required to establish the common grid model. - Paragraph 2: The proposal for the generation and load data provision methodology shall specify which generation units and loads are required to provide information to their respective TSOs for the purposes of capacity calculation. - Paragraph 3: The proposal for a generation and load data provision methodology shall specify the information to be provided by generation units and loads to TSOs. The information shall at least include the following: (a) information related to their technical characteristics; (b) information related to the availability of generation units and loads; (c) information related to the schedules of generation units; (d) relevant available information relating to how generation units will be dispatched. - Paragraph 5: Each TSO shall use and share with other TSOs the information above (for capacity calculation purposes only).	Addressed by ENTSO-E in CGMES project. However, data related to common grid model can be exchanged via DEP which would facilitate access to the same data by third parties and would facilitate data provision by generators and consumers	Data collection SUC, data transfer SUC. Not to be demonstrated in EU-SysFlex
Article 62 – Publication of market information - Paragraph 1: As soon as the orders are matched, each NEMO shall publish for relevant market participants at least the status of execution of orders and prices per trade produced by the continuous trading matching algorithm. - Paragraph 2: Each NEMO shall ensure that information on aggregated executed volumes and prices is made publicly available in an easily accessible format for at least 5 years.	DEP can be used for publication of relevant market data	Data collection SUC, data transfer SUC. Not to be demonstrated in EU-SysFlex

2.10 REGULATION ON SUBMISSION AND PUBLICATION OF DATA IN ELECTRICITY MARKETS

	Can a DEP support fulfilling the requirement?	EU-SysFlex use cases
Article 1 – Subject matter - This Regulation lays down the minimum common set of data relating to generation, transportation and consumption of electricity to be made available to market participants. It also provides for a central collection and publication of the data.	Through DEP data between different stakeholders can be exchanged, incl. for publication	Data collection SUC, data transfer SUC, aggregation SUC. "ENTSO-E" BUC, "Flexibility Platform" BUC
Article 3 – Establishment of a central information transparency platform - Paragraph 1: A central information transparency platform shall be established and operated within ENTSO-E. ENTSO-E shall publish on the transparency platform all data which TSOs are required to submit to the ENTSO-E in accordance with this Regulation. The central information transparency platform shall be available to the public free of charge through the internet. The data shall be up to date, easily accessible, downloadable and available for at least five years. Data updates shall be time-stamped, archived and made available to the public.	DEP can be used to facilitate data submission from data owners via TSOs or data providers to ENTSO-E transparency platform. ENTSO-E's ECCo SP DEP in conjunction with another DEP can be used to facilitate access to data on transparency platform	Data collection SUC, data transfer SUC, aggregation SUC. "ENTSO-E" BUC
Article 4 – Submission and publication of data - Paragraph 1: Primary owners of data shall submit data to TSOs or to data providers, ensuring that data are complete, of the required quality and provided in a manner that allows TSOs or data providers to process and deliver the data to the ENTSO-E in sufficient time to allow the ENTSO-E. - Paragraph 2: Primary owners of data may fulfil their obligation by submitting data directly to the central information transparency platform provided they use a third party acting as data provider on their behalf. This way of submitting data shall be subject to the prior agreement of the TSO in whose control area the primary owner is located.	DEP can be used to facilitate data submission from data owners via TSOs or data providers to ENTSO-E transparency platform. ENTSO-E's ECCo SP DEP in conjunction with another DEP can be used to facilitate access to data on transparency platform	Data collection SUC, data transfer SUC, aggregation SUC. "ENTSO-E" BUC

3. CONCLUSION

In 10 EU legal texts reviewed in this action 74 articles in total were identified relevant for data exchange and where DEP can support to fulfil respective legal requirement. Out of these cases 66 are covered by EU-SysFlex – either through data exchange system use cases (task 5.2) or data exchange business use cases (WP9).

Summary of DEP potential to address European legal requirements:

- DEP can ensure easy access to data and via DEP to different energy services
- DEP if properly managed can ensure non-discriminatory access to data
- DEP can enable consent management (access permissions), secure data exchange and access
- DEP can provide in compliance to GDPR different types of data easily and simultaneously to different types of stakeholders, incl. final customers themselves
- Comparison tools can be connected with DEP thereby providing them necessary data and enabling consumers to find and choose between tools
- DEP can link 'consumer energy management systems' to data from certified meters
- Different DEPs should be able to communicate with each other, it makes possible cross-border data exchange respecting different countries legal restrictions
- DEP can be used for transferring data for publication
- DEP can facilitate TSO and DSO tasks on data management and digitalization
- DEP can facilitate TSO-DSO cooperation
- DEP can facilitate access to meter data from both certified meters and sub-meters necessary for demand response
- DEP can facilitate easy access to flexibility market
- DEP can facilitate data exchange between FSP, market operator and system operator
- Through DEP all technologies providing flexibility can provide and receive data necessary to participate in the flexibility market
- DEP can be used to integrate different market platforms
- DEP can be used for exchanging flexibility bids, flexibility needs, activation requests, data necessary for prequalification of flexibility providers, data necessary for verification of flexibility activations, flexibility availability
- DEP can be used to exchange data necessary for identifying congestions in the grid and setting limits
- DEP can be used for data exchanges necessary for system operation between TSOs, DSOs and SGUs
- DEP could be used for some data exchanges in emergency, blackout or restoration states

Finally, potential network code in the area of data exchange could consider the relevance of DEP as a possible solution, incl. for cross-border data exchange.

4. COPYRIGHT

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