EDSO
for smart grids

European Distribution System Operators for Smart Grids

Data Management: The role of Distribution System Operators in managing data

June 2014

Executive Summary

The European Union (EU) has set ambitious energy policy objectives to 2020: decreasing greenhouse gas emissions, increasing energy efficiency and the share of renewable energy. Implementing these policies has led to a steady growth of renewable energy sources (RES) which, in turn, is triggering a shift in the entire energy value chain. A more dynamic system based on variable generation is replacing the traditional system based on predictable and centralised power generation. Distribution System Operators (DSOs) are at the core of this transformation, connecting solar panels and wind turbines, and empowering consumers to take a more active part in the energy system.

To maintain a high security of supply and quality of service in spite of those changes, DSOs will have to monitor their grid at all voltage levels. The progressive roll-out of smart meters, unless a different decision is taken by a member state based on the result of a cost-benefit analysis, the automation of the grid and the deployment of sensors will generate large quantities of data, which will have to be managed in a secure and efficient way.

DSOs, who are already serving 260 million customers in Europe, possess experience in collecting, validating, managing and providing data in order to operate the grid in an efficient way. As shown in annex, the DSO as neutral market facilitator and data manager is a common model in Europe. For DSOs, smart metering is an evolution, not a revolution.

Tomorrow, DSOs could grow, taking on new roles that benefit all players in the electricity market. To make this happen, European Distribution System Operators for Smart Grids (EDSO) encourages regulators and policy-makers to follow these key principles when reflecting on data management:

Consumers

- Clear explanations of data use must be provided to consumers if rolling-out new meters and data management systems in order to clarify the role and responsibilities of all players
- Privacy and security of consumers' data should be under the supervision of a regulated party.

National Regulatory Authorities

- Transparent criteria, taking into account the interest of consumers, market parties and the grid reality, should be used by NRAs to evaluate different data management models (see section 2.a)
- Neutral market facilitation is already part of the DSO's activities. If deemed necessary by regulators, more regulation specifically related to neutral data management is a possibility.

DSO role and responsibilities

- In countries where the DSO is installing and managing meters, it should also be storing and processing data
- To maintain security of supply, DSOs must always have direct access to meter and grid data
- The DSO should be able to partner freely with ICT companies, in order to operate the grid in the most efficient and secure way
- Data exchanges should be based on a standard communication protocol, to be chosen at National level
- To guarantee the security of supply and quality of service, appropriate cooperation and data sharing processes should be setup between TSOs and DSOs.

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1. Introduction

The European Union (EU) has committed to achieving ambitious energy policy objectives to 2020: decreasing greenhouse gas emissions, increasing energy efficiency and the share of renewable energy. Implementing these policies has led to a steady growth of renewable energy sources (RES) which, in turn, is triggering a shift in the entire energy value chain.

A more dynamic system based on variable and distributed generation is replacing the traditional static system based on predictable and centralised power generation. Distribution System Operators (DSOs) are at the core of this transformation and have the potential to empower consumers to take a more active part in the energy system, for example, by rolling-out smart meters, unless a different decision is taken by a member state based on the results of a cost-benefit analysis, but also by connecting solar panels, wind turbines, electric vehicle charging points and local energy storage to their grids, thus delivering power to the consumer in a reliable and cost-efficient way.

Essential to these developments is the transformation of Europe's traditional grids into so-called smart grids, a move that will strongly aid the achievement of the EU's energy objectives and bring us, cost-efficiently, into a more sustainable and competitive energy future.

Monitoring the grid and keeping a high-level quality of service will lead DSOs to gather more data from their grid users. This data will have to be stored, processed, and made accessible to third-parties in a safe and transparent way.

In 2012/2013, the European Commission (EC) studied this topic within the framework of the Smart Grid Task Force (SGTF), where industry representatives were together invited to sketch different options for data management. Three models were proposed at the end of the process: "DSO as neutral market facilitator", "independent central data hub", and "data access point manager" [1] (a decentralised model, with data stored on each meter and exchanged directly between all market players). No definitive conclusions were drawn in 2013, but a follow-up study commissioned by the EC suggested that "the DSO model probably contains the most efficient data handling of the three models"[2]. The debate, however, is still not closed.

In this context, it is important to show how an efficient data management system will contribute to a high quality supply of electricity, a secure and stable network, and will create a level playing field for innovative services in a cost-effective, non-discriminatory, transparent and secure way.

The purpose of this document is not to highlight all types of data collected and processed by DSOs but to present an overview of data management by DSOs, focusing on the benefits DSOs can bring to market players and society as a whole, provided the right conditions are in place.

[1] Smart Grid Task Force, "Options on handling Smart Grids Data", January 2013
[2] ECN/ECORYS, "The role of DSOs in a Smart Grid environment", April 2014 (p 76)

2. DSOs and data management – concept and challenges

DSOs have a long experience in data management, collecting, validating, managing and providing data in order to guarantee security of supply and quality of service, as well as providing support to market activities. In addition, high voltage networks managed by DSOs (as well as producers and customers connected to them) are fully automated in most countries and are operated remotely from control centres that manage multiple data flows.

Such activities are operated under regulatory supervision and guided by cost-efficiency principles, based on well-established processes and market transactions, and make use of the best available ICT technologies and solutions from reference vendors and service providers.

In some countries, DSOs are already providing detailed data directly to consumers, or to their representatives, in a free and non-discriminatory way, in order to enable energy efficiency and market services.

Under the European Union's Third Energy Package, adopted in 2009, at least 80% of customers will be equipped with smart meters by 2020[3], unless a different decision is taken by a member state based on the results of a cost-benefit analysis. This is expected to fuel active consumer participation in the retail electricity market.

Smart meters incorporate detailed energy measurement functions with integrated communications. In the near future, they could help to empower consumers by providing them with accurate information on their own consumption patterns.

It must be understood that DSOs are already, today, in charge of managing a number of data processes as shown in annex. Smart meters, generating more data than today's analogue meters, are leading to an evolution of the DSO's role, not a revolution. The increased data flow means more opportunity to make use of data, and the need to develop new and flexible technical solutions to manage these larger quantities of data, while guaranteeing data security and consumers' privacy.

This chapter will list criteria that should be taken into account when agreeing on an efficient model for data management. Data collected by DSOs today, how it is used, and how it could be used in the future will then be presented.

a. Principles to consider when defining a data management model

The data model to be implemented in each member state should be the result of an evaluation process that, considering each sector's configuration and market design (resulting from the differing implementation of European Directive 2009/72/EC), puts the focus on the value for the consumer.

As highlighted by European energy regulators in the "Status Review of Regulatory Aspects of Smart Metering"[4], a relevant number of countries do not give customers control over their data.

[3] Directive 2009/72/EC

[4] CEER, "Status Review of Regulatory Aspects of Smart Metering", September 2013 (pg. 16)

Therefore, to determine the data model that best suits each country's needs, the current and future roles and responsibilities of each agent should be determined, especially the ones related to metering activities.

The main objectives that any data management model should fulfil are:

- **Clear roles and responsibilities**: the different types of data collected, whom can access it, through which communication channels and using which information exchange protocols, should be clearly defined in each country

- **Easy access to the information**: each player (consumer, supplier ...) should have easy access to the data it needs for its activity. The implemented data model should be transparent to the end user. Guaranteeing a high level of information availability is a must

- **Non-discriminatory data storage and processing**: the company storing and processing the data should be neutral and deliver it without discrimination to any market parties, provided the consumer has condoned this

- **Data privacy:** detailed grid user data must have a maximum confidentiality level. Any inadequate use, or even leakage, of information could endanger the whole system

- **Simplicity and robustness**: any model that is expected to work beyond theory, must in practice be evaluated during its normal operation (reading, consumer switching, billing, settlements, etc.) and with possible deviations concerning data (delays, drawbacks, etc.)

- **Reasonable cost for consumers**: each model has a different implementation cost. To meet consumers' needs, while minimising electricity bills and delivering accurate information, the cost of implementing the chosen model must be taken into account, and if necessary, the costs of different alternatives explained to stakeholders.

These objectives should be evaluated and prioritised by each NRA, analysing how each data model alternative fits with the desired market design. The draft guidance document published by the Council of European Energy Regulators (CEER) in April 2014[5] goes in that direction by listing a number of guiding principles which overlap with the ones listed above.

b. Current use of data by DSOs

As pointed out by CEER[6], three kinds of data are essential for the retail market: point of delivery identification data (identification of the meter and its point of connection), user and contract data (name and address of the customer - name of the supplier and first day of supply) and consumption data. In addition, the DSO also needs grid data to monitor its infrastructure.

[5] CEER, "Draft Advice on Data Management for Better Retail Market Functioning", April 2014
[6] ibid

By processing data, DSOs can facilitate interactions between consumers, market actors and public entities and set in motion a number of processes: billing, settlement, energy forecasting and monitoring for Transmission System Operators (TSOs), energy forecasting for local authorities and energy forecasting to support DSO processes like planning, connection, access and operation. Provided over the next pages is a short description of what DSOs already do today to support the electricity retail market.

Metering point administration

DSOs manage a database of all electricity meters (metering points) and connections. This database contains technical information about the supply of electricity to each address (capacity, limitations, contractual agreements, etc.). One important piece of information found in the database is the meter point reference number. This number is needed by electricity suppliers when consumers want to switch supplier. DSOs are the guardian of a unique identification system which may be used in all markets and with all markets players. The use of one shared identification reference avoids potential conflicts between parties and sets the basis for a reliable market.

Supplier switching

To purchase electricity from a new supplier, customers need to terminate their old supply contract. When this is done, the old supplier is notified of the consumer's decision to switch, which the DSO then implements. Thereafter, all the necessary information is exchanged between the new and former supplier, and the DSO, with the latter acting as a neutral interface, providing the meter values (read or calculated) and validating the switching.

Consumption data for billing and customer awareness purposes

DSOs enable an efficient and transparent retail electricity market by providing information for customer awareness and for market stakeholders. They store and provide consumer metering data (stored with due regard for privacy rights and commercial information protection). Tomorrow, DSOs will operate an advanced metering infrastructure and will be able to provide data in a standardised and transparent way so any player in the market can develop and offer services to customers.

Planning, operation and forecasting

Today, DSOs use data to support their core business processes: energy losses supervision and control, planning, connection, access and operation. This data is key to allow DSOs to monitor their networks. The DSO provides aggregated data at the interface to the TSO for the TSO's long-term planning needs. The DSO also provides data to local public authorities for energy planning purposes. The DSO's global vision over a region, its capacity to compare the data over the years, taking into account climate factors, gives a real added value in forecasting.

Settlement (allocation and reconciliation)

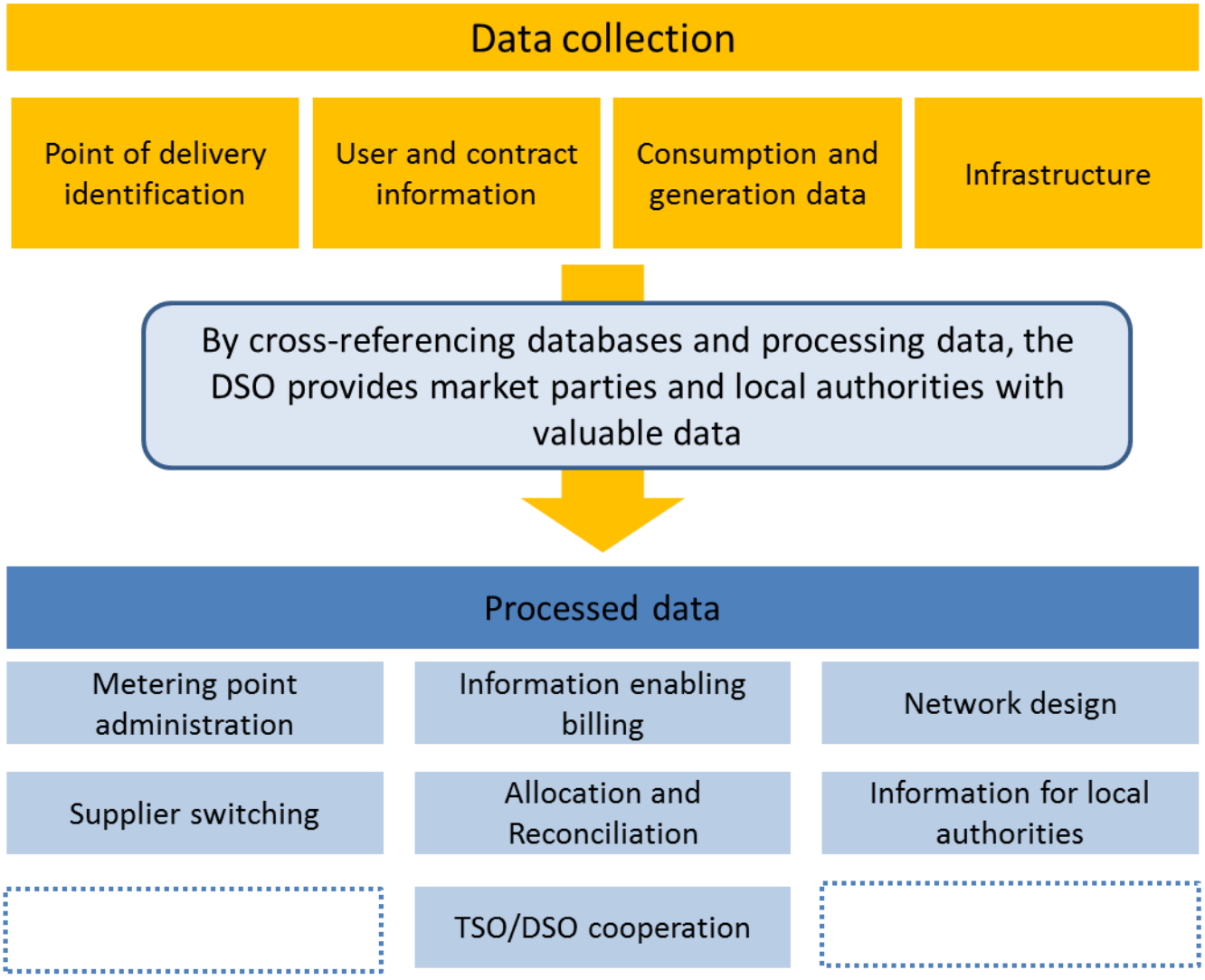
As, today, there is no possibility to know in real-time who uses how much electricity, a household's consumption is estimated on the basis of a "profile". This data is not immediately available, since traditional meters are only checked once a year (or every few months). On the basis of these profiles, estimating the energy to be supplied by different market parties to consumers is called *allocation*. The difference between the amount estimated during the allocation process and the actual amount

measured is only known after the *reconciliation* process. These two processes, in turn, form part of the *settlement* process.

Following the energy market opening, DSOs have endorsed responsibilities for aggregation and extrapolation of complex data for the allocation and reconciliation processes. DSOs have, therefore, developed strong skills upon collecting, validating and aggregating data and modelling production profiles as well as consumption profiles, distinguishing between different types of consumers. Accurate and timely data from smart metering could improve the quality of settlement, which in turn could encourage innovation and a more efficient use of energy.

In order to present clearly what DSOs do with data today, and how this benefits all electricity market players, the figure below reconciles the various kinds of data gathered by DSOs and the processes described above.

Figure 1: Sample of data traditionally collected and processed by the DSO



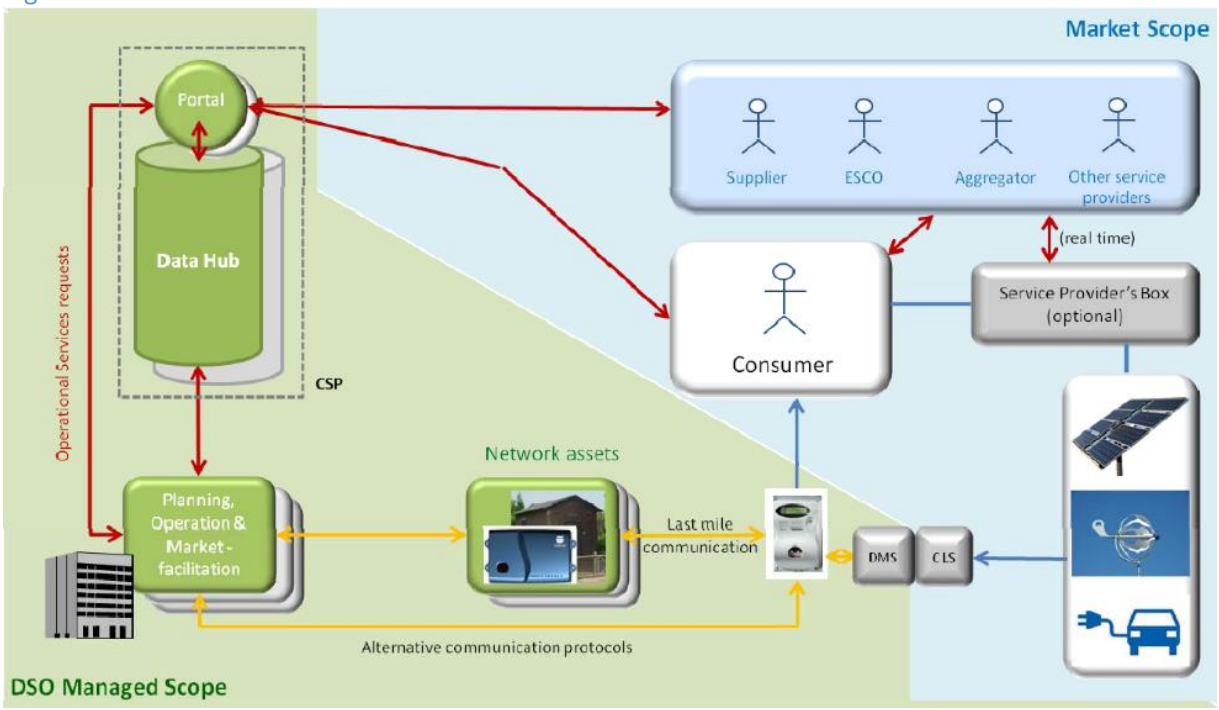
NB: Depending on the country considered, the DSO may already be in charge of more data processes.

DSOs, who already serve 260 million customers in Europe, have developed skills and know-how in managing suppliers' balances. They can handle the activity of recording balancing responsibility and ensuring data is distributed in a non-discriminatory way. Tomorrow, DSOs could further develop these activities and take on new roles, benefiting all players in the electricity market.

c. Future distribution of roles and responsibilities in a smart grid context

Tomorrow, the roles and responsibilities of DSOs regarding data management could evolve and grow to take into account the progressive switch to smart metering, the development of flexibility and the growing need for accurate energy use data. The SGTF called this model the "DSO as neutral market facilitator".

Figure 2: DSO as neutral market facilitator[7]



The deployment of smart meters involves an evolution of metering technology**,** but causes no fundamental change in the roles and responsibilities of DSOs and market parties. Today, the DSO is in charge of gathering all the data from "regular" meters, storing it in a hub and giving authorised parties access to it. This role could be efficiently maintained in a smart grid environment, but with some adjustments in terms of technology and processes: smart meters are (or will be) remotely read, data is gathered by the DSO and the authorised parties are granted access to data based on relevant information for their needs.

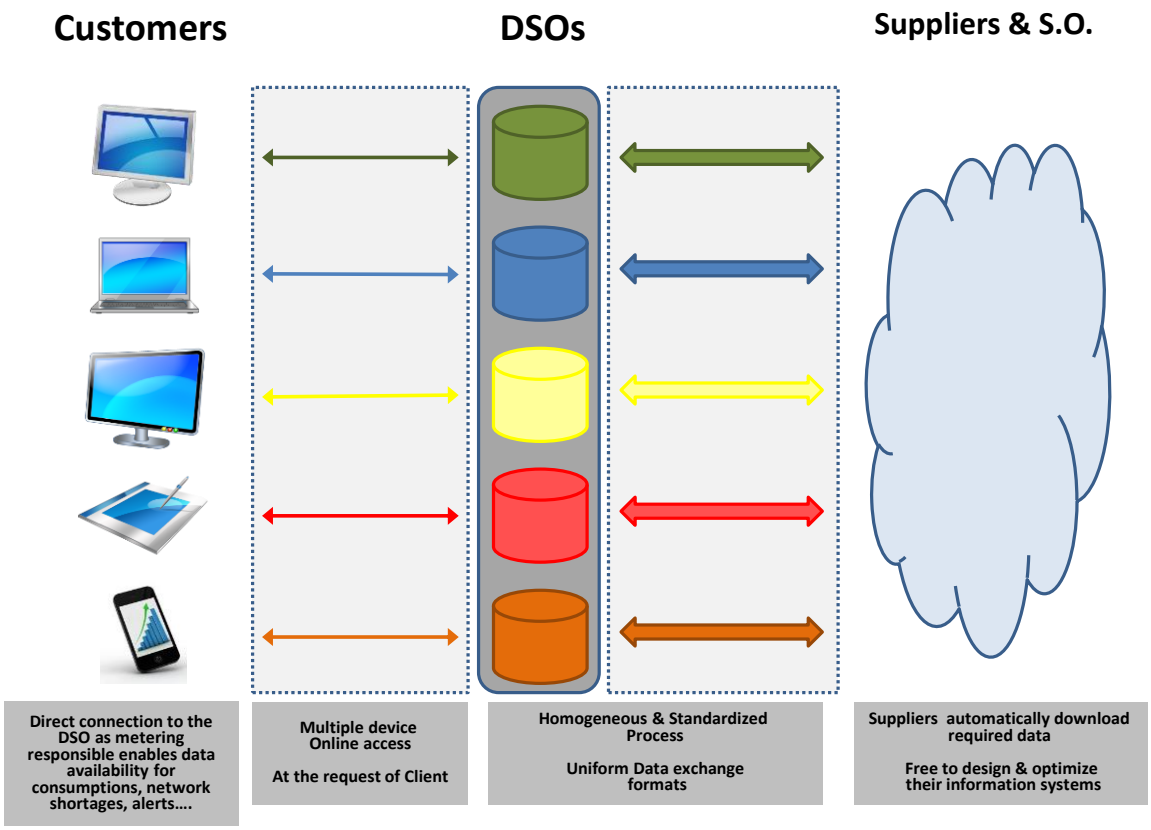
Information technology companies will be a key partner in assisting DSOs in their evolution by providing new technologies to match their needs. Each DSO, depending on the applicable national regulation, should decide which technology to deploy, how the data will be transferred and how IT companies may support them in this task. For example, some DSOs may opt for a power line communication (PLC) based solution, where they would need to contract "mobile services" from

[7] Smart Grid Task Force, "Options on handling Smart Grids Data", January 2013 (pg. 9)

telecommunication companies to transfer data from concentrators to data hubs, as a regular client. On the other hand, some DSOs may choose to completely internalise the communication chain, contracting telecoms companies to set-up a private telecommunications network.

A concrete example of neutral market facilitation exists in Spain where, since March 2014, a law requires that 70% of domestic customers are billed using the hourly prices set in the wholesale electricity market. DSOs will now assume a role of capturing, validating and making available, in a standardised way, the hourly data needed by the suppliers and the system operators. In practice, DSOs will provide secure access to servers, where each supplier can download data from its clients, with a maximum delay of seven working days and keep a two-year record of hourly consumption data. Each DSO will also inform customers of their hourly consumption via dedicated webpages. In addition to multiple graphs and figures, designed to help analyse and improve consumption habits, the customer will also be able to download the validated hourly consumption data used for billing to an excel file.

Figure 3: Current data management processes in Spain



In addition to data handling, DSOs may pave the way for flexibility. They will be able to guarantee that the capacity or flexibility being traded for portfolio optimisation matches the physical limits of the grid and stays consistent with contracts. For generation, the DSO can check that a unit has the physical possibility to generate and, similarly, that the network can channel the capacity sold at the period of time considered in the offer, according to its technical connection contract. In case demand response is proposed without a technical possibility to actually measure its impact on the

consumption of the customer, coherence checking with the subscription of the customer and his history of consumption at different periods may be carried out by the DSO. This offers added transparency to the market by avoiding manipulation and by assuring that what is traded is technically available.

Markets involving capacities and **system flexibility services**[8] are going to require more processing of metering data. For instance, in the particular case of demand response, the amount of energy flowing through the grid cannot be measured. It can only be estimated by comparing the amount of energy that would normally have been consumed at the exact period of time if no action had been triggered (the baseline), and the actual consumption (measured by the meter). With a recognised expertise in modelling and as neutral and regulated parties, DSOs can apply their skills to feed the market with high-value data. In the future, more advanced solutions, such as smart meters signalling the beginning and the end of demand response actions and calculating the right amount of energy being consumed in that period of time, could be managed by DSOs.

To carry out their traditional activities and responsibilities towards their networks, DSOs will have to manage growing amounts of data to adapt to the energy transition, expectations of society and evolution of technology. In more detail, this means they will have to:

- Manage congestion (through control and monitoring of HV/MV/LV[9] networks)
- Develop advanced network design for optimised maintenance and asset management
- Record aggregators' actions and impact on the grid to certify that flexible resources have been activated and keep track of the aggregator's balance
- Strengthen cooperation between TSO and DSO by exchanging accurate data on the system state
- Develop advanced forecasting tools (in order to calculate losses and possible constraints).

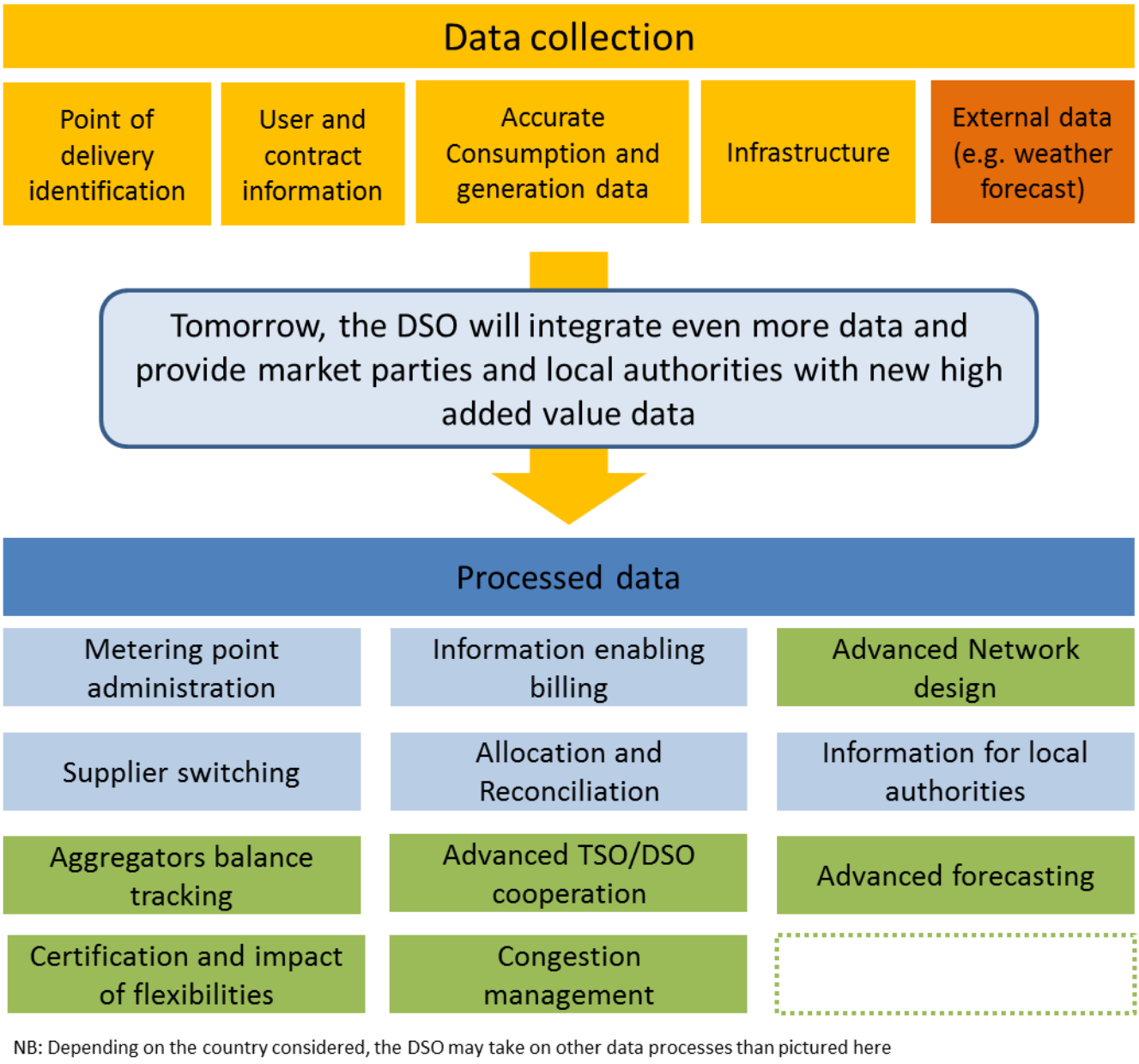
Another fundamental process for DSOs is giving transparent and non-discriminatory access to its networks to both suppliers and consumers. Until some time ago, grid users requesting market relevant data were limited in number. Today and in the future, network users (distributed generation, electric vehicles, and flexible demand) increasingly have reason to access such data.

Figure 4 summarises how DSOs could grow and further deliver value to other players by making the most of all the data available. Changes and additions to its current role appear in green.

[8] For further information on system flexibility services, please see EDSO paper "Flexibility: The role of DSOs in tomorrow's electricity market", May 2014

[9] Voltage levels according to European standardisation bodies CEN/CENELEC: LV (<1 kV), MV (1-36 kV), HV (>36 kV)

Figure 4: Sample of data to be collected and processed by the DSO



NB: Depending on the country considered, the DSO may take on other data processes than pictured here

3. Value of DSO as data manager

The model in which DSOs manage data in a neutral and non-discriminatory way is the most common today in EU member states. It can still be efficient tomorrow and in any national context, either with one main DSO acting as the data manager, a gathering of DSOs joining forces to manage grid data, or multiple DSOs acting as data managers under common standards. As regulated entities, the DSOs and the costs they incur related to data management and metering are subject to regulatory supervision, driving the need for cost-efficiency e.g. by cooperating or outsourcing parts of their processes to service companies, making use of the necessary economies of scale without putting the responsibility for regulated duties in other hands. Below we look into the pros and cons of these alternatives.

Different examples are examined, in which different countries have adopted different data handling models that maximise the criteria previously defined. To summarise, the model that better fulfils the criteria varies depending on the starting point of each country, the number of existing DSOs and their size.

a. DSO (standardised) data management vs. third-party centralised hub

In Italy, as talks continue in a bid to determine the best data management model, the consultancy Accenture was commissioned by Enel Distribuzione to compare the cost of switching from the current model (DSO as data manager) to a centralised data platform managed by a third (regulated) party .

The main benefit to be expected from appointing/creating a new entity to be the centralised and regulated data manager is the possibility to start from scratch and to design an entirely new system based on best available technologies. Very important here is to have a neutral player whose roles and responsibilities are clearly defined.

However, this centralised approach has a number of limitations in terms of simplicity and robustness. The transition time for the setting up of the platform would span several years and would require building up experience from scratch. There is also an elevated risk of data transmission failure since this model would, in effect, multiply the total number of communications needed between the various actors for the performance of the same functions - in turn multiplying the risk of communication failures.

Cost-wise, setting up a new data management body would be an expensive enterprise. In addition to technical investment, creating the appropriate regulatory framework to ensure the new entity sufficiently protects the data will warrant further time and effort from NRAs.

These limitations are not applicable to the DSO model, where the DSO is already regulated and under which infrastructures and processes would merely need to be upgraded to accommodate the growing volume of data flowing to and from distribution grids and to meet the needs of other (and new) market players. Table 1 summarises the pros and cons of both approaches.

Table 1: High level comparison of two data management models considered in Italy

Key Criteria	DSO as neutral market facilitator	Third-party data platform
Clear roles and responsibilities	✓	●
Easy access to information	✓	✓
Non-discriminatory access	✓	✓
Data privacy	✓	●
Simplicity and robustness	✓	✗
Lower possible cost for consumers	✓	✗

b. Coordinated data management between several DSOs

In the Netherlands, rules for the market model are proposed by the association NEDU (Nederlandse Energie Data Uitwisseling or Dutch Energy Data Exchange) of which all market parties in the Netherlands can become a member. The Dutch electricity and gas market is competitive, with sixty-four suppliers, twenty-eight balance responsible parties (BRPs), two TSOs, eight DSOs, thirteen metering companies, eight big generators and more than ten thousand small generating installations. DSOs operate 15.7 million metering points (electricity and gas) in the Netherlands. There is near-real-time switching one day ahead, near-real-time moving on the same day, and high switching rates, with 44% of customers having switched since 2004 (13% in 2013).

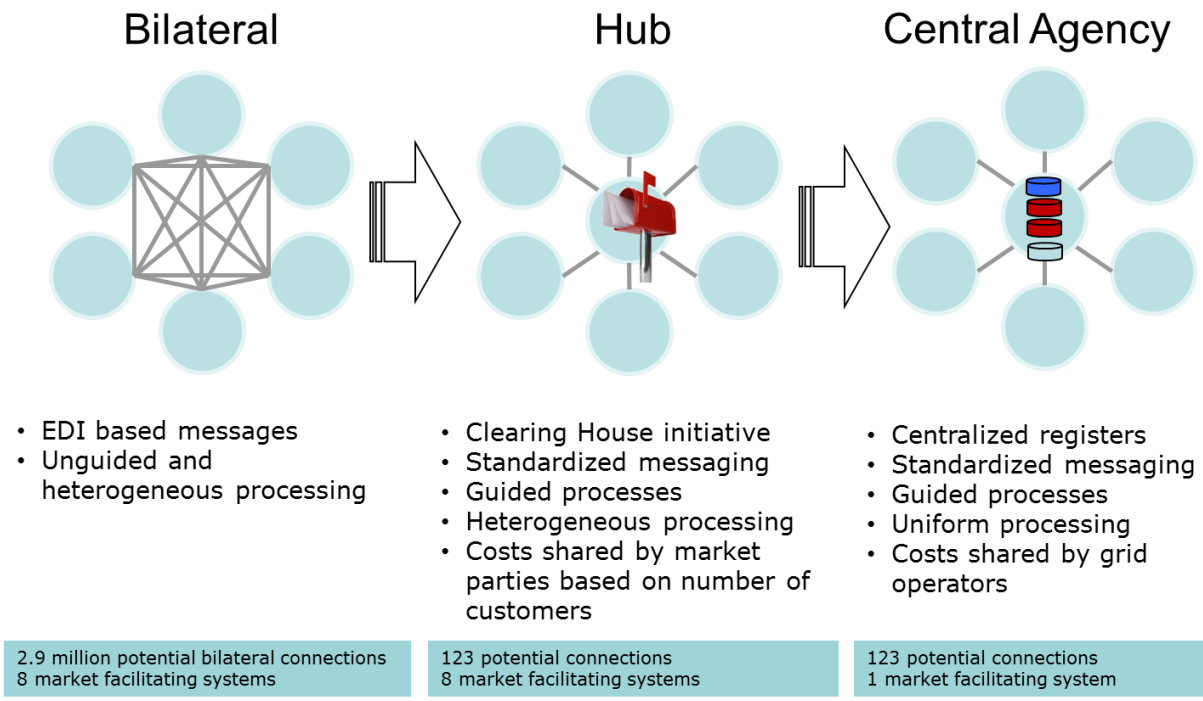
The Dutch NRA converts the proposals of NEDU into code after public consultation. This process ensures that there are clear roles and responsibilities regarding the use of data and that the rights of consumers with regard to privacy and data security are given proper consideration.

In the Dutch market, DSOs maintain a centralised 'register of grid connections', which plays a central role in many processes. Standardised procedures are set up for switching, moving and cancelling supply contracts under this register. This guarantees a level playing field for all commercial parties in the Dutch market and is supported by law stipulating that the DSO cannot develop commercial products.

The DSOs formed a company to operate the ICT system, which they own and which is called EDSN (Energy Data Service Netherlands). EDSN is primarily a management organisation that works with external IT partners to develop and operate the central system. As a rule, the cost of systems that are used by multiple parties (suppliers, metering companies, BRPs, DSOs etc.) are borne by the DSOs. The DSOs are reimbursed through tariffs. This also ensures that any cost savings realised are passed to the customers. Access to data is free of charge for all market parties.

When this new model was first implemented, the DSO-led EDSN facilitated only the exchange of standardised messaging for the switching processes between market parties. The back-office IT-systems were located at the premises of each DSO and other market parties. In 2007, a decision was taken by the DSOs to evolve to a central system and processes, since this would improve the robustness and simplicity of operations and provide for bigger synergies. Thus, the system has evolved from a bilateral one (2002) to a hub based system (2007) and, since 2013, has been in the process of becoming a central agency.

Figure 5: Transition from a bilateral data management system to a central agency system



Now that the centralised metering data system has been created, the implementation of centralised settlement processes like allocation and reconciliation are being planned. It is a step by step approach for reasons related to risk management, business alignment and cost (smooth and cost-wise migration from individual IT-systems to EDSN IT-systems).

Table 2: High-level comparison of two successive data management models used in the Netherlands

Key Criteria	Original Dutch system (bilateral exchange)	DSO Central Agency
Clear roles and responsibilities	✓	✓
Easy access to information	✗	✓
Non-discriminatory access	✓	✓
Data privacy	✓	✓
Simplicity and robustness	✗	✓
Lower possible cost for consumers	✗	✓

4. Conclusions and recommendations

The progressive roll-out of smart meters in member states where a cost benefit analysis was positive, the automation of the grid, together with the deployment of sensors, will generate large quantities of data which will have to be managed in an efficient and secure way.

Each country will need to decide upon the best data management model to suit the needs of its customers and market players. A consistent set of evaluation criteria will be necessary to choose the right entity for this task.

DSOs, who already serve 260 million customers in Europe, have experience in collecting, validating, managing and providing data in order to operate the grid in an efficient way. For them, smart metering is an evolution, not a revolution.

Tomorrow, DSOs could grow, taking on new roles that benefit all players in the electricity market. To make this happen, European Distribution System Operators for Smart Grids (EDSO) encourages regulators and policy-makers to follow these key principles when reflecting on data management:

Consumers

- Clear explanations of data use must be provided to consumers when rolling-out new meters and data management systems in order to clarify the role and responsibilities of all players
- Privacy and security of consumer data should be under the supervision of a regulated party.

National Regulatory Authorities (NRAs)

- Transparent criteria, taking into account the interest of consumers, market parties and the grid reality, should be used by NRAs to evaluate different data management models
- Neutral market facilitation is already part of the DSO's activities. If deemed necessary by regulators, more regulation specifically related to neutral data management is a possibility.

DSO roles and responsibilities

- In countries where the DSO is installing and managing meters, it should also be storing and processing data
- To maintain security of supply, DSOs must always have direct access to meter and grid data
- The DSO should be able to partner freely with ICT companies, in order to operate the grid in the most efficient and secure way
- Data exchanges should be based on a standard communication protocol, to be chosen at National level
- To guarantee security of supply and quality of service, appropriate cooperation and data sharing processes should be setup between TSOs and DSOs.

Annex

Overview of smart metering roll-out plan and data management setup in a few EU member states

	France	Germany	Italy	Netherlands	Portugal	Spain	United Kingdom
Smart Meter Roll-out (Yes / No / Target / current %)	Yes. 35 Mil meters to be rolled out by ERDF by 2020 in 3 phases (2 Mil / 5Mil / 7Mil per year). In 2021, 90% of households will be equipped with Linky meters	To be decided based on in-depth CBA delivered in 2013 and complementary analysis (ongoing)	Yes. 32 Mil meters rolled-out	Yes. In total 15.7 Mil electricity and gas meters (80% by 2020). Currently 1 Mil meters in place (6,4% in mid-2014)	No. The Portuguese government requested the NRA to conduct a CBA until May 31st 2014. If negative, a new CBA will be conducted in 2016. Target, in any case, is 80% by 2020	Yes. 100% domestic meters (≈26 Mil) by end 2018. 30% installed by end 2014	Yes. 53 Mil meters (gas and electricity) to be rolled-out by 2020
nº / structure of DSO	1 DSO covers 95% of the territory 160 local DSOs (only 4 with more than 100,000 clients)	More than 900 electricity DSOs (approximately 40 significantly sized)	1 DSO covering 85% of the consumers	3 main DSOs, 5 smaller DSOs	1 DSO covering 99% of territory. Rest by local co-operative societies	5 main DSOs cover 95% territory Other 350 DSO < 100,000 clients	14 DNOs
Metering activity responsible	DSO	Liberalised, but DSO as metering supplier of last resort	DSO	DSO	DSO	DSO	Supplier
Meter ownership	Meters belong to contracting authorities	Varies according to liberalised metering market	DSO	DSO	DSO	99.9% rented by DSO to consumer	Supplier

Independent agency for data management (today / planned)	No / No	No / No	No / being discussed	Yes	No (today). Planned: pending government definition (solution may be an autonomous activity for DSOs)	No / No	Yes, the 'Data Communications Company' started its activities in September 2013
Detailed data available to customer	Yes. The French NRA requested DSOs set up a free and secured website to make data available	To be decided	Yes	Retailer is providing every 2 months meter data to consumers with smart meters.	Yes, through a DSO portal. Customers with smart meters (including HV, MV and more than 30,000 LV customers) can have access to detailed data	Yes. DSOs are developing web portals to make detailed data available in an easy and useful way	Yes (when DCC in place)
Entity that has the data hub with commercial valuable data (Entity / Access)	DSO / Access to all suppliers or third parties, provided they are granted access by the consumer planned	To be decided		DSO / Free access to data for all retailers	DSO / Free access to data for all suppliers, which have full access to customers' information. For customers belonging to different suppliers, (with permission) suppliers can access the customer's delivery point register data	DSO / Free access to data for all retailers	A new regulated entity, called the Data Communications Company (DCC)
Entity responsible for energy balance	TSO is responsible for energy balancing at system level, with data from DSO	TSO		TSO is responsible for energy balancing at the system level, with data from DSO. DSO is responsible for energy flows security on its	TSO with data from DSO and other agents	TSO with data from DSO and other agents	

	DSO is responsible for energy flow security on its network			network.			
Current highlights	Undergoing public debate with the NRA and stakeholders on Linky (ERDF's smart meter) services and cost recovery Implementation of NEBEF, the French Demand Response mechanism, since January 2014	None		A centralised implementation of allocation and reconciliation processes is planned.	Phasing-out process of regulated prices by end of 2015. Government announced new legislation related to the switching independent operator	Hourly price mechanism for consumers implemented in April 2014. Metering procedures being developed, with DSO at heart of information provision	

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EDSO for Smart Grids is a European association gathering leading Electricity Distribution System Operators, cooperating to bring smart grids from vision to reality.

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