The Voice of the Networks

Energy Networks Association

Open Networks Project

July 2019

Flexibility Market Principles

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Introduction

The **Open Networks Project** is a major energy industry initiative, run by the Energy Networks Association, that will transform the way our energy networks work, underpinning the delivery of the smart grid. This project brings together 9 of UK and Ireland's electricity grid operators, respected academics, NGOs, Government departments and the energy regulator Ofgem. The **2019 Project Initiation Document** outlines what the Open Networks Project will deliver in 2019, how it will be delivered and when. **Workstream 1A** is focused on **Flexibility Services** in the developing **Flexibility Market** and has 3 key objectives:

1. Develop and deliver good practice and convergence of directly contracted DSO services to customers across DNOs to deliver a consistent experience for customers
2. Facilitate markets outside the direct procurement of service by DSOs to allow third parties to develop effective and liquid market platforms for customers to realise value for flexibility
3. Support the wider use of DSO services by removing barriers and encouraging the consideration of flexibility solutions

The following extract summarises the aims for **Product 1** in **Workstream 1A**, **Flexibility Market Principles**, for which this document is a key deliverable.

> ***2019 PID Extract – WS1A P1 Flexibility Market Principles***
>
> *Outline guiding principles for the flexibility marketplace for DSO services that ensure competition and mitigate against any conflicts of interest or unintended consequences to make sure consumers benefit from a fair and more efficient system.*
>
> *This product will:*
>
> a) *Develop guiding principles to drive the right behaviour for the DNOs, potential **Platform** providers and **Market Participants** involved in the procurement of flexibility to resolve network issues.*
> b) *Stakeholders have indicated through responses to the Future Worlds consultation that this is an area of high priority to them and as a result we will be consulting on this.*

Flexibility Markets – a principles-based approach

A principles-based approach to **Flexibility Markets** offers significant opportunities to enhance the confidence and satisfaction of participants, growing industry trust. Such an approach should provide certainty and consistency for **Market Participants**, as well as facilitating innovation and enhancing competitiveness. Early definition of fair principles for participants, based on engagement with the whole sector, can reduce the level of perceived conflict, support efficient operation of **Markets** as they develop, and help define where a more formal governance approach may be needed in the future. In addition, other stakeholders can benefit from assurances regarding the behaviour of participants as they focus on outcomes that embed good practice in the market.

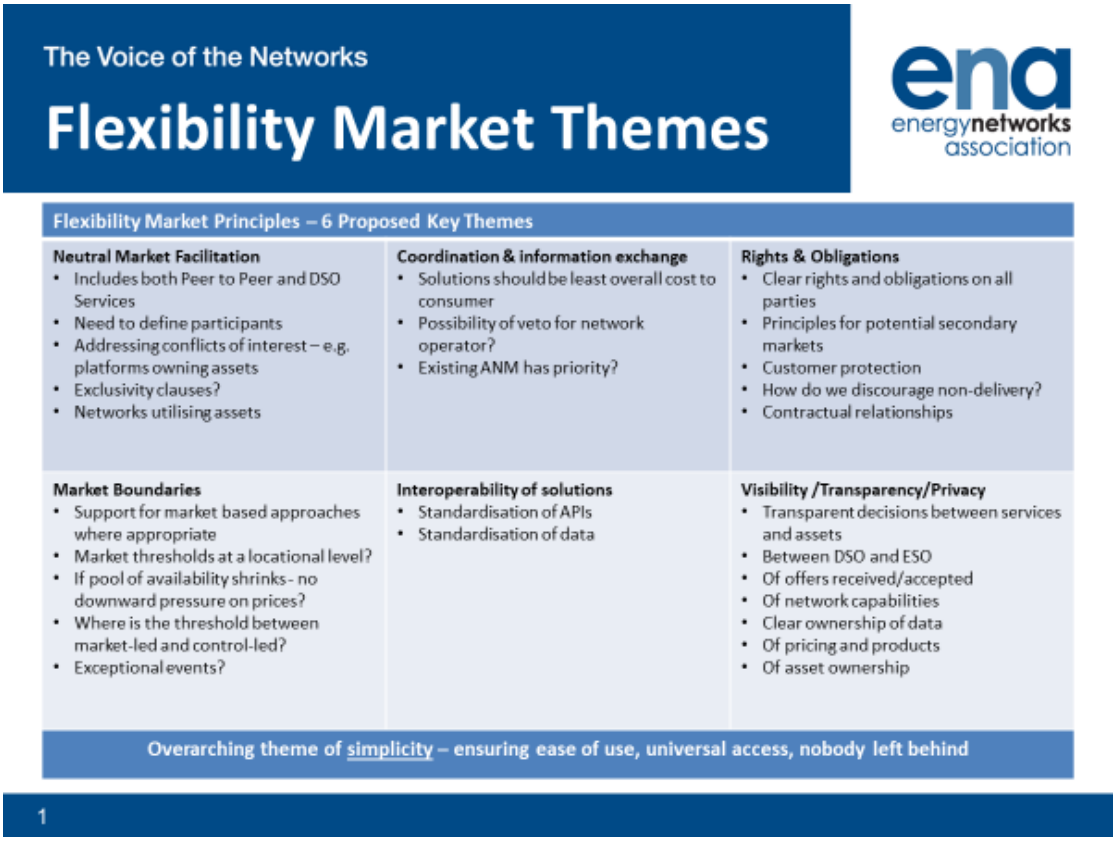
These **Flexibility Market** principles will be developed in such a way that includes:

- **Greater Reliance on Broad-based Standards -** rather than detailed rules, the principles:
  - are drafted at a high level of generality, with the intention that they should be overarching requirements that can be applied flexibly to a rapidly changing industry.
  - contain terms which are qualitative not quantitative: general, usually evaluative terms ("fair", "reasonable", "suitable") as opposed to specific rules ("within 2 business days"; "turnover of £20million").
  - are purposive, expressing the reason behind the rule.
  - have very broad application to a diverse range of circumstances.
  - are largely behavioural standards – they are concerned with, for example, the "integrity", "skill care and diligence" and "reasonable care" with which **Market Participants** conduct and organise their businesses and the fairness with which they treat customers and manage conflicts of interest.

- **A Focus on Outcomes -** in a dynamic market with high levels of innovation, the flexibility **Market Participants** are best placed to determine what processes and actions are required within their businesses to achieve a given regulatory objective. So, the principles, instead of focussing on prescribing the processes or actions that **Market Participants** must take, should define the outcomes that they require the flexibility market to achieve. **Market Participants** will then be encouraged to find the most efficient way of achieving the outcome required.

Initially the product team identified **7** key themes to group the **Flexibility Market** principles under. However, after consultation at the Advisory Group in March 2019, it became apparent that the theme of **simplicity** should be an overarching principle that applies to all the

themes. The following diagram outlines the **6** remaining themes and the overarching principle of **simplicity**:



Advisory Group

These themes were presented to the Advisory Group at the March 2019 meeting for ratification.

Sources

As the transition to a smart grid gathers pace a number of industry experts in the UK and Europe have already started to consider some of the essential aspects of a functioning **Flexibility Market**. This document acknowledges the value of that analysis and where appropriate has utilised their insight in the formation of flexibility principles. The following studies feature in this document and are acknowledged in the text:

1. **An Introduction to Interoperability in the Energy Sector (Energy Systems Catapult - December 2018)** - this report provides clarity on the different uses of the term interoperability, discusses the types of interoperability which must be considered to deliver demand-side flexibility and provides case-studies which illustrate the practical need to consider the different elements in context with each other. Furthermore,

evidence for taking a systematic approach for products and services is provided, which highlights the need to think about multiple forms of interoperability simultaneously.

2. **CEER New Services and DSO Involvement** - the Council of European Energy Regulators (CEER) was established in 2000 for the cooperation of the independent energy regulators of Europe. It seeks to facilitate the creation of a single, competitive, efficient and sustainable EU internal energy market. This paper aims to contribute to provide clarity on energy regulators' positions regarding system services in the fields of energy storage, direct consumer services, data management, and services outside of the energy sector. The paper concludes that, as neutral market facilitators, distribution system operators are vital in facilitating these developments, but at the same time they should typically not crowd-out the provision of these services by the competitive marketplace. A stakeholder roundtable contributed input to this paper.
3. **E.DSO TSO-DSO Report: An Integrated Approach to Active System Management** - a report on the development and integration of new flexibility services in the electricity system and market launched by the European associations representing the distribution system operators (DSOs) – CEDEC, E.DSO for Smart Grids, Eurelectric and GEODE - as well as ENTSO-E, representing the transmission system operators (TSOs). The report builds on the TSO-DSO Data Management report from 2016 that concludes it is necessary for TSOs and DSOs to agree on mutual processes and data exchanges to guarantee the reliable, efficient and affordable operation of the electricity system and grid, and to secure non-discriminatory and efficient markets. In line with the Clean Energy Package (in Article 32.1 of the Electricity Directive), that provides for DSOs procuring flexibility services in their service area, the European TSO and DSO associations focus on the use of flexibility for grid and system purposes, as well as on the interaction of different market processes.
4. **ENA: Our Six Steps for Delivering Flexibility Services (2019)** - In 2018, Britain's six Distribution Network Operators, and more recently GTC, committed to openly test the market to compare relevant reinforcement and market flexibility solutions for all new projects of any significant value as part of the Flexibility Commitment. Building on this, the Distribution Network Operators, GTC, the Transmission Owners and National Grid Electricity System Operator are committing to six key steps as flexibility services are rolled out more widely and we transition to a low-carbon, smarter, and cost-effective energy system that is fit for Britain's future. Under ENA, **System Operators** are committed to collaborating and working closely together to ensure the successful transition to a low carbon energy system, while maintaining secure electricity supplies and delivering value for money for customers. These steps apply to how **System Operators** will procure and use **Flexibility Services** to maximise benefits to households, businesses, and communities across the country. They will act as the

foundations for enabling, supporting, and growing **Flexibility Markets** across the country. This commitment will directly benefit customers; not only will **Flexibility Markets** provide new solutions for networks to help reduce the cost of traditional network reinforcement, but they will create new revenue streams for customers by enabling them to use their flexible technologies to sell services into these new markets. The commitment is to:

a. Champion a level playing field
b. Ensure visibility and accessibility
c. Conduct procurement in an open and transparent manner
d. Provide clarity on the dispatch of services
e. Provide regular, consistent and transparent reporting
f. Work together towards whole energy system outcomes

These steps have been embodied in the wider principles in this document and will be carried forward into consistent, tangible processes, procedures, and agreed working methodologies by all **System Operators** through the ENA Open Networks Project.

5. **Energy Data Task Force Report (Digital Launch - Energy Systems Catapult 2019)** – The Energy Data Taskforce's aim is to provide a set of recommendations that will support the delivery of a Modern, Digitalised Energy System unlocking the benefits of decarbonisation and decentralisation through better use of data. The taskforce believes that digitalisation is the blood stream that releases value, opportunity and resilience enabling decarbonisation and decentralisation to be delivered at optimal cost, lowest carbon impact for the benefit of consumers. This report concludes that data and digitalisation, while not the sole enablers of Energy System transition, are essential to unlock the decarbonisation and decentralisation dividends for the benefit of consumers. As the system becomes more disparate, diverse and decentralised, data sharing will be crucial to coordinating the wide range of actors conducting new roles across the sector and to ensuring system stability. In addition, greater data openness will provide much superior price and market visibility, increase liquidity and drive investment into the right technologies, locations and solutions for the system, all delivering better system and price outcomes for consumers.
6. **Ofgem DSO Workshop June 2019 & Ofgem DSO Paper July 2019** - Ofgem have made decisions and will have to make decisions about whether, and in what circumstances, DNOs should provide new DSO services. They made the decision to introduce a new licence condition to prevent DNOs operating storage, they set out that DNOs should not participate in commercial aggregation, they issued a direction on the regulatory treatment of CLASS and will review its treatment once again for RIIO-ED2. Looking ahead they need to consider appropriate roles for DNOs in the flexibility market platform ecosystem, and other services not yet defined.

7. **Open Networks Workstream 2 Product 3 2018 Terms and Definitions –** At the outset of the Open Networks Project the Customer Experience workstream clarified a number of key terms and definitions in the electricity industry to facilitate discussions both between the project participants and our stakeholders.
8. **Open Networks Workstream 3 2018 Future Worlds Consultation –** EA Technology were commissioned by Open Networks to produce a Smart Grid Architecture Model that explored a number of possible future worlds for smart grid governance. As part of that work they identified the key actors in these future worlds and defined their roles.
9. **Platform markets and energy services (EPRG Working Paper 2013)** – this paper explores how the electricity supply industry can be conceived of as a platform-mediated, two-sided market and the consequences for pricing. Through two cases, a balancing services provider for smart home energy management systems and an electric vehicle charge manager, they show where a platform entrant could position itself in the retail electricity markets between supply companies and end-users. The drivers of such a transition include increased volatility due to renewable generation, the new complexity of roles for end-users, and the introduction of information and communication technologies. They suggest that conceiving of electricity as a platform market where new entrants provide an energy optimisation and management service may stimulate a competitive ecosystem and innovation.

Flexibility Market Definitions

1. **Active Network Management -** is the use of distributed control systems to continually monitor network limits, along with systems that provide signals to **Flexible Resources** to modify outputs in line with these limits.[1]
2. **Aggregator –** this is a commercial entity that combines disparate **Flexible Resources** and offers it as larger units in to the flexibility market. The means of aggregation could be commercial or technical. The Open Networks project defined an **Aggregator** as a company who acts as an intermediary between active parties such as distributed energy resources and active customers who can offer flexibility services, and **System Operators** who wish to obtain such services for efficient management of networks.[2]
3. **Distributed Energy Resources –** Distributed Energy Resources (DERs) are smaller scale power generation technologies (typically in the range of up to 10MW and including electric energy storage facilities) and larger end use electricity consumers (e.g. industrial and commercial) with the ability to flex their demand (i.e. demand-side response) that are directly connected to the electricity distribution network.[3]
4. **Emergency Conditions -** denote conditions when normal operating arrangements are suspended. Emergency Conditions might arise where the condition of an energy system poses an immediate threat of injury or damage, or during a natural disaster or other emergency, or there is an actual or threatened emergency affecting energy supplies.[4]
5. **Flexibility -** the modification of generation injection and/or consumption patterns, on an individual or aggregated level, often in reaction to an external signal, to provide a service within the energy system.[5]
6. **Flexibility Market -** the arena of commercial dealings between buyers and sellers of **Flexibility Services**.[6]
7. **Flexibility Platform** - an IT platform where the coordination, trading, dispatch and support services for **Flexibility Markets** take place.[7]
8. **Flexibility Product -** refers to a product that can be used for different purposes and should be sufficiently aligned (interoperable), to permit the market-based allocation of flexibility services with the objective of an efficient allocation that maximises the value of the flexibility to enable bids by market parties. Such flexibility products can either be an option (availability) or direct activation.

[1] Open Networks WS2 P3 2018 Terms and Definitions
[2] Open Networks WS3 2018 Future Worlds Consultation
[3] Ibid.
[4] Open Networks WS2 P3 2018 Terms and Definitions
[5] Ibid.
[6] Ibid.
[7] Ofgem DSO Workshop June 2019 & Ofgem DSO Paper July 2019

9. **Flexible Resources -** typically distributed generation, storage or demand response, are connected to the electricity network, and are flexible in how they operate and impact the network.[8]
10. **Flexibility Service -** the offer of modifying generation and/or consumption patterns in reaction to an external signal (such as a change in price) to provide a service within the energy system.[9]
11. **Flexibility Service Provider –** a market participant providing **Flexibility Services** to either the wholesale market or to **System Operators**.
12. **Market -** a regular gathering of people/parties for the purchase and sale of commodities (electricity in this document).
13. **Market Participant –** this is a collective term for those entities offering or procuring services within the **Flexibility Market**. It includes **System Operators**, **Flexible Resource** owners and operators, **Aggregators**, **Suppliers**, community groups, local authorities and individuals.
14. **Platform Market -** a **Market** where user interactions are mediated by an intermediary, the platform provider, and are subject to network effects. As opposed to a marketplace or trading exchange, a platform intermediary must offer inherent value beyond the simple mediation process for the two sides of the **Market**. This added-value usually comes from ICT and the associated complementary innovation that increases utility and attractiveness of the **Flexibility Platform** to all user groups.[10]
15. **Regulator -** The energy Regulator is responsible for regulating the electricity industry. The energy Regulator carries out functions to protect the interests of current and future consumers of electricity supplied by authorised Suppliers, wherever appropriate, by promoting effective competition between persons engaged in, or in commercial activities connected with, the generation, transmission, distribution or supply of electricity. The electricity Regulator works closely with industry in carrying out its functions such as licensing electricity Suppliers, generators, transmission and distribution, setting the levels of return which the monopoly networks companies can make and deciding on changes to market rules.[11]
16. **Smart Grid -** an electrical grid which includes a variety of operational and energy measures including smart meters, smart appliances, renewable energy resources, and energy efficient resources. Electronic power conditioning and control of the production and distribution of electricity are important aspects of the Smart Grid.
17. **Supplier -** A Supplier is a company that buys electricity in the wholesale market or directly from generators and sells it on to end use electricity consumers. The Supplier

[8] Open Networks WS2 P3 2018 Terms and Definitions
[9] Ibid.
[10] Platform markets and energy services (EPRG Working Paper 2013)
[11] Open Networks WS3 2018 Future Worlds Consultation

sets the tariffs consumers pay for the electricity they use. Suppliers work in a competitive market where Customers can choose any Supplier to provide their electricity. Suppliers can also be active in flexibility markets; providing services through their Customers.[12]

18. **System Operator –** this is a collective term for the organisations that are natural monopolies in the **Flexibility Market**. It includes the ESO and DSOs. They are neutral facilitators of the **Market** and have a role to monitor, control and actively manage the power flows on the distribution system to maintain a safe, secure and reliable electricity supply.[13]

[12] Ibid.

[13] Open Networks WS2 P3 2018 Terms and Definitions

Principles

Principles are presented below, grouped by themes. Where sourced from external literature, footnotes are used to specify that source.

1. Neutral Market Facilitation

The principles under this theme are particularly focused on the role of the **System Operators** as market facilitators and acknowledges their unique role as natural monopolies. The principles address potential conflicts of interest (e.g. asset ownership) and facilitate participation in network solutions, revenue stacking (e.g. careful use of exclusivity clauses), and peer to peer opportunities.

i. **System Operators** must run their businesses in a way that reflects reasonable expectations of network users and other stakeholders, including new entrants and new business models.[14]

ii. **System Operators** must act as neutral market facilitators in the way they undertake core functions.[15]

iii. Market neutrality is a fundamental principle of operating Britain's energy network infrastructure. **System Operators** should procure **Flexibility Services** in a way that creates a level playing field for all energy technologies and services.[16]

iv. Where **Flexibility Services** are open to competition, **System Operators** should not be allowed to be active in that area. This is due to **System Operators** having part of their costs covered by regulated tariffs, subsequently carrying a lower risk profile supported by their core monopoly activity and placing the **System Operator** in an advantageous position over other **Market Participants**.[17]

v. **System Operators** will not offer **Flexibility Services** commercially outside of the parameters to be determined in the pending DSO Paper that Ofgem has scheduled for July 2019.[18]

vi. Flexibility solutions should be assessed by **System Operators** on whether they have the capabilities to meet the requirements of the offered product irrespective of technology.

vii. **System Operators** should not hinder the opportunities for **Market Participants** to stack revenue only employing exclusivity clauses where appropriate.

viii. **Flexibility Services** should have their full costs surfaced, such that:

    i. Cost-recovery can be targeted appropriately;

[14] CEER New Services and DSO Involvement March 2019
[15] Ibid.
[16] ENA: Our Six Steps for Delivering Flexibility Services (2019)
[17] CEER New Services and DSO Involvement March 2019
[18] Ofgem DSO Workshop June 2019 & Ofgem DSO Paper July 2019

ii. Market participants' imbalance exposure can be corrected, to prevent inaccurate treatment; and,
iii. Asset vs service trade-offs can be undertaken using the most accurate data.

2. Market Boundaries

The principles in this area address the limitations (if any) of market-based solutions to network services. They promote the use of market-based approaches wherever appropriate, however where limited competition exists in the supply of a service, there may be no downward pressure on prices, so alternative approaches, such as bilateral agreements, may be required. **Emergency Conditions** may also necessitate a limit to market-led solutions.

i. Wherever possible, contracts for **Flexibility Services** will be selected and awarded through market-based approaches.
ii. Market-based approaches will include enough detail to allow a service offer to be made, and for those making service offers to understand how they will be assessed.
iii. **Flexibility Services** should be tradeable in different markets and user-friendly mechanisms should be in place to enhance **Flexibility Services**.[19]
iv. **System Operators** should enable any service provider to sell its service in all markets, by facilitating physical connection and data access and delivery. Ensure liquid markets to use the potential of the **Flexibility Services** to the full extent.[20]
v. **System Operators** should facilitate liquid markets in order to use the potential of **Flexibility Services** to the fullest extent.[21]
vi. It might be that there are circumstances where limited competition exists in the supply of a service, for example due to there being specific technical requirements. In such circumstances, it may be necessary to enter into bilateral arrangements. Should this be required, **System Operators** will:
    i. endeavour to contact those providers they believe capable of providing the service to see if they are interested in entering into a contract; and
    ii. offer non-discriminatory terms to procure the service.
    iii. report periodically on the levels of bilateral arrangements and efforts made to reduce those levels as the market develops.
vii. In **Emergency Conditions**, in order to maintain security of supply, **System Operators** may have to resort to a control-led approach rather than a market-led approach. Such interventions must be justified and transparent such that stakeholders can review them subsequent to the event.

[19] E.DSO TSO-DSO Report – An Integrated Approach to Active System Management
[20] Ibid.
[21] Ibid.

3. **Transparency/Visibility/Privacy**

The principles under this theme acknowledge that transparent decisions between **System Operators** and **Market Participants** will be central to the **Flexibility Market**. Areas of visibility should include (but is not limited to); asset ownership, offers received/accepted, network capabilities, **System Operator** pricing, industry defined products, dispatch, success criteria, data ownership and links between the **Flexibility Market** and the wholesale market.

i. **System Operators** should clearly define their needs from an operational perspective and, where possible, they should seek to use standard products to meet those needs. If it is necessary to develop new products, the design process will include engagement with **Market Participants** to ensure they are designed with providers in mind.[22]
ii. **System Operators** should ensure that **Market Participants** are aware of the full range of network products at all voltage levels.
iii. **System Operators** should ensure they highlight where and when opportunities exist for flexibility services to play a role in meeting network needs, such as removing constraints and enabling capacity in local electricity networks. This will include removing barriers to enable providers to access multiple markets for their services (e.g. stacking revenue with balancing services and local flexibility markets). This will be undertaken in a consistent and easily accessible manner. This will involve the provision of data for **Flexibility Service Providers**, to facilitate fully liquid markets.[23]
iv. **System Operators** should make reasonable attempts to make visible (in a non-discriminatory manner) all requisite data for existing and prospective **Market Participants**, in order for them to make informed decisions on service provision.
v. **System Operators** should use open and transparent procurement methodologies when comparing different solutions to meet network needs, such as **Flexibility Services** from the market, network-owned smart grid solutions and traditional grid reinforcement. **System Operators** should be transparent on the criteria used in decision-making. The guiding principle behind any decision is the solution that is overall least cost for customers (now or in the future), whilst meeting network needs.[24]
vi. **System Operators** should take a fair and clear approach to the dispatch of **Flexibility Services** to meet electricity network needs. They must set out the terms

[22] Ibid.
[23] ENA: Our Six Steps for Delivering Flexibility Services (2019)
[24] Ibid.

and methodology behind service dispatch (including any decision-making criteria), including reporting which services have been dispatched and why.[25]

vii. Regular, consistent, transparent monitoring and reporting is key to ensuring that all **System Operators** learn from their selection and use of **Flexibility Services** to run energy networks in a smarter, more efficient way. All decisions (e.g. reinforcement v. flexibility services), reasoning and decision processes should be transparent and made readily available. **System Operators** must commit to sharing those lessons publicly, to share best practice between other network operators and the wider industry.[26]

viii. All **Market Participants** should declare asset-ownership and take steps to ensure this is not to the detriment of third-party participants that use their services.

ix. Physical infrastructure is not complete without accessible data which enables it to be operated efficiently and impact evidenced - Data enables the system to make greater use of low-cost renewable energy & optimise system management and investment decisions.[27]

x. Data about the energy system should be Presumed Open. Instead of 'can we open' the question is 'is there a need to close' - open data reduces barriers to innovation, increases competition and productivity as well as creating new opportunities.[28]

xi. **System Operators** should enable **Market Participants** to extract the maximum value from data across the energy system - there is untapped value in energy system data that can be extracted if participants know what exists, can find related data and understand what it means.[29]

xii. It is possible to be more open with energy system data whilst ensuring robust system security and increased resilience - reaping the benefit of more open data whilst ensuring the security of the system.[30]

xiii. **System Operators** must comply with privacy regulation, according to European (GDPR) and national regulation, which is protecting customers' privacy and data when delivering market facilitating services to market parties.[31]

4. Rights & Obligations

The principles under this theme ensure there are clear rights and obligations on all parties particularly in the context of customer protection. Contractual relationships for the **Flexibility Market** are defined as well as principles for potential secondary markets.

[25] Ibid.
[26] Ibid.
[27] Energy Data Task Force Report (Digital Launch - Energy Systems Catapult 2019)
[28] Ibid.
[29] Ibid.
[30] Ibid.
[31] E.DSO TSO-DSO Report – An Integrated Approach to Active System Management

It is important to ensure rights and obligations promote certainty of delivery, to support secure system operation.

i. **System Operators** must act in the public interest, accounting for costs and benefits of different activities.[32]
ii. Consumers own their data and **System Operators** must safeguard this principle when handling any such data.[33]
iii. The liability and contractual relation between the buyer and the seller of **Flexibility Services** should be clear. A market process should ensure a direct relationship between the buyer and the seller of a service and any intermediary should be agreed by both parties.[34]
iv. The seller of flexibility is liable for non-delivery and the buyer of flexibility for non-payment. [35] Nevertheless this does not preclude the **System Operator** offering **Market Participants** protection from liability in some circumstances, subject to conditions, in order to stimulate the market and increase participation.

5. Interoperability of Solutions

The principles under this theme acknowledge that standardisation should be a central tenet for all **Market Participants** to ensure a dynamic and cohesive market. Examples of standardisation could include Application Programming Interfaces (APIs) to allow applications to communicate with one another for control signals and data. There are a number of Open Network products that would be applicable here, for example those addressing procurement, data exchange etc.

i. Interoperability of solutions is essential. It is of utmost importance that, no matter how many **Flexibility Platforms** will eventually be used, they are interoperable to ensure sufficient liquidity (e. g. no lock in) and coordination. It should be noted that coordination relies on data and information exchange, as well as ICT solutions.[36]
ii. **System Operators** should strive for convergence and standardisation of both products and processes, adopting those best practices identified through competition and innovation. Evidence of progress should be demonstrated in the Ofgem ICE plans and the Open Network's Best Practice Monitoring Product.

[32] CEER New Services and DSO Involvement March 2019
[33] Ibid.
[34] E.DSO TSO-DSO Report – An Integrated Approach to Active System Management
[35] Ibid.
[36] Ibid.

iii. Consumer Interoperability: **System Operators**, **Aggregators** and **Flexibility Platforms** must ensure that provisions exist for consumers to switch between both different commercial offerings and technology choices.[37]

iv. Commercial Interoperability: **System Operators** must ensure that incentives are aligned across the energy system to ensure that value can flow where it needs to, driven by market forces.[38]

v. Data Interoperability: **System Operators**, **Aggregators** and **Flexibility Platforms** must strive to ease the sharing and portability of data between different systems.[39]

vi. Device Interoperability: **System Operators**, **Aggregators** and **Flexibility Platforms** must ensure that technology is swappable, replaceable and exchangeable as needs change and technologies develop and to allow **Market Participants** to make informed choices between open and closed eco-systems.[40]

vii. Standard structures & interfaces enable data across organisations to be aggregated and utilised more easily - utilising standards where appropriate can increase the efficiency of data management & sharing.[41]

6. **Coordination & Information Exchange**

The principles under this theme state that the key driver for coordinating **Flexibility Markets** should be that solutions are the least overall cost to the customer. These principles detail when the **System Operator** might need to deviate from normal market operation to maintain system security.

i. **System Operators** shall co-ordinate mutual processes and agree on data exchanges between them to guarantee a reliable, efficient and affordable operation of the electricity system and grid, and to guarantee non-discriminatory and efficient market operation.[42]

ii. **Flexibility Platforms** must avoid harmful interference and conflicts beyond their associated grids: **Flexibility Platforms** should contain a functionality to ensure that any ESO or DSO interaction does not create any harmful impact on their respective grids or on the system as a whole. This requires correct and timely data exchange between **Flexibility Platforms** and a set of well-designed algorithms.[43]

[37] An Introduction to Interoperability in the Energy Sector (Energy Systems Catapult - December 2018)
[38] Ibid.
[39] Ibid.
[40] Ibid.
[41] Energy Data Task Force Report (Digital Launch - Energy Systems Catapult 2019)
[42] E.DSO TSO-DSO Report – An Integrated Approach to Active System Management
[43] Ibid.

iii. System integrity and existing contractual relationships to manage constraints will always take precedent over future commercial opportunities. **System Operators** must be clear on these situations and make these decisions visible.

iv. **System Operator** coordination and mutual data exchange is an activity in the regulated domain. As **System Operators** carry system responsibility to ensure the security of supply and system stability, any coordination and data exchange between them that is required to avoid harmful interference is the responsibility of **System Operators**. This will also ensure that the whole system is operated as efficiently as possible, and the value to the customer is maximised.[44]

v. **System Operators** should work closely together to ensure that change delivers the best outcomes for customers and consumers on a whole system basis (i.e. considering transmission and distribution systems as well as gas, heat, transport and other vectors).[45]

[44] Ibid.

[45] ENA: Our Six Steps for Delivering Flexibility Services (2019)