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TRANSITION & Project LEO Regulatory Governance



Scottish & Southern
Electricity Networks

ElectraLink

Contents



Background	04
Purpose	05
Product Overview	06
Regulatory Landscape	09
Regulatory Service Framework	11
Outputs	13
Appendix	16
Appendix A - Regulatory Roadmap	18
Appendix B - Impact Assessment and DCUSA Change Process Flow	24
Appendix C - DCUSA Sandbox Process Flow	26

Background

Projects TRANSITION and LEO are two Network Innovation Competition (NIC) funded projects led by Scottish and Southern Electricity Networks (SSEN).

TRANSITION Project

TRANSITION will design, develop, demonstrate, and assess the common tools, data and system architecture required to implement the proposed models produced by the Open Networks Workstream 3 project. This will include:

- Developing roles and responsibilities for market participants (MPs), and market rules to allow MPs to transact services;
- Clarifying the requirements and implementing a Neutral Market Facilitator (NMF) platform for trials;
- Engaging and consulting with stakeholders;
- Identifying up to three network learnings from the above; and
- Providing direct validation and incremental development of the Open Networks market models.

Local Energy Oxfordshire Project

For Local Energy Oxfordshire (LEO), SSEN has joined with key local and industry partners to launch Project LEO, one of the most wide-ranging and holistic smart grid trials ever conducted in the UK. The launch follows confirmation that the £40 million project, which will test electricity network flexibility models and markets across Oxfordshire, has received an award of £13.8m from the UK Government Industrial Strategy Challenge Fund.

An industry-first, Project LEO will explore how the growth in local renewables, electric vehicles (EVs), battery storage, vehicle-to-grid (V2G) technology and demand side response can be supported by a local, flexible, and responsive electricity grid to ensure value for consumers and opportunities for communities and market providers.



Purpose

The purpose of this document is to set out ElectraLink's Distribution System Operator (DSO) code governance guidance which will feed into SSEN's TRANSITION and LEO projects. The development of a Regulatory Roadmap and Regulatory Service Framework with repeatable Impact Assessment have been informed by the findings of Discovery and Validation workshops facilitated by ElectraLink in December 2019 and March 2020 respectively.

The regulatory framework and other outputs that has been developed build upon and compliment other work undertaken by industry. These include ENA's Open Networks Project and Charging Futures work. The code governance guidance in this report will support future DSO work plans, specifically:

- Access and Forward-Looking Charges¹;
- System Wide Resource Register (SWRR)²;
- Complete analysis of code changes and potential extensions of the SWRR (e.g. for resources <1MW);
- Transmission Distribution (T-D) Data Exchange - Completion of T-D data exchange requirements in planning timescales and a view of potential implementation plans and potential Code changes required to enable them; and
- SSEN's DSO Strategy – Identification of the barriers to delivery and wider regulatory considerations³.

¹ Ofgem: Reform of network access and forward-looking charges - [https://www.ofgem.gov.uk/electricity/transmission-networks/changing/reform-network-access-and-forward-looking-charges](https://www.ofgem.gov.uk/electricity/transmission-networks/charging/reform-network-access-and-forward-looking-charges)

² ENA: System Wide Resource Registers - <https://www.energynetworks.org/electricity/futures/open-net-works-project/der-information/system-wide-resource-registers.html>

³ SSEN: DSO Strategy - <https://www.ssen.co.uk/SmarterElectricity/>

Product Overview

The table below summarises the products that were developed by ElectraLink and SSEN during the delivery of the Regulatory Roadmap, Regulatory Service Framework and Impact Assessment.

Products and Delivery Dates	Output	Format
“Discovery Workshop Summary Report”	Summary of the findings from the Discovery Workshop held with SSEN stakeholders in December 2019	Report
“Regulatory Roadmap and Impact Assessment – Concept Report”	A high-level conceptual approach for the delivery of future work packages, including the Roadmap and Impact Assessment	Report
“Validation Workshop Summary Report”	Summary of the findings from the Validation Workshop held with SSEN stakeholders in March 2020.	Report
“Code Validation Matrix”	A tool developed by ElectraLink to ‘validate’ the requirements ‘discovered’ on the basis of complexity, timescales, scope and other criteria.	Excel Sheet
“Regulatory Roadmap and Impact Assessment – Final Report”	Key findings, presentation of all complete products and recommendations.	Report

Table 1 ElectraLink Product Overview

Discovery and Validation Approach

ElectraLink was appointed by the SSEN TRANSITION Project to provide regulatory governance support services. Engagement was split into four work packages (including mobilisation) to enable the development of a regulatory governance framework and methodology. It was agreed that once established, this framework will provide an iterative and agile process in identifying and developing the regulatory governance requirements as the TRANSITION and LEO Projects continue to evolve.

ElectraLink focussed on the initial five Trial Flexibility Services for Project LEO in the initial Discovery Workshop in order to ‘Discover’ the risks, issues, comments, ideas and requirements that need to be considered for their delivery. The workshop format was an unconstrained environment to enable a broad exploration of the regulatory governance landscape in which future solutions will need to operate.

Discussions took place based on the source of the flexibility, be it General (high-level), DSO Driven, ESO Driven and/or Demand Side. The Discovery Workshop was facilitated by the ElectraLink team with eight SSEN participants in attendance. The core objective was to promote open discussion between all workshop participants in an unconstrained environment to draw out key issues, opportunities and ideas ahead of validating these findings at the Validation Workshop, held in March 2020.

Five Flexibility Services for TRANSITION and Project LEO

Flexibility and flexibility services will enable greater penetration of renewables through a reduction in system integration costs of low carbon technologies and help facilitate the cost-effective decarbonisation of the GB electricity system. Flexibility will allow higher volumes of low carbon technologies and renewable energy to connect to the electricity system and provide additional savings and benefits to GB and customers.

Demand-side flexibility has the potential to contribute to increasing levels of flexibility on the network with demand customers providing services to balance the network or defer energy to times of lower demand. Therefore, establishing market frameworks that facilitate access to demand-side flexibility and enable its whole system value to be realised are critical in delivering the low carbon future.

It was highlighted by the TRANSITION Project that increasing the level of flexibility available to deliver flexibility services will benefit the DSO, ESO and other market actors. It is noted that these services will be aligned with the ENA Open Networks Project in early 2020, and that the work undertaken to date has been developed in a coordinated manner. SSEN has identified this opportunity, however it is noted that as currently defined the five services below do not constitute a 'final' set of services and further work will be undertaken to finalise these up until Summer 2020.

The five flexibility services identified by TRANSITION which will be tested as part of Project LEO are as follows:

1. DSO Constraint Management

To reduce the demand on a distribution network asset immediately under certain system conditions and at certain times of day for a maximum duration, e.g. support the network during fault conditions, during maintenance work or where a constraint is forecast, using a DSO triggered service.

2. Peak Management

To reduce the apparent power (kVA) using local reactive power (kVAr) to increase the headroom of a distribution network asset under certain system conditions and at certain times of day for a maximum duration. Typical application is to manage the peak demand in Winter or to manage peak distributed generation during Summer using a DSO instructed service

3. Short-Term Operating Reserve

To provide the ESO with access to sources of extra power to help manage the system when actual demand on the system is greater than forecast or there is an unforeseen generation unavailability which occurs more often than previously due to the imbalances caused by the growth of intermittent wind and solar generation. This is an ESO scheduled service.



4. Authorised Supply Capacity Trading

To allow customers supplied from the same [primary / grid] sub-station to share their Authorised Supply Capacity (import or export) for a period of time to help address specific customer issues, e.g. resolve generation constraints or trade Authorised Supply Capacity when not required. This service requires prior approval by the DNO and to ensure it does not create a constraint. This is a Peer-to-Peer (P2P) scheduled service.

5. Offsetting

To allow any demand, storage and generation customers supplied from the same constrained [primary or grid] sub-station to offset the increase in demand of one customer with the same level of increase in export of the other customer. The net effect of the transaction is zero so there is no effect on the constrained [primary or grid] sub-station as a result of this transaction.

Voltage as a Service (VaaS)

This is not within the scope of the five TRANSITION services but is included to demonstrate the potential opportunity for DNO / DSOs to offer services here.

Flexibility Services Prioritisation Exercise

During the Validation Workshop, a short exercise was undertaken to ‘prioritise’ the five flexibility services and the additional ‘Voltage as a service’ option to provide an initial understanding of pre-implementation requirements. These services were ‘prioritised’ based on impact vs. effort to deliver and are subject to deeper discussion, further exploration and development. The outcome is presented in Figure 1 below with the numbered boxes in the figure corresponding to the numbered service descriptions in the text above.

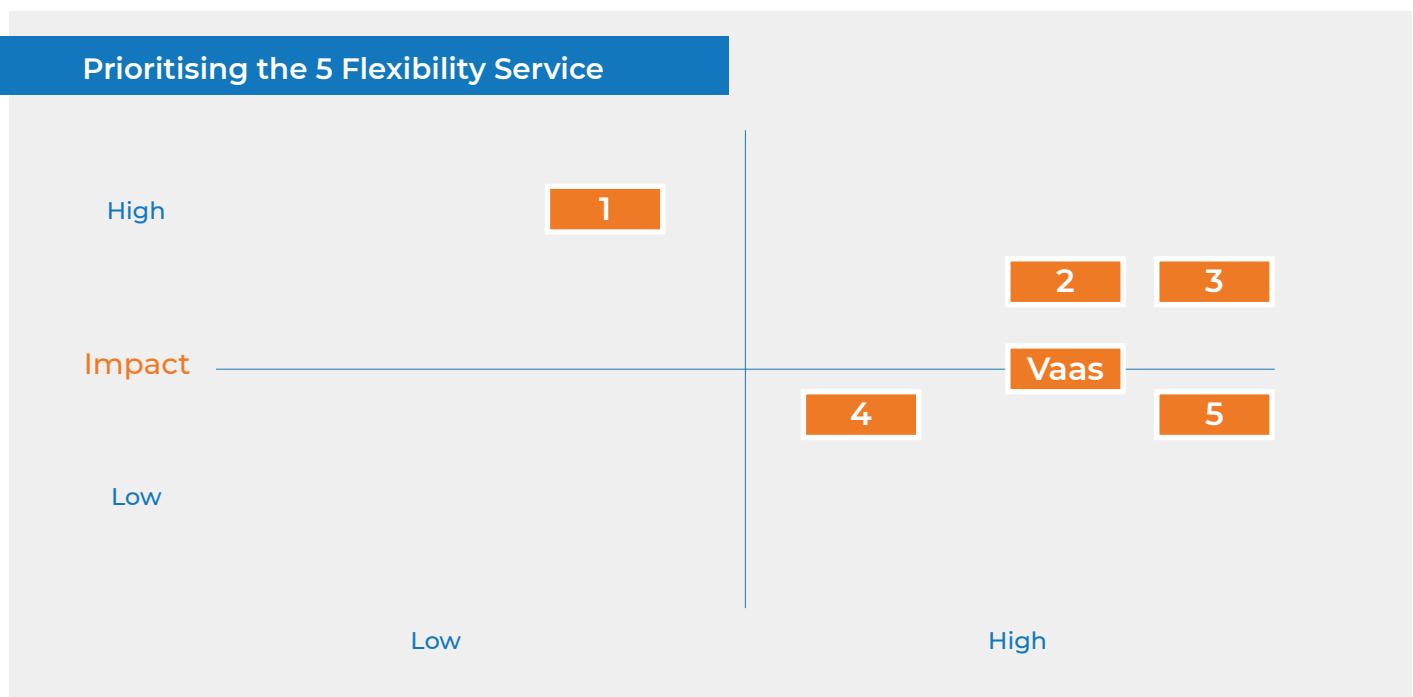


Figure 1 Flexibility Services Prioritisation Exercise

Regulatory Landscape

Legislation

The TRANSITION Project is subject to the legislation that facilitated the privatisation of the electricity market and set in place a competitive electricity supply industry in Great Britain. This legislation also established the licensing regime as well as the industry regulator, Ofgem.

For the purposes of this project the relevant legislation is detailed below. Whilst it is recognised that any legislative changes would be rare and a last resort, they are included for completeness:

- Electricity Act 1989; and
- Relevant UK Competition Law.

Regulation

Under the Electricity Act 1989, certain activities concerning electricity may only be carried out with a licence (or under a relevant exemption or exception).

Ofgem determines the content of electricity licences and grants licences to successful applicants. It assesses applications for licences in accordance with published criteria.

For the purposes of this project the relevant regulations are:

- Electricity Distribution Standard Licence Conditions;
- Electricity Generation Standard Licence Conditions;
- Electricity Interconnector Standard Licence Conditions;
- Electricity Supply Standard Licence Conditions; and
- Electricity Transmission Standard Licence Conditions.

Self-Regulation (Industry Codes)

Licences contain conditions that Licence holders must comply with, including conditions in relation to becoming a party to, and complying with, industry codes and standards. Industry codes and standards establish rules that govern market operation and the terms for connection and access to energy networks.

Each industry code has its own Code Administrator and respective website. Code Administrators can provide information on the codes they are responsible for and assist in understanding the arrangements to become a party to a code (if appropriate).

For the purposes of this project the relevant codes are:

- Balancing and Settlement Code (BSC);
- Connection Use of System Code (CUSC);
- Distribution Use of System Agreement (DCUSA);
- Grid Code (GC);
- System Operator Transmission Owner Code (STC);
- EU Network Code (ENC);
- Distribution Code (DCODE);
- Smart Energy Code (SEC); and
- Retail Energy Code (REC) - including the incumbent Master Registration Agreement (MRA)

Industry Standards

Licensees are also required to comply with technical codes and standards relating to transmission and distribution networks.

For the purposes of this project the relevant standards are:

- GB Security and Quality of Supply Standard (SQSS); and
- Distribution System Planning Standard (DSPS)

Under certain circumstances, Ofgem issues a direction to a licensee relieving it of its obligations to comply with a pre-agreed part of these obligations. These directions are generally referred to as derogations.

Discovery and Validation Approach

Based on the flexibility discussions from the ‘Discovery’ workshop, it was agreed that there are three likely sources of flexibility in the system. Table 2 below maps the possible sources of flexibility in the system to the five flexibility services identified by TRANSITION and LEO.

Flexibility Source	Description	Mapping
DSO Driven Flexibility	Flexibility driven by the DSO requiring flexibility in order to manage its network.	Service 1 (DSO Constraint Management) and Service 2 (Peak Management) fit into this category
ESO Driven Flexibility	Flexibility driven by the ESO requiring flexibility in order to manage the National Electricity Transmission System.	Service 3 (Short Term Operating Reserve) above fits into this category
Demand Side (P2P) Flexibility	Flexibility driven at the demand side requiring flexibility from network users to increase efficiency and reduce infrastructure costs.	Service 4 (Offsetting) and Service 5 (Authorised Supply Capacity Trading) above fit into this category

Table 2 Flexibility Services Mapping



Regulatory Service Framework

The Legislation, Licences, Codes and Standards are mapped onto the *Regulatory Service Framework* in Figure 2 below and should be read in conjunction with the supporting reference table (*Table 3*) on the following page. This allows a potential flexibility service to be assessed according to the regulation that it affects. For example, if a P2P Flexibility Service is identified, it provides a view on the regulation it will be subject to and provides an indication of potential regulatory change. The framework will also support the assessment of multiple flexibility services so that synergies can be found in overlapping codes and potentially reduce the need for a large number of change proposals. Additionally, if a Sandbox application has been granted for a particular licence or code, it can be highlighted on the framework in order to allow multiple flexibility services to benefit from the applicable derogation.

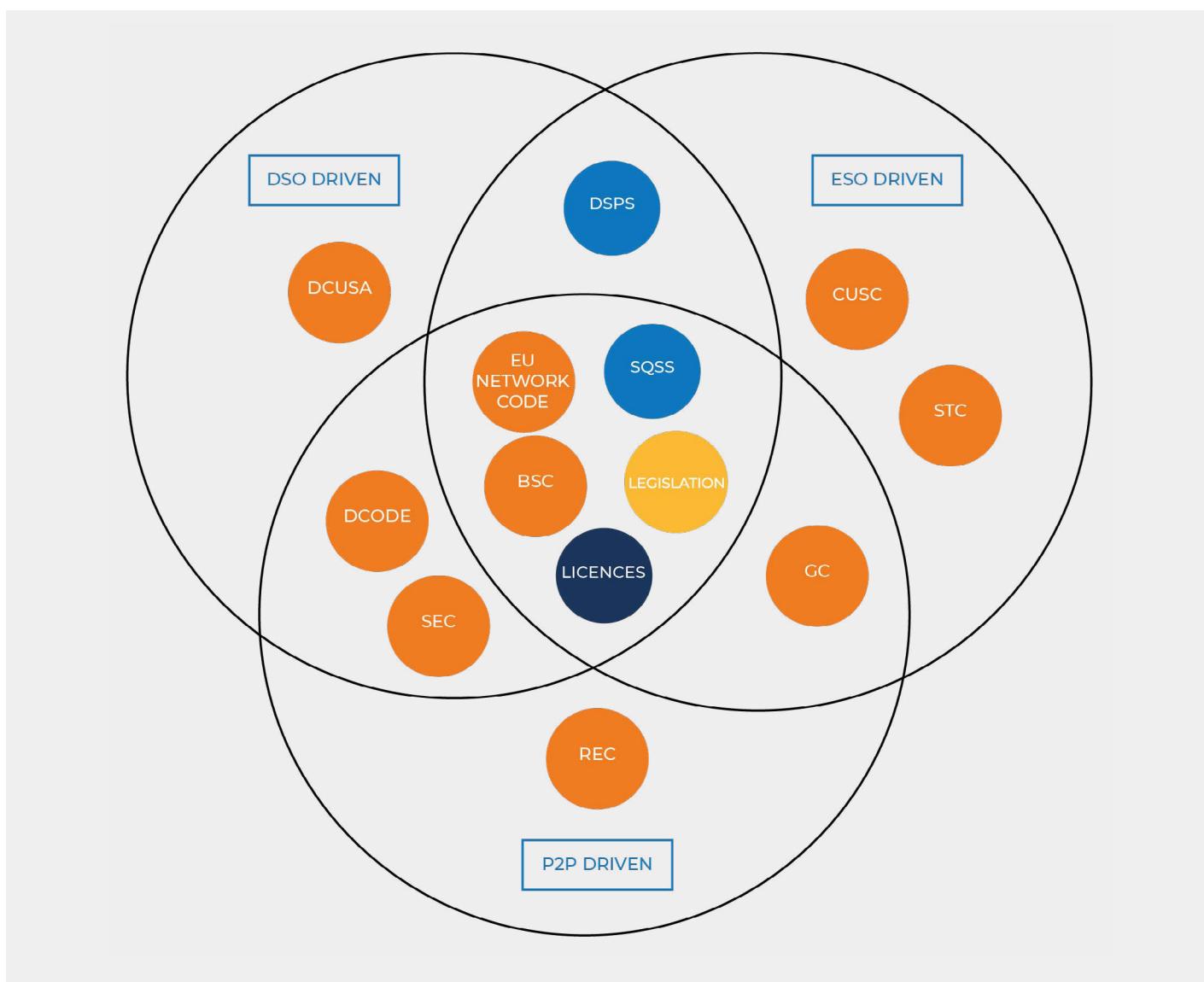


Figure 2 Regulatory Service Framework

Table 3, below supports Figure 2, providing the Acronym, the Legislation, Licences, Codes and Standards and the Administrator/Owner.

Acronym	Name	Type	Administrator/ Owner
DCUSA	Distribution Connection Use of System Agreement	Code	ElectraLink
BSC	Balancing & Settlement Code	Code	Elexon
REC	Retail Energy Code	Code	Procurement underway
SEC	Smart Energy Code	Code	SECAS
CUSC	Connection and Use of System Code (Electricity Transmission)	Code	National Grid
DCODE	Distribution Code (Electricity Distribution)	Code	ENA and Distribution Network Operators
ENC	EU Network Code	Code	EU
STC	System Operator Transmission Owner Code	Code	National Grid
GC	Grid Code (Electricity Transmission)	Code	National Grid
SQSS	Security and Quality of Supply Standards	Technical Standards	National Grid ESO
DSPS	Distribution System Planning Standard	Technical Standards	Distribution Network Operators
Licences	E.g. Electricity Distribution Standard Licence Conditions	Licence Conditions	Ofgem
Legislation	E.g. The Electricity Act 1989	Act / Legislation	Government

Table 3 Regulatory Service Framework Key



Outputs

Seventy-one regulatory considerations and requirements have been reviewed on the basis of priority, complexity, time horizon, regulatory impact, customer impact and whether the requirement should be included in the regulatory roadmap.

As a result of this validation process, these requirements were further refined into twenty-one 'in scope' code change considerations for the Regulatory Roadmap. These findings are initially presented in the Code Change Requirements Table (Table 6). An excerpt from this table is included below as well as the final criteria used to Validate the Discovery requirements. Each of these validation criteria are explained in further detail in Table 4 Validation Criteria below.

Validation Criteria	Description
Priority	In terms of service delivery, how imminently is this change needed to meet the service requirements and any planned implementation dates?
Complexity	In practice, how complex will the change be to navigate as well as an initial understanding of its likelihood of success?
Time Horizon	How soon will a change be initiated i.e. submitted to code authority or other authority as appropriate?
Service Live	How soon is the service required and what is its anticipated 'go live' date?
Regulatory Impact	What does the change impact upon with complexity increasing from one to four – (1) Technical Standards, (2) Codes, (3) Licence Conditions, (4) Legislation or other?

Table 4 Validation Criteria

A Validation Matrix was developed in coordination with SSEN to test each of the regulatory considerations and apply a common assessment process. The Validation Matrix criteria (Table 5) are set out below and colour coding is used to demonstrate both time required and complexity.

Priority	Complexity	Time Horizon - Code Change	Service Live	Regulatory Impact
In Progress (Live)	In Progress (Live)	< 6 months	Over 3 years	Technical Standards
Low	Low	< 1 Year	Two to three years	Codes
Medium	Medium	> 1 Year (Specify Time)	One to two years	Licence Conditions
High	High	If over 3 Years	Within one year	Legislation
				Others?

Table 5 Code Change Validation Matrix

Table 6 sets out the twenty-one refined requirements that were discussed and agreed during the Validation Workshop. These requirements set the context for the Regulatory Roadmap (Appendix A) and Impact Assessment (Appendix B). The refined and validated requirements are presented in the Regulatory Roadmap section of this report.

ID	Source	Requirements	In scope?	Workshop Comments
2.1	P2P	P2P codification - Impacts on REC and DCUSA - How would this be trialled in practice?	YES	ElectraLink to provide view on this as part of the Roadmap and Impact Assessment Deliverable
3	General	Managing flexibility payments, transactions and settlement (as a DSO)	YES	Not scalable presently - BSC exists at T/SO level - How would it work at D? - Forward looking network access review
8	General	Privacy access concerns around data and any flexibility solutions	YES	D Code addresses aspects of privacy
8.1	DSO	Security or access concerns around data and any flexibility solutions	YES	NIS / Cyber Code
15	General	Equality of consumer access to flexibility services? (2.1)	YES	Customer relationship / aggregation at domestic customer level doesn't exist yet
20	General	Regulatory oversight of assets and services and participants in the flexibility market. Standardisation required to create level playing field and appropriate oversight.	YES	Aggregators will they be regulated? Best practice development - Consumer education considerations
24	ESO	Impact on Use of System daily rates to be understood	YES	DUoS / TUoS - How is DUoS adapted to charge accordingly and pay DNOs?
29	ESO	Cheaper to connect to Distribution network vs. Transmission network?	YES	Connection charges and ongoing Duos / BSUoS etc.
33	DSO	Local charging will affect DUoS charging statements and will need to be settled during charging regime review	YES	DCUSA
34	DSO	Impacts on DCUSA and Common Distribution Charging Methodology (CDCM) - Potential to impact assess	YES	DCUSA / Opportunity
35	DSO	Would people closer to generators pay less under flexibility, if not how would it be managed?	YES	DCUSA / DUoS
36	DSO	ITerms and Conditions built into connection agreement for flexibility of this kind at all levels?	YES	Commercial Layer - DCUSA STC for domestic, how would this affect participation in flexibility?

ID	Source	Requirements	In scope?	Workshop Comments
42	DSO	Measure values at service provision - Settlement and metering - How do we know if energy has been delivered?	YES	Flexibility T&Cs - How would this be balanced and settled in BSC or DCUSA equivalent? Could DCC/ Smart meter enable this for energy exported/ delivered? Energy Theft implications as greater visibility of usage etc.
44	DSO	Modify a connection agreement or create a commercial agreement	YES	DNOs
46	DSO	Unmetered Supplies Operator (UMSO) perform a regulated function in managing unmetered inventory	YES	Street lighting, move to LEDs - Does this sit in BSC or elsewhere? TCR Decision?? (transmission demand residual)
49	DSO	Increase in operational costs for DSO need to be recovered	YES	Price control determination, ED2, DUoS (DCUSA) and how are they recovered?
49.1	DSO	Separate licence for DSO and DNO and how those relationships/ responsibilities are defined	YES	Separation Required? Change to DCUSA significant and DCUSA Parties
52	DSO	Dynamic and free up constraint management assets stuck in a queue i.e. Queue management processes	YES	What are the code mods required for queue management? ONP (SSEN to provide) Impact on Competition Law and how that sits in reg framework Plus Statutory instruments
53	DSO	Must not prohibit customers from taking part in flexibility or penalise them unfairly i.e. participation should decrease / maintain bills	YES	Licence condition / Market requirement
59	P2P	Managed P2P trading framework	YES	Could be considered for Code modification (DCUSA)
62	P2P	How must P2P transactions be managed with the demands of services 1, 2 and 3 (ESO relationships)	YES	Further research required

Table 6 Code Change Requirements – Validation Workshop Findings



Code and Regulatory Landscape - Regulatory Roadmap* (See Appendix A)

*Content of Roadmap subject to SSEN review as of 24 March 2020

As TRANSITION and LEO progress, it must be ensured that regulatory requirements are considered, both in terms of potential barriers that existing Licences and Codes may present and equally opportunities to determine new ways of working. Whilst the evaluation of new technologies and ways of working are essential, the associated regulatory framework must also be established in parallel, whether that be the need for new Licence and Code arrangements to enable innovation or the timely and incremental evolution of measures already underpinning market. By establishing an early view of the future regulatory requirements and possible constraints, this will help inform the technical and service evaluations that will be undertaken and provide an informed view when engaging the Regulator.

The Regulatory Roadmap in Appendix A has been developed in coordination with SSEN, with engagement and development undertaken during the Discovery and Validation Workshops. The purpose of the Regulatory Roadmap is to deliver oversight and coordination of any future code changes or wider changes that may need to be initiated as part of the delivery of the five flexibility services. It is noted that this approach is not limited to only the five flexibility services and that the Roadmap and Impact Assessment have been designed to be repeatable and relevant in the context of wider code change requirements that may emerge in the delivery of other services and wider solutions encountered during the DSO transition.

Code and Regulatory Roadmap – Near Term Requirements

Table 8 in Appendix A summarises the near-term requirements for further consideration. It is possible that these change requirements and impacts can be explored in further detail and that these could be considered for progression through the DCUSA Sandbox in future.*

Code and Regulatory Landscape - Impact Assessment (See Appendix B)

Regulatory Impact Assessment

The Regulatory Impact Assessment (*Figure 3*) in Appendix B establishes a repeatable, high level methodology for understanding initially, the impact any code or standards change may have from a regulatory perspective. The outputs of this methodology will inform SSEN and provide understanding of process requirements, key change impacts, advisory timescales, likelihood of success and wider considerations. A worked example DCUSA code change process flow is included Appendix B (*Figure 4*) which highlights the requirements a party would have to undertake to initiate and complete the DCUSA change process. This approach can be applied to other code change processes and wider regulatory change.

Market Operation Requirements

The impact a service could have on the market operation and SSEN's service offering are set out in Appendix B - Figure 3 as well as an assessment of various needs and requirements to deliver a service. These sit outside of the impact assessment but are included to highlight the wider considerations for service delivery outside of the regulatory and governance landscape. These Market Operation considerations are included in column five of the Regulatory Impact Assessment.

Impact Assessment Outcomes

Post impact assessment findings will enable SSEN to better understand service delivery and how it is impacted by governance and regulatory change requirements. In addition, it will provide an indication of the complexity, volume and timescales of any changes being assessed or proposed, these impacts assessment outcomes are included in column six of the Regulatory Impact Assessment.

DCUSA Sandbox (See Appendix C)

DCUSA Sandbox

The DCUSA Sandbox seeks to bring flexibility and the creative spirit to innovation in the electricity system, providing a regulatory test environment for new products and solutions as part of Ofgem's Innovation Sandbox Service. In the past, innovative regulatory ideas have often come up against strict regulatory obstacles, but the net zero target for 2050 is injecting hopeful urgency into how the energy market adapts to solve problems.

Through the DCUSA Sandbox, DCUSA administrator ElectraLink can provide expert, independent guidance on proposed changes to aspects of DCUSA, for innovators to explore new concepts that aim to maximise the value of renewables, develop new services and drive decarbonisation. This option will be reviewed further with SSEN and an appropriate review of regulatory change requirements for the flexibility services will be central to this. An example Sandbox Application process flow is provided in Appendix C. This overviews the process an innovator will follow to develop and submit a DCUSA Sandbox application and subsequent report with each of the key stage gates defined.



Appendix A - Regulatory Roadmap

Table 7 Regulatory Roadmap – All Items

Roadmap ID	Workshop ID	Source	Requirements	Priority	Complexity	Time Horizon (Years)	Service Live (Years)	Regulatory Impact
1	2.1	P2P	Modifications to codes and standards will be required to enable P2P flexibility services at scale. This will impact on REC and DCUSA and greater understanding is needed in terms of how the required P2P regulatory principles could be suitably tested, perhaps via the DCUSA and REC Sandboxes initially.	High	Medium	3	5	REC and DCUSA / May impact Licence Conditions
2	3	General	Modifications to codes and standards will be required to enable P2P flexibility services at scale. This will impact on REC and DCUSA and greater understanding is needed in terms of how the required P2P regulatory principles could be suitably tested, perhaps	Medium	Medium	3	5	DCUSA / Forward looking Network Access Review / BSC / SQSS / P2/7
3	8	General	When DSOs offer new flexibility services and solutions to market, customer privacy and access will be central to DSO thinking to ensure appropriate levels of consumer protection	High	Medium	2	5	DCUSA / Forward looking Network Access Review / BSC / SQSS / P2/7
4	8.1	DSO	Cyber security and/ or access concerns around data and flexibility services will be explored and developed as new services and solutions emerge and are central to SSEN's DSO strategy	High	High	3	5	NIS Regulations

Roadmap ID	Workshop ID	Source	Requirements	Priority	Complexity	Time Horizon (Years)	Service Live (Years)	Regulatory Impact
5	15	General	Equality of customer access to flexibility services is a key market principle that needs to be better understood to ensure customers are not unfairly penalised or disadvantaged?	Low	Medium	5	8	Licence Conditions / DCUSA and REC
6	20	General	What level of regulatory oversight of assets and services will be enacted and how will this impact participants in the flexibility market. Standardisation required to create level playing field and appropriate oversight.	High	High	3	5	D Code / DCUSA
7	24	ESO	Impact on Use of System daily rates to be understood as flexibility services proliferate and new market and technology solutions emerge.	Medium	Low	Further Initial Research	Further Initial Research	DCUSA / DuOS and TuOs
8	29	ESO	Exploration of connection charges and cost efficiency to connect to distribution network vs. transmission network?	Medium	Low	Further Initial Research	Further Initial Research	DCUSA / DuOS and TuOs
9	33	DSO	Local charging, P2P services and technology solutions at LV will impact upon DUoS charging statements. These issues and opportunities will need to be explored and settled during charging regime review.	Low	Low	Further Initial Research	Further Initial Research	DCUSA / DuOS and TuOs
10	34	DSO	Impacts of the five flexibility services on DCUSA and Common Distribution Charging Methodology (CDCM) - Potential to understand linkages, roles, system relationships and responsibilities with the view to impact assessing the level of change required to enable these services at business as usual	Medium	Low	Opportunity	Opportunity	DCUSA

Roadmap ID	Workshop ID	Source	Requirements	Priority	Complexity	Time Horizon (Years)	Service Live (Years)	Regulatory Impact
11	35	DSO	Would people closer to generators pay less operating under flexibility services? If not how would it be managed and is it planned that this will be explored during charging regime review?	Low	Low	Further Initial Research	Further Initial Research	DCUSA / DuOS and TuOs
12	36	DSO	Is there a need for standard terms and conditions to be built into connection agreements for flexibility of this kind at all voltage levels?	Medium	Medium	2	5	DCUSA / STC
13	42	DSO	Measure values of energy delivered at service provision. Settlement and metering - How will DSOs measure if energy has been delivered and/or a response from the customer has occurred?	Medium	Medium	2	5	Licence Conditions / DCUSA and BSC
14	44	DSO	Understand the requirements to modify a connection agreement or create a commercial agreement for new flexibility services	Low	Low	2	5	DNOs / May require code change at DCUSA level if STC change required
15	46	DSO	Unmetered Supplies Operator (UMSO) perform a regulated function in managing unmetered inventory	Low	Low	Further Initial Research	Further Initial Research	BSC
16	49	DSO	Increase in operational costs for DSO activities will need to be recovered and this will be explored further in DNO business plans prior to RIIO ED2	Medium	Medium	3	N/A	RIIO ED2 and Licence Conditions

Roadmap ID	Workshop ID	Source	Requirements	Priority	Complexity	Time Horizon (Years)	Service Live (Years)	Regulatory Impact
17	49.1	DSO	There will be new and separate licence requirements for DSOs and DNOs, how those relationships and responsibilities are defined and how this impacts on code modification and regulatory environment needs to be understood. Will total separation occur or will this involve a gradual shift to and step changes to network operation responsibilities?	Medium	High	8	N/A - Impacts whole business operation and not service specific	Legislation / Licence Conditions / Regulatory Price Control
18	52	DSO	Dynamic assets and the potential to free up constraint managed assets stuck in a queue if they provide a more immediate network service or benefit that is required. This would need to be explored via queue management processes (including work done as part of the Open Networks Project) and Market and Competition requirements and impacts would need to be explored	Medium	Medium	3	5	DCUSA / D Code and STC
19	53	DSO	Must not prohibit customers from taking part in flexibility or penalise them unfairly i.e. participation should decrease / maintain bills - This links to equality of access (Roadmap Item 5)	Low	Medium	5	8	Licence Conditions / DCUSA and REC
20	59	P2P	Managed P2P trading framework will need to be developed to enable P2P services and transactions at scale, this would require a modification to DCUSA and could be explored in a safe regulatory environment via the DCUSA Sandbox and other Code Sandboxes.	Medium	High	6	10	Licence Conditions / DCUSA and REC / D Code and STC
21	62	P2P	How should P2P transactions be managed with the demands of services 1, 2 and 3 (ESO relationships) this will require further exploration as part of Project LEO.	Medium	High	5	8	Licence Conditions / DCUSA, STC and BSC

Table 8 Near Term Time Horizon Flexibility Service Requirements

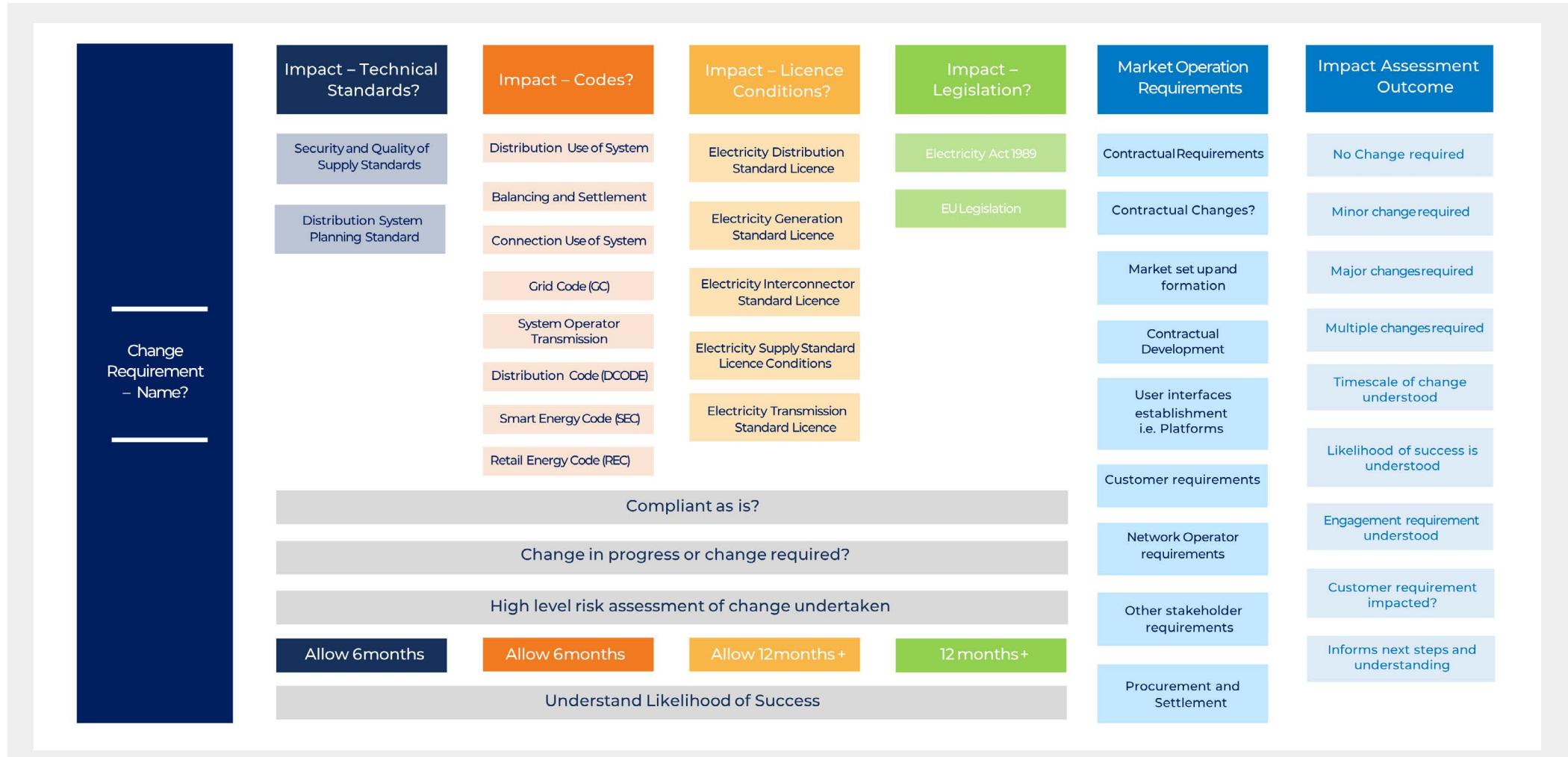
#	Discovery ID	Source	Requirements	Priority	Complexity	Time Horizon (Years)	Service Life (Years)	Regulatory Impact
3	8	General	When DSOs offer new flexibility services and solutions to market, customer privacy and access will be central to DSO thinking to ensure appropriate levels of consumer protection	High	Medium	2	5	D Code
12	36	DSO	Is there a need for standard terms and conditions to be built into connection agreements for flexibility of this kind at all voltage levels?	Medium	Medium	2	5	DCUSA / STC
13	42	DSO	Measure values of energy delivered at service provision. Settlement and metering - How will DSOs measure if energy has been delivered and/or a response from the customer has occurred?	Medium	Medium	2	5	Licence Conditions / DCUSA and BSC
14	44	DSO	Understand the requirements to modify a connection agreement or create a commercial agreement for new flexibility services	Low	Low	2	5	DNOs / May require code change at DCUSA level if STC change required

Table 9 High Priority Flexibility Service Requirements

#	Discovery ID	Source	Requirements	Priority	Complexity	Time Horizon (Years)	Service Live (Years)	Regulatory Impact
1	2.1	P2P	Modifications to codes and standards will be required to enable P2P flexibility services at scale. This will impact on REC and DCUSA and greater understanding is needed in terms of how the required P2P regulatory principles could be suitably tested, perhaps via the DCUSA and REC Sandboxes initially.	High	Medium	3	5	REC and DCUSA / May impact Licence Conditions
3	8	General	When DSOs offer new flexibility services and solutions to market, customer privacy and access will be central to DSO thinking to ensure appropriate levels of consumer protection	High	Medium	2	5	D Code
4	8.1	DSO	Cyber security and/ or access concerns around data and flexibility services will be explored and developed as new services and solutions emerge and are central to SSEN's DSO strategy	High	High	3	5	NIS Regulations
6	20	General	What level of regulatory oversight of assets and services will be enacted and how will this impact participants in the flexibility market. Standardisation required to create level playing field and appropriate oversight.	High	High	3	5	D Code / DCUSA

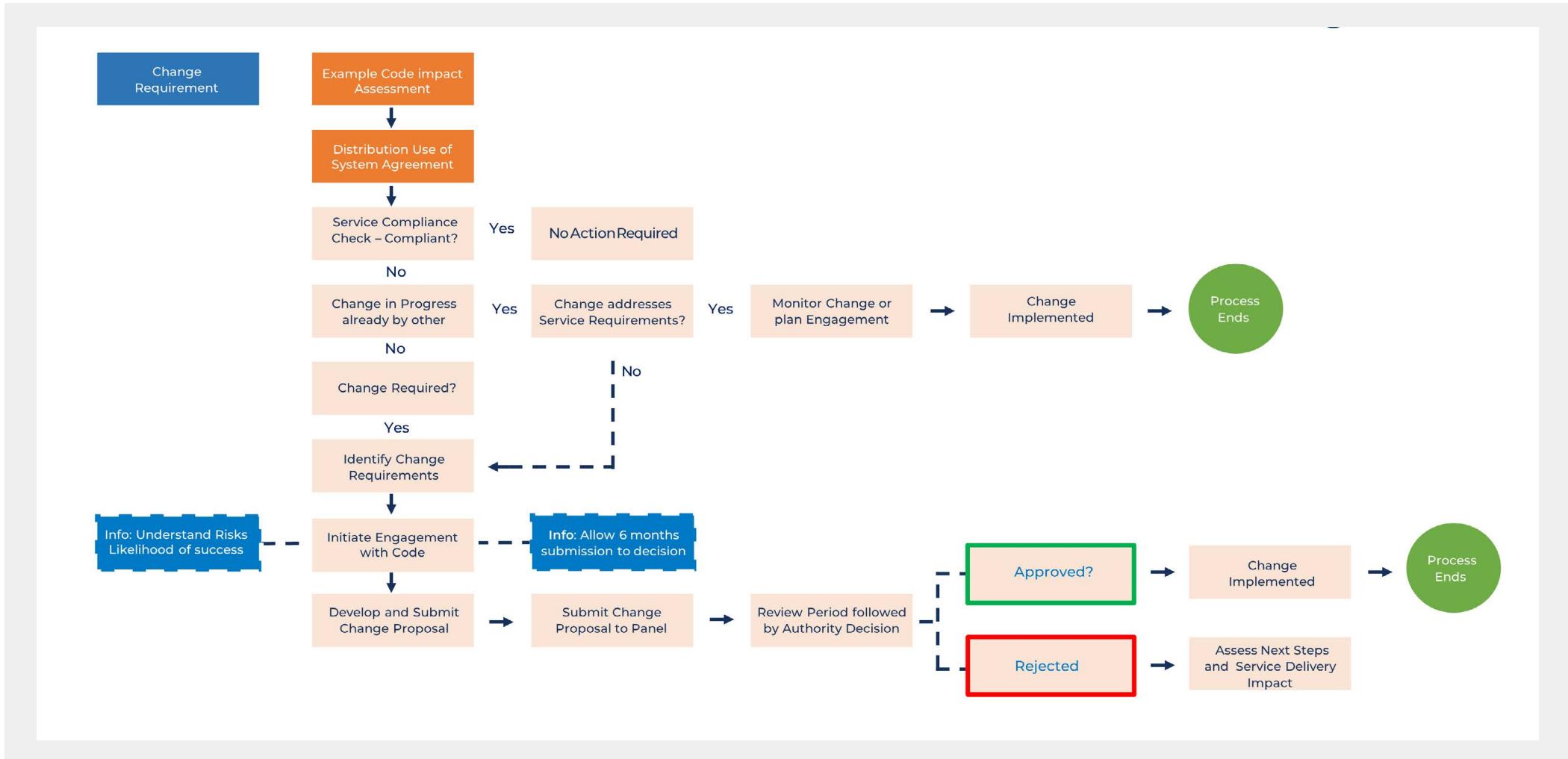
Appendix B - Impact Assessment and DCUSA Change Process Flow

Figure 3 Regulatory Impact Assessment (Page 14)



The Example Process Flow (Figure 4) highlights the steps a party would need to take, to initiate and implement a code change for an exemplar code; DCUSA.

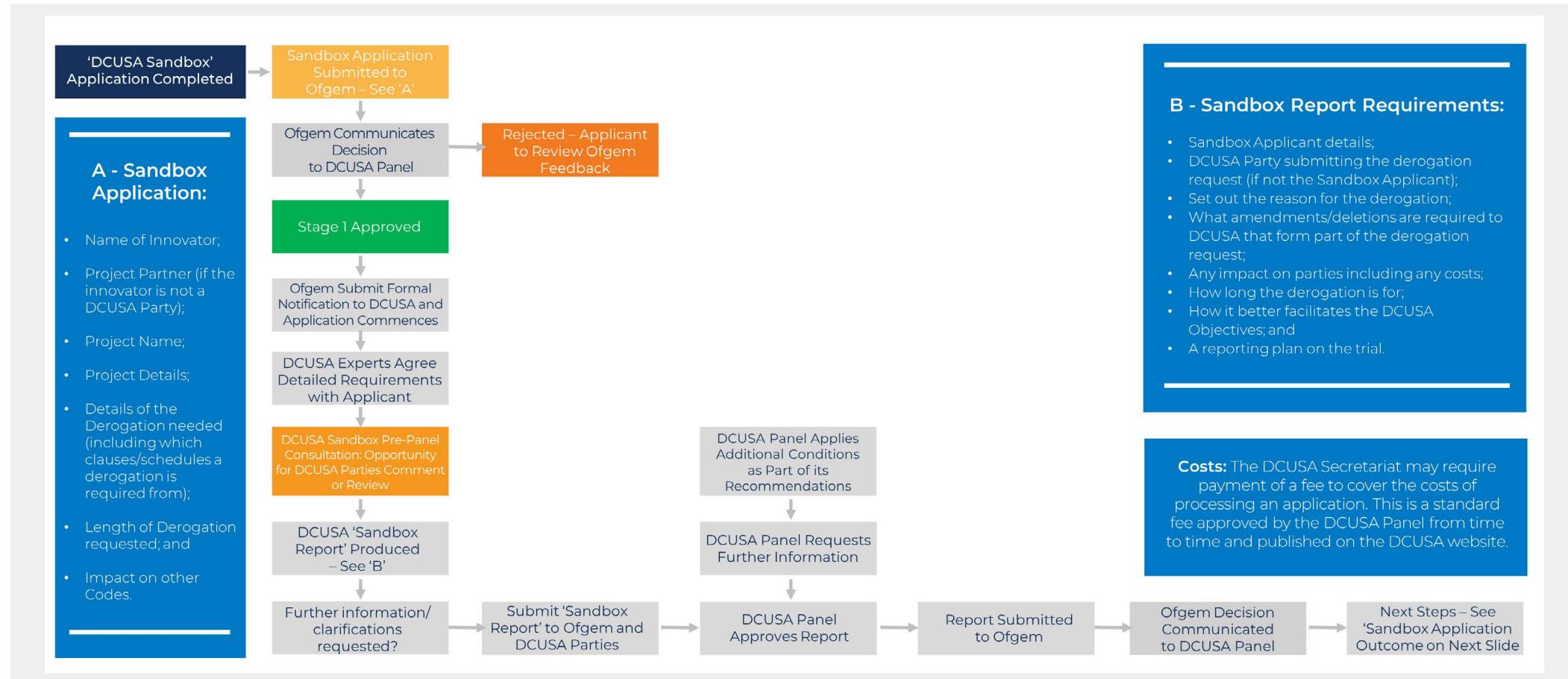
Figure 4 Impact Assessment – Example DCUSA Change Process Flow (Page 14)



Appendix C - DCUSA Sandbox Process Flow

The Example Process Flow (Figure 5) highlights the process a DCUSA Party i.e. SSEN would need to undertake in order to conceptualise, initiate and deliver a change via the DCUSA Change Process. All codes have defined change processes with key stage gates that industry parties must utilise to deliver and codify change.

Figure 5 DCUSA Innovation Sandbox - Example Process Flow (Page 14/15)



Contact us:



+44(0)345 300 2315



future.networks@sse.com
www.ssen.co.uk/Innovation
@ssen_fn

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