

## **RIIO-ED2 Overarching Working Group**

### Meeting 5



# OAWG Subgroup Decarbonisation and Strategic Investment think piece on decision making for load related expenditure

17/04/20

OAWG

# Background

- Some DNOs have worked together to develop a Capacity Mechanism as an alternative to the existing ED1 treatment for load related expenditure; the change being driven by the relative uncertainty in pace of change in the ED2 period as the UK drives towards it's Net Zero targets.
- The Capacity Mechanism is a volume driver with the measure being capacity released/created in response to either user actions or change in demand (reactive investment) or to enable future capacity requirements to be met.
- Capacity can be either released by flexibility services, energy efficiency or created by asset based solutions or combinations of these. Other innovative ways of creating capacity might come forward during ED2.
- When presented to the OAWG in March 2020, Ofgem had a number of questions which are being assessed through the creation of an options matrix where the Capacity Mechanism can be considered alongside alternative options to help stakeholders, companies and Ofgem consider which options may be appropriate to be presented within the forthcoming ED2 Sector Specific Methodology Consultation.
- The Capacity Mechanism differs from alternative proposals as it does not distinguish between the driver for capacity, whether this is LCT enablement, economic growth and can be adjusted for any impact of access and charging reform.
- One question which was specifically raised as a characteristic of the Capacity Mechanism was how to mitigate the risk of asset stranding and whether a utilisation measure would be appropriate.

# Decision making & ensuring efficient investment

- First and foremost is the need for companies to ensure they have robust decision making, supported by forecasting using a consistent methodology and an agreed CBA.
- All decisions should be assessed as being made with the best information available at the time which is in line with Ofgem's position for ED1 as stated in their December 2019 decision on closeout methodology:

*"In undertaking its assessment of the licensee's efficient Load Related Expenditure, the Authority will interpret efficiency to mean investment decision-making by a licensee that:*

*(a) Took into account all the information that could reasonably have been expected to have been available to the licensee at the time of making the relevant decision(s); and,*

*(b) Resulted in Load Related Expenditure during the Price Control Period that would reasonably, at the time of making the relevant decision(s), have been expected to be required in order to meet the changing and uncertain needs and requirements of the licensee's Distribution System."*

Question: This ED1 approach is already broadly in line with T2 volume drivers for demand and generation driven investment.

# Utilisation

In broad terms 'utilisation' is making effective use of something.

For networks this means in general terms the current being carried by a network asset does not exceed the maximum current carrying capacity of the network asset i.e. demand does not exceed capacity.

It is a snapshot of a point in time at a specific point of the network, and can be used:

- To support development of forecasts, to indicate a potential need for future action
- At the time and as part of the decision making process for actually taking action (e.g. flex tender)
- After capacity has been created/released to see how it is being used

# Utilisation - metrics

## Potential metrics

There are three potential metric groups identified:

### Direct representation

- Based on measurement of network utilisation on the network

### Indirect representation

- Those based on proxies for demand (counts of households, LCT numbers etc)

### Track how forecasts change

- Monitoring of accuracy of forecasts over a prolonged period of time to confirm the extent to which a forecast is “on track” as time progresses by comparing reforecasts to the initial forecast.
  - *Potential to incentivise forecasting approach?*

# Considerations

- Anticipatory investment, particularly to enable LCT update and economic growth, by its nature means that the utilisation will follow the investment, sometimes in future price controls. Any assessment should be made “in the round” as there will inevitably be some forecasts that will take longer to manifest in load demand than others.
- To enable incentivisation of anticipatory investment and avoid becoming a disincentive to companies, measurement of utilisation should be undertaken over a relatively long time horizon. Some investments will take multiple price control periods to become fully utilised, and measurement in-period will provide little intelligence.
- Complexity needs to be considered – a relatively simple and straightforward to implement volume driver could become too complex by adding in ex-post assessments, particularly those which span price controls.

## Consideration on Direct metrics

- Grid (132kV) and Primary (33kV) substations have an established process with LIs measured and reported to Ofgem in ED1. These have monitoring in place and forecasts down to that level (in ENWL) of granularity.
- There is less monitoring at HV, and little monitoring at LV level generally at present.
- Smart Meters might ultimately provide insights into LV network use, however there are outstanding questions over timescales and data accuracy.
- Therefore direct metrics for HV/LV may not be possible right now and are contingent on other aspects of the price control (e.g. what HV/LV monitoring is put in place).
- DNOs are likely to have future plans for enhanced monitoring for HV and LV for ED2 and future periods and therefore this limitation may be reduced in the coming years

## Consideration on Indirect metrics

- Potentially indirect metrics may complement capacity measures and forecasts made to indicate some sense of the pace of change of customers needs from networks?
- There is a risk that indirect measures over-complicate the framework.

# Appendix – deeper dive information

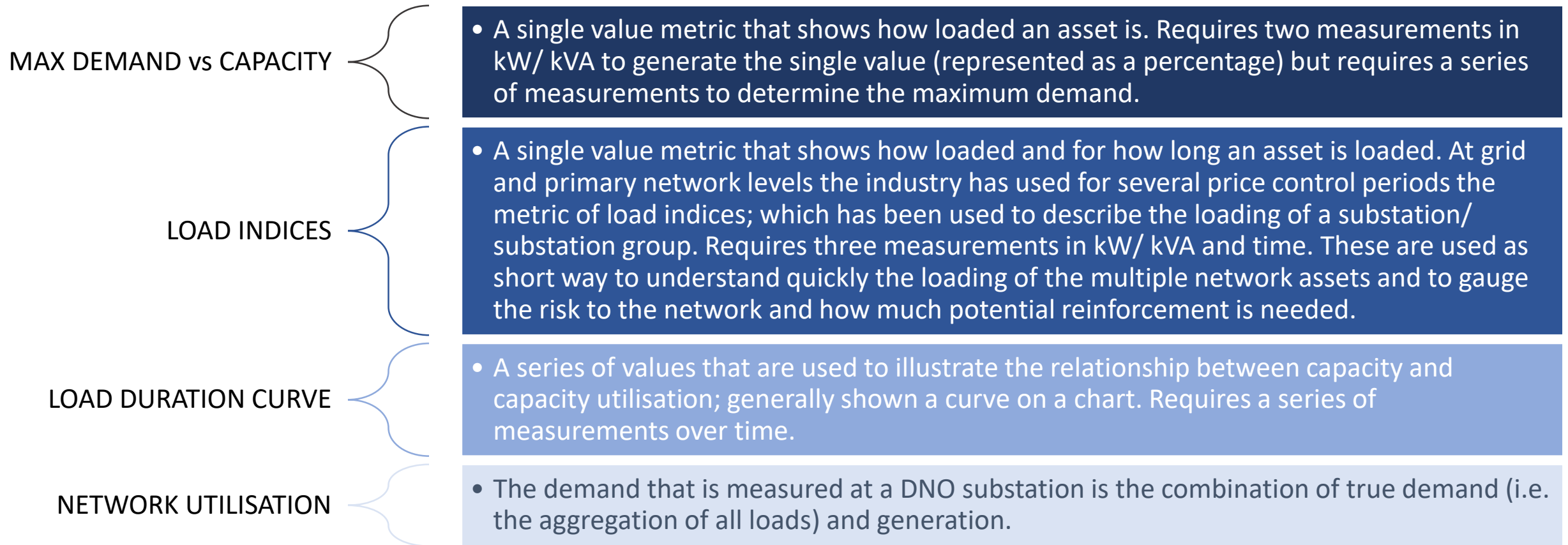
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17/04/20



# Direct Metrics

Draft for discussion



**Moving from options 1 to 4 requires generally more measurement data, generally time series measurements in HH time periods**

# Indirect metrics

Draft for discussion

## 1.ADMD

- A single value metric that represents the likely average demand of a domestic customers; there can be multiple values depending upon the LCTs connected to a customer's premises. Doesn't represent the capacity of the existing network and how it is being used.

## 1.Volume of LCTs

- A single value metric that counts the number of LCTs on a network asset ie by LV feeder, by substation etc. Counts can be by LCT type. Doesn't represent the capacity of the existing network and how it is being used.

## •Forecast accuracy

- Compare original forecast when decision made to latest forecast based on latest information

# ED2 Overarching Working Group

**Subgroup - Achieving Net Zero including Strategic Investment**

Update to 6 May 2020 Full OAWG



Llywodraeth Cymru  
Welsh Government

# DFES and LAEP's are robust, transparent and stakeholder inclusive processes

- High degrees of transparency surround the assumptions, methodology, inputs and outputs;
- Common processes are being developed through Open Networks (WS1B product 2) to standardise DFES and align with FES where appropriate. Ofgem is involved in this work.
- Fundamentally relies upon many stakeholders' insights including local and national government, ESO, Businesses and Domestic Customers as well as DNO information;
  - Regional insights on Local Government Policy;
  - National insights on technology readiness to deploy economically at scale.
- Active stakeholder engagement takes place as part of the process (E.g. GLA/GMCA/Bristol Council);
- CEG's challenge all dimensions including the process, assumptions, completeness of engagement and outcomes;
- Active challenge and engagement between ESO and each DNO and between DNO's through Open Networks plus review and challenge by TOs and GDNs as part of their price control discussions
- Aspects of FES/DFES work are undertaken by non licence experts where appropriate (eg Regen, Element Energy).

ESO FES is a guide at a national level for “average levels of needs at an average pace”, focussing on national considerations but will not reflect the local needs of particular customers. This subgroup expects regional insights gained through ongoing and enhanced customer and stakeholder engagement to be key factors in DNO's ED2 business plans.

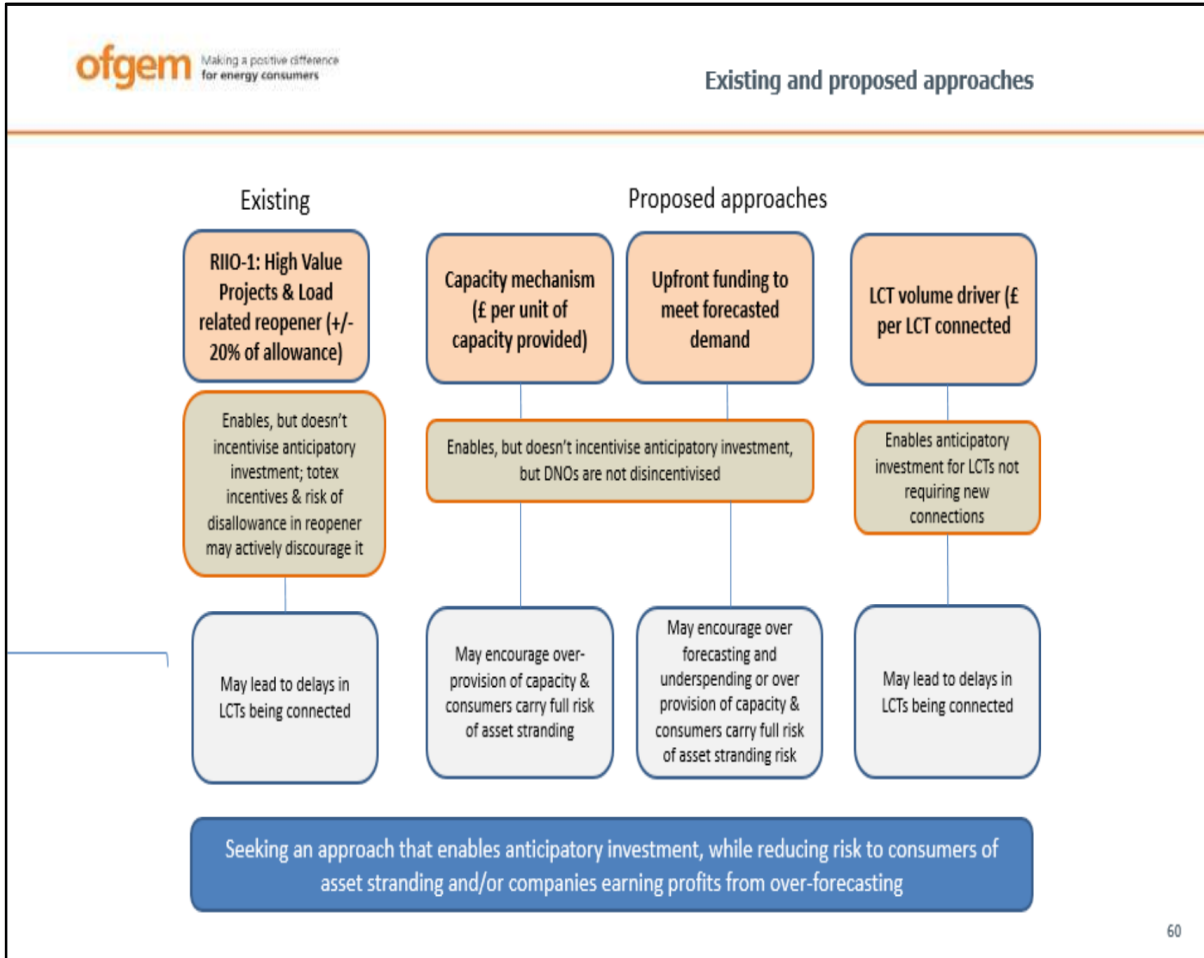
# Key Connections related Mechanisms in ED1 considered for ED2

Work in progress

- Time to Quote - applies to Domestic scale;
- Time to Connect - applies to Domestic 1-4 premises;
- Connections Customer Satisfaction (BMoCS) – currently has substantial weighting on connections customers views - Domestic scale 1-4 premises;
- Connections themselves may often provided by others such as ICP's / IDNO's - associated reinforcement, where required this will be undertaken by the DNO;
- Incentive on Connections Engagement – focusses directly on a range of connections customers to ensure they get the service they require. ICE applies to non-competitive segments, as choice protects customers;
- A Licence obligation to offer connections in a maximum of 65 days and potential for Ofgem to determine on the connection offers on the rare occasions this is required;
- Obligations under the Electricity Act (as amended) are relevant to develop and maintain an efficient, co-ordinated and economical system of electricity distribution which encompasses connections.

Connections matters for RIIO-ED2 are in scope of the Customer and Social Issues Working Group.

# Addressing concerns on asset stranding / inefficient investment



- Ofgem is: *"seeking an approach that enables anticipatory investment, while reducing risk to consumers of asset stranding and/or companies earning profits from over-forecasting"*
- Two mutually exclusive objectives, but requiring resolution through a single approach to Strategic Investment, which must be:
  - **Transparent** – we must be able to easily explain what we are doing and it should be open to challenge
  - **Repeatable** – approach works for all DNOs, for different types of network investment, with different drivers (including LCTs)
  - **Robust** – we must be able to show decisions made today take account of all information that could reasonably be expected to be available at the time of decision
  - **Deliverable** – a balance must be struck between the detail and controls required with ability to run the process to ensure it is not unduly burdensome or costly

# Emerging views of the active stakeholders in the overarching working group

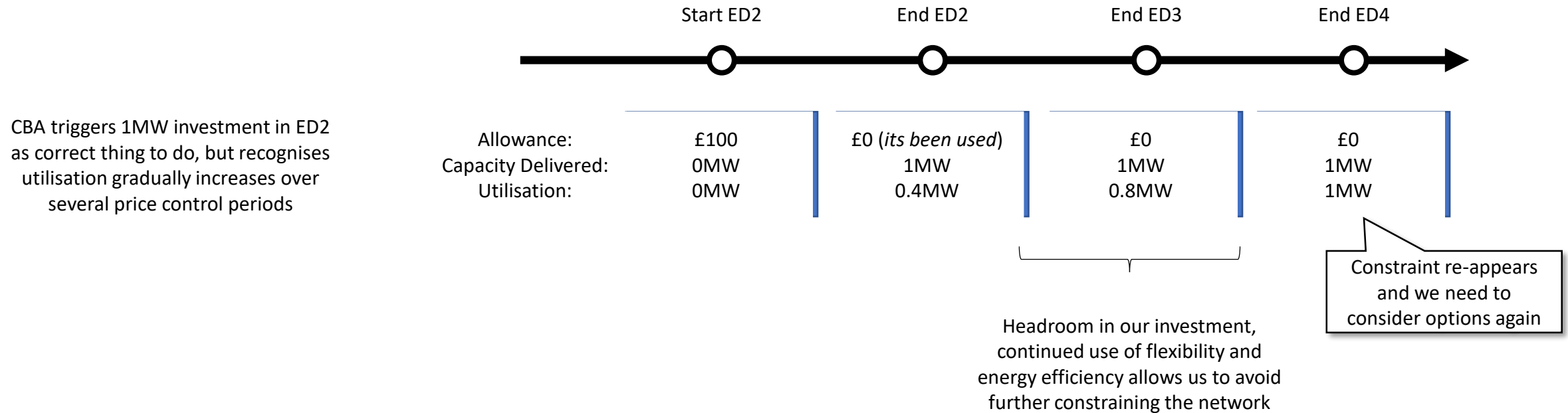
- **Avoiding stranding and in-efficient investment is important for consumers and network companies alike**
  - Stranding means consumers fund under used assets and for DNOs its an inefficient use of capital
- **Having a robust need case identification process and funding mechanisms with clear triggers are the two most effective ways to mitigate this risk**
  - Built using scenarios which reasonably capture uncertainty faced and legislative targets
  - Use Cost Benefit Analysis and decision making techniques to make efficient decisions through uncertainty (e.g. Least Worst Regret or Central outlook plus Real options)
  - Have an accurate and resilient volume driver uncertainty mechanism, to adjust revenues when triggered in the ED2 period
- **This could be complemented with a utilisation measure, such as a reformed Load Index metric**
  - This enables a feedback loop to help improve future need case identification of efficiency and give confidence to stakeholders
  - Utilisation measure provides a useful tool to Ofgem in minimising the risk of asset stranding
  - However, designing an associated incentive on utilisation is likely to be complex
  - If not designed appropriately this incentive could encourage over cautious approach, with more incremental investment and multiple interventions in the same place – reducing efficiency and slowing net zero
  - When should a check take-place? What is optimal utilisation? How does an incentive account for exogenous factors outside a DNOs control?
- **Ofgem's Return Adjustment Mechanism proposal, whilst having potential adverse impacts overall, if brought into the ED2 mechanism as seems likely could be a back-stop measure against perceived risk of profiteering, when complemented with strong uncertainty mechanism with clear triggers.**

# Review of approaches to reduce stranding & profiteering risk

	Description	Pros/ cons
1 Robust need case identification process	<ul style="list-style-type: none"> <li>Models full range of uncertainty faced, through scenarios etc.</li> <li>Includes a process for making decisions under uncertainty. Including NPV for each investment option by scenario and the employment of decision making tools, like <b>Central outlook and Real Options CBA or Least Worst Regret</b> to enable efficient decisions, which are repeatable through time</li> </ul>	<ul style="list-style-type: none"> <li>✓ Captures the full spectrum of outcomes and approaches to reach net zero at different rates</li> <li>✓ Uses robust and well recognised tools which already exist such as investment decision pack and CBA</li> <li>✓ Ensures investment decisions are balanced on a range of scenarios, with whole system and flexibility considerations</li> </ul>
2 Clear & robust mechanism to fund investment	<ul style="list-style-type: none"> <li>An efficient level of ex-ante baseline funding based on a robust need case identification process justified through business plan</li> <li>Accurate and resilient volume driver, supplemented with a high value re-opener uncertainty mechanism, to adjust revenues as further certainty emerges</li> </ul>	<ul style="list-style-type: none"> <li>✓ Ensure we only get funded for the investments we actually deliver, as identified from the need case identification process</li> <li>✓ Ensures funding through the uncertainty mechanism doesn't <b>overall</b> result in over or under-funding for assets delivered</li> </ul>
3 Utilisation metrics & incentives	<ul style="list-style-type: none"> <li>A metric of the capacity utilisation by the end of ED2, based on deployed strategic investment, either directly or indirectly</li> <li>A financial incentive linked to the utilisation metric, which rewards/ penalises efficient decision making</li> </ul>	<ul style="list-style-type: none"> <li>✓ Practical measure provides a feedback loop to improve future need case identification efficiency</li> <li>✓ Metric encourages improvements to forecasting and monitoring</li> <li>✗ Could rewards / penalises things that are out with DNO control</li> <li>✗ Could encourage a cautious approach – incremental reactive approach to investment – doesn't facilitate net zero, increases risk of wider network issues and delay for customers</li> </ul>
4 Back-stop measures	<ul style="list-style-type: none"> <li>A last resort ability which allows DNOs to “park perceived excess capacity” which fails a 'used and useful' test or was deemed 'too early' following a materiality test</li> </ul>	<ul style="list-style-type: none"> <li>✓ Safety net to protect consumers from catastrophic decisions, with non-trivial bill impacts</li> <li>✗ Is complex to implement</li> </ul>



# Case study: Utilisation mechanisms



- **When should a utilisation check take place?**
  - In the above example a mechanism at the end of ED2 or ED3 might not account for the long-term nature of the investment decision made in ED2
- **What is the optimal level of utilisation?**
  - Is aiming for 100% utilisation sensible? Does this not account for our continued use of efficient flexibility
- **How would utilisation incentivisation take account of factors outside the DNO's control and availability of information at the time of decision?**
- **Would a utilisation incentive encourage DNOs to adopt an overly cautious or incremental approach to avoid penalties?**

# Next Steps

This sub group proposes to

- Summarise our findings at a future OAWG meeting;
- Respond to feedback and insight at the main group;
- Meet any requests from Ofgem for follow up or clarification ahead of the consultation if any arise;
- Highlight where follow on development work, if any might be taken forward.

Note related work on regional / national plans

- stakeholders are able to feed in their views as part of the scenarios assessment exercise being carried out by the national/regional planning OAWG sub-group.

# **Energy Networks Association**

## **OFGEM RIIO-ED2 OAWG DSO Sub Group**

**Evaluating price control mechanisms for DSO considerations**

30 April 2020

## MAIN SLIDEPACK

- Outcomes being sought
- Potential customer benefits
- Costs
- Conclusion – a proposed framework

## APPENDIX

- Terms of reference
- DSO definition
- Division of costs and whole system benefits
- Costs from Open Networks Future Worlds
- Ofgem overarching framework for outputs and incentives
- Ofgem DSO functions vs Open Networks
- x8 dSO functions and existing dSO activities
- Other dSO Regulatory Considerations for ED2

# Outcomes being sought through dSO

**Overarching  
Outcomes**

**What this  
means**

## Reliability

- Keeping the lights on using all available resources (network & non-network)
- Protecting the vulnerable and ensuring no one is left behind
- Resilient to new challenges
- Coordinating with other utilities to manage across boundaries

## Access

- Providing choice and great customer service
- Quicker and cheaper connections
- Embedding flexibility to lower costs
- Publishing data to empower users to self-serve

## Optimisation

- Lowering total system costs
- Supporting Net Zero
- Having transparent decision making
- Supporting local energy markets to thrive

The above is aligned to Ofgem's four strategic outcomes from their DSO Position Paper :

1. Clear boundaries and effective conflict mitigation between monopolies and markets
2. Effective competition for balancing and ancillary services, and other markets
3. Neutral tendering of network management and reinforcement requirements
4. Strongly embedded whole electricity system outcomes

# Potential customer benefits from DSO solutions

## Direct

- 1. Lower DUoS from DNO efficiency and incentives
- 2. Reduced network losses (configuration and voltage conservation)
- 3. Customer energy consumption reduced (voltage conservation)

## Indirect

- 1. Facilitation and creation of flexibility markets (for constraint management)
- 2. Delivery of lower cost flexibility to ESO through Smart Grid solutions (eg. CLASS, regional load transfers, reactive power services)

## Cheaper Connection

- 1. Development of alternative connections including timed profiles and ANM. Lower sole use connection charged to connecting customer
- 2. Lower cost of connection for DG result in lower energy bills

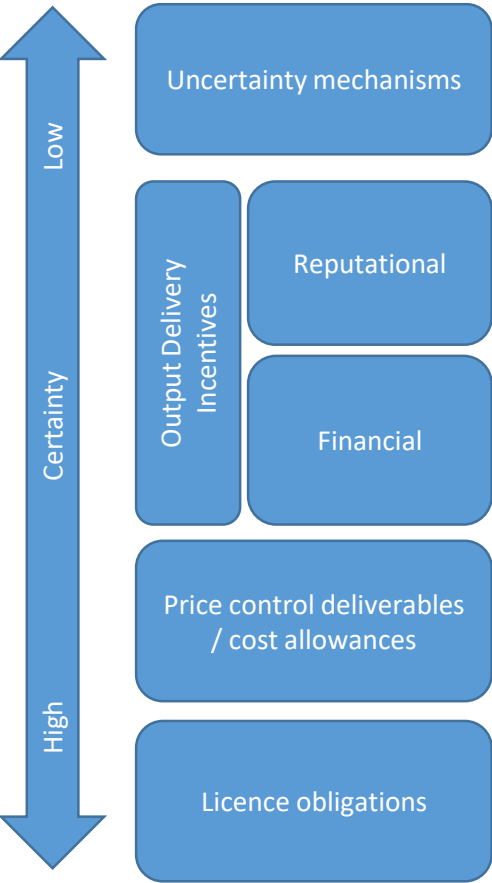
## Avoided Investment

- 1. Negated or delayed conventional investment from a smarter more flexible system
- 2. Less shared use connection related reinforcement

## Costs – from Open Networks Future Worlds report

- A view of potential dSO implementation costs was prepared by Baringa for the ENA and consulted on as part of the 2018 ENA Open Networks Future Worlds assessment
- It sets out a total cost of £352m to implement DSO functions in DNOs in the period 2018 to 2028 for *World B – co-ordination between DSOs and ESO*
  - Also included in the detailed analysis are costs for ESO and flexibility co-ordinators in World B and other worlds
- This provides an idea of the scale of potential costs of dSO in the ED2 period albeit there are inherent inaccuracies to be considered
  - This is for a 10-year period starting in 2018
  - The view is developing and maturing through time
  - Counter-intuitively, there are no technology costs envisaged for network operation and system defence and restoration
- Costs for provision of data were excluded from the Future Worlds estimates (in the ED2 working groups, this has been considered separately by the data working group)
- Despite these inaccuracies, the Future Networks analysis provides a good ‘sighting shot’ for the scale of investment required to implement DSO functions
  - The order of magnitude is supported by some other cost forecasts – e.g. WPD costed plans for DSO functions
- The breakdown of the £352m by the eight DSO functions is contained in the appendix – slide 11

# Conclusion: A proposed framework – applying outputs to dSO



Options for output arrangements

## dSO KEY ENABLERS

- 2. **Price control deliverables and totex – dSO enabling actions that are certain**  
Include business plan commitments to deliver enabling actions regardless of size of flexibility markets or numbers of low carbon technologies to be connected
- 1. **Licence obligation – covering core principles and legal requirements**  
Include flexibility commitments to develop markets and provide transparency. Potentially to comply with aspects such as clean energy package, energy white paper, etc.

Our proposal is to use three standard output approaches and consider the need for an additional ODI

## dSO INCREMENTAL ACTIONS

- 3. **Uncertainty mechanism to work with PCDs and totex – dSO uncertain incremental actions**  
Linked to the incremental spend required dependent on need within the period
- 4. **OPTIONAL - Output delivery incentive – if required to strengthen incentive**  
Could drive more optimal outcomes such as carbon intensity of flexibility contracted





As part of the Ofgem process for involving stakeholders in a range of areas pertinent to the upcoming RIIO ED2 regulatory review, five working groups have been established. Under the Overarching Working Group, a sub-group on DSO considerations has been asked to advise on what DSO functionality DNOs can and should provide in ED2 and what appropriate regulatory mechanisms could be proposed in the RIIO-ED2 sector methodology. ***This is the second report of the DSO sub-group to the OAWG. It focuses on the costs of implementing DSO functions and potential output arrangements.***

**How to set price controls for DSO considerations** (from Ofgem Commissioning presentation Slide 4, ED2 Overarching Working Group, 17 January 2020). We want to hear and understand your suggestions, and assessment of proposals, for methodological changes that could better achieve these goals, for instance:

1. Do we need to change how we evaluate costs and benefits?
2. Do we need new uncertainty mechanisms?
3. Do we need to remove outputs and incentives or introduce new outputs?
4. Do existing incentives (such as on totex) drive the appropriate behaviour? If not, what would we need to change?

In undertaking this analysis, the DSO sub-group has focused on the ED2 outputs required by electricity distribution network operators and the requisite functionality to support those activities.

The Ofgem DSO position paper effectively changed the definition moving away from the concept of a DSO as an entity.

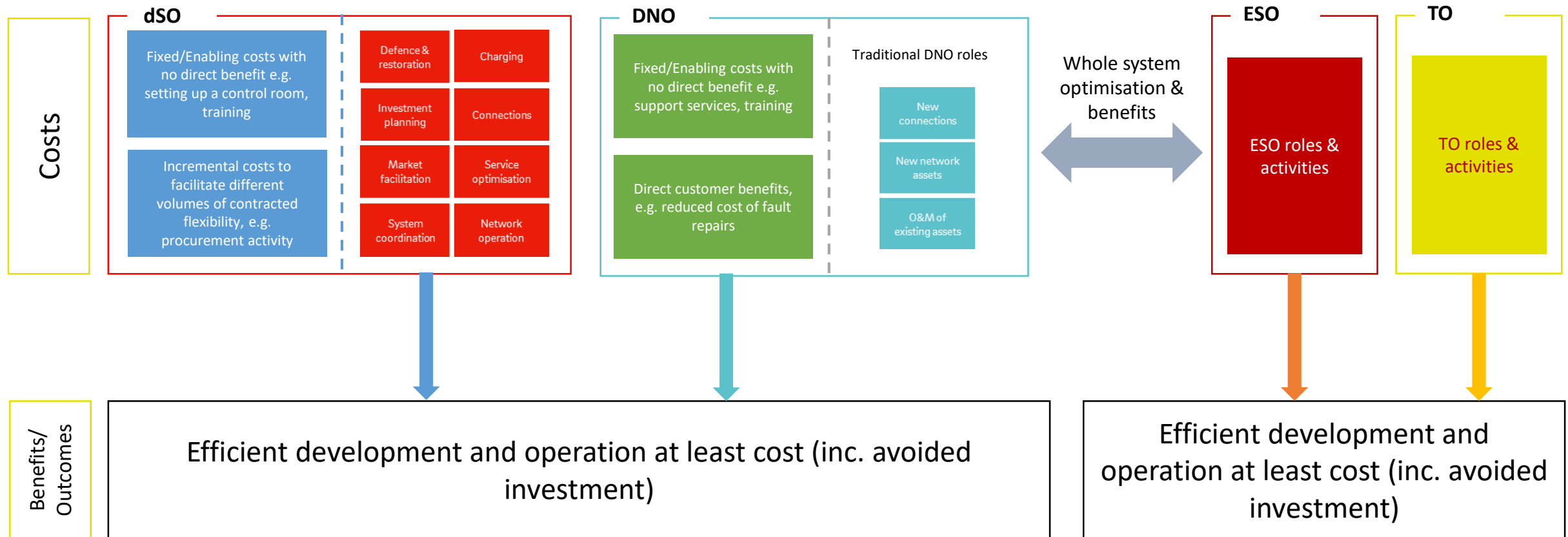
DSO (Distribution System Operation) is a set of functions and capabilities that in combination allow the flexing of demand and generation to be used to optimise the operation of networks. This provides:

- Optionality in network investment decisions.
- Greater utilisation of existing and new network assets.
- Market facilitation
- Security, sustainability and affordability.

DNOs will be accountable for a significant number of these DSO functions and capabilities.

*Maybe we should distinguish between a **dSO** (distribution System Operators - DNOs in the new world) and **DSO** (Distribution System Operation - the wider range of functions that could be performed by dSOs **and** 3<sup>rd</sup> parties)*

# Division of dSO/DNO costs & dSO/DNO/Whole system benefits



- Question about whether it is possible to assign a proportion of the total benefits/outcomes back to the party and activity that contributed to that benefit/outcome. If not then have to find an alternative. Without the dSO/DNO separation, this allocation of benefit is even more complex.

## Costs – from Open Networks Future Worlds report

DSO "Stage 1"										
Function	Function "Size"	Maturity Gap	Technology Cost (£m)	System CapEx	System OpEx	Resource Costs (£m)	Interface Costs	Transition Costs (£m)	Scale Factor	TOTAL
	Function size according to operating model (H or L)	Maturity gap from today, scoring grouped into H, M, L	Costs of technology CapEx and OpEx throughout stage	Breakdown of the technology costs	Breakdown of the technology costs	Cost of resource OpEx	Cost in interfaces per actor	"Factor" of system CapEx based on the maturity gap	Scale based on duplication e.g. across multiple DSOs	
1. System Coordination	H	M	£6.9	£3.4	£3.5	£4	£5	£2	3	£53
2. Network Operation	H	M	£0.0	£0.0	£0.0	£5	£6	£0	6	£66
3. Investment Planning	H	L	£2.4	£1.2	£1.2	£4	£0	£0	2	£14
4. Connections & Connection Rights	H	L	£0.8	£0.4	£0.4	£4	£1	£0	6	£38
5. System Defence & Restoration	H	L	£0.0	£0.0	£0.0	£2	£1	£0	6	£19
6. Service / Market Facilitation	H	M	£8.4	£4.0	£4.4	£4	£2	£2	3	£51
7. Service Optimisation	H	M	£6.5	£3.2	£3.3	£3	£3	£2	6	£87
8. Charging	H	L	£5.7	£2.8	£2.9	£5	£0	£1	2	£24
<b>TOTALS</b>			<b>£30.7</b>	<b>£15.0</b>	<b>£15.7</b>	<b>£33</b>	<b>£19</b>	<b>£6</b>	4.25	<b>£352</b>

SOURCE: <https://www.energynetworks.org/electricity/futures/open-networks-project/workstream-products-2020/ws3-dso-transition/future-worlds/future-worlds-impact-assessment.html>

## Overarching framework for outputs and incentives in RIIO-ED2

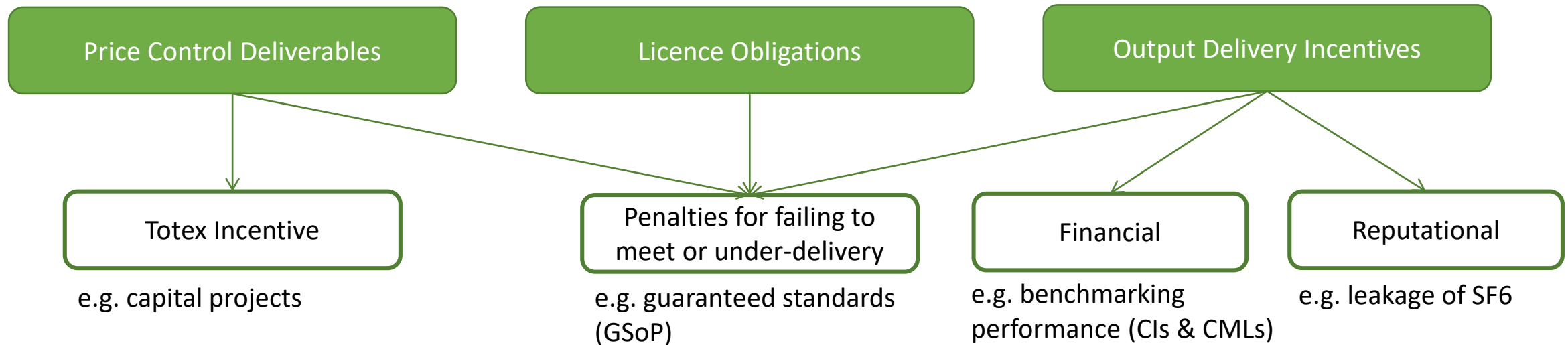
- Ofgem's RIIO-ED2 Open letter consultation set out approach pg.14 (see [here](#))
- Previous six output categories simplified to three:

1. Meet the needs of consumers and network users

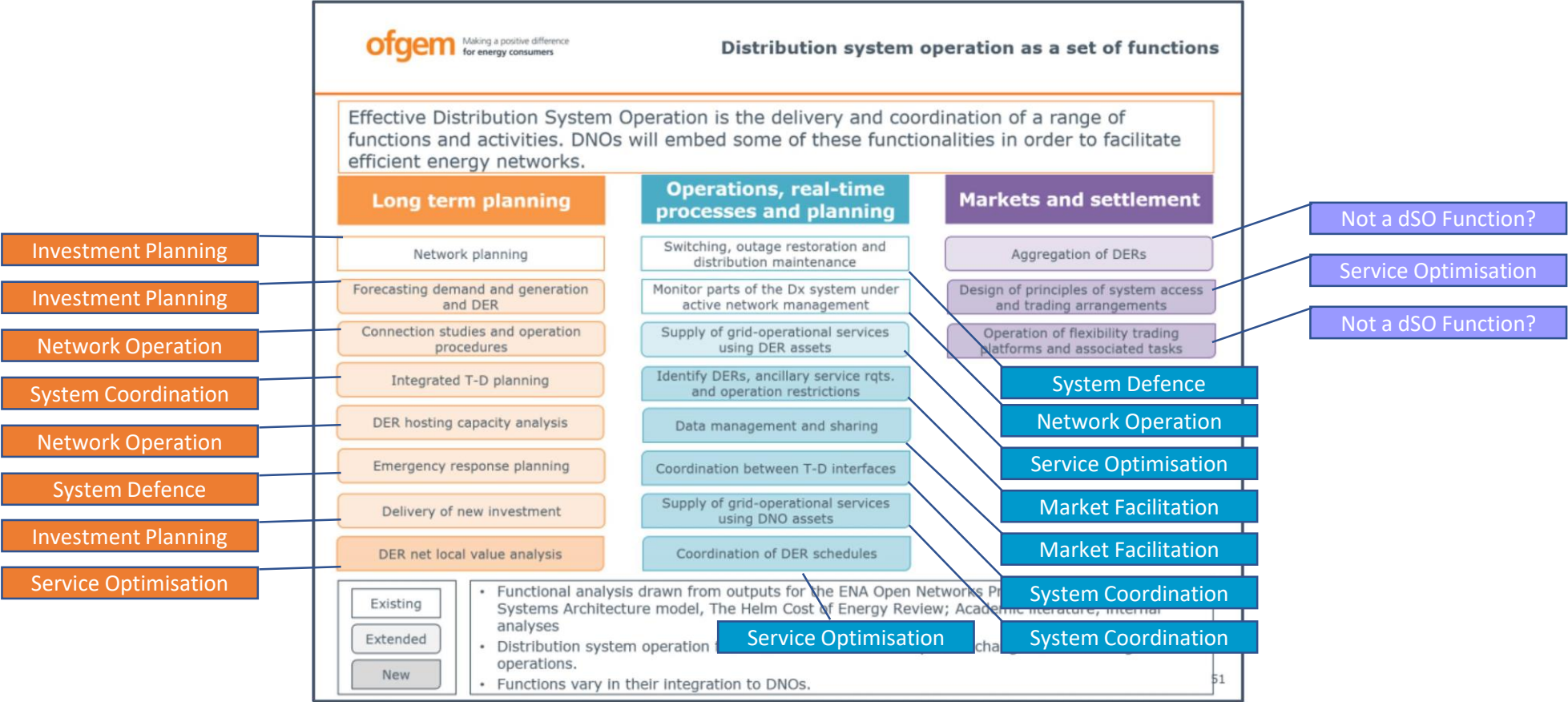
2. Maintain a safe and resilient network

3. Deliver an environmentally sustainable network

- These three outputs can be delivered by one of or a combination of the following:



# dSO Functions - Ofgem DSO Functions v Open Networks



A. Co-ordination with GB System Operator
B. Co-ordination with other DSOs and Distribution Networks (including IDSOs)
C. Co-ordination with local energy systems including industrial networks, community schemes, smart cities etc.
D. Co-ordination of networks to enable cross vector energy exchanges.
E. Co-ordination of local network services.

***Value for customers in ED2 or ED3+***

- Improved co-ordination between buyers of flexibility in ED2 reduces barriers to entry and transaction costs for sellers
- Co-ordinated processes lead to more efficient outcomes generating consumer value
- Consistent approaches and markets will lead to greater participation and therefore market fluidity
- Effective ED2 bilateral contracting that establishes knowledge to develop enhanced multilateral co-ordination in ED3+

***Changes from ED1 DNO role (Medium -)***

- New activities to share energy system data
- Extended whole system co-ordination between DNO and ESO associated with customer flexibility procurement

***Outputs and costs***

- Joint DNO flexibility processes and systems – GB standardisation for DNO flexibility products
- Data sharing to provide flex market development
- Innovation to target ED3+ co-ordination that is whole energy system and/or multilateral electricity actions



A. Operate network within thermal ratings
B. Operate network within voltage limits
C. Operate network to maintain dynamic stability
D. Operate network within fault level limits
E. Operate network to meet other power quality criteria
F. Operate network taking account of ongoing asset
G. Operate network to minimise losses
H. Enable network outages to provide access to assets and
I. Optimised use of assets and dispatch of services

### *Value for customers in ED2 or ED3+*

- Continued security of supply
- Increased efficiency of network operation reducing the need for additional investment (for example driven by EV demand increases)
- Appropriate operational tools support efficient use of flexibility services

### *Changes from ED1 DNO role (High)*

- More active management of LV networks
- Using LV data to plan and operate networks
- Use of third party data to better forecast and operate networks
- Management of increasingly active higher voltage networks with higher levels of variability and utilisation

### *Outputs and costs*

- Investment in control and monitoring equipment (using third party equipment where possible, e.g. smart meters)
- Forecasting tools to support efficient system operation
- Appropriately trained people to operate increasingly active and digitalised networks

<b>A. Traditional investment planning</b>
<b>B. Whole system planning</b>
<b>C. Non-traditional investment planning</b>
<b>D. Security of supply (D&amp;G)</b>

### *Value for customers in ED2 or ED3+*

- Efficient investment decisions utilising a range of network and customer solutions
- Identifying long term flexibility needs to ensure efficient market development
- Providing transparency in decision making
- More informed investment decisions - particularly at lower voltages

### *Changes from ED1 DNO role (Medium)*

- Additional resources (IT and people) to undertake robust and transparent CBA
- Maturation of DFES processes and outputs including whole system alignment
- Data driven investment processes particularly at lower voltages
- Collating and publishing of large data volumes and associated data manipulation

### *Outputs and costs*

- Investment plan for accommodating increasing volumes of DERs with blend of customer and network solutions
- IT analysis packages including need for CBA
- Additional economic analysis skills base
- Ability to collate, publish and analyse large data volumes

***Value for customers in ED2 or ED3+***

- Efficient connections for customers

***Changes from ED1 DNO role (Medium)***

- Greater use of flexible connections
- More innovation in connections
- Incorporating changes to network access review
- Increasing volume of DER connections

***Outputs and costs***

- IT infrastructure for flexible connections – increasingly shared with equipment to manage operation of customer contracted flexibility and other smart grid services
- Increased resourcing within connection teams

<b>A. Connection agreements</b>
<b>B. Connection access rights/principles/ information</b>
<b>C. Queue management/priorities</b>
<b>D. Commercial arrangements for constraints</b>

<b>A. Loss of Mains &amp; other Protection Arrangements</b>
<b>B. Network Contingency Planning for High Impact Low Probability (HILP) Events</b>
<b>C. Resilience (Voltage Reduction, LFDD, HFGD)</b>
<b>D. Resilience (Islanding)</b>
<b>E. Black Start</b>

### *Value for customers in ED2 or ED3+*

- New sources of revenue to provide flexibility through 'response' type services that reduces system risk
- Increased system resilience from changes to generator run-through arrangements
- Changes to emergency services provided to ESO for low frequency events
- Reduced ESO operational costs through Loss of Mains completion

### *Changes from ED1 DNO role (Medium -)*

- Greater volume of tools available to support distribution system defence
- Innovation in provision of black start capability from DERs in the distribution system

### *Outputs and costs*

- Additional resources to undertake emergency event contingency planning
- Innovation projects to explore improving security of supply in an increasingly distributed energy system

**A. Define distribution network service requirements including scope, timescale and locational aspects.**

**B. Assess value and facilitate services to utilise flexibility sources to support distribution network operation.**

**C. Facilitate the operation of Distributed Energy Resource Management systems (DERMs) and Local Energy Markets (LEMs) that are transparent.**

**D. Interaction with aggregators and other non-traditional actors.**

**E. Support the implementation of nontraditional market models for local energy supply.**

**F. Service conflict mitigation/resolution.**

**G. T-D co-ordination for transparent and consistent whole system outcomes**

### *Value for customers in ED2 or ED3+*

- Greater access for customers to distribution flexibility markets
- Standardised GB approaches increasing market liquidity
- Open data availability supporting efficient customer decisions
- Bilateral contracting with enhanced co-ordination (particularly with ESO) informs policy direction for a potentially more significant 'future world' changes in ED3+
- Facilitation of both peer to peer markets and markets for distribution system needs

### *Changes from ED1 DNO role (High)*

- Maturation of flexibility services end to end functions
- Increased IT infrastructure to support assessment, procurement and settlements processes
- Compliance testing and DER monitoring capabilities

### *Outputs and costs*

- Increased IT infrastructure to support end to end facilitation process
- Increased commercial resource within DNOs to manage process

### A. Smartgrid network flexibility

### B. Service access management

### C. Service selection

### D. T-D co-ordination

### E. Conditions/process of market failure

### F. Regulation & competition frameworks

#### *Value for customers in ED2 or ED3+*

- Transparent decision making process
- Efficient T-D co-ordination allowing appropriate revenue stacking

#### *Changes from ED1 DNO role (Medium -)*

- New flexibility services deployed to match customer need – e.g. LV customer flexibility to accommodate EV charging
- Increased use of distribution services to support ESO needs (e.g. CLASS, reactive power or high volts)
- Maturation of processes developed in ED1 – increasing use and normalisation

#### *Outputs and costs*

- Additional IT infrastructure aligning with ESO and third party systems
- IT systems and people to publish data to provide transparency on system needs and services deployed
- Resources to deploy increased scope and scale of services

**A. Distribution Use of System Charges**

**B. Determines Point of Connection**

**C. Determines Whole system reinforcement charges**

**D. Exit Charging (dependent on size, variations and apportionment)**

### *Value for customers in ED2 or ED3+*

- More cost reflective charging and access means more efficient behaviour reducing consumer bills

### *Changes from ED1 DNO role (Low)*

- Reforms delivered from Ofgem's Forward Looking Charging and Access review
- New charging arrangements for provision of data – universal service or paid by those using the data?

### *Outputs and costs*

- IT infrastructure to support revised charging and billing processes

# Current dSO Activities

Although there are no existing activities that are called out within RIIO ED1 as DSO activities there are several which start to explore the future activities of a dSO:

Activity	Description
<b>Flexibility Services</b>	<ul style="list-style-type: none"> <li>The procurement of flexibility services to date has been focused on addressing Load Related network issues and as such most DNOs have funded this activity through either network innovation (early trials) or through their Load Related allowance in lieu of conventional reinforcement.</li> <li>There are existing challenges in how the purchase of Flexibility Services interacts with the Load Related 80% Safety Net which need to be resolved given the disparity of costs between a short term solution (1-4 year) and conventional reinforcement (45 year).</li> <li>As part of the ENA Open Networks workstream 1b is developing a consistent methodology for the valuation of flexibility services.</li> </ul>
<b>Active Network Management</b>	<ul style="list-style-type: none"> <li>In RIIO ED1 Active Network Management (ANM) has focused on the management of connected generation within network limits via commercial terms and agreed (static) principles of access.</li> <li>This enabling technology had been funded through either Innovation funding (NIC and IRM) or as an alternative smart connection funded through a combination of customer contributions and network reinforcement.</li> <li>Actions are justified with the associated benefits (e.g. carbon abatement) using a “whole life costing” approach and CBA.</li> <li>DCP 348 outlines charging arrangements for ANM connections which significantly puts the cost of ongoing O&amp;M onto the DNO and ultimately socialised through DUoS. These costs must be considered as part of our RIIO ED2 plans and also a changing mix of CAPEX vs OPEX solutions.</li> </ul>
<b>Efficient Use of Assets</b>	<ul style="list-style-type: none"> <li>Assets are paid for by customers and DNOs have an obligation to use them efficiently and effectively</li> <li>New and innovative ways of using these assets to provide grid services should be explored within the regulatory mechanism to avoid distortion of the market</li> <li>Ofgem have an open consultation on the treatment of DNOs providing direct services to the ESO with CLASS used as a key example (Open 10<sup>th</sup> Feb, Close 23<sup>rd</sup> March).</li> </ul>



# Other dSO Regulatory Considerations for ED2

Component	RIIO ED2 Requirements	ED1 Regulatory mechanisms
<b>Provision of whole system services</b>	<ul style="list-style-type: none"> <li>The outcome of the CLASS regulatory treatment consultation will inform the regulatory treatment for all direct service provision elements for ED2.</li> </ul>	<ul style="list-style-type: none"> <li>Directly Remunerated Services</li> </ul>
<b>DSO related investment and non-capex costs</b>	<ul style="list-style-type: none"> <li>It would be worthwhile to explicitly identify costs that support the development towards DSO even if they also support the transition to Net Zero. This would enable any future decisions to implement DSO separation to account for all costs incurred to date in 'building' a DSO.</li> <li>The scale of DSO ambition will dictate the level of planned expenditure but will be related to individual DNOs LCT uptake forecasts and DSO transition aspirations. ED2 cost benchmarking methodology needs to deal with regional differences and forecast costs that are new or increased on historical levels in order to deliver meaningful outcomes.</li> <li>To operate and maintain a 'smart' network it should be expected that OPEX costs increase whilst CAPEX costs reduce. Although the RIIO mechanism accounts for the trade off between CAPEX and OPEX activities this may result in cash flow challenges for DNOs without historical trends to guide forecast Fast pot/Slow pot split.</li> </ul>	<ul style="list-style-type: none"> <li>Totex</li> <li>Interruption Incentive Scheme</li> <li>Business Carbon Footprint</li> <li>Losses Discretionary Award</li> </ul>
<b>Enhanced Network Monitoring, Control &amp; ICT</b>	<ul style="list-style-type: none"> <li>At the heart of any future DSO will be enhanced Network Monitoring &amp; Control. These investments will support the transition to Net Zero and are likely to be in excess of historical Network Monitoring and Control expenditure.</li> <li>There are existing concerns about Flexibility vs ANM type control - these should not be seen as competing options when in reality ANM might be an enabler for network Flexibility (Open Networks Workstream 1a considering)</li> <li>To understand the network and the challenges implicit in LCT uptake we need to improve our visibility of the network, particularly at LV and HV voltages.</li> <li>At the heart of any future DSO will be enabling Telecoms and IT infrastructure. These investments will support the transition to Net Zero and are likely to be in excess of historic IT/Telecoms expenditure.</li> </ul>	<ul style="list-style-type: none"> <li>Totex</li> <li>Directly Remunerated Services</li> </ul>
<b>Flexibility services and connections</b>	<ul style="list-style-type: none"> <li>To date Flexibility services have been used to defer or avoid Reinforcement expenditure, in RIIO ED2 this could extend to other investment categories.</li> <li>It is essential that we record the expected costs that will be incurred, the investment that is deferred/avoided and demonstrate that it represents lowest overall cost for customers.</li> <li>The cost to run tenders, schedule, dispatch and settle with Flexibility providers should also be included in Flexibility costs.</li> <li>Forecast Flexibility costs should be included within the TOTEX allowance with the associated investment driver explicitly identified.</li> </ul>	<ul style="list-style-type: none"> <li>Totex</li> <li>Broad Measure of Customer Service</li> <li>Average Time to Quote &amp; Connect</li> <li>Incentive on Connections Engagement</li> <li>Complaints</li> <li>Stakeholder Engagement &amp; Consumer Vulnerability</li> </ul>

# RIO-ED2 OAWG

## Update on local and regional planning sub group (scenarios)

6 May 2020





# The sub group has agreed four approaches to scenarios for ED2

Ofgem proposed two 'extreme' options, shown in orange. The sub group believes that there are compromise options between these, which are likely to be appropriate for ED2:

## 1. Fully regional scenarios

- Companies free to set their own (well justified) scenarios for their plan, which could be based on company DFES

## 2. Regional scenarios but common approach

- DNOs set the same scenario framework following GB FES assumptions, but apply their own, well justified regional adjustments, via a consistent methodology (as per Open Networks WS 1b Product 2)

## 3. Common set with 'best view'

- As per the approach used at RIIO-ED1, all DNOs produce a common set of scenarios. DNOs provide their base plan on their own best view.

## 4. Common scenario(s)

- One or more scenarios consistently applied across all companies, and Ofgem selects the best view

# A set of evaluation criteria has been agreed to assess options

Criteria have been divided into 5 groups, and the desirable characteristics for scenarios discussed and agreed with the working group:

Regionality	Benchmarking	Risk and uncertainty	Effort	Plan development
Enables local stakeholder views to be represented/reflected in the scenario	Enables Ofgem to perform consistent comparative benchmarking across companies	Reduces risk of windfall gains/losses because scenario was wrongly calibrated from the outset	Avoids burden of effort for Ofgem to prepare and evaluate scenarios	Provides sufficient ex ante allowances, without over reliance on uncertainty mechanisms
Scenario likely to reflect the best view of 'reality' for companies on the ground	Enables Ofgem to perform consistent comparative benchmarking across a range of scenarios	Enables strategic investment to achieve net zero	Avoids burden of effort for companies to develop (or agree) scenarios	Supports a whole system approach - at a national level
Provides consistent 'guidelines' companies can use to test their own view of the most likely scenario	Provides a good suite of data for calibration of uncertainty mechanisms	Minimises the risk of asset stranding	Can make use of the most up to date information	Supports a whole system approach - at a regional level
	Enables early work on a core baseline scenario for benchmarking purposes	Gives "ownership" of the scenario and plan to the licensee	Makes use of credible and consistent DFES that are already being prepared	

## Sub group members are now assessing each option

Each group member is now filling in the agreed scoring spreadsheet, so that we can come potentially come to a joint view on the most appropriate option(s) to take forward.

Members can 'weight' the importance of each category (e.g. regionality, effort) according to how important they think they are

Each member can score each option against each criteria on a 1-3 scale  
1 = poor, 2 = average, 3 = good

Members can add explanatory comments or caveats in yellow cells, which means we can have a richer analysis of results

	Relative importance		Option 1 -fully regional scenarios		Option 2 - regional scenarios commo	
	Suggested Weighting	Comments	Score	Comments	Score	Comments
<b>Regionality</b>	20%		0	0	0	0
Enables local stakeholder views to be represented/reflected in the scenario						
Scenario likely to reflect the best view of 'reality' for companies on the ground						
Provides consistent 'guidelines' companies can use to test their own view of the most likely scenario						

# Work remains to assess results and develop the preferred options

The immediate next steps are:

- Sub group members fill in scoring template (by 7<sup>th</sup> May)
- UKPN to collate results (by 11<sup>th</sup> May)
- Results to be presented at sub group meeting (14<sup>th</sup> May)

Longer term, further work will be needed to develop the preferred option(s), including:

- The process to develop scenarios
- Any linkages to the ENA's previous work on common scenarios – as used for GD2/T2
- Exploring the merits of creating a common evidence framework
- The 'cut off' point for scenarios to include in the December 2021 business plans

## Net zero adaptability - Ofgem



- Our [decarbonisation action plan](#) steps we would take towards enabling effective decarbonisation of the energy sector at the lowest cost to consumers.
- In it, we said:

*“A new mechanism – **a system-wide net zero reopener** spanning the gas and electricity sectors – aims to balance the need for investor confidence and the need to respond flexibly to **changing technological and policy developments in the path to net zero.**”*

*“We will introduce a suite of net zero investment and innovation mechanisms, including ...a **new net zero reopener**, that can help to enable key developments in regulatory policy or technology to be reflected flexibly in the price controls.”*

- We are seeking views on the development and implementation of this reopener.



- It is critical that the RII0-2 price controls enable the gas and electricity networks to support the achievement of net zero targets. Policy for net zero may not develop in tidy five year segments, conveniently aligned with our RII0-2 timetable.
- There may be circumstances during RII0-2 where assumptions that were used to set the price control are no longer appropriate, due to changes caused by the transition to net zero.
- It may be appropriate to make adjustments to reflect these during the period rather than waiting until RII0-3
- We may not be able to foresee all of the relevant changes at the time of the price control so do not propose to be highly prescriptive on the types of change that may trigger use of the reopener.
- We propose that this reopener would be used to reflect changes that:
  - 1) relate specifically to the achievement of the net zero target, and
  - 2) have a significant impact on the role of the networks and/or the scope of what should be reflected within the price controls.
- These changes could arise from a range of sources such as changes in central or devolved government policy or technological changes – **but only ever where in relation to the delivery of net zero targets.**
- The process we put in place will need to allow for proper consultation and consideration of the impacts that changes might have on companies.

We are seeking your views on:

1. what types of event or change do you think should trigger the net zero reopener mechanism?
2. What types of changes to licences do you think the net zero reopener mechanism should provide for?
3. What process do you believe we should we follow under the net zero reopener to determine whether changes to companies' licences are needed (and, if so, to determine what should those changes be?)?

**Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.**

**We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers' experiences and the operation of energy systems and markets.**