

RIIO-ED2 Overarching Working Group

Meeting 7

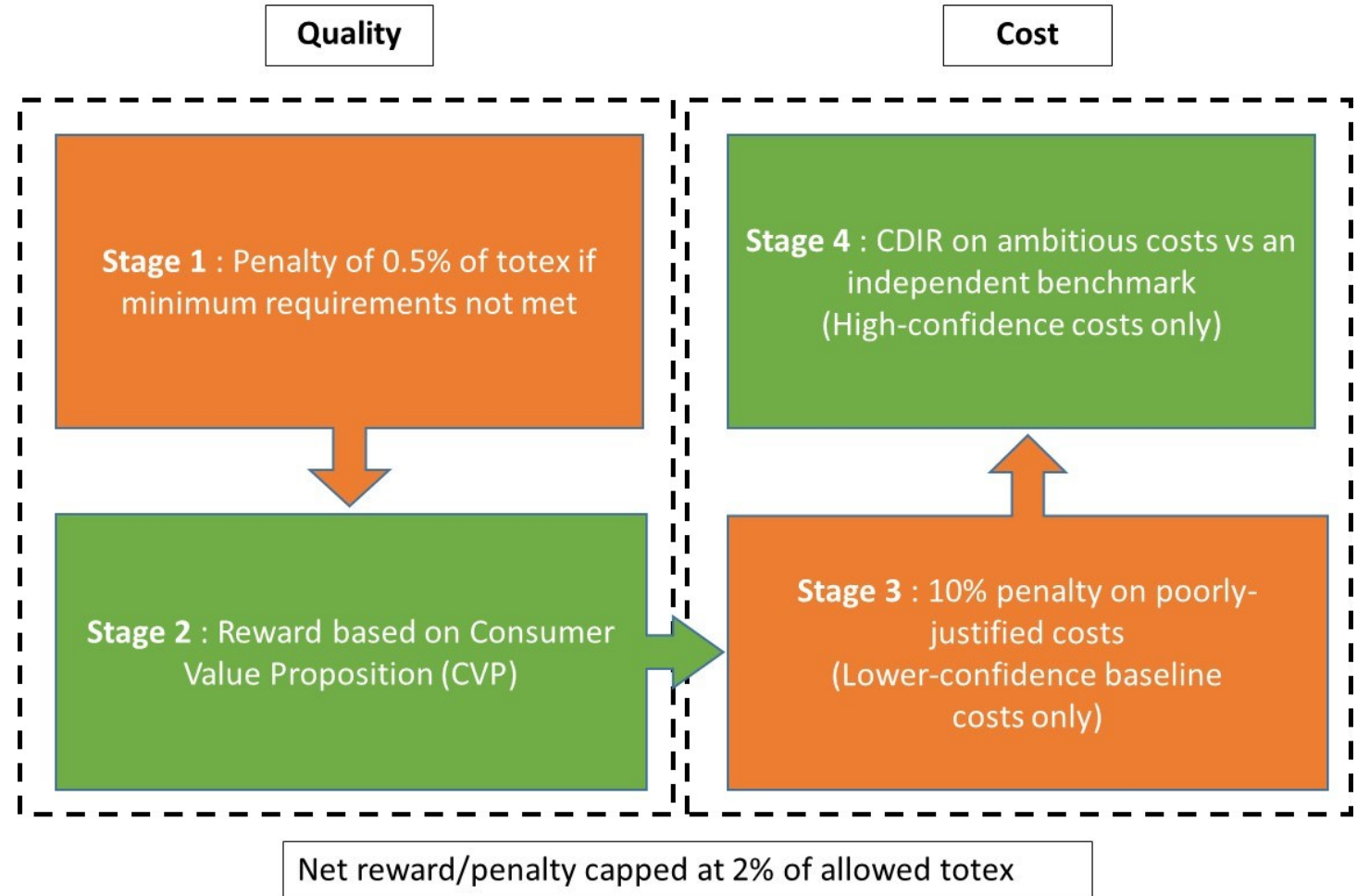


9 July 2020

Business plan incentive / business plan guidance



- We confirmed in the ED2 framework decision that we would implement the Business Plan Incentive (BPI) in ED2.
- We said that we would consider refinements to the BPI based on experiences in the transmission and gas distribution sectors.
- Overall, we expect the basic structure of the BPI in ED2 to be the same as in the other sectors but will consider where incremental improvements can be made.

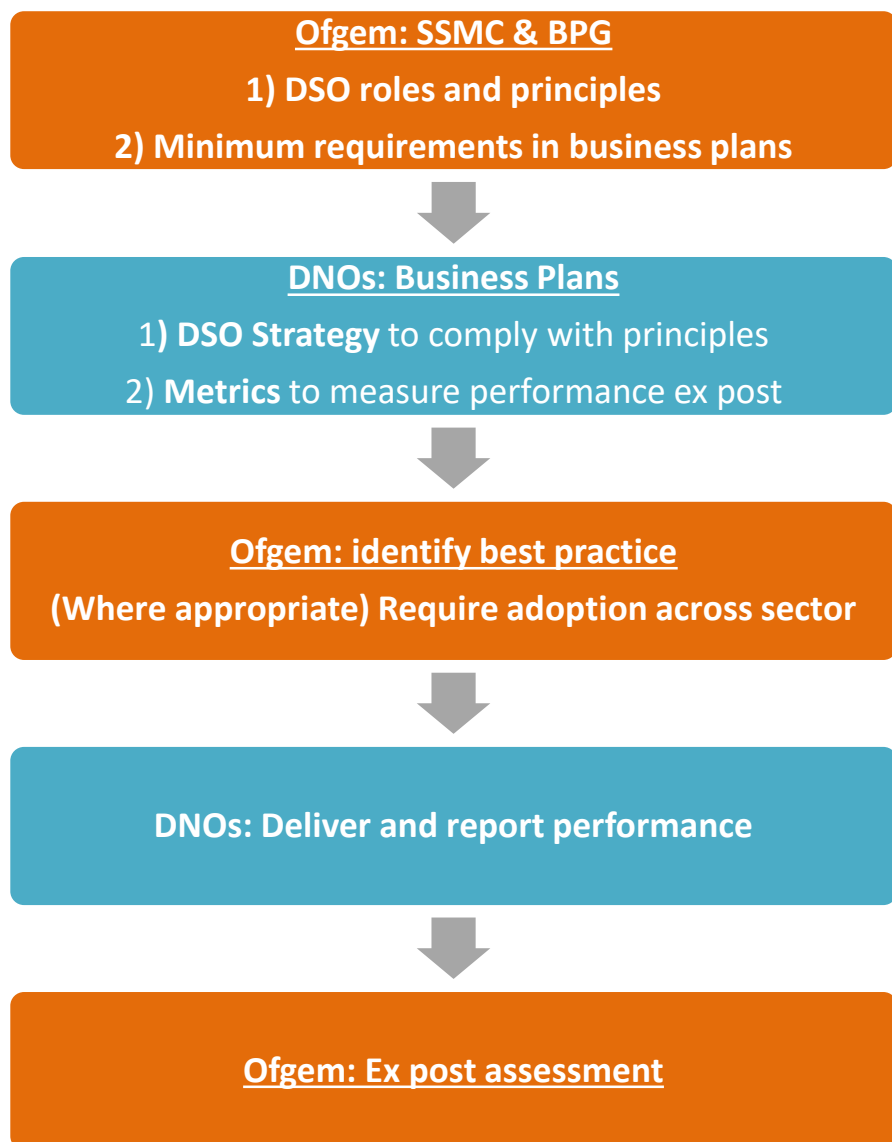


- The minimum requirements will be set out in draft in the draft business plan guidance, which we expect to publish later this month as a consultation.
- The minimum requirements are designed to ensure that business plans are substantially complete and contain all of the information that Ofgem needs in setting the price control.
- Minimum requirements are likely to include submission of :
 - completed BPDTs in line with guidance
 - financial information
 - information on how the plans have incorporated the views of stakeholders
 - innovation strategies
- Assessment of the minimum requirements is a one off assessment at the time of the price control based on the material contained within the business plan. Companies will not be 'held to account' via the minimum requirements for actual performance in ED2 – where we want to do this, it would be via another mechanism such as a licence condition or an assessment at closeout.
- The draft business plan guidance is a consultation and stakeholders will be invited to comment on the proposed set of minimum requirements.

- Companies may choose to submit bespoke outputs or uncertainty mechanisms but there is no requirement on them to do so.
- Where such proposals are made, there **will be** requirements around the information that would need to be submitted in support of those proposals. These won't be 'minimum requirements' under Stage 1 of the BPI, but may have an impact on whether the proposal is accepted or not.
- If a company proposes a bespoke output or uncertainty mechanism that we believe would have wider applicability, we may seek to implement that proposal as a common mechanism across the sector. Companies may be invited to propose where a bespoke mechanisms would have this wider applicability and such proposals may be more likely to be accepted.
- Companies will be encouraged to focus on quality rather than quantity of submissions.

- Through the consumer value proposition (CVP) companies will be invited to demonstrate how their business plans go beyond the expectations set out in our business plan guidance to deliver additional value to consumers. Proposals can be rewarded via the BPI based on this additional value.
- In the GD2 and T2 price controls a large number of proposals were included in business plans but the majority of these have not been accepted at the DDs stage.
- CVP proposals in the GD & T controls were not limited to any specific areas of activity, though we did include some suggested areas.
- In ED2, we think there may be an opportunity to use the CVP to support wider price control objectives by inviting companies to include proposals on a focused set of activity areas.
- These areas could include:
 - DSO – planning, operation, market development
 - Services to large, or 'major', connections customers
 - Supporting vulnerable customers
- As with other bespoke proposals, a form of cap – either on the number or value of CVP proposals, or a combination of both - may be warranted to help ensure high quality submissions.

- In some areas of DNO activity (for example, those listed in the previous slide), it may be more challenging to establish **best practice**.
- This may be due to :
 - Existing incentives not being sufficiently focused these activities.
 - Newness of the activity
 - Evolving customer and stakeholder needs
- We have been considering how the BPI could be used to help establish and drive forward best practice in these areas.
- This could involve a process along these lines:
 - Setting out the principles that we expect companies to apply in these areas and the minimum activities, standards, and outcomes we expect companies to deliver (established via SSMC/D)
 - Asking companies to set out in their business plans how the plan reflects these
 - Plans that best meet those principles or exceed the minimums may be rewarded via the CVP
 - Best practice identified via this process could be implemented across the sector



Business plan incentive

CVP can reward ambition

During ED2: Delivery incentive mechanism

Penalty for non-compliance

Opportunity for reward for above baseline performance

Aims/Purpose

- Transparency
- Standardised approaches
- Accountability
- Comparability
- Quality not just compliance

DSO roles and principles

1. Planning
 - ☐ Embedding uncertainty
 - ☐ Valuing flexibility
2. Operation
 - ☐ Network visibility
 - ☐ Real-time operation
3. Market development
 - ☐ Data & information
 - ☐ Products, contracts, market services

We don't intend to mandate a common structure for ED2 business plans, as we did in ED1.

We do expect to put in place some requirements around format and presentation, to ensure that Ofgem and stakeholders can navigate the plans and locate relevant information.

For example we may require companies to clearly identify and where material relevant to our assessment of the minimum requirements sits within the plan.

RIIO-ED2 Sector Specific Methodology Consultation



- On 30 July we intend to publish a consultation on the methodology that we'll apply to the next electricity distribution price control
- We intend the RIIO-ED2 will ensure the networks are prepared to deliver net zero at lowest cost to consumers
- The consultation will cover the outputs we expect companies to deliver and the approach we will take to keep costs low
- In addition, we will have an overview document that will highlight how the overall package will support decarbonisation and how we will regulate DSO activities
- Stakeholders will have 8 weeks to respond
- We are still in the process of finalising our proposals and in any event it would not be appropriate to give full details on our proposed positions
- These slides are intended to give a sense of some of the key features of our proposals

Managing uncertainty

Strategic
investment
models

Net zero reopener to
align with
government policy

Other reopeners

Strategic
innovation funding

Core
Incentives

Customer satisfaction,
connections experience

Business plan incentive
for 'raising standards'

Enhanced reporting and
reputational incentive for
delivery of plans

Benchmarked
allowances

Licence
conditions

Open
digitised data

Plans to achieve targets for carbon
emission reductions /environmental
impact

Totex allowances for increases in load and asset replacement, where certainty is high

- In all cases we aim to set a baseline allowance that reflects a likely view of future demand based upon transparent and consistently applied methodology for establishing demand and identifying solutions.
- Require flexibility to adjust allowances in period to respond to uncertainty
- Incentives can help to drive efficient delivery
- Consulting on 4 models – will they enable decarbonisation at low cost. And can they be practically applied?

Model A

- DNO plans reflect Ofgem targets for heat pumps with incentives on utilisation
- Local Plans used to identify schemes in other areas

Model B

- Volume driver with incentive on low carbon technologies installed

Model C

- Capacity mechanism & utilisation incentive

Model D

- Net Zero Reopener

- Retaining optionality to consider longer institutional arrangements over longer term
- We will be setting out how we will regulate the DSO functions that DNOs are currently best placed to undertake, including through licence conditions, outputs and incentives; and separately identifying the costs as clearly as possible to support this.
- Introducing suite of licence conditions for DSO functions undertaken by DNOs: planning, operation and market development
- DNOs required to produce a DSO plan in each area that demonstrates best practice
- We'll assess performance against plan – with potential penalties and rewards

- Retaining focus on customer service, connections, supporting vulnerable customers, reliability, resilience and minimising environmental impact
- Targets will build on performance improvements in ED1, so that consumers do not pay extra for service they already receive
- Less use of qualitative assessment. We'll set expectations for performance and expect companies to provide a plan that meets these, with performance-related metrics. We'll assess performance against the delivery of the plan and associated targets.
 - Bespoke outputs could be the basis of performance-related metrics. Common approach across companies is more likely to be adopted.

- For financial matters, we'll be confirming a starting position that's broadly aligned with other sectors, with intention to explore certain issues, such as depreciation
- We'll set out the tools we'll use to undertake cost assessment, how companies should approach forecasting and cost benefit analysis.
- We will consult on a suite of data tables, guidance and commentary templates that facilitate a consistent presentation of the cost, volume, output and financial data underpinning the business plan submissions. These templates are broadly in line with current ED1 reporting.
- Proposals to introduce early and late competition where it is appropriate and in the interests of consumers to do so
- Refining the BPI to offer more focus for CVPs and bespoke outputs

In other documents:

- Enhanced engagement guidance
- Business plan guidance
- Draft impact assessment



ARUP

Uncertainty Mechanisms for Load-related Investment



RIIO-ED2 Overarching Working Group

9th July 2020



Intros and context

Uncertainty mechanisms for LCT load – strategic investment

- Net Zero legislation 2019
- Uncertain net zero pathways
- Limited investment ahead of need under RIIO-ED1

Arup was commissioned by SSEN to assess, develop, design and test an uncertainty mechanism for strategic investment for low carbon technologies for ED2.
This summary is the output of Phase 1 (Optioneering).



Objectives

- Several mechanisms explored through the OAWG sub-group on Strategic Investment
- Arup supporting SSEN to appraise options and provide an independent perspective
- **Today is an update on Arup's assessment, at a conceptual level, of the mechanisms**
- Complement work already undertaken, and to support responses to SSMC
- **Gather wider views on which UMs to be taken forward for further development**

Approach to funding load-related capex

Funding Strategic Investment requires baseline and uncertainty mechanism funding.

Defining the baseline

- The Totex allowance in the DNO's business plan should include strategic investment in LCT (e.g. MW) priced in (blue line).
- The uncertainty mechanism should cater for deviations from the baseline PCD implicit in the Totex allowance. This is the difference between the orange and grey lines in the chart.

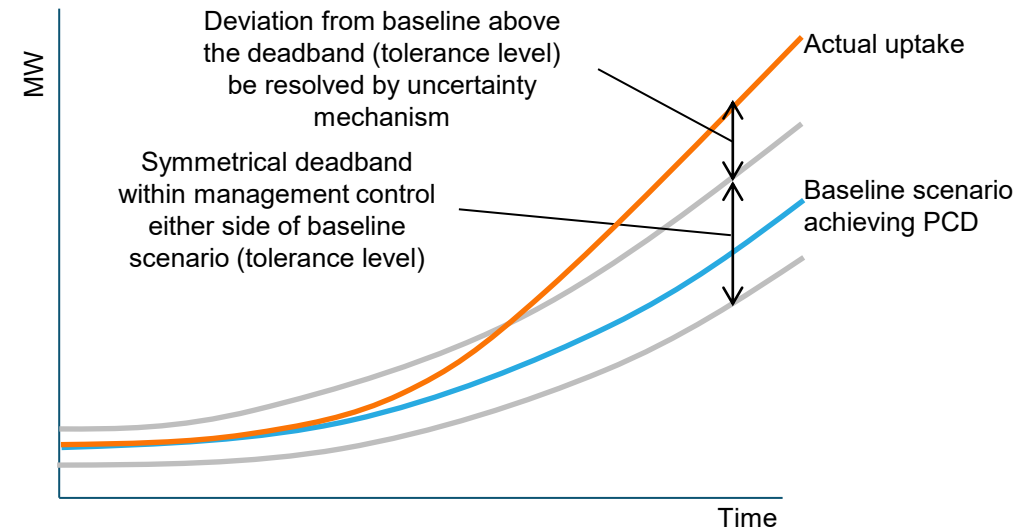
Defining the baseline

The baseline network capacity should be defined with the following attributes:

- Totex cost (£);
- Totex should include cost of flexibility solutions;
- What network capacity the DNO commits to deliver within the Totex baseline (PCD).
- A scenario associated with the PCD. The detail of scenario description is to be decided based on the detail of the uncertainty mechanism.
- Consider whether the baseline Totex for strategic investment in LCT should/could be ring-fenced to allow its easier adjustment through the UM.

Interaction between baseline and the uncertainty mechanism

- The UM would allow for allowances to be adjusted during ED2 should load needs deviate from the baseline, which has been set with incomplete information under sector uncertainty.
- Reopeners and volume drivers are both uncertainty mechanism options. Reopeners can have an event or threshold trigger and result in detailed assessment before any adjustments. Volume drivers are more mechanistic and work based on pre-determined formulas.
- For volume drivers to work effectively, their formulas need to be consistent with baseline assumptions.



Source: Arup

Lessons learned from RIIO-2 review to date

We have studied other sectors and feedback from the CCG to set a sensible framework for our review.

How the CCG rated uncertainty mechanisms proposed at T2, GT2 and GD2

The table to the right shows how the RIIO-2 Challenge Group rated the uncertainty mechanisms that companies proposed at the Electricity Transmission 2 (T2), the Gas Transmission 2 (GT2) and the Gas Distribution 2 (GD2).

The main lessons learnt from these price reviews are the following:

- Companies that received higher scores (greens) proposed:
 - Fewer mechanisms; and
 - A fairly proportionate allocation of risk between companies and consumers (although the group noted that further investigation of the consumer risk was required).
- Companies who received lower scores, proposed a TOTEX baseline that was:
 - Too low;
 - Put too much weight onto the uncertainty mechanism; and
 - Push too much risk onto consumers.

Key: ● Higher score ● Intermediate score ● Lower score

| Company | CCG December Evaluation Rating | Commentary |
|---------|--------------------------------|---|
| NGET | | Proposed 21 uncertainty mechanisms. The group noted that the boundary between baseline and mechanisms was unclear and there may be duplication. It also noted that the proposed uncertainty mechanism would double the allowed costs (£2.5bn + £3bn) through 4 automatic volume drivers – generation connections, demand, boundary capacity, facilitating competition – CATO. |
| SPT | | Proposed 5 key UMs with a maximum additional cost adjustment of £700m against a baseline of £280m. The group suggested that Ofgem review these proposals to ensure no bias or asymmetry. |
| SHET | | For the automatic volume driver for Generation and Demand Infrastructure, the group recommended independent validation of the proposals and, in particular, ensure that they do not introduce any bias that might disadvantage customers. |
| NGGT | | Included 12 uncertainty mechanisms (£33m) which the group generally approved. These included the whole system coordinated adjustment mechanism (UM10) to be defined by Ofgem and Net Zero (UM9) with Year 2 trigger at 1% of base revenue. |
| Cadent | | The group considered that major diversion should be accounted for through uncertainty mechanisms. However, connections and network reinforcement should be considered as a normal business risk for the company up to appropriate thresholds. |
| NGN | | The group looked favourably upon the 12 uncertainty mechanisms, which were mainly reopeners including rail diversions, generation. |
| SGN | | The group was concerned with the proportion of UMs proposed compared to the baseline and specifically that connections should be considered as a normal business risk. |
| WWU | | The group considered that the company provided a set of UMs which are normal business risks and encouraged Ofgem to validate and assess the proposals to ensure risk is not passed onto the consumer. |

UM assessment criteria

In addition to the assessment criteria proposed by Ofgem, we have included an additional 6 criteria to address regulatory duties/targets not covered by Ofgem's criteria and aspects which are specific to SSEN

Summary

| Criteria discussed at OAWG | | Additional criteria proposed by Arup | |
|----------------------------|--|---|-----------------------------|
| Criteria discussed at OAWG | | Criteria addressing regulatory duties/targets not covered by Ofgem's criteria | |
| 1 | Meet the UK Net Zero target by 2050 and the Scottish Climate Change Act targets (Provides infrastructure needed to meet LCT demand) | 8 | Addressing the initial risk |
| 2 | Minimises stranding risk | 9 | Consumer protection |
| 3 | Minimises risk of windfall profit | 10 | Affordability |
| 4 | Minimises risk of windfall loss | 11 | Security of supply |
| 5 | Encourages efficiency, including flexibility | 12 | Whole system impact |
| 6 | Uses data that can be collected in ED1 | Criteria addressing aspects specific to SSEN | |
| 7 | Is straightforward to implement | 13 | Regional differences |

UM assessment criteria

For each of the assessment criteria, we have identified key assessment questions to be used as part of the evaluation process.

Assessment criteria and assessment questions

| Criteria | | Assessment Questions |
|-----------------------------------|---|---|
| Criteria discussed at OAWG | | |
| 1 | Meet the UK Net Zero target by 2050 and the Scottish Climate Change Act targets (Provides infrastructure needed to meet LCT demand) | <ul style="list-style-type: none"> How well does the UM support the deployment of LCTs, including EVs, DG and heat pumps? How well does the UM support the deployment of emerging LCT technologies? How quickly can the UM prepare the network to deliver the LCT connection? How well does the UM support the delivery of UK Net zero target by 2050? How well does the UM support the delivery of the Scottish 2019 Climate Change Act targets*? |
| 2 | Minimises stranding risk | <ul style="list-style-type: none"> Does the UM support solutions that are fit for the future? Does the UM support innovative network solutions? |
| 3 | Minimises risk of windfall profit | <ul style="list-style-type: none"> Does the UM minimise risks of windfall profit? |
| 4 | Minimises risk of windfall loss | <ul style="list-style-type: none"> Does the UM minimise risks of windfall loss? |
| 5 | Encourages efficiency, including flexibility | <ul style="list-style-type: none"> Does the UM encourage cost effective investment? Are the unit costs used efficient? How responsive is the UM to changes in technology uptake? How responsive is the UM to changes in user behaviour (e.g. load profiles)? How well does the UM accommodate policy changes (e.g. hydrogen vs electricity)? |
| 6 | Uses data that can be collected in ED1 | <ul style="list-style-type: none"> Does the UM use readily available robust historical data, e.g. collected in ED1? Does the UM use forward-looking data that will be readily available? |
| 7 | Is straightforward to implement | <ul style="list-style-type: none"> Is the UM simple to administer (i.e. minimises regulatory burden)? Can the UM be objectively measured? Can the UM be implemented in a clear and transparent manner? |

* Scottish 2019 Climate Change Act targets: (a) 2020 is at least 56% lower than the 1990/1995 baseline; (b) 2030 is at least 75% lower than the 1990/1995 baseline; and (c) 2040 is at least 90% lower than the 1990/1995 baseline.

Long list of UM options

We have assessed 11 UMs against the assessment criteria, including the ones considering at the working group and several additional (e.g. Rolling allowance and Network asset volume driver).

We focus on Volume Drivers mechanisms in the next few slides.

| Reopeners | Volume drivers and other |
|--|---|
| RIIO-1 Mechanism <£25m Traditional reopener for strategic investment below £25m in two reopener windows. | Capacity Mechanism with baseline (£/MVA) Adjustment of allowance within period depending on volume (MW or MVA) of capacity developed. The baseline allowance has an implicit agreed volume (MW); the volume driver adjusts beyond this level (up or down). |
| RIIO-1 Mechanism >£25m Traditional reopener for strategic investment over £25m in one reopener window. | Capacity Mechanism without baseline (£/MVA) Adjustment of allowance within period depending on volume (MW or MVA) of capacity developed. This mechanism assumes no baseline allowance is provided. |
| Heating Policy reopener Restricted reopener triggered by changes in heating policy. Baseline and reopener threshold still work in progress. | LCT Device Driver (£/Device installed) Adjustment of allowance within period depending on number of devices (heat pumps and EV) connected. The baseline allowance has an implicit agreed number of LCT connections; the device driver adjusts beyond this number (up or down). |
| Whole System 'Coordinated Adjustment Mechanism' reopener Load-related reinforcement reopener triggered by refinement of plans that are optimal from a whole system perspective (e.g. ED2, T2, GD2). Both networks' outputs and cost allowances would be adjusted (up or down). | LCT Volume and Device Drivers (£/MVA plus £/Device installed) Adjustment of allowance within period depending on two drivers, outturn capacity (MW) and LCT devices connected. The baseline allowance has an implicit capacity (MW) and devices connected; the drivers adjust beyond these levels (up or down). |
| Net Zero reopener Reopener triggered at Year 2 if load costs related to Net Zero are above or below the ex ante allowance by > 1% of base revenue. | Network Asset Volume Driver (£/asset) Adjustment of allowance within period based on predefined unit cost for each asset type (e.g. LV feeder, transformer, etc). The baseline allowance has an implicit agreed volume (MW); the network asset input volume driver adjusts beyond this level (up or down). |
| | Rolling Allowance (mechanism adjusted from the water sector) Allowance covering multiple regulatory periods (10 years) to be drawn on in annual tranches corresponding to the LCT index updated every year based on historical and updated forecast uptake. |

Key:  Select Mechanisms  New mechanisms- Derived from water sector

UM options assessment

Our assessment of the mechanisms against criteria shows all mechanisms will require adjustments to meet all of the assessment criteria sufficiently.

Volume drivers and other uncertainty mechanisms

The table to the right summarises the assessment of the volume driver and gated allowance mechanisms. The narrative underpinning the assessment is detailed in the Appendix.

The assessment shows that all of the proposed volume driver mechanisms will require some level of adjustment to enable them to work.

The key shortcomings and limitations of these volume driver mechanisms relate to stranding risk, consumer protection, efficiency of unit costs, and understanding availability of LV capacity ahead of setting the baseline.

In the next section we propose refinements to mitigate these issues for three mechanisms – highlighted in blue in the table.

As part of the project we also assessed a new mechanism adjusted from the water sector [exploratory mechanism in the diagram on the right], which whilst addressing many criteria would be quite complex to start during the current process and would require further exploration and analysis.

A common limitation across all mechanisms is the process for allowing automatic adjustment for deemed economically efficient solutions, which still needs to be detailed.

| Criteria | Volume drivers and other mechanisms | | | | | Exploratory mechanism |
|---|--|---|--|---|---------------------------------------|--|
| | Capacity Mechanism with baseline (£/MVA) | Capacity Mechanism without baseline (£/MVA) | LCT Device Driver (£/Device installed) | LCT Incentive (£/MVA plus £/Device installed) | Network Asset Volume Driver (£/asset) | Rolling Allowance (mechanism adjusted from the water sector) |
| 1. Addressing the initial risk | Meets criteria | Partially meets criteria | Meets criteria | Meets criteria | Meets criteria | Meets criteria |
| 2. Meet the UK and Scottish Net Zero targets | Meets criteria | Partially meets criteria | Partially meets criteria | Partially meets criteria | Partially meets criteria | Meets criteria |
| 3. Minimises stranding risk | Partially meets criteria | Partially meets criteria | Meets criteria | Meets criteria | Does not meet criteria | Meets criteria |
| 4. Minimises risk of windfall profit | Meets criteria | Meets criteria | Partially meets criteria | Partially meets criteria | Meets criteria | Meets criteria |
| 5. Minimises risk of windfall loss | Partially meets criteria | Partially meets criteria | Meets criteria | Partially meets criteria | Meets criteria | Partially meets criteria |
| 6. Encourages efficiency, including flexibility | Meets criteria | Meets criteria | Partially meets criteria | Does not meet criteria | Partially meets criteria | Meets criteria |
| 7. Uses data that can be collected in ED1 | Partially meets criteria | Partially meets criteria | Partially meets criteria | Partially meets criteria | Meets criteria | Partially meets criteria |
| 8. Is straightforward to implement | Partially meets criteria | Meets criteria | Partially meets criteria | Does not meet criteria | Partially meets criteria | Does not meet criteria |
| 9. Consumer protection | Partially meets criteria | Partially meets criteria | Meets criteria | Does not meet criteria | Does not meet criteria | Meets criteria |
| 10. Affordability | Partially meets criteria | Partially meets criteria | Partially meets criteria | Partially meets criteria | Partially meets criteria | Meets criteria |
| 11. Security of supply | Meets criteria | Partially meets criteria | Partially meets criteria | Partially meets criteria | Meets criteria | Meets criteria |
| 12. Whole system impact | Does not meet criteria | Partially meets criteria | Partially meets criteria | Does not meet criteria | Does not meet criteria | Meets criteria |
| 13. Regional differences | Meets criteria | Meets criteria | Partially meets criteria | Partially meets criteria | Meets criteria | Meets criteria |

Key: ● Meets criteria ● Partially meets criteria ● Does not meet criteria ● Not applicable

Source: Arup Analysis

Selected option – Capacity Mechanism

The capacity mechanism with a baseline as currently defined to date is set out below.

Ofgem Working Group Mechanisms

| Criteria | Capacity Mechanism with baseline (£/MVA) |
|---|--|
| 1. Addressing the initial risk | Green |
| 2. Meet the UK and Scottish Net Zero targets | Green |
| 3. Minimises stranding risk | Yellow |
| 4. Minimises risk of windfall profit | Green |
| 5. Minimises risk of windfall loss | Yellow |
| 6. Encourages efficiency, including flexibility | Green |
| 7. Uses data that can be collected in ED1 | Yellow |
| 8. Is straightforward to implement | Yellow |
| 9. Consumer protection | Yellow |
| 10. Affordability | Yellow |
| 11. Security of supply | Green |
| 12. Whole system impact | Red |
| 13. Regional differences | Green |

| Capacity Mechanism with baseline (£/MVA) | |
|--|--|
| Type | Volume driver |
| Description | Unit Cost Allowance (UCA) used to calculate and adjust allowance within period depending on volume (MW) of capacity developed. The baseline scenario would account for a base level of capacity created and this mechanism would act to adjust the allowed revenue outside a specified deadband range. Any asset replacement would be excluded from this mechanism as considered as part of the baseline scenario. |
| Materiality | Small scale schemes, threshold still to be confirmed |
| Frequency | Automatic volume driver, frequency to be confirmed |
| Unit costs | Fixed ex ante allowance of £Y for X MVA and then capacity mechanism driven by UCA once threshold is reached with adjustments to be made automatically via PCFM |
| Eligibility | Capacity created outside of a deadband of the baseline scenario, deadband to be confirmed |
| Applicability to DNOs | Capacity created for low carbon technologies |

Selected option – Capacity Mechanism: limitations, solutions, feasibility

Key complexity is around the availability of data

| Mechanism | Key (current) shortcomings or limitations | Potential solutions | Feasibility of potential solutions with 3 months |
|---|---|---|---|
| Capacity Mechanism with baseline (£/MVA) Proposed by ENW | The mechanism will need to consider how investment ahead of need should be accepted to <u>minimise stranding risk</u> and <u>protect consumers</u> , i.e. if there has been a significant adjustment in the original baseline and uptake need. | A cap of +/- X % of baseline or TOTEX (£m) for Strategic Investment to review the original baseline and assess asset load indices | Feasible – Further development of mechanism adjustment process |
| | <u>Limited visibility of the capacity available at the LV level</u> to set the baseline and measure performance at the start of ED2 | Development of data required to understand capacity on the LV network ahead of baseline setting and mechanism determination | Difficult – Data not available |
| | Risk of getting the <u>unit costs</u> wrong - the mechanism may expose the DNO to windfall losses if there is a fixed unit cost allowance which does not reflect variations in the cost of providing capacity in different areas of the network i.e. it is more expensive to provide capacity in constrained areas. | Unit costs to reflect the variations in providing capacity in different areas/types of the network. | Possible – Analysis of the costs associated with load investment in different network areas to identify the potential unit cost variation – requires variation wrt level of constraints, voltage. |

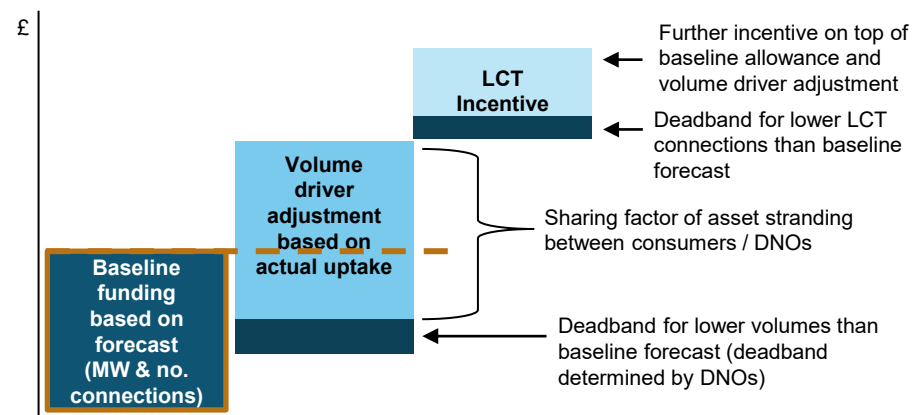
Selected option – LCT Incentive

Solution as proposed by RIIO-ED2 Ofgem Working Group Mechanisms

Ofgem Working Group Mechanisms

| Criteria | LCT Incentive (£/MVA plus £/Device installed) |
|---|---|
| 1. Addressing the initial risk | |
| 2. Meet the UK and Scottish Net Zero targets | |
| 3. Minimises stranding risk | |
| 4. Minimises risk of windfall profit | |
| 5. Minimises risk of windfall loss | |
| 6. Encourages efficiency, including flexibility | |
| 7. Uses data that can be collected in ED1 | |
| 8. Is straightforward to implement | |
| 9. Consumer protection | |
| 10. Affordability | |
| 11. Security of supply | |
| 12. Whole system impact | |
| 13. Regional differences | |

| Low Carbon Technology Incentive | |
|---------------------------------|--|
| Type | Volume and device drivers |
| Description | Baseline allowance includes an estimate of both volume (MW) and number of LCT devices connected. Volume driver adjusts allowance for higher/low outturn capacity (MW) as compared to the baseline. There is an additional incentive per LCT connected (above/below the baseline) on top of the volume adjustment. The mechanics of this mechanism is complex and raises several clarifying questions which we summarised in the table below. |
| Materiality | Symmetrical incentive for significantly higher or lower capacity volumes |
| Frequency | Automatic volume driver, frequency to be confirmed |
| Unit costs | Two types: (i) £ per outturn MVA above the MVA in the baseline; (ii) £ per LCT device connected |
| Eligibility | Two types: (i) Volume capacity outside the baseline plus deadband (deadband is only for lower volumes than in the baseline forecast); (ii) LCT device incentive outside of the baseline scenario plus a deadband (deadband is only for lower number LCT connections than in the baseline). Deadbands are yet to be determined. |
| Applicability to DNOs | Capacity created for low carbon technologies |



Selected option – LCT Incentive Proposed RIIO-ED2 Ofgem Working Group Mechanisms

Ofgem Working Group Mechanisms

Clarifying questions about the mechanism to put back to the Ofgem Working Group:

1. Is the load related to new devices connected rewarded twice, one via baseline or volume driver and again via the device driver?
2. How does the mechanism consider the network situation in terms of generation / demand constraints?
3. What is the definition of 'device'? Is there sufficient and consistent data available to track 'devices connected'?
4. How does the mechanism quantify the £/ device for different technology types?
5. Why is the volume deadband one-sided (i.e. only for lower volumes than baseline)?
6. How does the deadband for the device driver work?
7. Is the device driver based on outturn and if so, why is a deadband needed?

Source: Arup

Selected option – LCT Incentive: limitations, solutions, feasibility

Many unanswered questions – difficult to resolve whilst progressing business plans

| Mechanism | Key (current) shortcomings or limitations | Potential solutions | Feasibility of potential solutions with 3 months |
|--|--|---|---|
| LCT Incentive (£/MVA and £/Device installed) Proposed by Ofgem | The mechanism <u>rewards/penalises twice</u> the capacity created to accommodate new LCT connections above the baseline: once via the volume driver (£/MVA) and again via the LCT incentive (£/device installed). For example, a new EV charging point connected above the baseline is rewarded via the LCT/device connected and again via the capacity delivered to connect it. | Drop one of the incentives. (will turn it either into the Capacity mechanism or the LCT device mechanism) | Difficult – Requires the redesign of the mechanism. |
| | The mechanism does not distinguish different LCT technologies yet. | Create a long list of £/device installed, one for each possible LCT device, e.g. 22kW chargepoint, 7kW chargepoint, 150kW chargepoint, heat pump sizes, solar 'devices', etc. | Difficult – The quantification of £/device connected for each is very difficult to disentangle from what is captured in the £/MVA. List will not include devices not yet on market. |
| | The mechanism fails to take into consideration the network situation in terms of generation / demand <u>constraints, which may drive different unit costs</u> . | Development of data required to understand capacity on the LV network ahead of baseline setting and mechanism determination. | Possible – Data is unlikely to be available in the next 3 months. |

Selected option – Network Asset Volume Driver

Alternative volume driver mechanism may be driven by inputs rather than outputs.

Newly Proposed Mechanism

| Criteria | Network Asset Volume Driver (£/asset) |
|---|---------------------------------------|
| 1. Addressing the initial risk | Green |
| 2. Meet the UK and Scottish Net Zero targets | Yellow |
| 3. Minimises stranding risk | Red |
| 4. Minimises risk of windfall profit | Green |
| 5. Minimises risk of windfall loss | Green |
| 6. Encourages efficiency, including flexibility | Yellow |
| 7. Uses data that can be collected in ED1 | Green |
| 8. Is straightforward to implement | Yellow |
| 9. Consumer protection | Red |
| 10. Affordability | Yellow |
| 11. Security of supply | Green |
| 12. Whole system impact | Red |
| 13. Regional differences | Green |

| Network Asset Volume Driver | |
|-----------------------------|---|
| Type | Volume Driver (symmetrical) |
| Description | <p>A series of volume drivers with their corresponding unit costs. The volume drivers would be the asset interventions used by WSP in the ENA investment tool as set out opposite or simply asset types for each voltage level.</p> <p>The mechanism would adjust the baseline allowance for the load-related programme if the load-related expenditure is more than X% different than the baseline allowance. The additional allowance would be derived as:</p> $\Sigma(\text{asset volume} \times \text{predefined unit cost}) - \text{baseline allowance}$ <p>The efficiency of the volume needs to be tested.</p> |
| Materiality | To be decided – proposed +/-20% of load related expenditure allowance or 1% base revenue |
| Frequency | Annual or end of ED2 reconciliation |
| Unit costs | A list of unit costs by asset - £/input asset |
| Eligibility | <p>New network assets</p> <p>Exclude replacement assets</p> |
| Applicability to DNOs | Tailored to DNOs |

Example of asset categories

Required Interventions

- EHV Feeder Overlay
- EHV Feeder Parallel
- HV Feeder Overlay
- HV Feeder Split
- HV Feeder VolCtrl
- HV Feeder Rebalance
- HV Feeder VolReg
- LV Feeder Overlay
- LV Feeder Split
- LV Feeder OLTC
- LV Substation UpgradePM
- LV Substation UpgradeGM
- LV Substation NewPM
- LV Substation NewGM
- HV Substation New
- HV Substation ExtraTR
- HV Substation Upgrade
- EHV Substation New
- EHV Substation ExtraTR
- EHV Substation Upgrade

Selected option – Network Asset Volume Driver: limitations, solutions, feasibility

Complexity is around defining assets lists and unit costs

| Mechanism | Key (current) shortcomings or limitations | Potential solutions | Feasibility of potential solutions with 3 months |
|---|---|--|---|
| Network asset volume driver (£/asset) | No mechanisms currently to prevent over-delivery of network assets | Set up a volume validation similar to the capacity mechanism | Feasible – Similar to capacity solutions |
| | Unclear what network assets this would encompass. It would exclude flexibility solutions. | Create a long list of network assets with their unit costs. | Possible – List may not be exhaustive. Will not resolve omission of flexibility |

Selected option – Rolling allowance

Alternative volume driver mechanism could be a rolling allowance driven by LCT uptake.

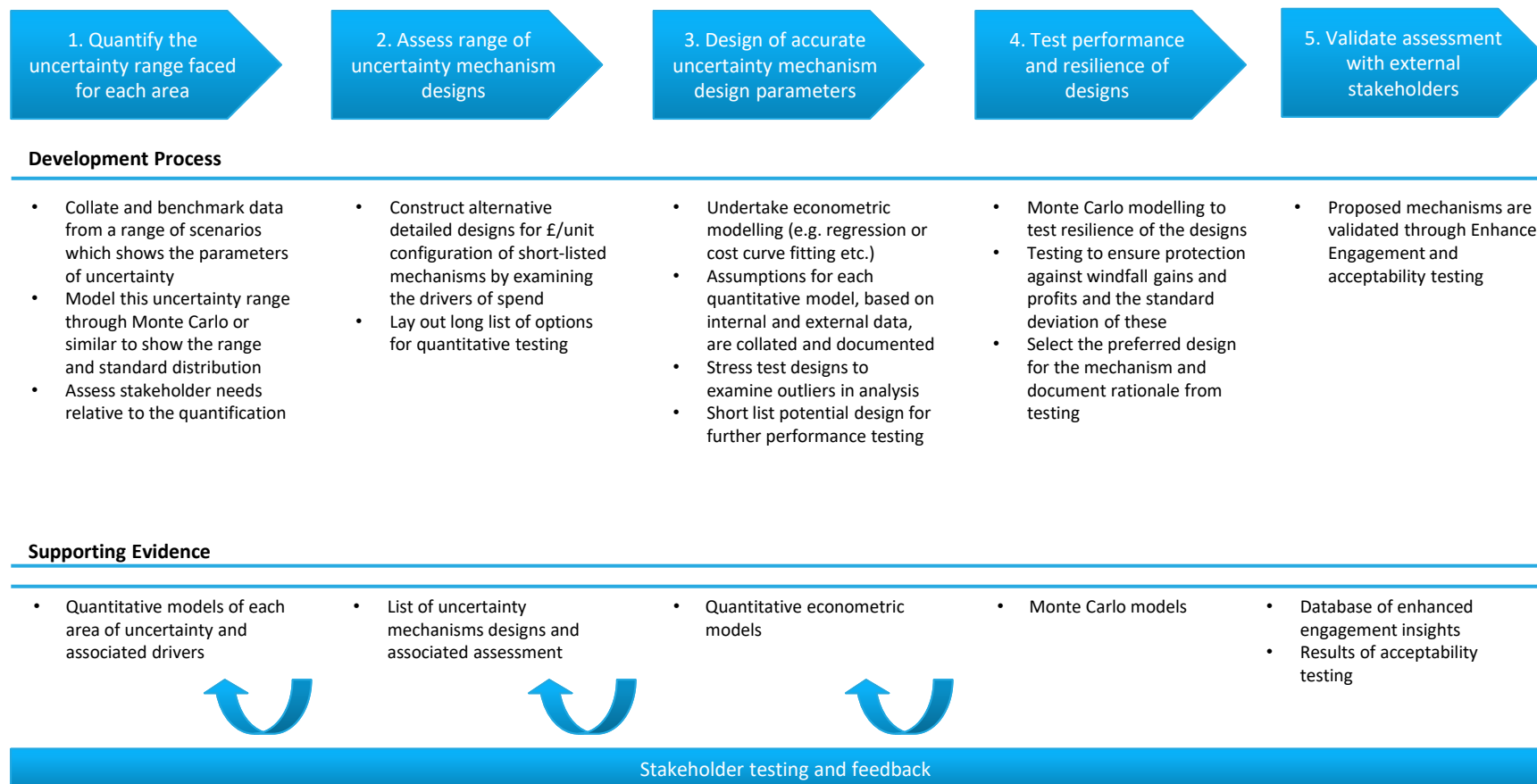
Newly Proposed Mechanism

| Criteria | Rolling Allowance (mechanism adjusted from the water sector) |
|---|---|
| 1. Addressing the initial risk | |
| 2. Meet the UK and Scottish Net Zero targets | |
| 3. Minimises stranding risk | |
| 4. Minimises risk of windfall profit | |
| 5. Minimises risk of windfall loss | |
| 6. Encourages efficiency, including flexibility | |
| 7. Uses data that can be collected in ED1 | |
| 8. Is straightforward to implement | |
| 9. Consumer protection | |
| 10. Affordability | |
| 11. Security of supply | |
| 12. Whole system impact | |
| 13. Regional differences | |

| Rolling allowance (mechanism adopted from the water sector) | |
|--|--|
| Type | LCT uptake driver (symmetrical). |
| Description | <p>An indicative upfront allowance plus an indicative upfront LCT uptake index that reflect the Net Zero demand scenario. Both to be defined in the business plan (BP).</p> <p>It can cover the 10 years of ED2 and ED3.</p> <p>Allowance to be released in annual tranches corresponding to the share of LCT uptake predicted for the year ahead.</p> <p>Share of LCT uptake is a rolling one - annual share is an average of last 2 years of actual uptake and next 3 years of uptake forecasts.</p> <p>Symmetrical. At any year, if the LCT uptake goes above that assumed in the BP, companies receive the additional. If LCT uptake at the end of the period is lower than assumed in the BP, the unspent allowance is clawed back.</p> <p>LCT uptake index is a weighted basket of different technologies (weights are load capacity)</p> <p><i>LCT uptake index = a * expected EV charging points connected + b * expected Heat Pumps connected + c * expected solar panels installed + ...</i></p> |
| Materiality | n/a |
| Frequency | Yearly - automatic calculation of annual tranche allowance based on the share of LCT uptake. |
| Unit costs | n/a, full allowance determined at the start of ED2 |
| Eligibility | The trigger for the tranche allowance is the leading LCT uptake index. |
| Applicability to DNOs | <p>Tailored to DNOs.</p> <p>Adapted from a combination of mechanisms set in the water sector at PR19: (i) the multi-period funding mechanism (eg Havant Thicket reservoir, £121.5m); (ii) the gated funding for in-period approval mechanism (e.g. North East London resilience, £180m); and (iii) the safeguard clause for unconfirmed investments (unconfirmed environmental obligations).</p> |

Detailed mechanism design

Proposed methodology for next steps





ARUP

Load-related Uncertainty Mechanisms for Strategic Investment



Appendix: Detailed Assessment of
Uncertainty Mechanism Options

Options assessment - Reopeners

Detailed assessment against criteria

Key: ● Meets criteria ● Partially meets criteria ● Does not meet criteria ● Not applicable

| Reopeners | | | | | |
|---|---|--|---|--|--|
| Criteria | RIO-1 Mechanism <£25m | RIO-1 Mechanism >£25m | Heating Policy reopener | Whole System 'Coordinated Adjustment Mechanism' reopener | Net Zero reopener |
| 1. Addressing the initial risk | Mitigates the risks of pace, policy and type of technology. Reopener windows mitigate the risk of limited data for LV level network. | Mitigates the risks of pace, policy and type of technology. Reopener window mitigates the risk of limited data for LV level network. | Only mitigates the risks of heating policy changes. | Does not address risks outside baseline because mechanism only switches from Distribution to Transmission baselines. | Mitigates the risks of pace, policy and type of technology but not of lack of LV network data |
| 2. Meet the UK and Scottish Net Zero targets | Encourages investment to a limited extent. The 20% deadband for strategic investment does not support addressing medium-term demand changes given only two windows. | It only encourages investment for significant (potentially Net Zero driven) investment projects. One only reopener window in May 2019. Does not provide incentives for more dispersed, programme-based investment (e.g. domestic load upgrades). | It meets Net Zero for heat but not for other needs (transport, generation, etc) | Net Zero is not the primary focus of this mechanism. | Yes, primary objective of this reopener is to meet Net Zero. |
| 3. Minimises stranding risk | Both the 20% deadband for strategic investment costs and the high bar for the adjustment above it minimise the stranding risk. | Requires reopener approval ahead of spend reducing risk of stranded assets | Reopener minimise stranding risk by putting off decisions until triggered by policy | Reopener minimises stranding risk as coordinated with transmission | Unclear as depends on Net Zero pathways |
| 4. Minimises risk of windfall profit | Restricted to two reopener periods and only applies if deviation from ex-ante allowance is by >+/-20% and exceeds 1% of annual average base ED1 revenue. | Restricted to one reopener period and costs of project would be investigated by Ofgem ahead of spend | Restricted reopener - scrutiny attached reduces the risk of windfall profit. | Restricted reopener with 2 windows and potential £20m threshold - scrutiny attached | Restricted reopener with 1 window and 1% revenue threshold |
| 5. Minimises risk of windfall loss | DNO exposed to windfall loss if test is not passed (>+/- 20% and not approved); but subject to the Totex Incentive Mechanism. | Restricted to one reopener period and costs of project would be investigated by Ofgem ahead of spend | Only addresses heating risk, does not provide protection for other LCT related investment | If outturn scenario is much higher than the planned, DNOs face a choice between breaching security of supply vs overspending allowance to prevent that | Depends on the selected Net Zero pathway |
| 6. Encourages efficiency, including flexibility | Agnostic to technology however could be slow to technology changes given the two reopener windows. Unit cost - TBC | Agnostic to technology however could be slow to technology changes given the one reopener window. Unit cost - TBC | Efficiency - TBD Fully accommodates policy change. But is not flexible enough to accommodate technology or behaviour change as can only be triggered by policy | Efficiency - most cost efficient from a whole system perspective. Not flexible enough to accommodate technology or behaviour or policy change outside the 2 trigger windows. | Efficiency - TBD Provides sufficient flexibility if Net Zero pathway is selected by the window trigger but not beyond |
| 7. Uses data that can be collected in ED1 | Data already available and process in place | Data already available and process in place | | | |

Options assessment - Reopeners

Detailed assessment against criteria

Key: ● Meets criteria ● Partially meets criteria ● Does not meet criteria ● Not applicable

| Reopeners (cont.) | | | | | |
|------------------------------------|---|---|---|---|--|
| Criteria | RIO-1 Mechanism <£25m | RIO-1 Mechanism >£25m | Heating Policy reopener | Whole System 'Coordinated Adjustment Mechanism' reopener | Net Zero reopener |
| 8. Is straightforward to implement | Regulatory burden during the regulatory periods. Unit costs to be applied unclear | Regulatory burden through the one reopener period with significant information provided and consultation undertaken ahead of approval | Regulatory burden during the regulatory periods | Regulatory burden during the regulatory periods | Regulatory burden during the regulatory periods |
| 9. Consumer protection | Risk allocation, TBC - based on baseline scenario. Less likely to see overdelivery as it follows the need. Two windows/ 20% deadband = low bill volatility. | Unlikely to see overdelivery as following the need and restricted to one reopener window. Low bill volatility | DNO protected from policy risk. Consumers protected through reopener - over-delivery, bill volatility, intergenerational equity. Double-counting - TBC, depending on how easy it would be to separate heating policy driven changes from what the DNO has already undertaken to address heating needs | Reopeners protect consumers through further scrutiny | Reopeners protect consumers through further scrutiny |
| 10. Affordability | Will depend on the baseline scenario, demand follows the need | Will depend on the baseline scenario, demand follows the need | Will depend on the baseline scenario and the reopener threshold | Will depend on the baseline scenario and the reopener threshold | Will depend on the baseline scenario and the reopener threshold |
| 11. Security of supply | Not providing capacity ahead of need to support security of supply | Not providing ahead of need to support security of supply | Yes, if sufficient lead time between policy and policy impact | Yes as optimised at a whole system level but may not deliver investment unrelated to other networks | Depends on the selected net zero pathway |
| 12. Whole system impact | Whole system not considered for | Whole system not considered for | Yes, energy vs gas | Yes, that's the primary purpose of this mechanism | Whole system not considered for |
| 13. Regional differences | Agnostic to generation/demand constraints | Agnostic to generation/demand constraints | Only if reopener triggers are tailored to the regional policy | Yes, takes into account regional differences | If reopener triggers tailored to the regional policy and pathways, yes |

Source: Arup Analysis

Options assessment – Volume drivers and other mechanisms

Detailed assessment against criteria

Key: ● Meets criteria ● Partially meets criteria ● Does not meet criteria ● Not applicable

| Criteria | Other uncertainty mechanisms | | | | | |
|--|--|--|---|--|---|--|
| | Capacity Mechanism with baseline (£/MVA) | Capacity Mechanism without baseline (£/MVA) | LCT Device Driver (£/Device installed) | LCT Incentive (£/MVA plus £/Device installed) | Network Asset Volume Driver (£/asset) | Rolling Allowance (mechanism adjusted from the water sector) |
| 1.Addressing the initial risk | Mitigates the risks of pace, policy and type of technology. Baseline mitigates the risk of limited data for LV level network. | Lack of baseline does not account for risks within management control. Mitigates the risks of pace, policy and type of technology. | Mitigates the risks of pace, policy and type of technology. Baseline mitigates the risk of limited data for LV level network. | Mitigates the risks of pace, policy and type of technology. Baseline mitigates the risk of limited data for LV level network. | Mitigates the risks of pace, policy and type of technology. Baseline mitigates the risk of limited data for LV level network. | Mitigates the risks of pace, policy and type of technology. Gates mitigate the risk of limited data for LV level network. |
| 2. Meet the UK and Scottish Net Zero targets | Incentivises all investment for the DNOs to provide capacity on their networks allowing LCT technologies to connect ahead of need, reducing connection lead times. | As there is no baseline allowance for LCT-related load driven expenditure, if the mechanism is not triggered there would be limited progress made to achieving Net Zero. | Encourages DNO to provide connections for LCT, thus may occur at a slower pace than through other mechanisms. (More likely to follow the need rather than be ahead of need) | Partially. The £/device encourages DNO to provide connections for LCTs. If depends whether £/device applies to actual devices connected (follows the need) or expected devices connected (ahead of the need). If the former, it and may miss Net Zero targets. In addition, the volume driver adjusts the allowance in line with actual demand which means that it follows the need. | Partially - it encourages DNOs to reinforce network assets even if not directly related to LCTs. It is not driven by the output or service provided, it is driven by the asset input and is not clearly linked to LCTs. | Encourages the DNOs to provide capacity ahead of the need driven by LCT uptake (albeit with gates assessment). Gates facilitate the deployment of emerging LCT technologies as and when there is evidence of need. The mechanism allows LCT technologies to connect with short lead times for connections. |
| 3. Minimises stranding risk | Actively encourages the DNO to develop capacity for LCT demand ahead of the confirmed need, which would increase the risk of stranded assets in the medium term if the demand does not materialise. | Actively encourages the DNO to develop capacity for LCT demand, which would increase the risk of stranded assets. | Tighter incentive to only connect LCT that meet the expected scenario (baseline funding) with the volume driver either side. | The volume driver adjusts the baseline up or down in line with actual demand, which reduces the risk of stranding risk. | Actively encourages the DNO to develop capacity for LCT demand, which would increase the risk of stranded assets. | Gated investment decisions minimises stranding risk by putting off investment until there is evidence of need driven by LCT uptake. |
| 4. Minimises risk of windfall profit | The potential for windfall profits will depend on the 'starting point' of the network. The mechanism prevents networks with significant spare capacity from making windfall profits from connecting LCT without spending on creating extra capacity. | The potential for windfall profits will depend on the 'starting point' of the network. The mechanism prevents networks with significant spare capacity from making windfall profits from connecting LCT without spending on creating extra capacity. | The potential for windfall profits will depend on the 'starting point' of the network. A less constrained network will find it less challenging to connect without incurring costs and would make windfall profits. | The potential for windfall profits will depend on the 'starting point' of the network. A less constrained network is more likely to make a windfall profit as it can receive an incentive for each device connected (£/device connected) without incurring costs for creating extra capacity because the company can accommodate the LCT connection within the existing capacity. | The potential for windfall profits will depend on the 'starting point' of the network. The mechanisms prevents networks with significant spare capacity from making windfall profits from connecting LCT without spending on creating extra capacity. | At each gate, investment allowed until next gate is investigated by the regulator ahead of spend. Allowance unspent in the previous gate is clawed back and added to the allowance pot. |

Source: Arup Analysis

Options assessment – Volume drivers and other mechanisms

Detailed assessment against criteria

Key: ● Meets criteria ● Partially meets criteria ● Does not meet criteria ● Not applicable

| Criteria | Other uncertainty mechanisms (cont.) | | | | | |
|---|--|--|---|---|---|--|
| | Capacity Mechanism with baseline (£/MVA) | Capacity Mechanism without baseline (£/MVA) | LCT Device Driver (£/Device installed) | LCT Incentive (£/MVA plus £/Device installed) | Network Asset Volume Driver (£/asset) | Rolling Allowance (mechanism adjusted from the water sector) |
| 5. Minimises risk of windfall loss | The mechanism may expose the DNO to windfall losses if there is a fixed unit cost allowance which does not reflect variations in the cost of providing capacity in different areas of the network i.e. it is more expensive to provide capacity in one area compared to another. | If the marginal cost of capacity increases but the unit cost allowance does not, the mechanism may expose the DNO to windfall losses. | The potential for windfall losses will depend on the 'starting point' of the network. A more constrained network will find it more challenging increasing the chances of windfall losses. | The volume driver adjusts the allowance in line with actual demand, so if DNO invests ahead of the need and capacity is unutilised it incurs windfall losses. The risk of windfall losses may be partially mitigated (hence orange as opposed to red) if £/device connected is based on expected (as opposed to actual) connections. It is unclear at this point whether the £/device connected follows the need (i.e. is paid per actual connections) or if anticipates the need (i.e. is paid per expected connection). | DNOs remunerated for the assets put in place based on predefined unit costs - reduces the risk of windfall loss. | Only partially minimises the risk of windfall losses. At each gate, company proposes investment to be allowed until next gate (which is scrutinised by the regulator ahead of spend). This partially minimises the risk of windfall losses because the company can carry over over-expenditure from one gate to the next gate. However, if LCT uptake is faster than assumed in the ex-ante conditional allowance, the company overspends and bears the cost of this over-expenditure. |
| 6. Encourages efficiency, including flexibility | Agnostic to how the capacity is used by technologies (i.e. the capacity can be used by any LCT) and provides additional capacity to achieve peak Unit cost - TBC | Agnostic to how the capacity is used by technologies (i.e. the capacity can be used by LCT) and provides additional capacity to achieve peak Unit cost - TBC | - Not as flexible to new device types if the UCA is technology specific - The mechanism is agnostic to the technologies' load profiles and policy changes (potential that this mechanism could not be transferred to other technologies) | Not as flexible to new device types if the UCA is technology specific The mechanism is agnostic to the technologies' load profiles and policy changes (potential that this mechanism could not be transferred to other technologies) | Mechanism does not allow flexibility of solutions outside the asset list that is predetermined. It does not allow for flexibility solutions. It is agnostic to user technology. Unit costs - TBC | Efficiency – the regulator scrutinises proposed allowance at each gate ahead of spend. Flexibility - mechanism fully accommodates pace and type of technology uptake; changes in user behaviour and policy changes (e.g. hydrogen vs electricity). |
| 7. Uses data that can be collected in ED1 | - Historical data of capacity installed is available for the higher voltage levels, - Assessment would be more challenging on the LV network based on the progress of current monitoring programme which may make it more challenging to set a robust baseline. | Historical data of capacity installed is available for the higher voltage levels, would be more challenging on the LV network based on the progress of current monitoring programme. Is sufficient data available to set MVAs for LV network? | Lack of sufficient and consistent data for the data connected - EVs, heat pumps, solar etc. | Lack of sufficient and consistent data for the historical LCTs connected - EVs, heat pumps, solar etc. | Asset register is readily available but may not be locational. Forward-looking data - need to separate replacement from new load-driven assets | Historical data of capacity installed is available for the higher voltage levels, would be more challenging on the LV network based on the progress of current monitoring programme. Is sufficient data available to set MVAs for LV network? |

Source: Arup Analysis

Options assessment – Volume drivers and other mechanisms

Detailed assessment against criteria

Key: ● Meets criteria ● Partially meets criteria ● Does not meet criteria ● Not applicable

| Criteria | Other uncertainty mechanisms (cont.) | | | | | |
|------------------------------------|---|---|---|--|---|--|
| | Capacity Mechanism with baseline (£/MVA) | Capacity Mechanism without baseline (£/MVA) | LCT Device Driver (£/Device installed) | LCT Incentive (£/MVA plus £/Device installed) | Network Asset Volume Driver (£/asset) | Rolling Allowance (mechanism adjusted from the water sector) |
| 8. Is straightforward to implement | More likely to have a clearer formula for calculation, although will need an automatic process to determine the costs are efficient. Questions that the formula will need to consider are: - How much of the capacity is being utilised? - What level of ahead of need is appropriate? | As there is no baseline, the adjustment needs to be made to an allowance of 0, which should be easy. | Will be more a challenging formulae/ with more restrictive data on devices connected | Will be more a challenging formulae/ with more restrictive data that the DNO may not have access to – data on outturn volume and devices connected. | More likely to have a clearer formula for calculation. Would need to determine that the capacity is being utilised? What level of ahead of need is appropriate? Difficult to separate from asset replacement; there may be numerous unit costs to be applied to numerous asset classes | Gates assessment create significant regulatory burden. Implementation was untested at ED1. |
| 9. Consumer protection | Risk allocation and bill volatility, TBC - Based on baseline scenario More likely to see overdelivery of capacity as ahead of need Less protection, current consumers paying for future consumers network (ahead of need) | This mechanism fully shifts the risk to consumers as Ofgem's baseline assessment would otherwise provide consumer protection. As there is no baseline, the mechanism is likely to lead to significant bill volatility. The risk of double-counting is reduced as no baseline. | Risk allocation and volatility, TBC - Based on baseline scenario Less likely to see overdelivery as following the need More protection for consumers as network developed as per need | Risk allocation and volatility, TBC - Based on baseline scenario High risk of double counting. Less likely to see overdelivery as following the need More protection for consumers as network developed as per need | Risk allocation and bill volatility, TBC - Based on baseline scenario More likely to see overdelivery of capacity as potentially ahead of need Risk of double-counting with asset replacement Less protection, current consumers paying for future consumers network (ahead of need) | Minimises risk of over-delivery as investment follows the expected need and unspent expenditure is clawed back at each gate. Avoids double counting because investment at each gate is determined by expected need above the baseline. Minimises bill volatility as the full allowance is known ex-ante; the gates split it over time. |
| 10. Affordability | Could overprovide to go ahead of need & will be shaped by the baseline scenario | Depends on the details of the mechanism | More likely to follow the need & will be shaped by the baseline scenario | More likely to follow the need & will be shaped by the baseline scenario | Depends on the details of the mechanism | The spend that matters for bill affordability is that approved at each gate where approved allowance follows the expected need until the next gate. |

Source: Arup Analysis

Options assessment – Volume drivers and other mechanisms

Detailed assessment against criteria

Key: ● Meets criteria ● Partially meets criteria ● Does not meet criteria ● Not applicable

| Criteria | Other uncertainty mechanisms (cont.) | | | | | |
|--------------------------|--|---|--|---|--|--|
| | Capacity Mechanism with baseline (£/MVA) | Capacity Mechanism without baseline (£/MVA) | LCT Device Driver (£/Device installed) | LCT Incentive (£/MVA plus £/Device installed) | Network Asset Volume Driver (£/asset) | Rolling Allowance (mechanism adjusted from the water sector) |
| 11. Security of supply | Sufficient capacity provided supporting security of supply | Less so than mechanism with a baseline | Not providing ahead of need to support security of supply | Not providing ahead of need to support security of supply | Sufficient capacity provided supporting security of supply | Gates are an opportunity to assess expected need and balance it with network capacity, so companies have an opportunity to propose investment that is sufficient to provide security of supply. |
| 12. Whole system impact | Whole system not considered for | Whole system not considered for | Whole system not considered for | Whole system not considered for | Whole system not considered for | The gates and the possibility of establishing an allowance for strategic investments that spans multiple price controls allows this mechanism to address issues of misalignment of TO and DO price controls and longer planning timelines in transmission. It would also accommodate whole system optimisation which may shift investment between distribution and transmission. |
| 13. Regional differences | Agnostic to generation/demand constraints | Agnostic to generation/demand constraints | Doesn't consider the network situation in terms of generation/demand constraints | Does not consider the network situation in terms of generation/demand constraints | Agnostic to the technology and generation/demand constraints if the list of assets and unit costs includes all types across regions (can be pretty exhaustive) | The gates investment approval make this mechanism agnostic to generation/demand constraints. |

Source: Arup Analysis

Thinking about a decarbonisation framework for ED2

Sustainability First
Judith Ward & Maxine Frerk

Ofgem ED2 DEWG – 7 July 2020
Ofgem ED2 OAWG – 9 July 2020

www.sustainabilityfirst.org.uk

 @SustainFirst

Sustainability
first

A de-carbonisation framework for ED2 – four questions

- How to obtain a common baseline on ED1 emissions to inform science-based targets for ED2 ?
- How to categorise scope 1, 2 and 3 emissions ?
 - Matters a lot for BCF science-based targets - and how best to incentivize each scope
- What might a framework for de-carbonisation look like in-the-round ?
- What does a strong net-zero ambition look like for ED2 outputs ?

Hazard Warning

All numbers for illustration only –
not science-based !



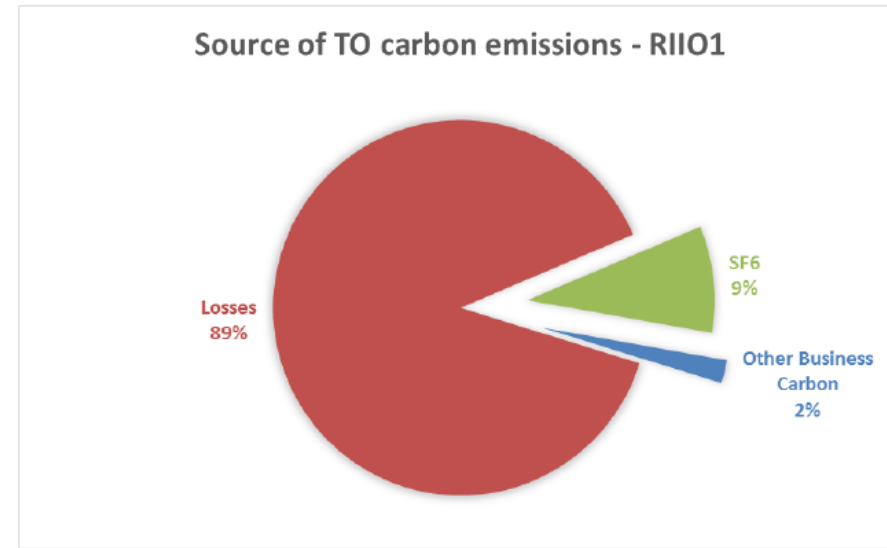
Baselining BCF emissions

- At the start of the ET2 price control process, Ofgem illustrated the position on RIIO-ET1 BCF emissions.
- Losses depicted as 89% of TO BCF emissions

ET RIIO2 Stakeholder WG 1



What makes up BCF

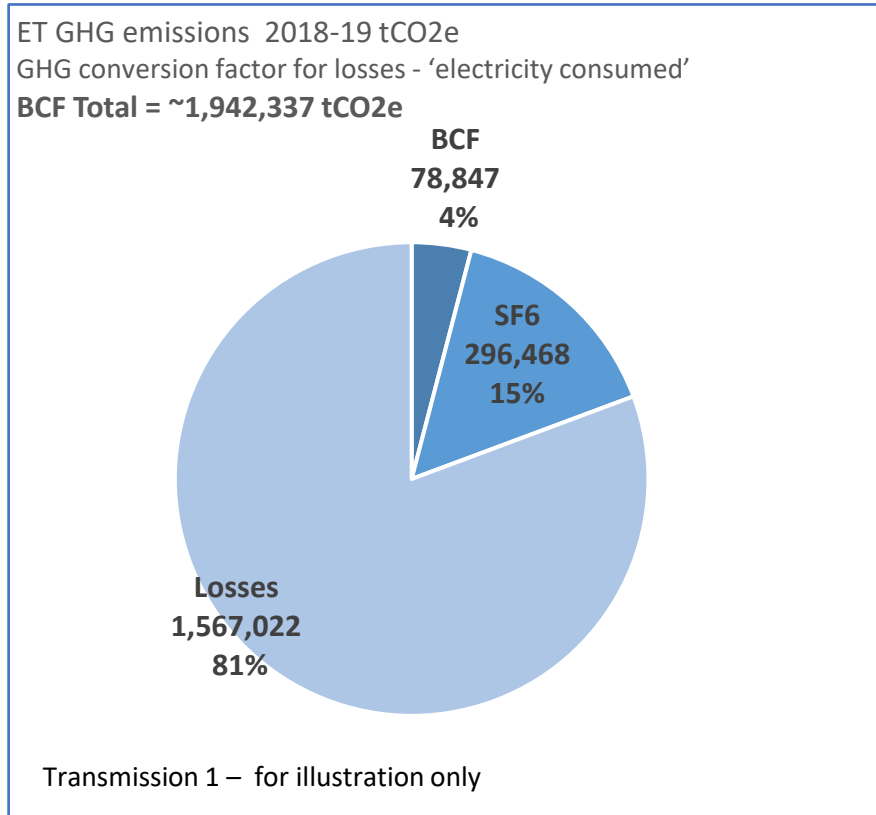


16

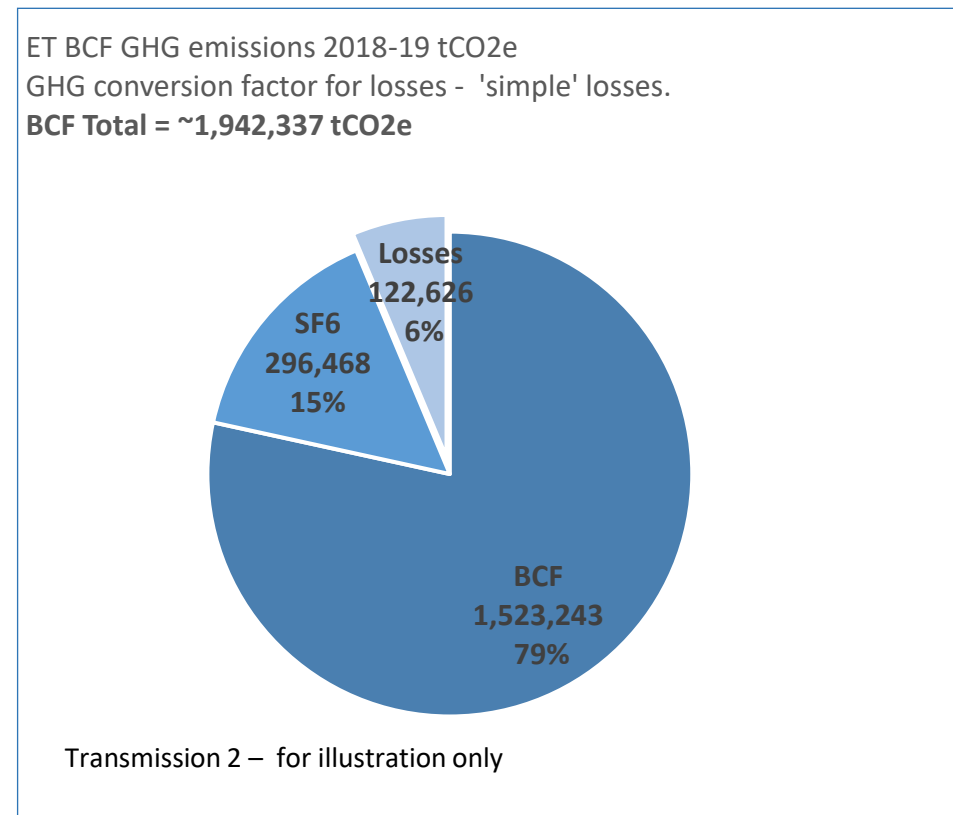
Source : Ofgem slides. RIIO-ET2 working group. October 2018

Transmission : BCF emissions in 18-19

This ? (prev slide)



Or This ?



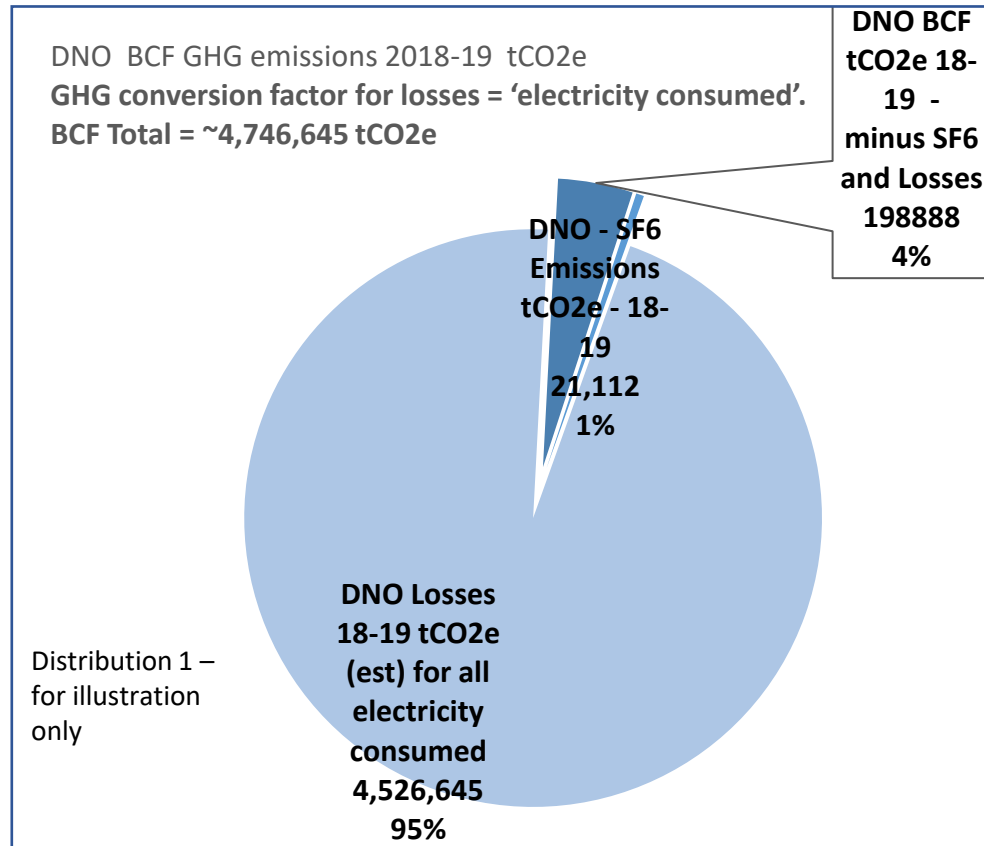
Choice of GHG conversion factor (kgCO₂e/kWh) makes a difference on how T-Losses reported.

'Electricity consumed' - 0.2773 kgCO₂e/kWh ? 'Simple' losses Or 0.0217 kgCO₂e/kWh.

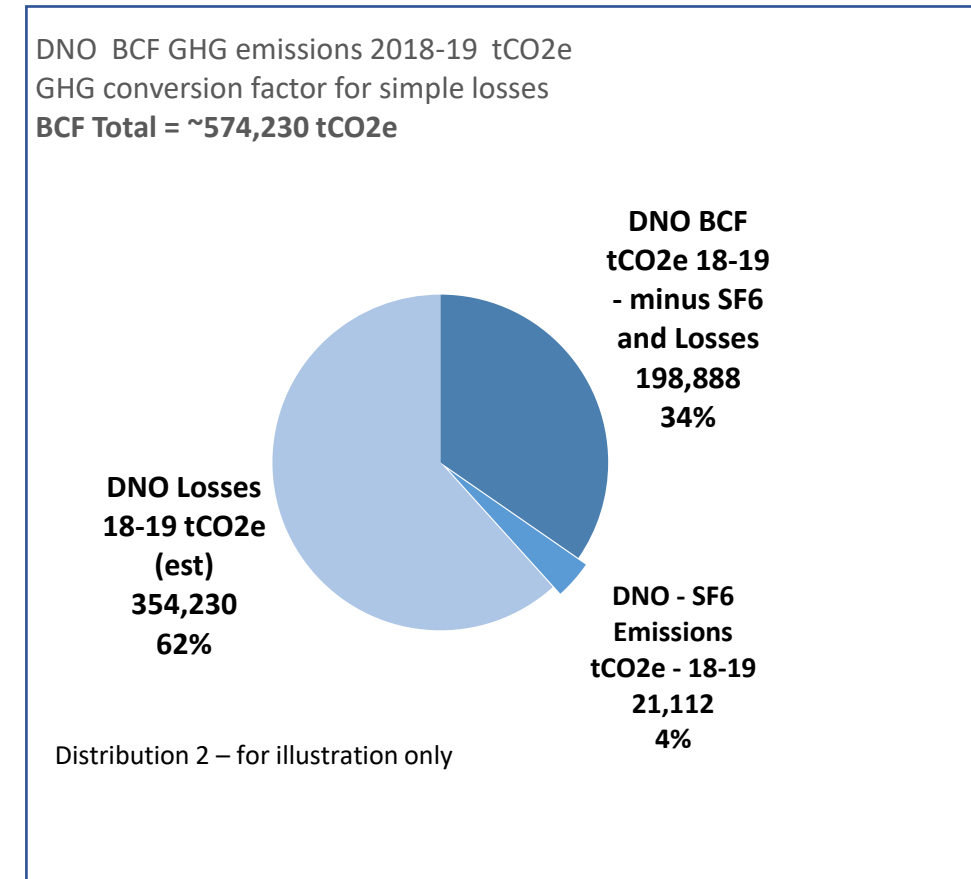
(Govnt GHG Conversion Factors for Company Reporting. Methodology Paper for Emissions Factors. Final Report. Aug 2019. p 28)

Distribution : BCF emissions in 18-19

This ?



Or This ?



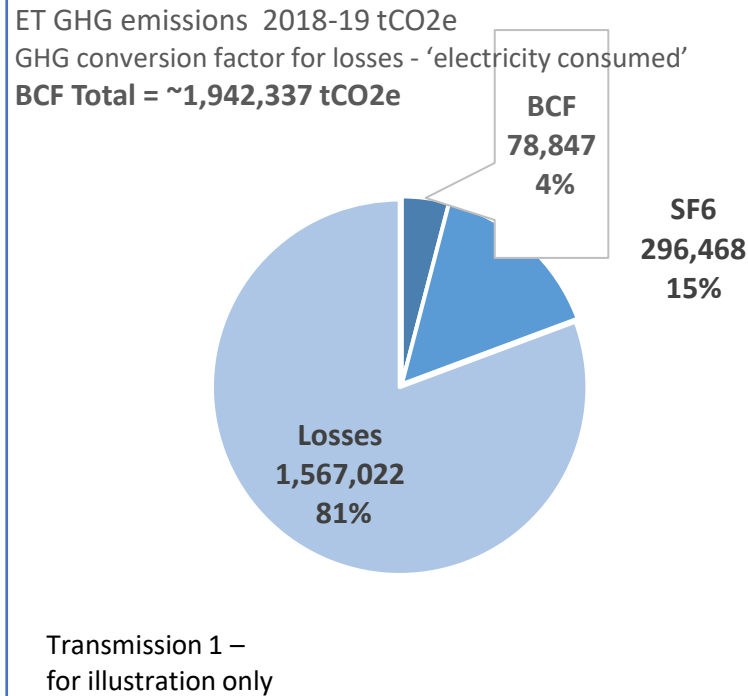
Appropriate kgCO₂e/kWh GHG conversion factor for D-Losses ?

'Electricity consumed' - 0.2773 kgCO₂e/kWh ? 'Simple' losses Or 0.0217 kgCO₂e/kWh.

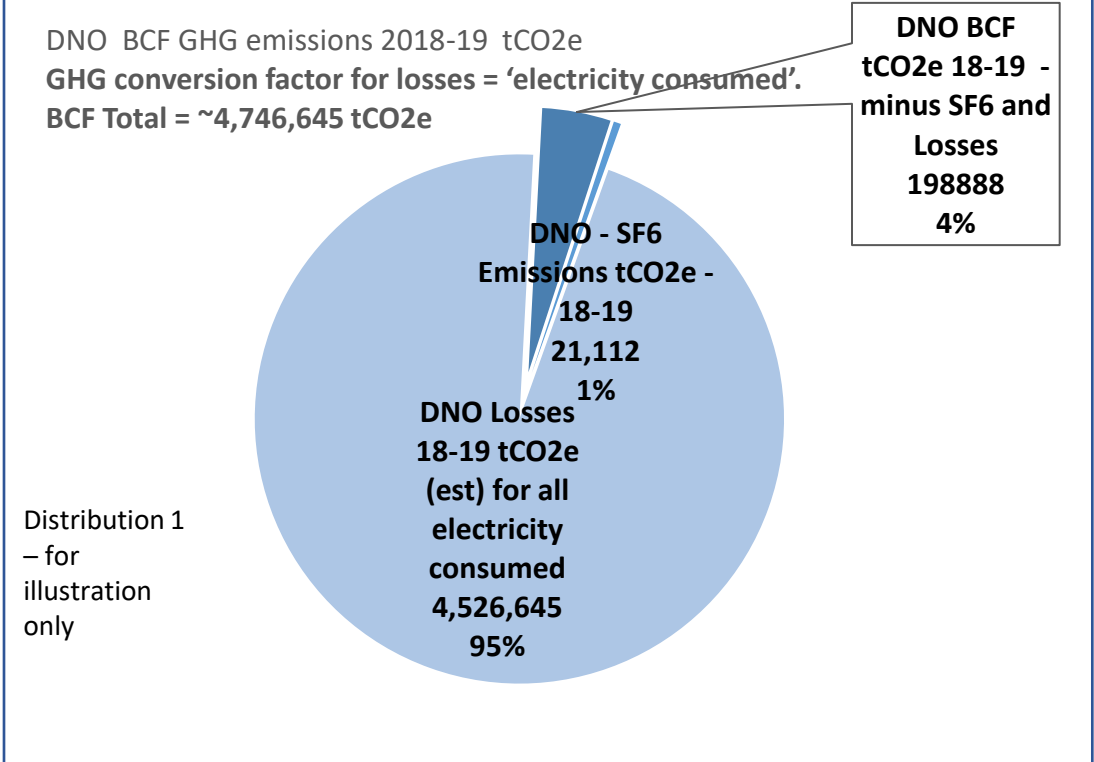
(Govnt GHG Conversion Factors for Company Reporting. Methodology Paper for Emissions Factors. Final Report. Aug 2019)

'Step-back' 1 - T & D BCF 18-19 emissions

Transmission BCF



Distribution BCF

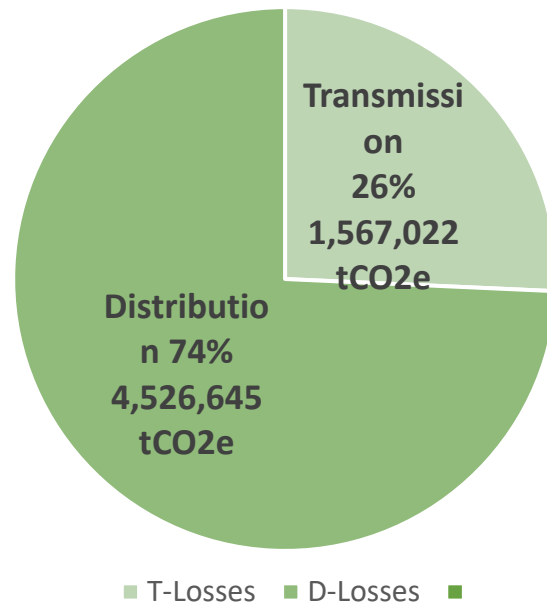


Distribution BCF over twice that of Transmission

'Step-back' 2 - T & D BCF 18-19 emissions

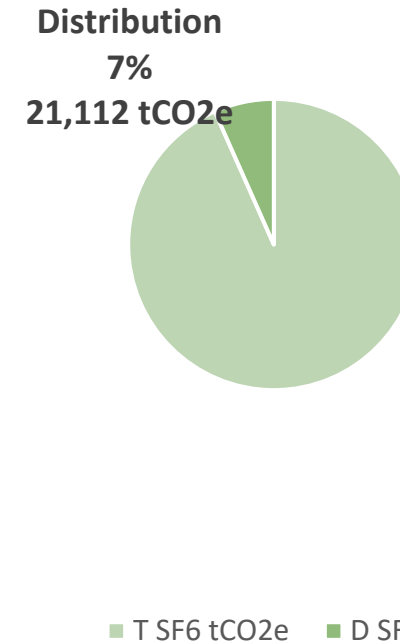
Losses

T& D 18-19. Losses Share %
6,093,667 tCO₂e*



SF6 Leakage

T & D 18-19. SF6 Leakage Share %
317,580 tCO₂e*



*GHG conversion factor for 'electricity consumed' = 0.2773 kgCO₂e/kWh

tCO₂e emissions associated w D-Losses considerably exceed those from T-Losses or SF6. And, T-SF6 leakage share ~15x greater than D-SF6

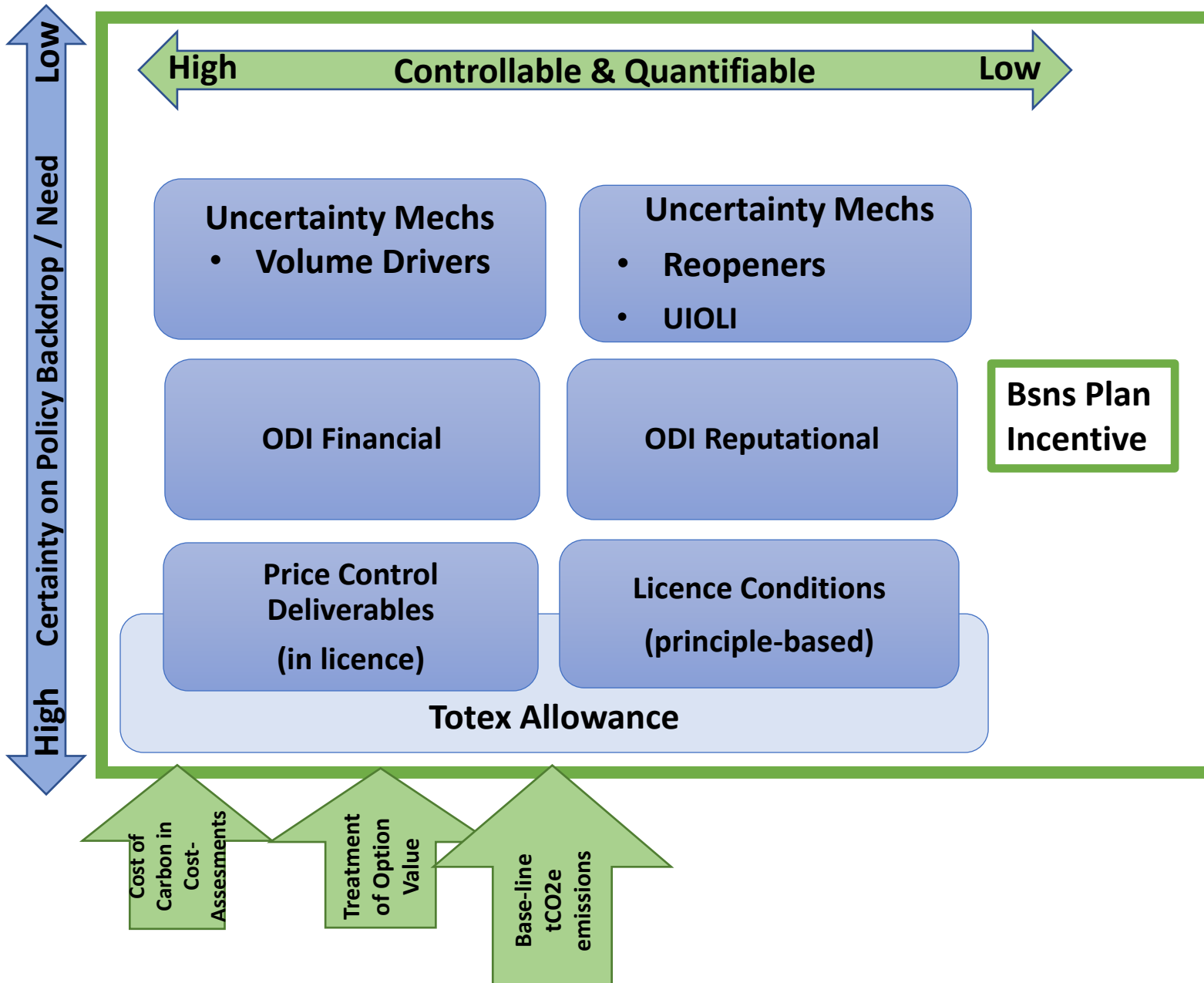
So, where does this take us for ED1 BCF baselining & outputs on GHG reduction for ED2 ?

- Baselining ED1 BCF emissions = crucial first step for science-based targets
- A better understanding & overview will help design of economic & effective incentives & outputs for tackling GHG emissions.
- Possibly more Ofgem guidance on BCF reporting ? (E.g clarify classifications for scopes 1,2 & 3 emissions; GHG conversion factors for losses etc)
- For ED2, BCF numbers for 18-19 would suggest :
 - **D-Losses** – a focus on actions / outcomes = important
 - **SF6** – to look across T & D at a long-term cross-industry strategy & plan

‘Step-back’ 3 - a possible decarbonisation framework for ED2

- What might a framework for decarbonization look like in-the-round ?
- Given net-zero, what incentive arrangements will send strong signals and make most difference in reducing DNO GHG emissions ?

ED2 – Possible framework for approaches to decarbonisation outputs*



Objective (i) – Decarbonise the networks w emphasis on BCF & embedded carbon in networks

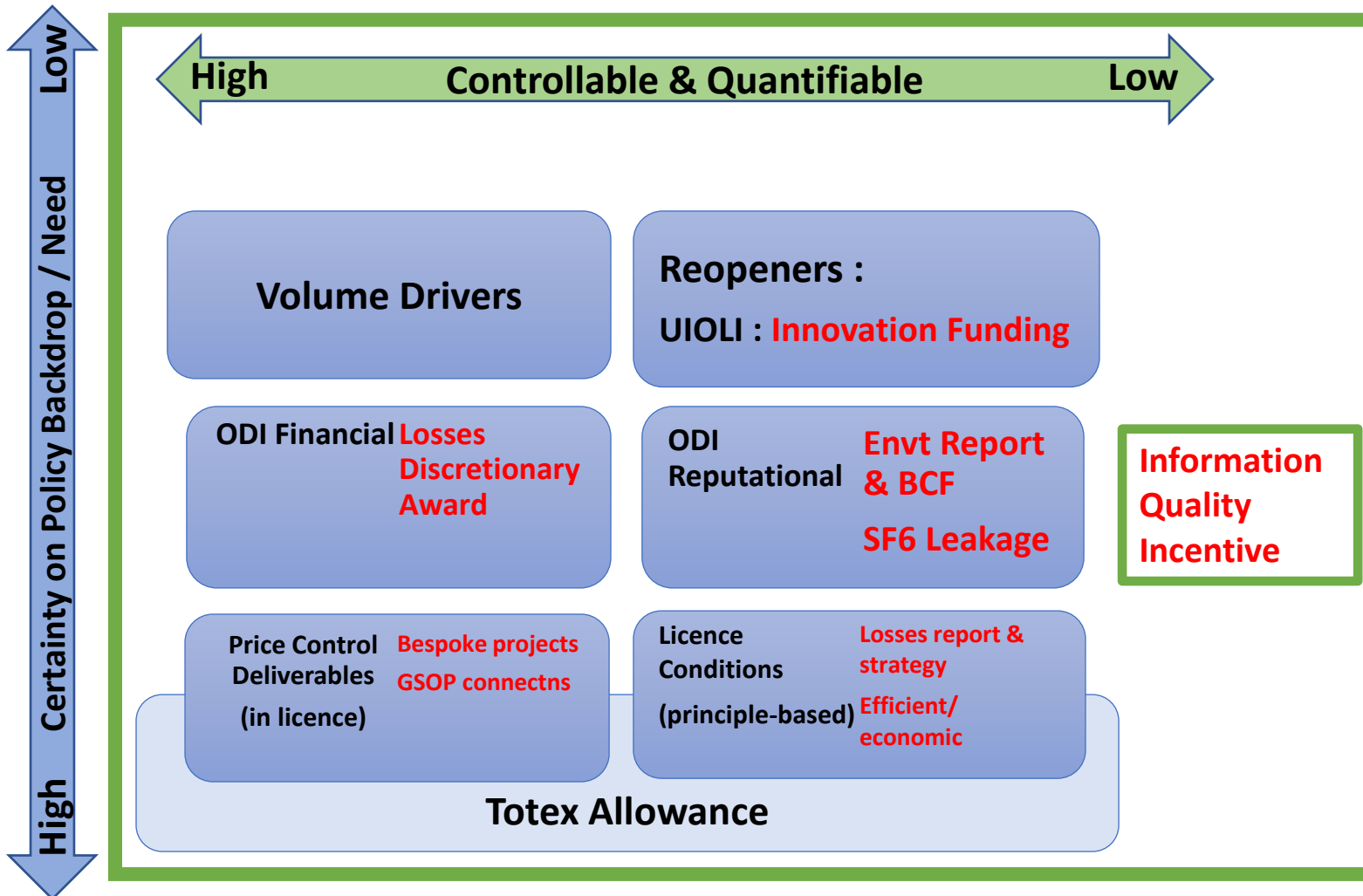
Objective (iii) – Support transition to a smarter more flexible & sustainable energy system

Objectives (i) & (iii) - Business Plan Incentive –
e.g. cross-company collaboration to improve common basis for

- Science-based BCF targets
- Underpinning for D-scenarios

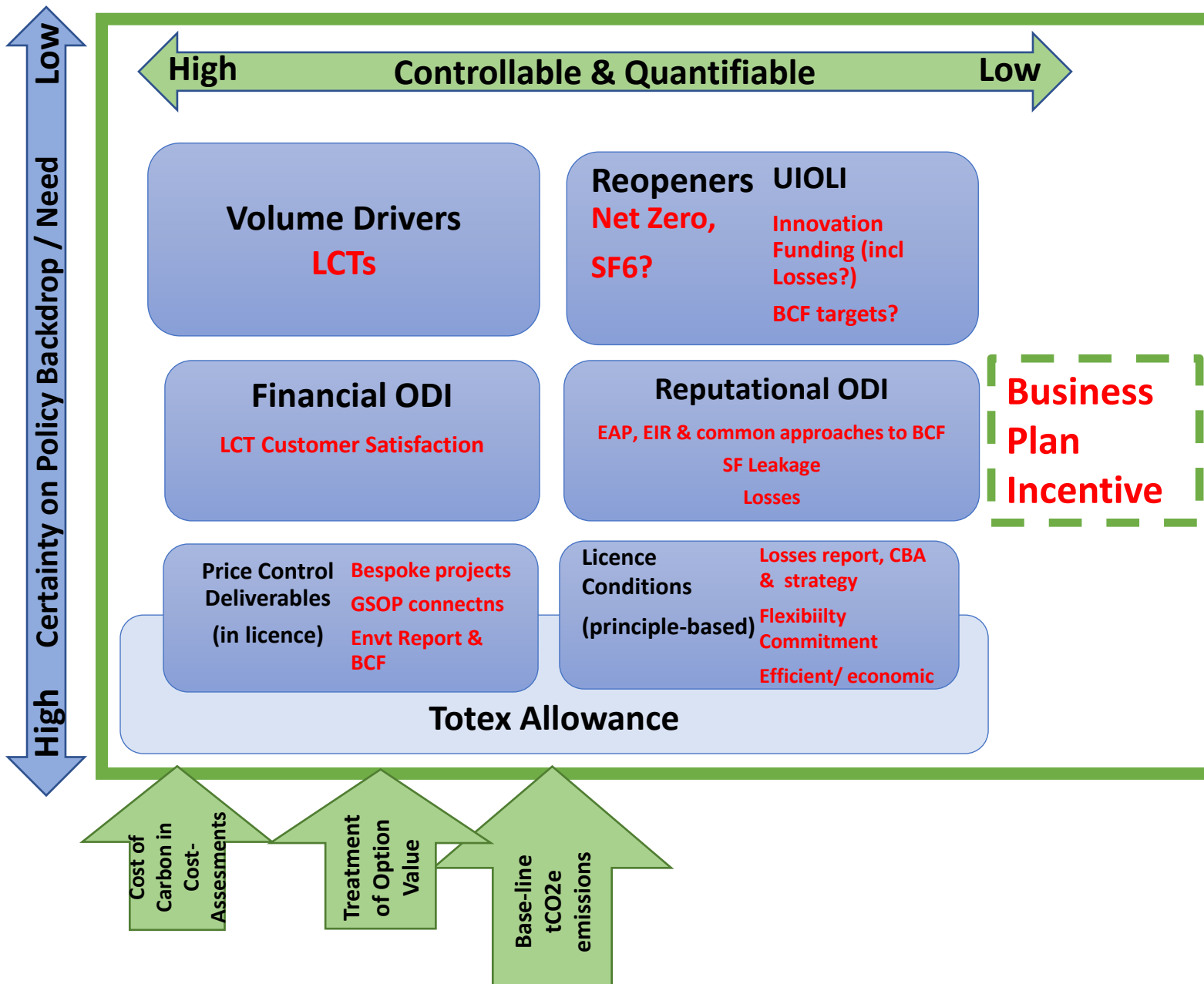
*Not addressed here. Ofgem Objective (ii) - reduce environmental impact of network activity – unless a GHG activity e.g SF6

How does this look for ED1 ?



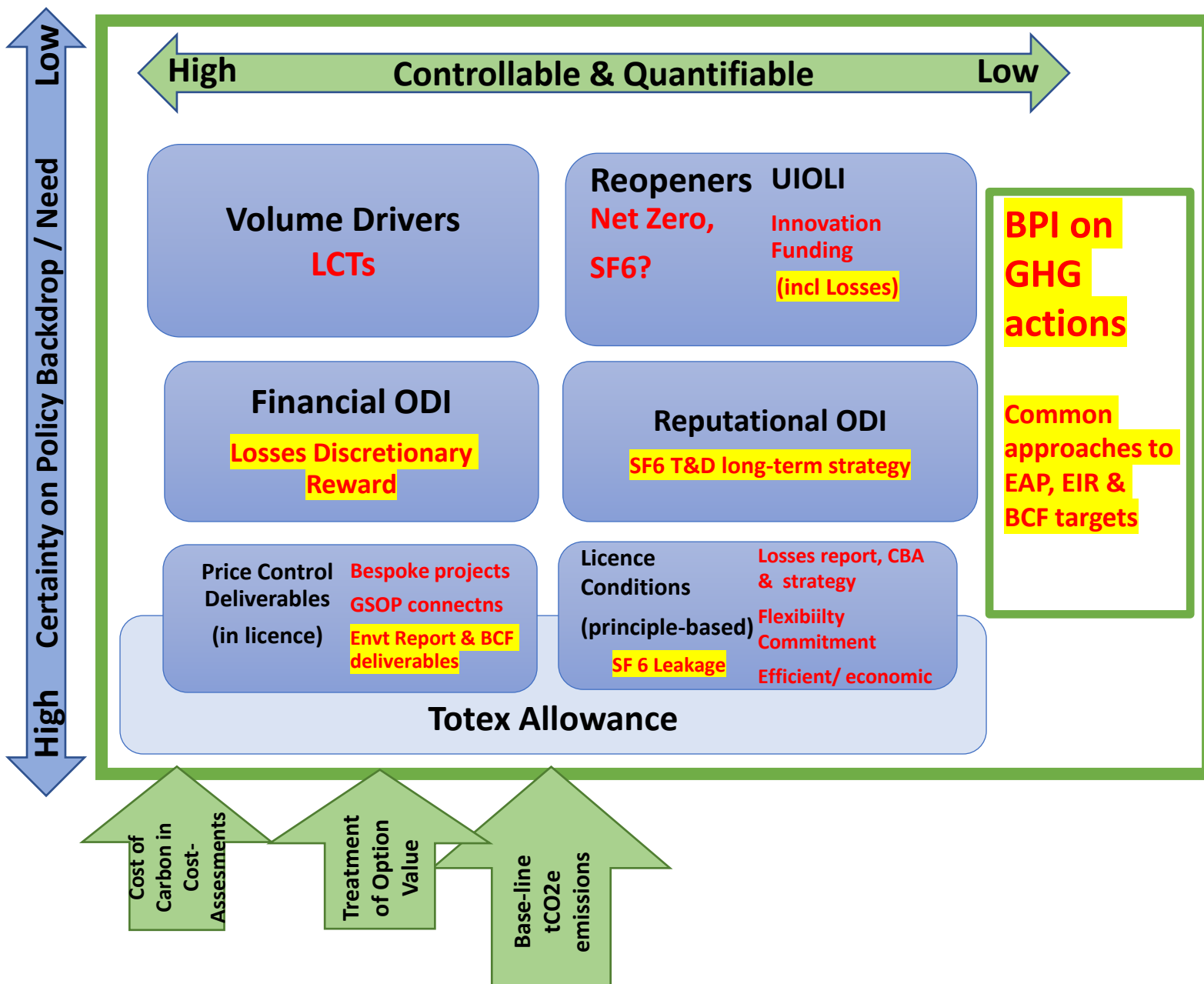
- ED1 incentives run to April 2023
- Outputs framed six years backlong-before today's net-zero imperative.
- ED2 period = critical in setting path to 6th Carbon Budget
- ED1 to ED2 : major reset needed for GHG reduction.

ED2 – Where do working group discussions seem to take us ?



- Largely incremental from ED1
- A stress on reputational incentives (caution on 'measurable outputs').
- A focus on reopeners & uncertainty mechs (caution on net-zero trajectory)
- Can such a package deliver the necessary 'step-up' towards net-zero ?

ED2 – What might a strong net-zero ambition look like on decarbonisation outputs ?



How to send strong signals & make most impact in reducing DNO GHG emissions ?

EAP, EIR & science-based targets for BCF : common basis for measurement, reporting, & benchmarking – incl common classification of scope 1, 2 & 3 emissions.

Qn : a Financial ODI ? Clear link to BPI?
Specific EAP BCF projects as PCDs?

Losses : CBA. strategy & common approaches to measurement

Qn : a Financial ODI ? (eg retain LDA?) UIOLI Funding ?

SF 6 : Long-term strategy and plan across T&D for SF6 containment & replacement?

Qn : a new reputational incentive ?

SF 6 Leakage - Qn - Licence? (ET = Financial ODI)

Cost-of-carbon for net-zero : guidance on value (same as Ofgem ? traded / non-traded?) and how to integrate into cost-assessments for :

- Avoided emissions for BCF reporting
- New load-related / LCT & strategic investments

Bespoke ODI : as per ET2 for well-justified exceptional ambition on net-zero

Contact us

Judith Ward – judith.ward@sustainabilityfirst.org.uk
Maxine Frerk – Maxine.frerk@sustainabilityfirst.org.uk

Sustainability First

www.sustainabilityfirst.org.uk

 @SustainFirst

Sustainability
first

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.