

Challenge Group – 14 May 19



Agenda topic	Timing
Welcome, introductions and actions	10:00 - 10:10
Intro/project update	10:10 - 11:00
Analytical framework	11:00 - 12:15
Lunch	12:15 - 12:45
Key charging cost model concepts	12:45 - 14:00
Break	14:00 - 14:10
Initial discussion on links between different work areas	14:10 - 15:25
DG sub-group reports – summary of feedback received	15:25 - 15:55
AOB	15:55 - 16:00

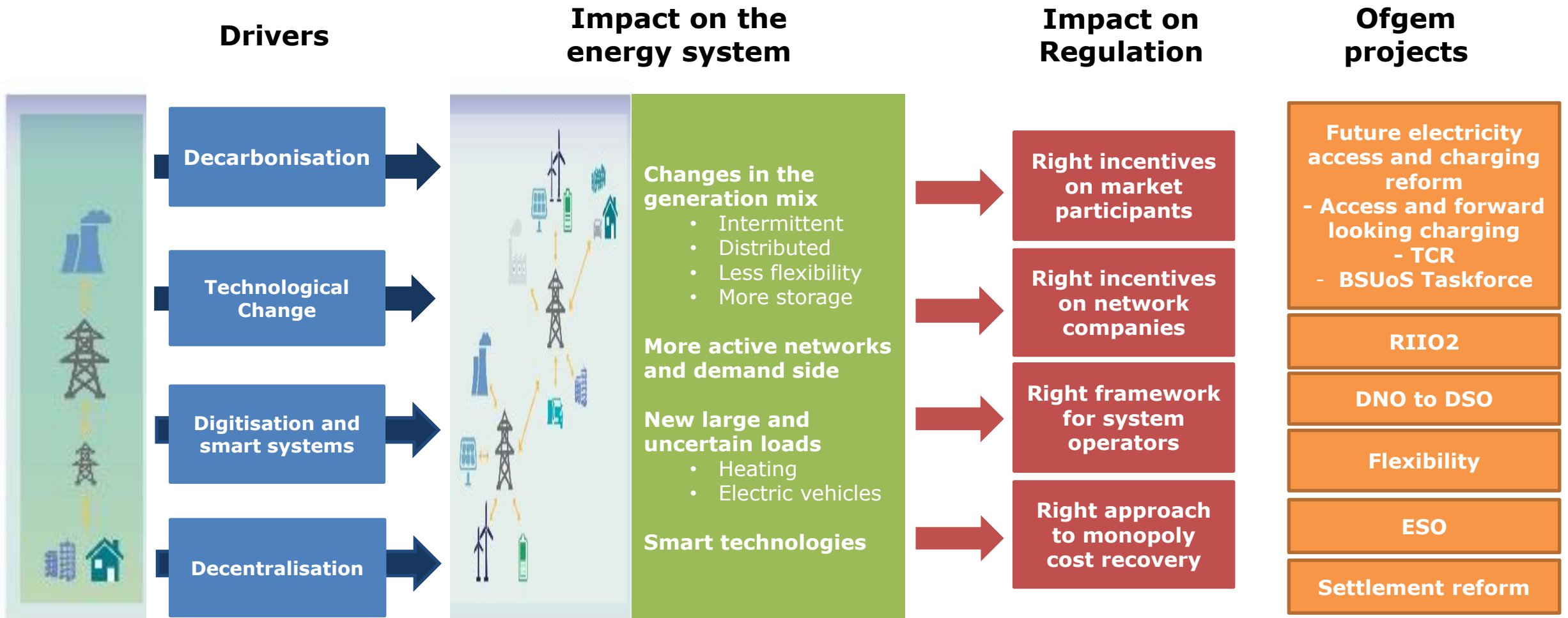
Objective of the SCR: Ensure that electricity networks are used efficiently and flexibly, reflecting users' needs and allowing consumers to benefit from new technologies and services while avoiding unnecessary costs on energy bills in general.

Key questions for today:

- How should we assess the potential impact of the options for reform?
- What are your views on key charging model concepts to ensure that charges are reflective of network conditions and send effective signals to users?
- How do access, charging and procurement of flexibility fit together to ensure that networks are used efficiently and flexibly?

Project update

Changes in the system means changes in regulation



We are committed to undertaking the SCR in a transparent and open manner. The Challenge Group is an important component of that.

Objective of Challenge Group: to provide ongoing wider stakeholder input into the SCR. This will provide a challenge function and ensure that policy development takes into account a wide range of perspectives and is sufficiently ambitious. This should help inform and develop the work being produced by ourselves and the Delivery Group. It is not required to sign-off documents

Our aim is that largely the materials we present at Challenge Group meetings will provide you all with sufficient opportunities to do this. There is no expectation for you to do more than this.

- Where Challenge Group members want to be provide more detailed input, we are trying ways to achieve this (eg charging survey, circulating detailed reports).
- There may be specific policy areas where we seek more detailed input from Challenge Group members (Eg supplier engagement). We will flag this via Challenge Group meetings.

We intend to be more rigorous with time-keeping and discussion to ensure that we have enough time to cover content and that all stakeholders have the opportunity to provide feedback.

We want to explain how we are responding to your feedback. This is summary of some of the key changes made:

You said

You wanted to input into the development of the analytical framework.

Some parties wanted to review the detailed reports that the DG sub-group have been developing.

You wanted us to explain our thinking on the links between the Access SCR and other workstreams (eg flexibility).

You wanted to better understand how feedback being taken into account.

You want to have more information to be able to “challenge” the work being produced.

You want to have more time to review material prior to the meeting.

We did

We have added it to the agenda today.

The reports were circulated for comment before Easter and feedback has been taken into account.

We have added this to the agenda today.

- We have added this agenda item.
- Previous feedback informed development of sub-group reports/our work on charge design.
- For each agenda item, we will aim to better explain how feedback being taken into account.

We will review timing and content of future Challenge Group meetings to ensure that you have more information to be able to challenge.

We commit to circulating material as early as possible in advance of meetings.

1st working paper – July 2019

- Locational DUoS - charging cost model framework and granularity options
- Network charge design options
- Access rights options
- Combined charging, access rights and cost model options
- Links between access, charging and flexibility procurement

2nd working paper

- Small user consumer protection
- Distribution connection charging and user commitment
- TNUoS – small DG charging and “reference node”

Network cost Drivers

- What are key drivers of future network costs?
- How does user contribution to these vary by time and location?

Key input for policy thinking



Access rights

- What are the options for improving definition and choice of access rights to better meet users' needs and support efficient use and development of the network?
- How feasible and desirable are these options?

DUoS cost models and locational granularity

- What are the options for a) how the different DUoS charging models could be changed to provide better and more cost-reflective charges and b) how locationally granular DUoS charges should be?
- How feasible and desirable are these options?

Charge Design

- What are the options for how charges for DUoS and on TNUoS demand charges are structured?
- How feasible and desirable are these options?

Now that the first reports are being published, we are developing our thinking on the next priorities. We wanted to provide you with visibility of this. Some of this work represents a continuation of the existing work areas:

Access rights

Further work to determine the feasibility and value of access choices to network operators and users. We intend to reach out to CG members to get further input on the value of new access choices to network users.
We will also further develop links between access and charging.

DUoS cost models and locational granularity

Further work to assess cost drivers. Use this information to develop options for granular charging options.
Assess feasibility and desirability of cost models options.

Charging design

Further work assessing feasibility, benefits and issues of the different charging options to inform our preliminary views.
As part of this, we will engage with suppliers to explore the potential impact of different charging options on their systems, tariff offerings, etc

Links between workstreams

Further work to determine interactions between charging, access and SO/DNO procurement and relative pros and cons of different approaches to valuing flexibility.

Supplier Engagement

We previously noted that we would commence a supplier engagement process in late April. We have been working to develop our approach, which has included making changes to our proposed timelines.

We propose working with the suppliers within the Challenge Group to understand indicative responses to charge design and access options and the technical feasibility of implementing identified options, using an interview approach during June to feed in to the July working paper. We will be seeking volunteers to participate in this process.

As the assessment of our options progress, we anticipate that further interviews focusing on targeted questions will be required over the summer period.

We will also be identifying and engaging with a wider group of suppliers to test our research questions. We will seek to align this further work over the summer with the additional interviews outlined above.

We are also launching two new workstreams. These work areas will be the focus of our second working paper and will be the focus of future CG meetings:

Distribution
connection
boundary

Develop and assess initial options for connection boundary and user commitment. We are launching a new sub-group on this and will bring the issue to the CG in due course.

Small users

Develop options to ensure access and charging arrangements are appropriate for small users, including any protections needed. See next slides.

Our initial view is that we expect the work focused on small users to cover:

Foundational analysis	<ul style="list-style-type: none"> • Understanding of user characteristics • Developing alternative 'protection' approaches, including a 'core' access level • Implementation considerations eg engaging with the HHS Design Working Group
Analytical approach	<ul style="list-style-type: none"> • Developing understanding of guiding principle 2 for 'essential' or flexible use. This will be informed by our work on our vulnerability strategy. • Considering potential options for scope of protections
Coordination of options across workstreams	<ul style="list-style-type: none"> • Drawing together a picture of the range of arrangements which may apply to small users • Contributing to assessment of options across other workstreams and contributing to their options development to inform assessment and modelling
Behavioural response	<ul style="list-style-type: none"> • Understanding of likely response, through supplier engagement and (if possible) trials

Is there additional work that we should include as part of this workstream?

We intend to establish a subgroup of relevant industry experts to contribute to aspects of this work, with others being led by Ofgem or others.

Spring /summer 2019

Ahead of the launch of the subgroup, we would like to establish up a 'standing' subgroup to contribute on an ad hoc basis to analysis led by Ofgem or other parties

Q3/4 2019

Once launched, the subgroup will join with the network companies to develop specific pieces of analysis relating to small users, as well as inputting to Ofgem-led analysis

We are now seeking expressions of interest to join this 'standing' subgroup focused on small users issues.

If interested, please email NetworkAccessReform@ofgem.gov.uk

Analytical Framework

- We have been continuing to develop our analytical framework approach since commencement of the SCR
- This includes consideration of the appropriate mix between qualitative and quantitative analysis, and the potential requirements for modelling to be undertaken to support the development of a quantitative evidence base as part of our decision-making
- The purpose of this item is to provide an update on the work that has been done to date, and to provide an overview of our developing requirements (noting that this is still a work in progress)

Our question for you on Menti will be:

1. Do you agree with our developing modelling approach? Are there other aspects to consider?

- We need to be able to understand the likely impacts of the options we are considering to be confident we are making the right decision for consumers
- Our approach is guided by our Impact Assessment guidance (see below)
- For the purposes of these options, the main impacts we think we need to consider are:
 - Impact on networks – through reduced opex or capex and any impact on network resilience
 - Impact on wider system – impact on generation/flexibility mix (including ability to connect new low carbon generation quicker) and costs
 - Consequent environmental impacts, particularly carbon
 - Distributional impacts, particularly for vulnerable consumers
 - Other impacts for *consumers*, eg quicker connections, certainty of access/charges
 - Implementation costs, eg system changes

Ofgem's Impact Assessment Guidance includes:

- An IA should focus on the assessment of a range of options developed during the 'concept' phase of work. The guidance notes that options will be discarded throughout the development process based on the assessment of available evidence
- The shortlisted options identified should be assessed to take into account the full range of impacts, costs and benefits, considering where possible:
 - Monetised, aggregate cost-benefits analysis (CBA)
 - Distributional effects
 - Hard-to-monetise, strategic and sustainability considerations
 - Consideration of competition and consumers
 - Burdens on business
- The IA should generally consider risks, unintended consequences and wider impacts
- **Our IA guidance recognises the likely uncertainties inherent in future costs and benefits forecasts, and challenges associated with accurate identification of the value of costs and benefits. It is therefore recognised that analysis will typically be both qualitative and quantitative where appropriate**
- An impact assessment is not the sole determinant of Ofgem's final decisions, but forms a vital part of the decision-making process

Work Undertaken:

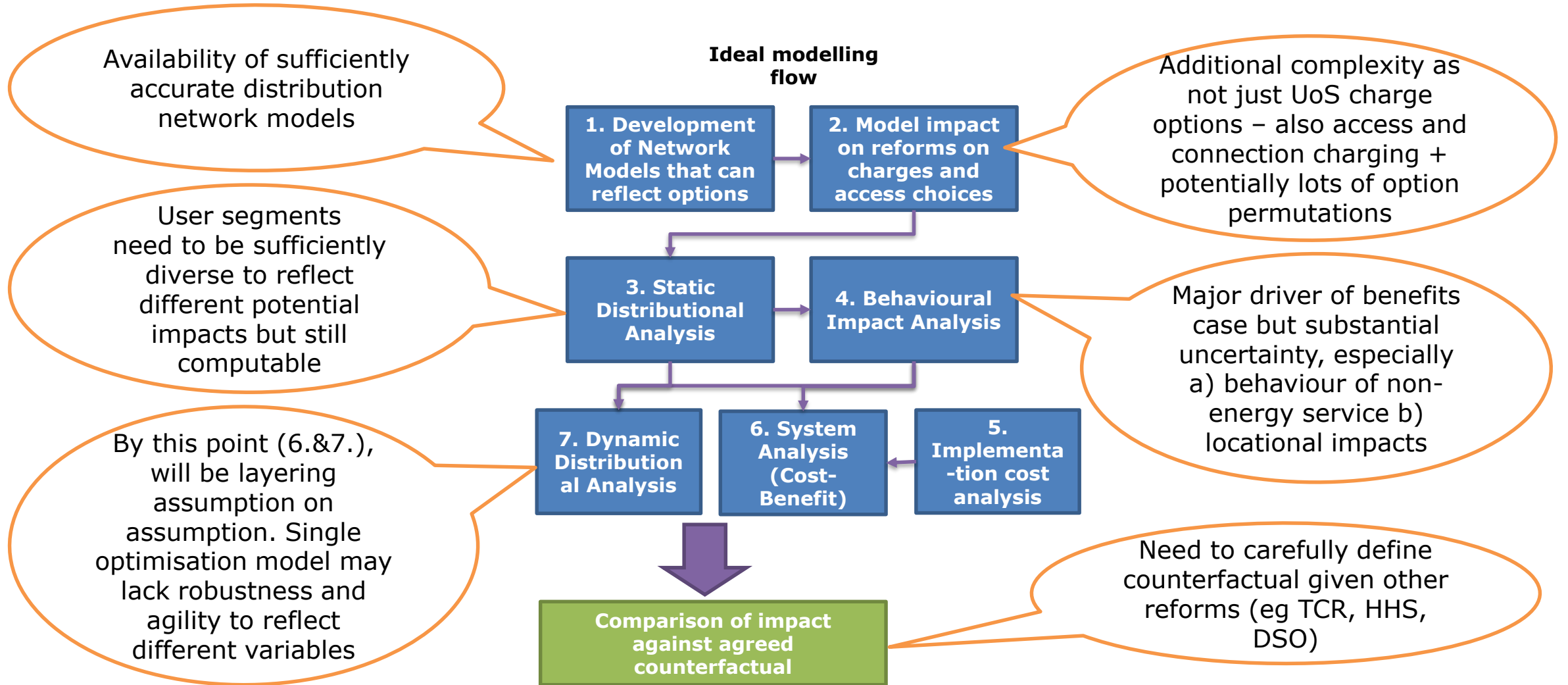
- Developed and engaged on guiding principles, that will guide our qualitative assessment
- Begun analysis of long-list of options against these principles
- Review of existing available models and market engagement with external consultants on capabilities/options for modelling
- Engagement with TCR to understand approach and lessons learned
- Discussion of approach with Ofgem Analytical Panel (ongoing)



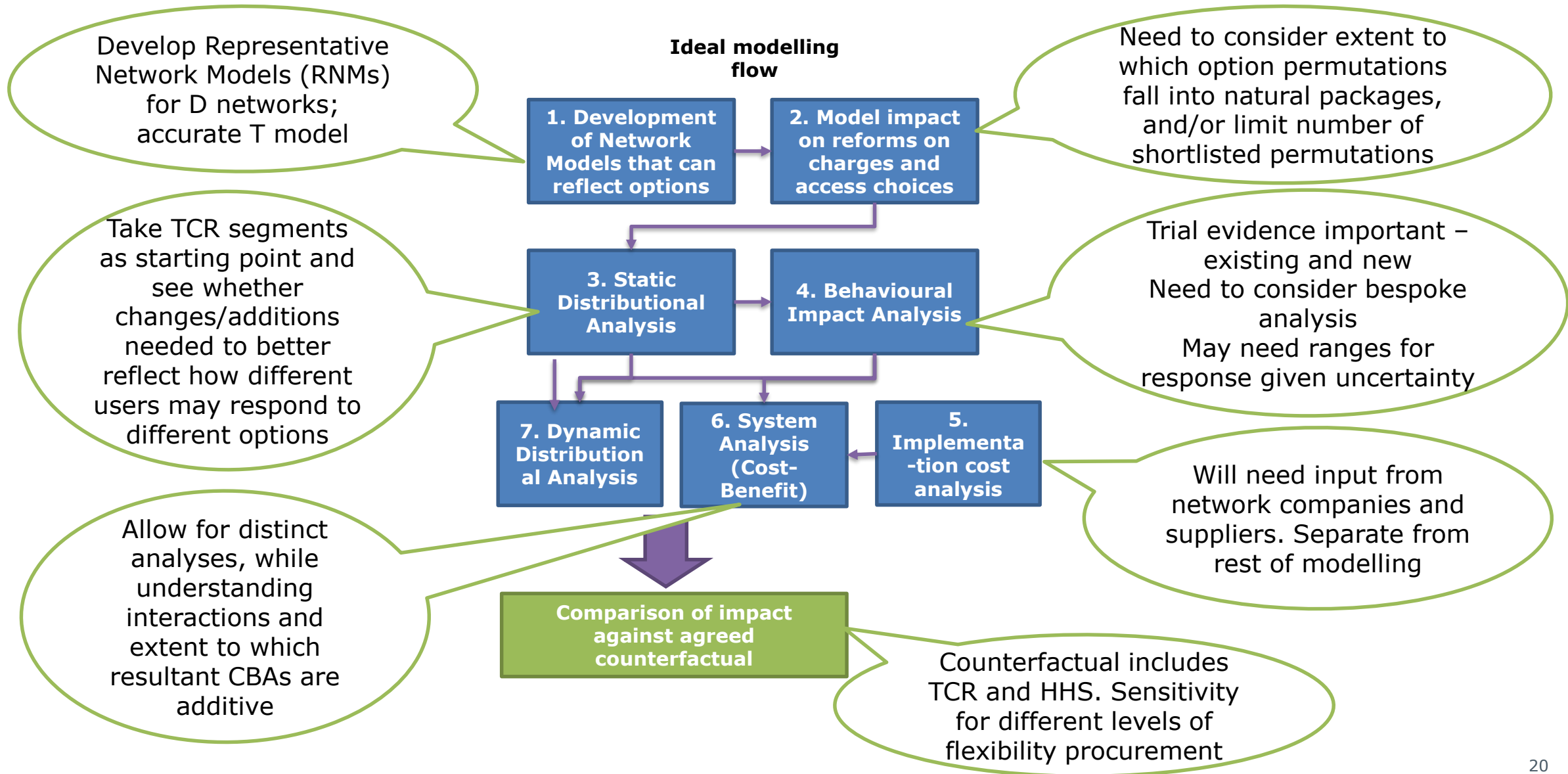
Work Planned:

- Continue qualitative assessment of long-list of options
- Develop scope for tender for modelling support, including:
 - Finalising requirements re. approach/outputs
 - Determining whether modelling should undertaken through a single contract or split into segments
- Agreeing detailed approach with consultants once they are in place, taking into account feedback from a further CG discussion

- We have made good progress in developing our modelling requirements however this is a work in progress and we are continuing to refine these requirements.
- There will be elements of the requirement such as the detailed methodology, assumptions and shortlist of options to assess which are defined once a contract with consultants is in place

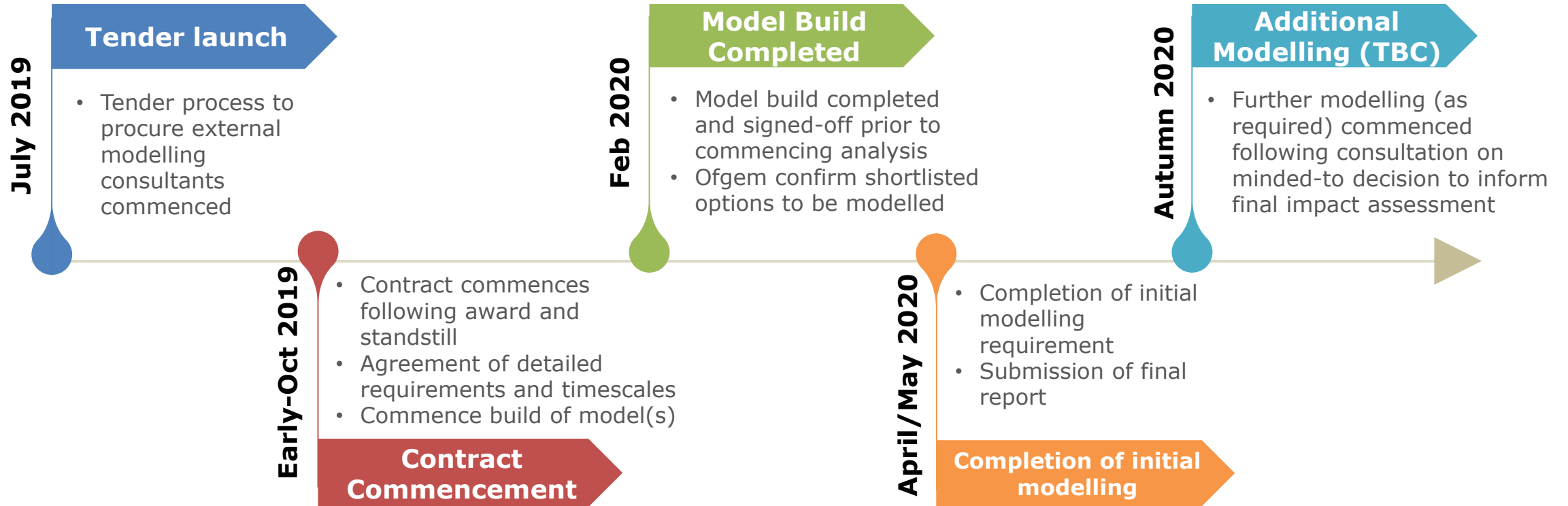


These challenges are substantial. We still intend to aim to undertake modelling but it is clear **methodology needs careful consideration** and the level of uncertainty about modelling robustness means results will need to be handled with care, and **reinforces importance of qualitative assessment.**



Ofgem, the commissioned consultants and the Delivery/Challenge groups will all contribute to the modelling requirements we have identified in this presentation. These responsibilities are indicative, as modelling support may split into segments and sourced through different routes.

Requirement	Ofgem role	Consultant(s) role (these activities may be split across more than one consultancy)	Delivery Group (DG) and Challenge Group role
Options shortlisting	<ul style="list-style-type: none"> Define options Qualitative assessment of options long-list Define options shortlist for quantitative analysis and further Ofgem qualitative assessment 	<ul style="list-style-type: none"> Quantitative analysis of shortlisted options (modelling) 	<ul style="list-style-type: none"> DG development of agreed products (eg network cost drivers, locational options feasibility) to feed into Ofgem option development and assessment
RNM Development and Tariff Modelling	<ul style="list-style-type: none"> Define criteria to be reflected in RNMs Define options which will impact upon tariff models and work with consultants to determine impact 	<ul style="list-style-type: none"> Build of RNMs Work with Ofgem to assess option impact on tariff models and model EDCM/CDCM tariff models to reflect cost model and charge design options 	<ul style="list-style-type: none"> DG (DNO/TO/ESO) provision of data to develop RNMs Potential DG role in RNM / Tariff modelling Provide feedback on modelling outputs
Distributional Analysis	<ul style="list-style-type: none"> Identification of user archetypes Sign off of agreed archetypes following consultant feedback Potential role in undertaking elements of distributional analysis 	<ul style="list-style-type: none"> Comment on Ofgem identified archetypes based on knowledge of available data sets and thinking on behavioural impacts Undertake static and dynamic analysis 	<ul style="list-style-type: none"> Provide feedback on archetype choice through stakeholder engagement
Behavioural Analysis	<ul style="list-style-type: none"> Literature and academic paper review to determine responses Workshops with suppliers and potentially additional user testing Sign off of proposed behavioural modelling approach Engage with relevant trials 	<ul style="list-style-type: none"> Provision of additional evidence from existing expertise/studies/trials – but not carrying out additional user testing Definition of what impacts are to be quantified Application of any evidence we provide to modelling 	<ul style="list-style-type: none"> Provide feedback through stakeholder engagement
Economic / System analysis	<ul style="list-style-type: none"> Identify priority analysis areas Sign off approach and analysis Work with Delivery Group to get necessary inputs 	<ul style="list-style-type: none"> Lead definition and delivery of analysis Determination and management of options linkages 	<ul style="list-style-type: none"> Delivery Group to provide network cost data Provide feedback through stakeholder engagement
Stakeholder engagement	<ul style="list-style-type: none"> Identify additional key stakeholders Co-facilitation of workshops 	<ul style="list-style-type: none"> Lead stakeholder engagement process (workshop design and delivery) 	<ul style="list-style-type: none"> Participation in workshops to inform modelling methodology, assumptions and test outputs



Cost models

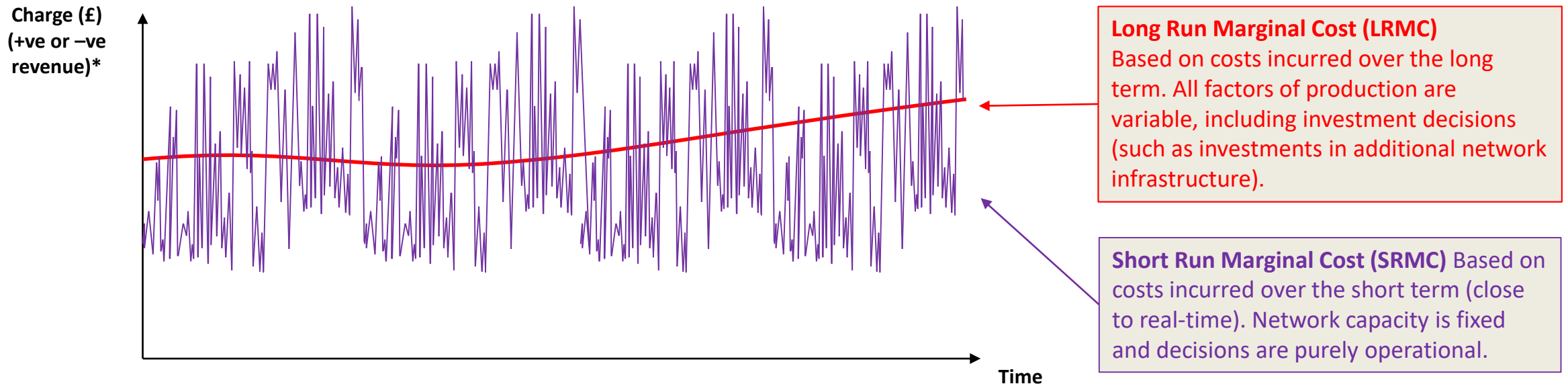
Today's session will cover:

- Short Run Marginal Cost (SRMC) and Long Run Marginal Cost (LRMC) charging approaches
- The different costs that could be included in an LRMC based charge
- How users are exposed to upstream/downstream costs in a cost-reflective way

This presentation outlines our initial thinking that we are keen to test with the challenge group. It does not reflect any formal policy positions.

Today, we are keen for your views on:

- 1) The merits of charges based on short-run operational costs (SRMC) versus long-run investment costs (LRMC).
- 2) If adopting an LRMC approach, the merit of including replacement costs ('ultra' long-run) or just focusing on reinforcement costs ('moderate' long-run).
- 3) Whether having a "top-down" approach to charging can be consistent with a level playing field.



Long-Run Marginal Cost

Factors that could be considered include:

- whether demand is located close to generation (or vice versa)
- the marginal cost associated with an increment of generation/demand. This could be based on the drivers of network cost that are associated with reinforcement, asset replacement and the availability of spare capacity.

Short-Run Marginal Cost

Factors that could be considered include:

- whether or not the network is constrained in real-time (or close to real-time) and cost of managing this constraint in terms of the
- the degree to which adding (or removing) a MW at each location on the network will alleviate/exacerbate the constraint

*Note that graphical representations in this presentation are for illustrative purposes only.

Long-Run Marginal Cost

Benefits

- Proven internationally, and is the current basis for the GB model across both transmission and distribution.
- Provides a more stable and investable signal without having to forecast and hedge against a volatile real-time signal.
- Short-term flexibility actions still valued under some charge design options (particularly time of use variants) at average LRMC charge.

Drawbacks

- Unlikely to fully resolve network congestion, therefore must be supplemented by additional tools (e.g. flexibility procurement, network access arrangements).
- The charging signal is only efficient if the methodology is well designed to capture drivers of network cost (such as those which may be locational or based on time of use).

Short-Run Marginal Cost

Benefits

- Can theoretically help minimise network congestion in real-time and reveals the true value of additional network infrastructure. Locational Marginal Pricing (LMP) particularly attractive in theory.

Drawbacks

- Difficult to see how can create accurate SRMC signal other than through either a) ex-post charge (see BSUoS Task Force draft conclusions on challenges) or b) LMP/market splitting.
- If implemented through an ex-post charge, very difficult to forecast, and may not be able to create a marginal price.
- Latter seems superior approach, but no examples globally where has been implemented at distribution level and major practical challenges (computation resource, quality of network data, lack of alignment with existing GB/EU energy market design). For these reasons, not within scope of SCR.

Over time, both LRMC and SRMC should theoretically converge on signals for the efficient build of network infrastructure.

Which costs should be included in the network charge if adopting a LRMC approach?

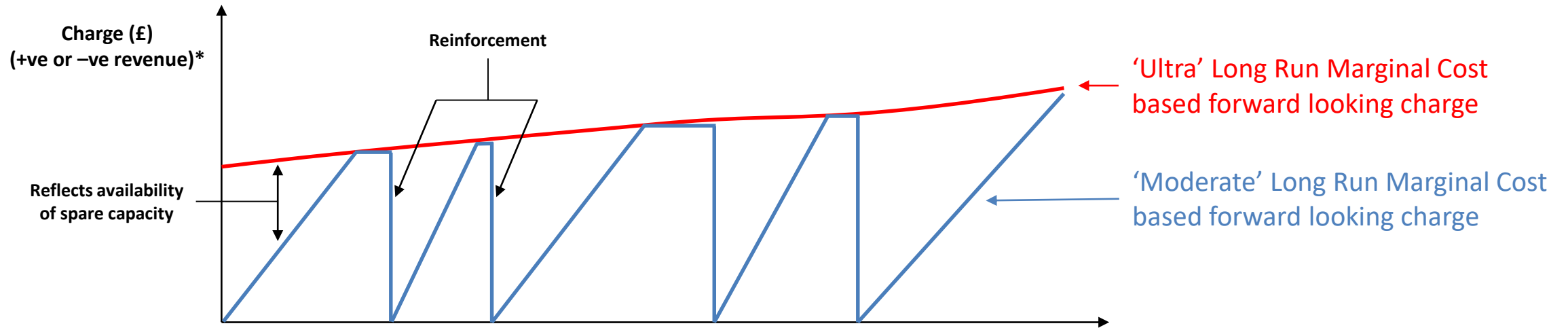
This depends on which network costs are considered as 'forward looking' under a Long Run based regime.

Under an 'Ultra' Long Run Marginal Cost based approach, a wider range of costs are associated with the forward looking charge:

- **Reinforcement and replacement costs** are used as a basis for the forward-looking charge.
- The CDCM (Common Distribution Charging Methodology) and transport model could be considered examples of this.
- The CDCM methodology 're-builds' the optimal mix of network assets as the basis for a customer's charge (and captures replacement/reinforcement costs by proxy). It is indifferent to timing of replacement/reinforcement and load growth assumptions. It does not conduct any power flow modelling.
- The transport model is based on electrical distance between generation and demand, and is not based on load growth. It therefore captures the total costs associated with the network assets required to accommodate an additional MW at each location.
- **These approaches send long-run charging signals that reflect the incremental costs associated with the total cost of network assets.**

Under a 'Moderate' Long Run Incremental Cost based approach, costs are directly related to incremental reinforcement only.

- **Incremental reinforcement costs** associated with increases in load are used as the basis for the forward-looking charge.
- The approaches used in the EDCM (Extra high voltage Distribution Charging Methodology) for distribution are examples of this.
- The charges come from a power flow based assessment of today's network, modelled to a nodal level of granularity.
- Charges are more closely linked to the timing of network reinforcements based on load growth assumptions.
- The charges are derived from the incremental cost of reinforcing at each node to accommodate the addition or removal of a MW.
- **It sends long-run charging signals that reflect the incremental costs associated with reinforcing the existing network.**



'Ultra' LRMC

Benefits:

- Provides an efficient signal for long-term network costs
- Could include very long-term timeframe costs such as replacement
- Charges are likely to be more stable, and send a clearer long-term signal for where to locate on the network.

Drawbacks:

- May not appear efficient in the near-term and could produce counter-intuitive results (e.g. areas of the network where spare capacity is available in the near-term due to historical build, but might not be efficient to utilise in the long-term).
- Inclusion of very long-time horizon costs may not provide a meaningful signal (e.g. asset replacement costs that occur beyond the lifetime of a power plant).

'Moderate' LRMC

Benefits:

- Could provide stronger signals where network costs are more imminent
- Potentially encourages more efficient locational decisions in the near-term
- Could be adapted to include replacement costs as assets approach end of life

Drawbacks:

- Could be very volatile as highly linked to near-term usage of the local network.
- May increase uncertainty based on ability to make accurate future forecasts, which would depend on information relating to network reinforcement.
- May be too focussed on the near-term, and therefore not send an efficient signal in the 'ultra' long run.

*Note that for ease of illustration the charge is depicted as generally increasing, but could also be falling (based on underlying changes in incremental network cost of a MW).

The current charging framework is based on the premise that users need to pay charges reflecting the cost of flowing their electricity to/from the central transmission hub (the “reference node”). This means that users connected at higher voltages are not exposed to any downstream costs.

One question that has been raised is whether this tilts the playing field in favour of more centralised generation.


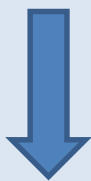
We do not think this is the case, providing that it is possible for users to also get credits that reflect where they offset peak flows on the network. Conceptually it works through:

- Generation paying for the cost of transporting electricity to the reference node
- Demand paying for the cost of transporting electricity from the reference node
- For both, where the dominant power flows are in the opposite direction then rather than paying they can receive a credit to reflect the costs they are offsetting



On the next slide, we set out four illustrative scenarios for network cost drivers depending on the direction of peak network flows at the distribution and transmission level, and the associated charges/credits we think would be needed to ensure that overall charges are cost-reflective.

Note that the charges set out do not reflect the current framework.



Example A: Peak flow away from reference node

Network level	Peak flow direction	Charging	
Transmission reference node		All demand in zone	TNuoS charge
Transmission zones		All generators in zone	TNuoS credit
Grid Supply Point		Distribution-connected demand	DUoS charge
Distribution-connected customer		Distributed generators	DUoS credit


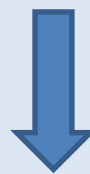
Example B: Peak flow towards reference node

Network level	Peak flow direction	Charging	
Transmission reference node		All demand in zone	TNuoS credit
Transmission zones		All generators in zone	TNuoS charge
Grid Supply Point		Distribution-connected demand	DUoS credit
Distribution-connected customer		Distributed generators	DUoS charge

Example C: Peak flow mixed – away (transmission), towards (distribution)

Network level	Peak flow direction	Charging	
Transmission reference node		All demand in zone	TNuoS charge
Transmission zones		All generators in zone	TNuoS credit
Grid Supply Point		Distribution-connected demand	DUoS credit
Distribution-connected customer		Distributed generators	DUoS charge

Example D: Peak flow (mixed) – towards (transmission), away (distribution)

Network level	Peak flow direction	Charging	
Transmission reference node		All demand in zone	TNuoS credit
Transmission zones		All generators in zone	TNuoS charge
Grid Supply Point		Distribution-connected demand	DUoS charge
Distribution-connected customer		Distributed generators	DUoS credit

The purpose of the next Product Descriptor is to inform the level of locational granularity of the charging regime (based on a more detailed understanding of cost drivers) and to determine the cost model features that that may be desirable.

The work packages will together provide evidence and options for the treatment of:

- Reinforcement, replacement and other network cost categories (or all network costs).
- Options for locational granularity that captures the variation in these costs and their drivers.
- Cost model features – what is feasible and what may be desirable, including:
 - SRMC vs LRMC: How feasible is each approach? What are the different variants of each approach?
 - How are different costs treated (e.g. replacement/reinforcement)?
 - How is spare capacity treated?
 - Do cost models approaches require load flow analysis or asset based modelling?
 - What are the stability/volatility impacts with respect to sending an effective and cost-reflective charge?

Work Package 1 – Locational Cost Drivers

- 1. Further analysis of cost drivers with a focus on the extent to which they vary locationally:**
 - Which cost drivers could be considered as forward looking?
 - What are the network costs associated with them?
 - What are the relative magnitudes of these costs?
- 2. Based on this assessment (and building on the conclusions of previous reports), provide practical options for the granularity of the charging regime that capture these variations.**

Work Package 2 – Cost Models

- 1. Determine which cost model features are feasible**
 - Conduct a qualitative assessment of different cost model features and provide an overall assessment of feasibility based on factors such as the availability of input data (linking to work package 1), and whether the option can be implemented within the timescales of the SCR.
- 2. Assess the desirability of options reform**
 - Conduct an assessment of the desirability of different cost model features in terms of their strengths and weaknesses, and the overall economic efficiencies associated with different options.
- 3. Provide a view on how these cost models might these options affect choices in other areas of the SCR such as locational granularity, charge design and network access arrangements.**

Electricity Network Access

Links slides for May Challenge Group



- We have broken down our thinking on the options we are considering within our review of access and charging into different workstreams to aid tractability
- The principal focus of Challenge Group discussions to date has been on these individual workstreams
- Purpose of this item is to build understanding of how those components fit together, and on how the options fit with wider work on flexibility
- We're keen to get your feedback on our initial thinking on the key links between these different areas

Our questions for you on Menti will be:

1. Do you agree with our characterisation of links between different charging aspects? Are there other important links to consider?
2. Do you agree with our characterisation of links between access and charging aspects? Are there other important links to consider?
3. What are your views on the relative pros and cons of the different routes for flexibility provision?

Access rights

- Defining the right to use the network (ie either importing or exporting electricity over it) in accordance with your needs.
- As part of this project we are considering better definition of access rights and what choices should be available.
- The ENA are leading a parallel workstream looking at potential improvements to how access rights are allocated.

Network charges

- One of the key obligations associated with having network access rights. Made up of forward-looking and residual elements.
- Forward-looking elements provide signals about how users' decisions can increase or reduce future network costs, while residual charges make up the remainder of network companies' allowed revenues.
- This SCR is considering improvements to forward-looking charging signals.
- The BSUoS task force has been considering whether BSUoS should be considered a forward-looking or residual charge.

**Upfront
(connection)
charges**

=

Cost of extension of
existing network to
connect user*

+

*For connections to distribution
networks only:
Contribution to any reinforcement
needed to wider network*

**For transmission connections,
some extension assets can be
recovered through local circuit
TNUoS charges.*

**Ongoing (use
of system)
charges**

=

Locational charging model output

**Locational
charging
granularity**
Extent to which
charges are
calculated
separately for
different locations

+

**Network cost
model
methodology**
Approach to
calculating future
network costs at
different locations

X

Conversion factor
to change model
output into desired
Charge design
(eg £/kW, £/kWh at
different times)

+

Residual charge
(focus of TCR)

Highlighting some key links between the aspects within this SCR

Upfront (connection) charges =

Potential substitute for sending locational signals

For connections to distribution networks only:
Contribution to any reinforcement needed to wider network

Choices on level of locational granularity in DUoS interact with what data is needed/available for cost methodology + different approaches to cost methodology could impact case for additional locational granularity.

Some charge designs may be incompatible with cost methodology + some combinations could lead to significant charge uncertainty

Ongoing (use of system) charges =

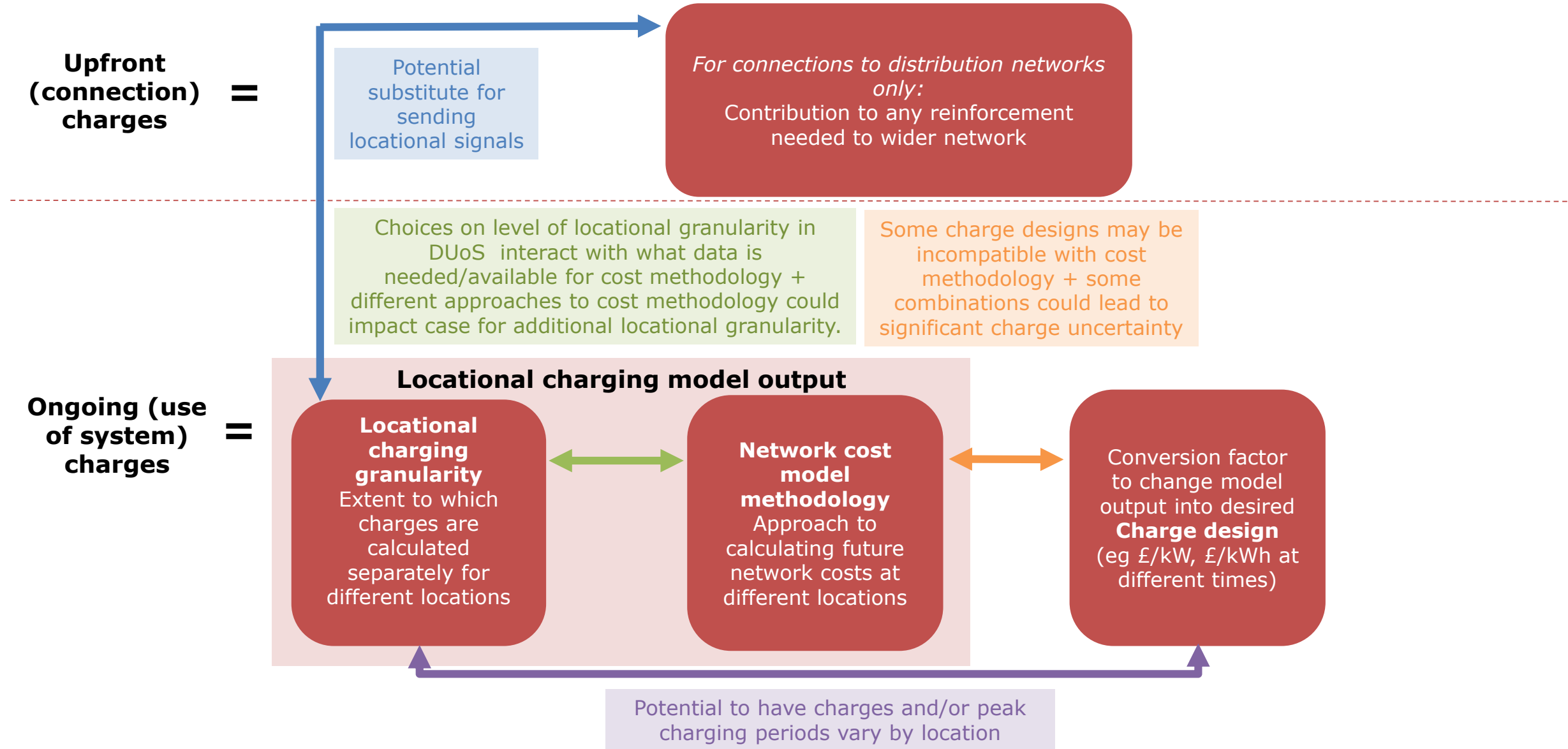
Locational charging model output

Locational charging granularity
Extent to which charges are calculated separately for different locations

Network cost model methodology
Approach to calculating future network costs at different locations

Conversion factor to change model output into desired **Charge design**
(eg £/kW, £/kWh at different times)

Potential to have charges and/or peak charging periods vary by location



In principle, forward-looking network charges should reflect what the potential better definition and choice of access rights mean for future network costs:

Choice	Firmness	<ul style="list-style-type: none"> • Non-firm access may reduce extent network companies have to pay money to manage network constraints (through reinforcement or flex procurement) • Would they reduce need to replace existing network assets over time to the same extent?
	Time-profiled	<ul style="list-style-type: none"> • Off-peak access (eg overnight or outside of certain seasons) may reduce extent network companies have to pay money to manage network constraints • Would they reduce need to replace existing network assets over time to the same extent?
	Shared	<ul style="list-style-type: none"> • Sharing access <u>behind a constraint</u> may reduce extent network companies have to pay money to manage constraints. Where there are no constraints, the value of sharing access to the network operator may be limited. • Would they reduce need to replace existing network assets over time to the same extent?
	More explicit definition	<ul style="list-style-type: none"> • Clarity that small DG have equivalent access to, and impact on, transmission network as larger generators • Greater clarity on access requirements of small users

There will be a need to consider how these can be reflected under the different charging options:

1. Generally, greater emphasis on access right choice suggests a stronger role for capacity charges rather than time of use volumetric charges – as under the latter the value of going for more flexible access rights is less recognised.
2. Case for cheaper connection charge/forward-looking use-of-system charges for more flexible access choices clearer if charges focused on signalling reinforcement costs, less clear if also about more long-term replacement costs
3. If access choices are not standardised, this will make it harder to reflect in use of system methodology (easier with bespoke connection charging calculations)
4. Is there a role for “overrun” charges, and would these need to be calculated using a different charging methodology?

1. Our aim is that we want flexibility to be used to the full extent this can offer benefit relative to traditional approaches. In the context of this project, this means managing network constraints through use of flexible resources **to the full extent that this is more efficient than traditional network upgrades.**
2. **Network access and forward-looking charging arrangements will provide the incentive for flexibility providers to come forward** (this can be termed 'price-driven flexibility'). **The different options we are considering will do this to differing extents.** We explore this further on the next slide.
3. **Where there is any shortfall (relative to the efficient level) in the extent of flexibility provided in response to access and charging signals, then we would expect the SO and DNOs to procure flexibility** ('contracted flexibility'). This is already incentivised under RIIIO framework, though we will be considering whether further enhancements are needed for RIIIO 2.
4. As such, **the value on offer to flexibility providers through access, charging and ESO*/DNO flexibility procurement should reflect the amount of value they can provide in terms of reducing the costs of managing network constraints**
5. Other aspects of the market design - particularly the wholesale, capacity and ESO energy balancing markets – should reflect the value that flexibility can provide in offsetting the need for generation capacity. **We recognise the importance of considering how flexibility providers can stack value across different markets.** We are working in conjunction with the ENA Open Networks project on the different models for flexibility procurement, to make sure that the competitive and coordinated markets develop.
6. We will need to **consider the relative pros and cons of the different routes for providing signals for flexibility carefully as part of our decisions within this SCR**, for example in how they differ in terms of accessibility for different parties and the level of certainty they provide in ensuring network resilience.

*This excludes SO procurement for energy balancing purposes, as noted in point 4

Sources of flexibility value under different access and forward-looking charging options

The matrix below illustrates how different potential SCR outcomes could mean the value of flexibility is relieving network constraints is recognised in different ways. These are simplified potential outcomes; in practice, there might be some other variants or hybrid options.

	No access right choice	Significant access right choice
Agreed capacity based charges	<p>Flexibility is mainly valued through flexibility procurement. This is effectively the current approach for transmission generators (via the Balancing Mechanism). Overrun charge methodology could also be used to value flex.</p>	<p>Users are able to indicate they are willing to offer flexibility in their choice of access right, in exchange for a lower capacity charge. Additional flexibility procurement may be needed.</p>
Charges based on usage/demand at certain times	<p>Flexibility is valued through time of use charging, though additional flexibility procurement may be needed to the extent that charges do not reflect value in a particular location at different times</p>	<p>As left + above, flexibility may also be valued through access right choice. However, users may have limited incentive to choose more flexible access rights if charges are solely time of use basis.</p>

As alluded to here, additional decisions impact the extent that access/charging will provide full value to flexibility:

- Even with time of use charges, the different options will more or less accurately reflect the real short-run costs that the ESO/DNOs would face (under the counterfactual of no charges) to manage network constraints. Eg fixed time of use vs real time pricing
- To the extent that charges do not fully reflect locational differences in costs, there may still be a need for flexibility procurement in high cost areas, where the averaged charge (or discount to charges for flexible access choices) does not engender sufficient flexibility

Feedback on DG sub-group reports

- The Menti feedback received at the last CG meeting was very useful.
- Some CG members wanted the opportunity to review the detailed reports. These were shared before Easter. Those versions incorporated the feedback received at the CG meeting.
- We received comments on each report. The following slides provide an overview of the nature of comments on each report and how we addressed these.
- We will provide more detailed responses to those that provided feedback on the reports.

Access report 1 – Current approach to the Design and Operation. This report aims to provide an overview of the basis upon which the GB network and system operators currently design and operate their electricity networks.

You said

Suggestion to improve clarity (eg ensuring transmission and distribution arrangements both covered)

We need to consider how potential changes to access and charging may impact how system is design and planned.

We did

Agreed. Amendments made.

Agreed. This report will help us do this.

Access report 2 – Access choices. This report aims to outline and assess the range of possible access design choices. Alongside the report, we have also published the sub-group’s initial assessment

We need to consider the links between access and charging (eg financial firmness and charging)

We need to clarify the links between different access choices (eg time-profiled non-firm).

We need to further consider the range of different users and the value that a broader range of access choices may provide to them (eg users with property portfolios)

You had suggestions for improving the definition of access choices and improving the clarity of how access choices would work (eg notification periods).

Agreed. The next stage of our work will further consider the links between access and charging.

Agreed. The next stage of our work will further consider the links between different access choices.

Agreed. Amended definitions used in document. Next stage of work will further consider the value of access choice to network users.

Agreed. We improved clarity of the options where suggested. We seek to further clarify and define options as part of next stage of work.

Cost drivers – This report has assess historical costs and discussed the significance of different cost drivers, including the potential to use them to segment customers. Further work on network costs, including forecasts will be taken forward in other workstreams.

You said

We need to analyse future costs, including:

- mix between load and non-load related costs
- impact of operational costs on network reinforcement to accommodate higher loads
- changes in cost drivers and future impacts

We should consider import / export on a more granular basis than annually

We need to clarify the relationship between flexible solutions and network charging signals

We should consider the wider implications of the factors used for setting prices

Noted that, even if losses do not drive network costs, the wider system costs are paid for by consumers

We did

Available cost forecasts and other data will be very useful for us in developing our baseline and assumptions for modelling. We will look to address this, as part of the future analysis

We will be undertaking further work on time profiles, including seasonality and time-of-day, to support development of our views on charge design

Covered in agenda item today

Will be considered as part of the charge design workstream, however, our SCR is technology neutral

We will give further consideration to wider system costs as part of the cost models work

Locational report - This report aims to outline and assess the options to increase the locational granularity of forward-looking DUoS charges.

You said

The (negative) effects of charging asymmetry should be considered if separate models for generation and demand are being proposed (as this seem counter to wider literature, e.g. MIT Utility of the Future Report)

We need to make sure that the delivery group is ambitious enough in considering the feasibility of options given improvements in smart metering and data processing over the next few years.

The focus appears to be on weighing up different methods of static location charges. It would be good to consider the potential for dynamic locational charges.

More locationally granular signals may put at risk those customers less able to engage to benefit from flexibility.

We did

The DG agrees with this comment and have clarified the wording in the report, which was not intended to suggest that generation and demand should be treated differently to the extent that cost drivers are the same.

The feasibility of different approaches will be further investigated as part of the locational cost drivers and cost models product descriptor, based on the input data that would be required for different cost models.

Dynamic charges have not been ruled out in the locational granularity report. This is being considered as part of the charge design work, and will also relate to cost model feasibility and design choices.

This will be considered in our small users work. The benefits of granularity could be negated if customers who are able to respond are not exposed to the signal.

Glossary – We produced a glossary to help wider stakeholders understand the terms being used in each of the reports.

You said

Queried the extent to which asset replacement is dependant on load.

Load was not defined in the Glossary.

'Termination Amount' referenced 'Secured Amount' which was not defined.

'User' was defined twice.

We did

We addressed this feedback in the Cost Drivers report.

We added a 'Load Related Expenditure' definition, as well as 'Non-load Related Capex - Asset Replacement' and 'Non-load Related Capex - Other'.

We added 'Secured Amount' (and 'Bilateral Agreement' which refers to 'Secured Amount').

We removed duplicate definition.

- The reports are due to be signed off by Delivery Group on 10 May.
- Once signed off, the slides will be published on the Charging Futures website.
- These reports represent the views of the Delivery Group members. The reports will inform our thinking. Ofgem will outline our initial thinking in the working papers.
- The reports represent initial thinking. We intend to further develop our thinking over the next year (eg refine the options and further assess the value/feasibility of options).

Any other business

Next Challenge Group

- The contents of the 1st working paper have been discussed today and at the previous two Challenge Groups.
- We intend to share a draft version of the 1st working paper with the CG for feedback.
- We intend to host the next Challenge Group in July. This meeting will focus on the content of the 1st working paper.

Webinars

- On 15 May, the non-Access SCR is hosting a webinar on how Active Network Management schemes costs could be recovered.
- We are holding webinars for wider stakeholders on the initial Access SCR reports (20 May (access) and 29 May (charging)).
- BSUoS Task Force has recorded a webinar on potential BSUoS reforms, it will be available shortly on charging futures website.

More information on future webinars can be found on the Charging Futures website - <http://www.chargingfutures.com/>