Agenda

10:00 – 11:55

- 10:00 Ways of Working & Wider Industry Feedback
- 10:15 Terms of Reference Confirmation
- 10:20 Action Review
- 10:30 Stakeholder Engagement Check in
- 10:55 Definitions Update
- 11:10 Project TransmiT
- *11:40 Break*

11:55 – 15:10

- 11:55 Review TNUoS Principles
- *12:55 Lunch*
- 13:35 CUSC Modification Tracker
- 14:35 Consultancy Scope
- *14:55 Break*

15:10 – 16:00

- 15:10 Task Force Meeting 3 Topics
- 15:40 Next Steps and Close

Charging Futures

Charging Futures

Reforming electricity charging together

TNUoS Task Force

Meeting 2

10th August 2022

Ways of Working & Wider Industry Feedback

Jon Wisdom

Terms of Reference Confirmation

All

Link to ToR

Action Review

Jon Wisdom

Actions from Meeting 1

ID/ date	Agenda Item	Description	Owner	Notes	Target Date	Status
1 13/07	2	Share Charging Futures website link with Task Force members	Teri Puddefoot		20/07/22	
2 13/07	4	Problem Statement required to understand what the TF will be working on	James Stone		TF Meeting 2	
3 13/07	6	Gain further information regarding Energy UK Forum	Paul Jones	Are TF members able to attend	TF Meeting 2	
4 13/07	6	Confirm if collective organisations should be captured when targeting smaller organisations	Jon Wisdom	E.g. smaller supplier organisations	TF Meeting 2	
5 13/07	6	Are Ofgem able to share the responses to Call for Evidence - GDPR	Matthew Patrick		TF Meeting 2	
6 13/07	6	Work required on how best to engage with suppliers listed in the Engagement Spreadsheet	Sam Davies, George Moran, Aled Moses	Teri Puddefoot to share list with supplier reps	TF Meeting 2	
7 13/07	7	Provide short summary on Project Transmit model and feed back to Task Force	Binoy Dharsi		TF Meeting 2	
8 13/07	7	Provide economic view on long and short run	John Tindle and Arjan Geveke		TF Meeting 2	
9 13/07	7	Think about the things that all users need common principles on	All	Prepare to give thoughts	TF Meeting 2	
10 13/07	17	Review CUSC mod spreadsheet and be prepared to feed back in TF Meeting 2	All	Prepare to give thoughts	TF Meeting 2	

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Stakeholder Engagement Check in

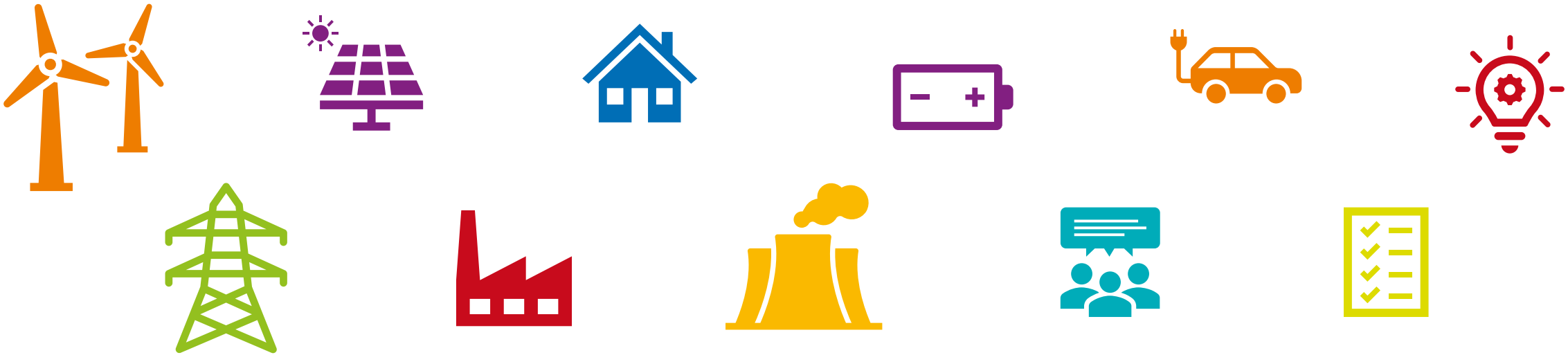
All

The objective of this session is to:

- Provide an update of the proposed re-allocation of resource following initial review of draft engagement list
- Discuss any progress in terms of engagement and share best practice

Engagement Check In

Link to Stakeholder Engagement



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Project TransmiT & Definitions Update

BD, JT and AG

LRMC vs SRMC and implications for network price signals

Definitions

Marginal cost

The incremental cost of producing one additional unit of a product or service, including both:

1) Operating costs (opex), and
2) Capital costs (capex)

SRMC (Short-run marginal cost)

Snapshot of marginal cost for a particular unit at a particular time. Will tend to vary over time:

1) **Changing incremental opex**: How efficiently existing assets are operating
2) **Changing incremental capex**: Whether or not additional capital investment is required

LRMC (Long-run marginal cost)

Average of all SRMC (opex and capex) over a period of time (usually measured over lifetime of an asset)

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Selected slides from Frontier Economics presentation to BSUoS Task Force

Original full slides: [ESO PowerPoint Template 16x9 (chargingfutures.com)]

Full BSUoS Task Force report including additional commentary: [ESO Word Template - Full Width (chargingfutures.com)]

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Ofgem has made clear that cost reflective charges should be based on a concept of marginal cost…

Minimising total system costs

- Market participants should face the costs that they impose on the system
- They then take these costs into account in all of their investment and operational decisions.
- In other words, charges should be *cost reflective*

Cost reflective network charges

- To internalise costs in the decisions of market participants:
  - *forward looking costs* must be reflected: these can be changed by future behaviour; and
  - *incremental or marginal* costs, not average costs
- No meaning to 'cost reflectivity' in relation to *historic* costs

> *Economic theory indicates that users will make the most efficient decisions about where, when and how to use the network when they are facing the incremental or marginal cost of their behaviour.* ***Ofgem, 2017 TCR consultation***

… and has stated that charges recovering any excess of total cost over marginal cost should be set to minimise the risk of distortions

Cost reflective charges won't recover sunk costs

- Natural monopoly networks: average cost > marginal cost
- Marginal cost tariffs will not recover total costs
- The *residual* needs to be recovered in the most efficient way possible

Cost reflectivity not relevant

- Sunk cost recovery charges not intended to generate incentives, but to recover irreversibly incurred costs
- Correct approach is to recover them in a way which minimises change in behaviour
- Recover charges from those who are not sensitive to price…
- … but fairness considerations also apply

> *Economic theory indicates that residual charges should be set in such a way to prevent the signals from the forward-looking charges from being distorted, so that users take account of the forward-looking signals to the greatest extent possible.* ***Ofgem, 2017 TCR consultation***

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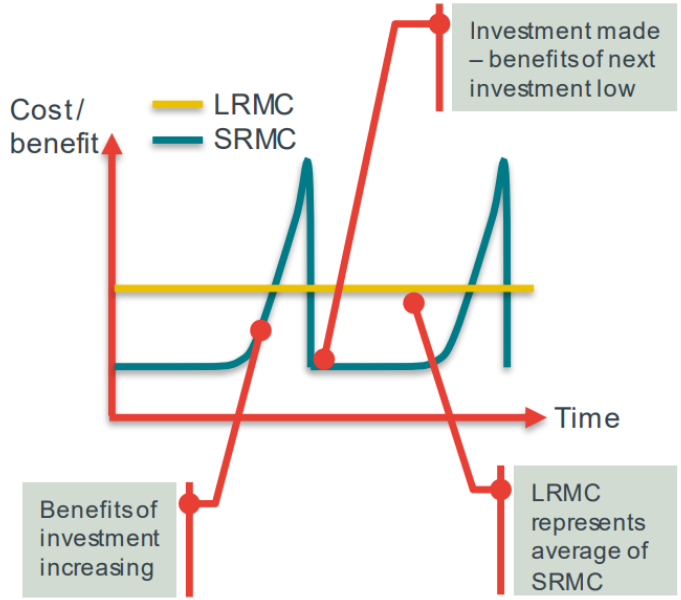
Under certain conditions, the two approaches are equivalent over time, so there is no logic to having both SRMC and LRMC signals

In this stylised two zone example:

- Ideally, the transmission system should be expanded until the NPV of incremental benefit equals the NPV of incremental cost
  - The incremental benefit of expansion can be measured by the SRMC (i.e. the reduced despatch costs*)
  - The incremental cost is simply the LRMC
- So over time, if the system is expanded optimally, the NPV of SRMC based signals should equate to those of LRMC based signals
- This would result in zonal price spreads which follow a sawtooth pattern



A regime with both SRMC and LRMC approaches would risk double counting locational signals

* In fact, reduced despatch costs and changes in producer and consumer welfare – we ignore these for simplicity

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Project TransmiT

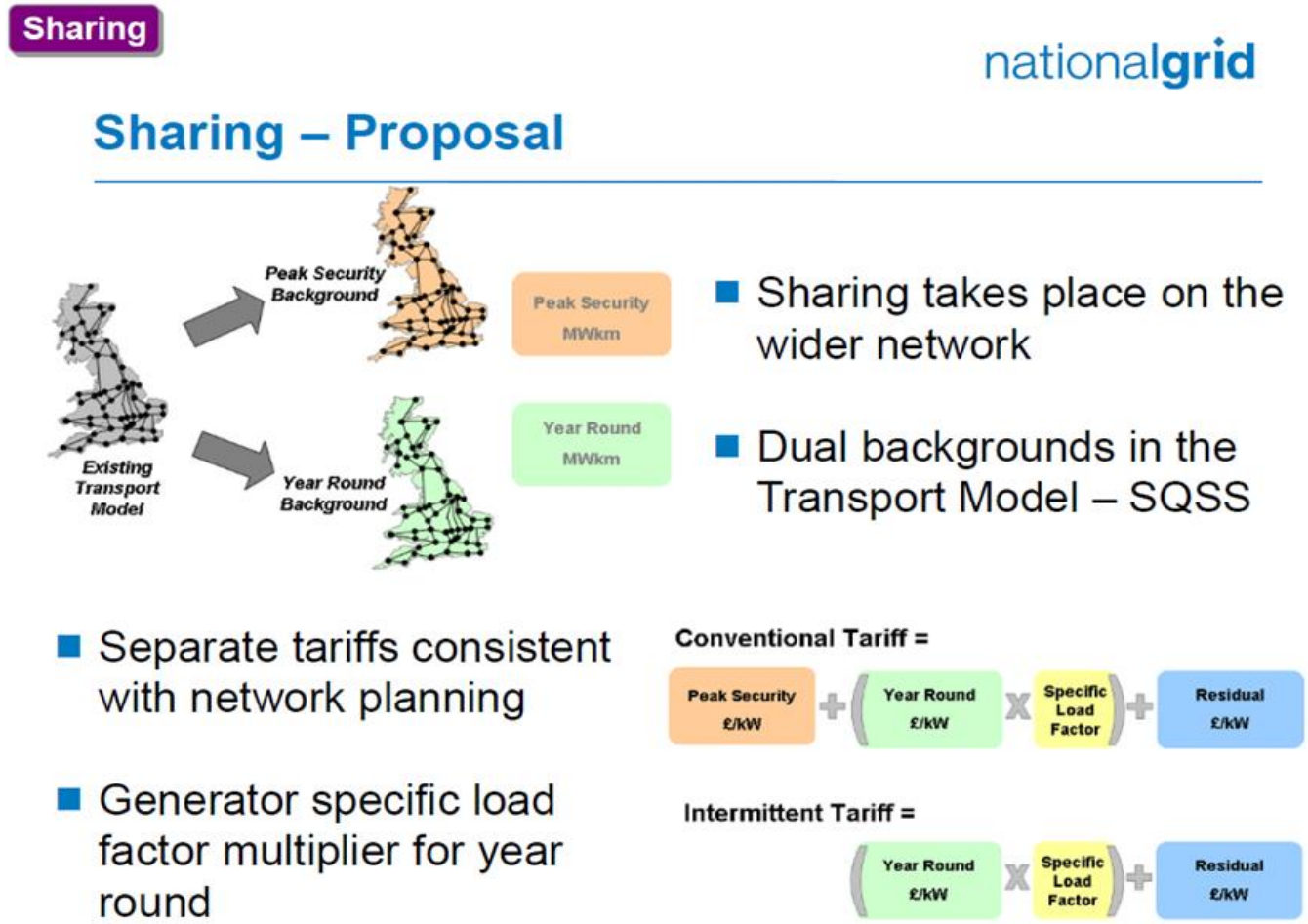
The underlying principle behind TNUoS charges is that efficient economic signals are provided to Users when services are priced to reflect the incremental costs of providing them. Therefore, charges should reflect the impact that Users of the transmission system at different locations would have on the Transmission Owner's costs. The ongoing application of this rationale was supported by the conclusion of the Ofgem Project TransmiT SCR process.

Modification	Description	Rationale
CMP213	The charging methodology splits the Wider Generation TNUoS tariff into two parts: the "Peak Security" tariff (relating to the costs driven by generators' use of the system at peak times) and the "Year-Round" tariff (relating to the costs driven by use of the network throughout the year). Only "Conventional generators" (dispatchable generation, whether Carbon or Low Carbon) are charged the former but all generators, including "Intermittent" generators (which are not dispatchable and are all Low Carbon), are subject to the latter. How the Year-Round tariff is applied depends on the zone and takes account of the level of diversity between Carbon and Low Carbon generation and the likelihood of coincident running of generators.	The underlying principle behind TNUoS charges is that efficient economic signals are provided to Users when services are priced to reflect the incremental costs of providing them. Therefore, charges should reflect the impact that Users of the transmission system at different locations would have on the Transmission Owner's costs.
CMP268	Recognition of sharing by Conventional Carbon plant of Not-Shared Year-Round circuits. CMP268 proposes to increase the existing number of generator classes from two – Intermittent and Conventional – to three. This splits Conventional into Conventional Generator – Carbon and Conventional Generator – Low Carbon	CMP268 to be more cost-reflective than the baseline and that the CMP213 analysis supports Conventional Carbon generators having lower impact on constraint costs. Agree in the principle that Conventional Carbon generators are more likely to avoid coincident running with wind and present a lower cost option to constrain off when coincident running does occur as part of normal commercial operations.

Should intermittent generation contribute to the peak element of the tariff?

Ofgem's decision on opting for variant WACM2 in CMP213 decision.

WACM 2 would split the TNUoS tariff for generators into two parts: the Peak Security tariff and the Year Round tariff. Only conventional generators would be charged the former but all generators, including intermittent ones, would be subject to the latter. This aligns to the transmission planning standard and reflects the fact that intermittent generators are not assumed to contribute to meeting peak security. In its power flow model used to calculate tariffs, National Grid would split the circuits between the two tariffs using similar assumptions to those in the transmission planning standard.



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Additional technical information

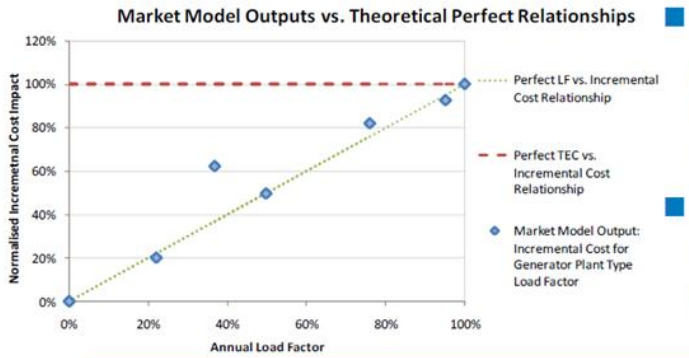
Sharing

nationalgrid

Sharing – Proposal

Peak Security £/kW + (Year Round £/kW x Specific Load Factor) + Residual £/kW

- Many characteristics of a generator contribute to incremental impact on network costs



- Market model; relationship between generators and network costs
- Proposer concluded annual load factor is good representation

Imperfect relationship; balances simplicity with cost reflectivity

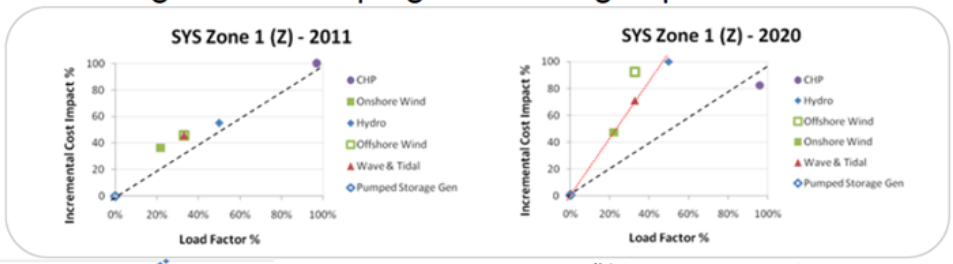
20

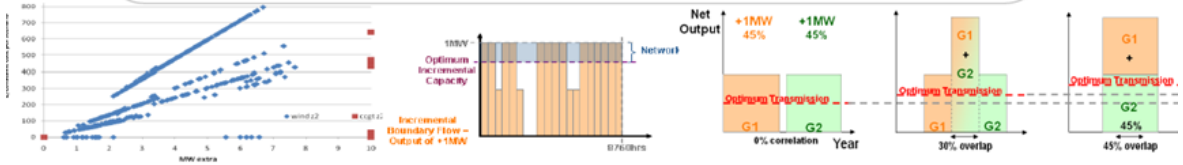
Sharing

nationalgrid

Sharing

- Despite its outward simplicity, the original proposal for sharing is based on somewhat complex underlying theory
- Considerable amount of time spent on understanding, debating and developing the sharing aspect





- Market modelling and theory used to explore network cost impacts

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Break

Next session starts at 11:55

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Review TNUoS Principles

James Stone

The objective of this session is to:

- Complete the review of TNUoS principles to be used as a framework for assessing any changes proposed by the Task Force

TNUoS Core Principles

We have identified 5 key principles. These are:

1. The more transmission system you use (or needs to be built for your use), the higher the incremental cost you should pay - and vice versa;
2. Level playing field – non discriminatory treatment;
3. Balance cost reflectivity, stability and predictability;
4. TNUoS reflects the long-run incremental cost of the transmission system (i.e. the physical assets), not operation of the transmission system; and provides a long-run marginal signal; and
5. TNUoS should send a relevant and useful signal

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Core principles to agree…

5. TNUoS should send a relevant and useful signal

- Temporal (Time of Use) – what timescale? Intra-day, intra-season, intra-year?
- Geographic – locating generation & demand capacity in close proximity and keeping them balanced
- Capacity availability – where capacity is abundant or scarce - Question of how sharing, redundancy etc is reflected in this signal
- Signals must be effective & useful (create the right incentives) – no point if they're ignored
- Investments signals but also closure signals
- Anything else?

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Core principles to agree…

4. TNUoS reflects the long-run incremental cost of the transmission system (i.e. the physical assets), not operation of the transmission system; and provides a long-run marginal signal

- Physics dictates what/how the network is used, not economics (i.e. a user can't choose to 'not use' part of the network - current flows across the system from point of generation to demand in accordance with physical laws, regardless of where the demand is – it's all or nothing!)
- What duration is long-run - next year, next price control?
- Forward looking signals – is historical data appropriate or is there a need to use forward looking data inputs?
- Should TNUoS better reflect "real drivers"?

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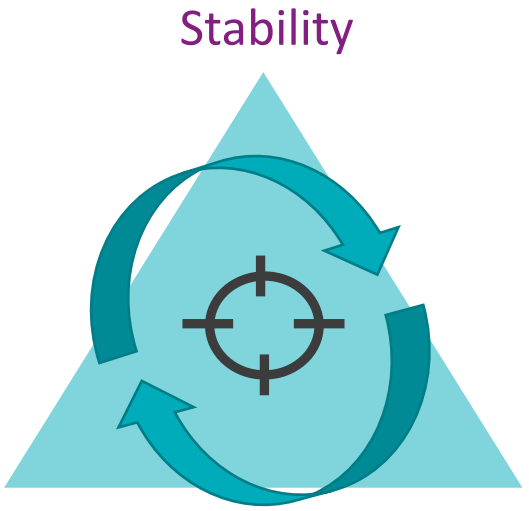
Core principles to agree…

3. Balance cost reflectivity, stability and predictability;

- Cost reflectivity - degree of averaging vs granularity is important
- If predictability can't be achieved then cost signals must be useful
- Need to understand what industry value more and why
- Doesn't mean there are any 'no regret' improvements that should be ruled out and cannot be made



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Core principles to agree…

2. Level playing field – non discriminatory treatment;

- Simple methodology – complexity (granular level) can be a barrier to new participants
- Clear and transparent
- All things equal - Identical treatment for identical parties
- Technology agnostic
- Sends useful price signals that only discriminate based on the users impacts on the transmission system
- Reducing distortions – may improve competition

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Core principles to agree…

1. **The more transmission system you use (or needs to be built for your use), the higher the incremental cost you should pay - and vice versa;**
   - The greater distance your energy is transported, the greater the charge
   - The larger the capacity, the larger the charge
   - The higher the load factor, the higher the charge
   - Any others?

Transmission system (asset) cost driven by capacity

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Lunch

Next session starts at 13:35

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CUSC Modification Tracker

James Stone

The objective of this session is to:

- Review feedback from the Taskforce on CUSC modification interaction.
- Agree the ‘Interaction Rating’ for each modification.
- Agree next steps for managing this interaction and any new modifications.

CUSC Modification Tracker

Link to the full modification tracker can be found embedded here;

Microsoft Excel Worksheet

- Initial modification list and interaction ratings were;

Interaction Rating	No. Modifications	Interaction Rating Description
High (Red)	5	Directly in Task Force's Terms of Reference. Significant impact on the methodology and the principles behind the methodology. Progress on these should be paused due to the scale of this interaction.
Medium (Yellow)	5	Linkage between the modification and Task Force, large impact on a small part of the methodology or affects a principle.
Low (Green)	12	Possible linkage between the modification and Task Force.
None (Blue)	1	Task Force confident of no interaction currently or in future.

- Feedback from 8 Taskforce members received.
- All responses agree with the tracker on 11 modifications, progress on this basis with no changes.
- Different ratings proposed for the remaining 12 modifications.

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CUSC Modification Tracker

The feedback received proposed changes to interaction ratings which are shown below (1 of 3);

Mod No.	Title	Proposed Change	Rationale
CMP276	Socialising TO costs associated with green policies	From Low to None	Demand Residual not charged over Triad and probably should be withdrawn.
CMP286/7	Improving TNUoS Predictability through Increased Notice of the Target Revenue (CMP286) and Inputs (CMP287) used in the TNUoS Tariff Setting Process.	From Medium to High	Predictability and data inputs are a key focus of the Taskforce
CMP292	Introducing a Section 8 cut-off date for changes to the Charging Methodologies	From Low to Medium	Processes considered by CMP292 will need to be changed based on Taskforce output
CMP315/375	Review of the expansion constant and the elements of the transmission system charged for (CMP315) and enduring expansion constant and expansion factor review (CMP375)	From Medium to High	Key input in to the locational element of the model. Implementation from CMP315/375 would need to meet timescales and principles of the Taskforce.

CUSC Modification Tracker

The feedback received proposed changes to interaction ratings which are shown below (2 of 3);

Mod No.	Title	Proposed Change	Rationale
CMP316	How the TNUoS methodology will be applied to a co-located Power Stations.	From Low to High	More common in future. Interaction with backgrounds and SQSS.
CMP331	Option to replace generic Annual Load Factors (ALFs) with site specific ALFs	From Low to Medium	To be consistent with other modifications also reviewing ALF.
CMP379	Determining TNUoS demand zones for transmission - connected demand at sites with multiple Distribution Network Operators (DNOs)	From Low to Medium	CMP379 looks to resolve a symptom of how demand is charged TNUoS, which is part of the Taskforce's scope.
CMP393	Using Imports and Exports to Calculate Annual Load Factor for Electricity Storage	From Low to Medium	Consistent with other ALF modifications. Also affects inputs to and treatment of storage.
CMP394	Removing Generation Charges from Electricity Storage Operators in Positive TNUoS Zones	From Medium to High	Interaction with the deployment of storage, it's usefulness in managing system constraints and how this is reflected in the SQSS (and therefore TNUoS backgrounds).

CUSC Modification Tracker

The feedback received proposed changes to interaction ratings which are shown below (3 of 3);

Mod No.	Title	Proposed Change	Rationale
CMPxxx	[All anticipatory modifications]	N/A	Broadly agree with the original rating but additional information would be needed before a definitive H/M/L rating could be given.
CMPxxx – OTNR and multiple wider tariffs	Clarification in the methodology to determine which wider tariff is applied when an offshore generator connects to two or more MITS Nodes, that fall into different generation zones.	From Medium to High	High interaction with the proposal to review wider tariffs (which is rated High).
CMPxxx – OTNR Anticipatory Investment	Ofgem's consultation has highlighted the AI cost gap could be paid by the benefiting generator and so this needs to be reflected in the methodology.	From Low to None	Similar to connection charges, User Commitment securities etc, in that it is how to recover money specific to one User and so not TNUoS conceptually.

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CUSC Modification Tracker

Next steps for monitoring CUSC modifications, the Taskforce agrees;

1. To recommend (to the CUSC panel) that progress on any High rated modifications is paused:
    - CMP271.
    - CMPxxx (OTNR) – Offshore MITS Node definition.
    - CMPxxx (OTNR) – determining if/how onshore generators should contribute towards the offshore network.
    - CMPxxx (OTNR) – review of wider tariffs.
    - CMPxxx – Demand Credits.
    - Plus any changes/exceptions as a result of the previous discussion.
2. To review High and Medium rated modifications monthly for any changes.
3. To review Low rated modifications every 3 months for any changes.
4. That Taskforce members who are also CUSC panel members will feedback (to the Taskforce) on CUSC panel discussions, especially on new modifications and prioritisation of existing modifications.
5. To keep CUSC panel informed of any changes in interaction rating and which modifications are recommended to proceed or be paused.

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Consultancy Scope

James Stone

The objective of this session is to discuss:

- High-level scope of potential consultancy work
- Approach to finding a “partner” and finalising scope
- Next Steps

Consultancy scope

We consider the high-level requirements of any potential consultancy work should include;

- Identifying, developing, and quantifying improvements to the locational TNUoS methodology via (i) simplification, (ii) improved cost reflectivity, (iii) increased predictability and, or (iv) greater stability of charges.
- Establishing limitations of the current locational methodology in better reflecting real-world drivers of investment in the Transmission network.
- Determining quantitively how current data inputs into the methodology affect the stability and cost reflectively of TNUoS tariffs for both Supplier and Generator parties.
- Idea generation in relation to recommended changes to, and or addition/removal of the economic signals provided by the locational TNUoS methodology including the relative values of any signals.

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Consultancy scope continued

We consider the high-level requirements of any potential consultancy work should include;

- Attendance at Task Force meetings – providing both support and challenge to discussions.
- Any additional modelling identified (including creation of tools/models) as necessary (and within the Task Force scope) to support/shape Task Force outcomes.
- Supporting the Task Force in wider engagement and communicating the findings from this work (including modelling undertaken) to the wider industry.
- Supporting the production of a recommendation report from the Task Force to the wider industry and Ofgem, - including production of analysis/technical appendices to be presented on behalf of the Task Force.

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Finding a partner & finalising scope

Innovation approach;

- The outcomes of the work are uncertain but will ultimately support wider industry change so should meet '**Research Innovation Project**' criteria - this can be funded via the Network Innovation Allowance (part of the ESO Price Control).
- Using an RfI will allow us to target a specific number of potential consultancies - therefore reducing the time taken to review agree a partner/onboard.
- RfI also provides flexibility in terms approach - it allows prospective consultancies to suggest the most efficient approach in best achieving any deliverables set.

Further defining scope;

- Adopting a phased project approach will allow a high-level scope and fixed costs to be agreed at the outset.
- Once the preferred consultancy is onboarded the first phase will be to further define the requirements - allowing the Task Force time to identify problems faced and shortlist key areas to tackle, to then be fed into the finalised scope.

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Next Steps

Key (indicative) milestones are;

- RfI to be sent to potential partners **mid-Aug**.
- Opportunity for consultancy questions and responses to then be submitted **late Aug**
- Final decision - consultancy appointed and onboarded – **late Sep.**
- Project plan developed and scope fully defined jointly with partner – **Oct.**
- Final scope agreed with Task Force and finalised – **late Oct**.

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Break

Next session starts at 15:10

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Task Force Meeting 3 Topics

James Stone

The objective of this session is to:

- Provide visibility of, and agree potential topics to cover in the next Task Force meeting

Task Force Meeting 3

Proposed topics for discussion

- What should the TNUoS charging design be doing and why doesn't it achieve this.
- What do we want TNUoS to do (vision) - identifies further changes that may be required.
- Start to explore predictability and themes on why it is important.
- How can we potentially measure/quantify the impacts of improved predictability.
- 'Literature review' of previous work undertaken by industry in relation to the TNUoS methodology – to be considered following industry engagement by ESO at the August 2022 TCMF where this was raised as a point of feedback.

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Next Steps and Close

Jon Wisdom

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Thank you

Next meeting is 7th September 2022