Balancing Services Charges Task Force

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National Grid ESO

Wider Context

- Ofgem has announced an ESO-led Task Force under Charging Futures arrangements

- The Task Force will build upon work done to date by ESO with our stakeholders

- The Task Force will inform the direction of balancing services charges

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Timing and Deliverables

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Based on the Ofgem letter and the draft Terms of Reference the Task Force will:

Deliverable	Date
Assess the extent to which elements of the charge **currently** provide a forward-looking signal which influences behaviour	February 2019
Assess the **potential** for existing elements of the charge to be charged more cost reflectively and hence provide better forward-looking signals	March 2019
Assess the **feasibility** of charging any potentially cost reflective elements of the charge on a forward-looking basis	April 2019 (Draft Report)
Assess the **feasibility** of the candidate charges to influence user behaviour and so identify extent elements which should considered cost-recovery	May 2019 (Final Report)

The above timetable will allow Ofgem to consider the task force output alongside feedback to their TCR minded to position consultation and prior to Code Modifications (if any) being raised.

Next Steps

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- Task Force members are in the process of being appointed from a selection of experienced and interested volunteers
- The draft Terms of Reference will shortly be approved by Ofgem and published by ESO
- The Task Force is expected to first meet towards end January 2019

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What's the appropriate balance of the BSUoS charging principles?

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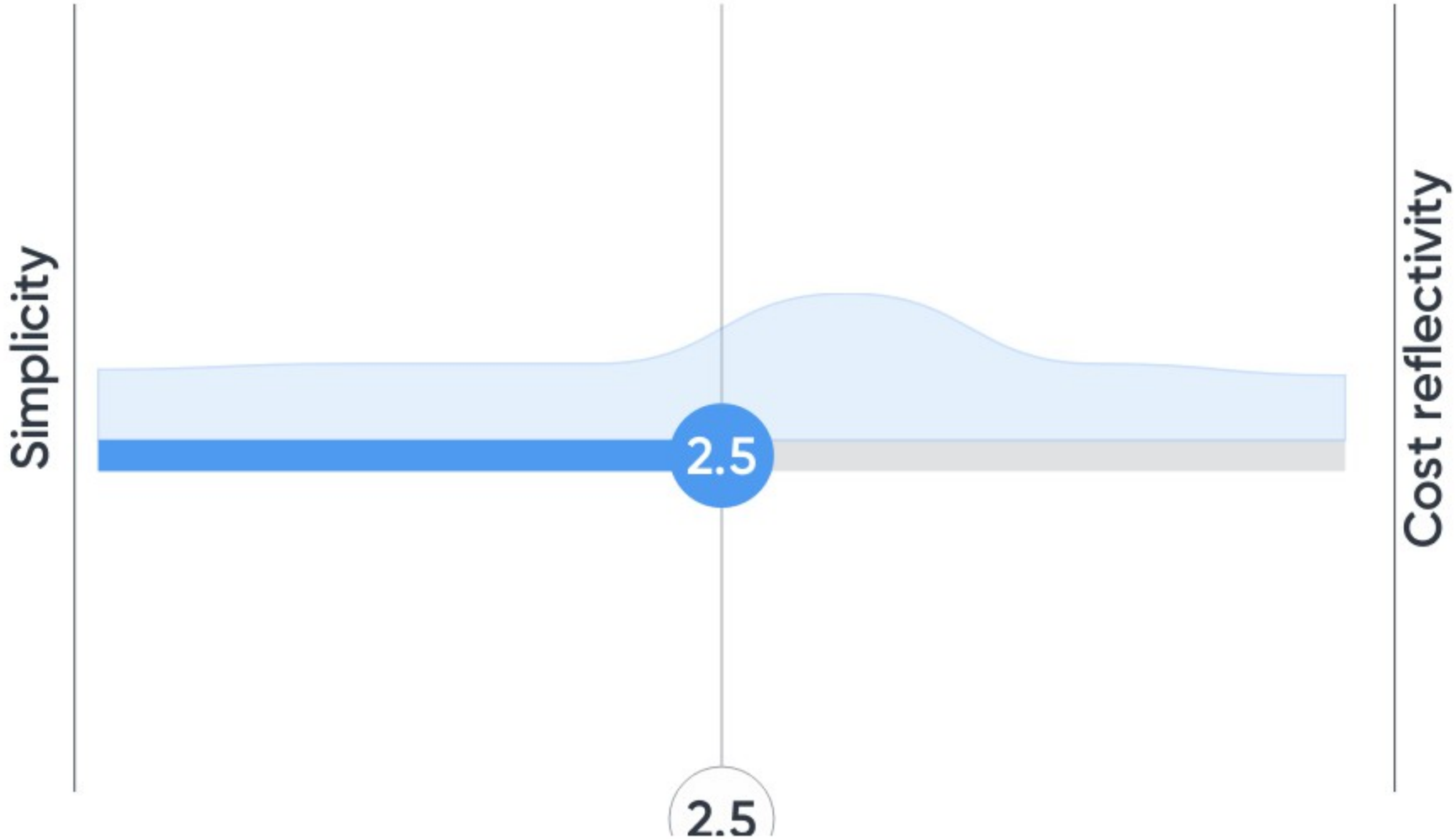

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ESO Workshop Survey Feedback

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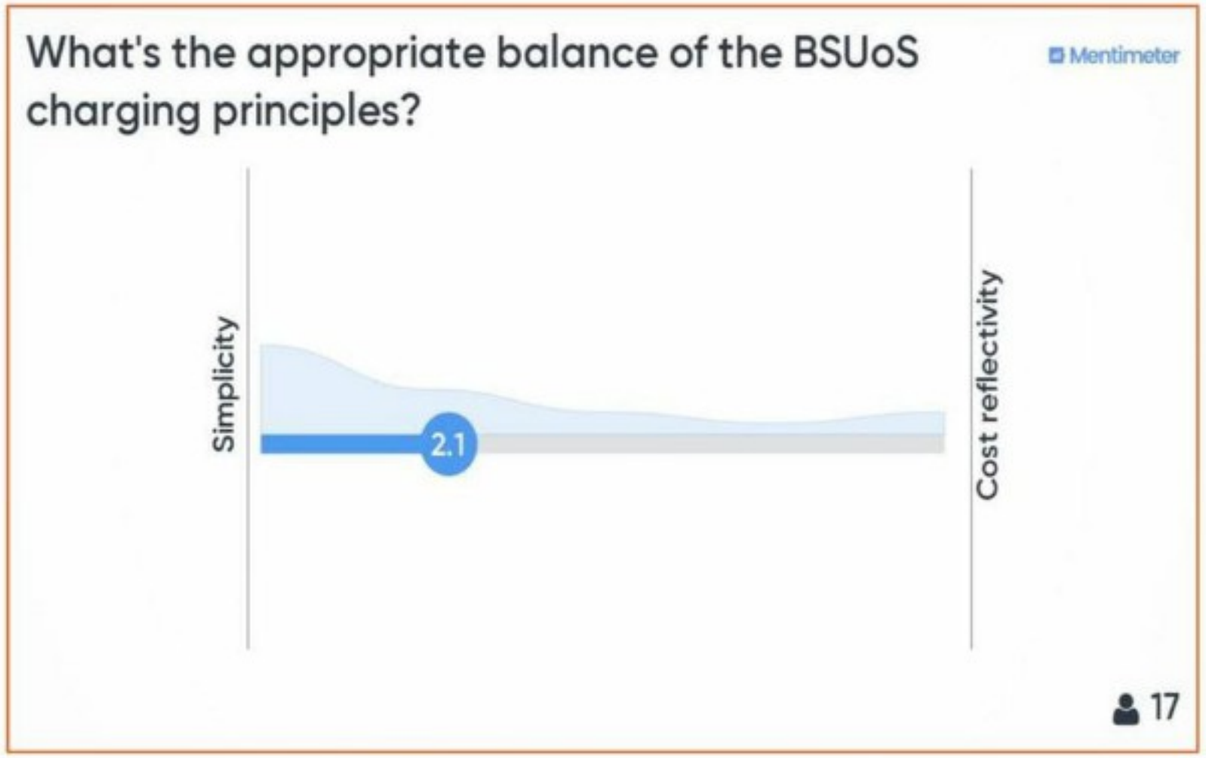
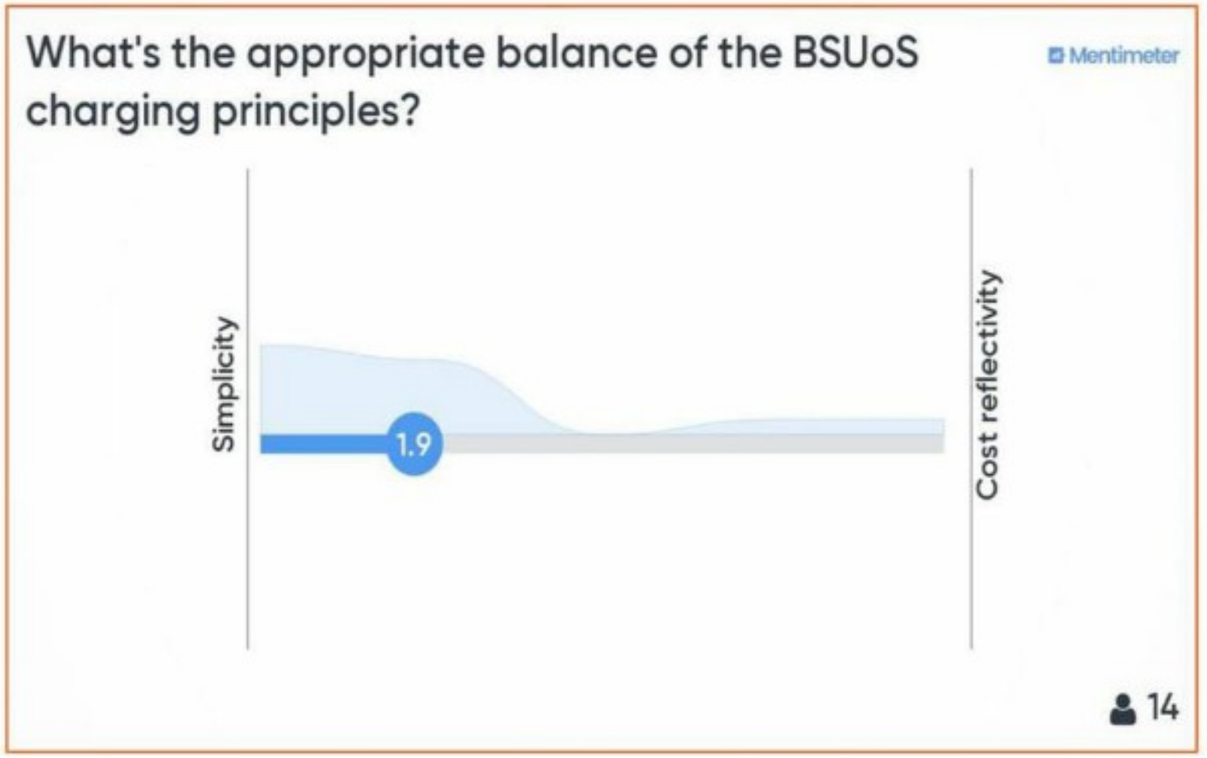


5th October Workshop



12th October Workshop

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How well does BSUoS...

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ESO Workshop Survey Feedback

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5th October Workshop

12th October Workshop

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Should BSUoS aim to...

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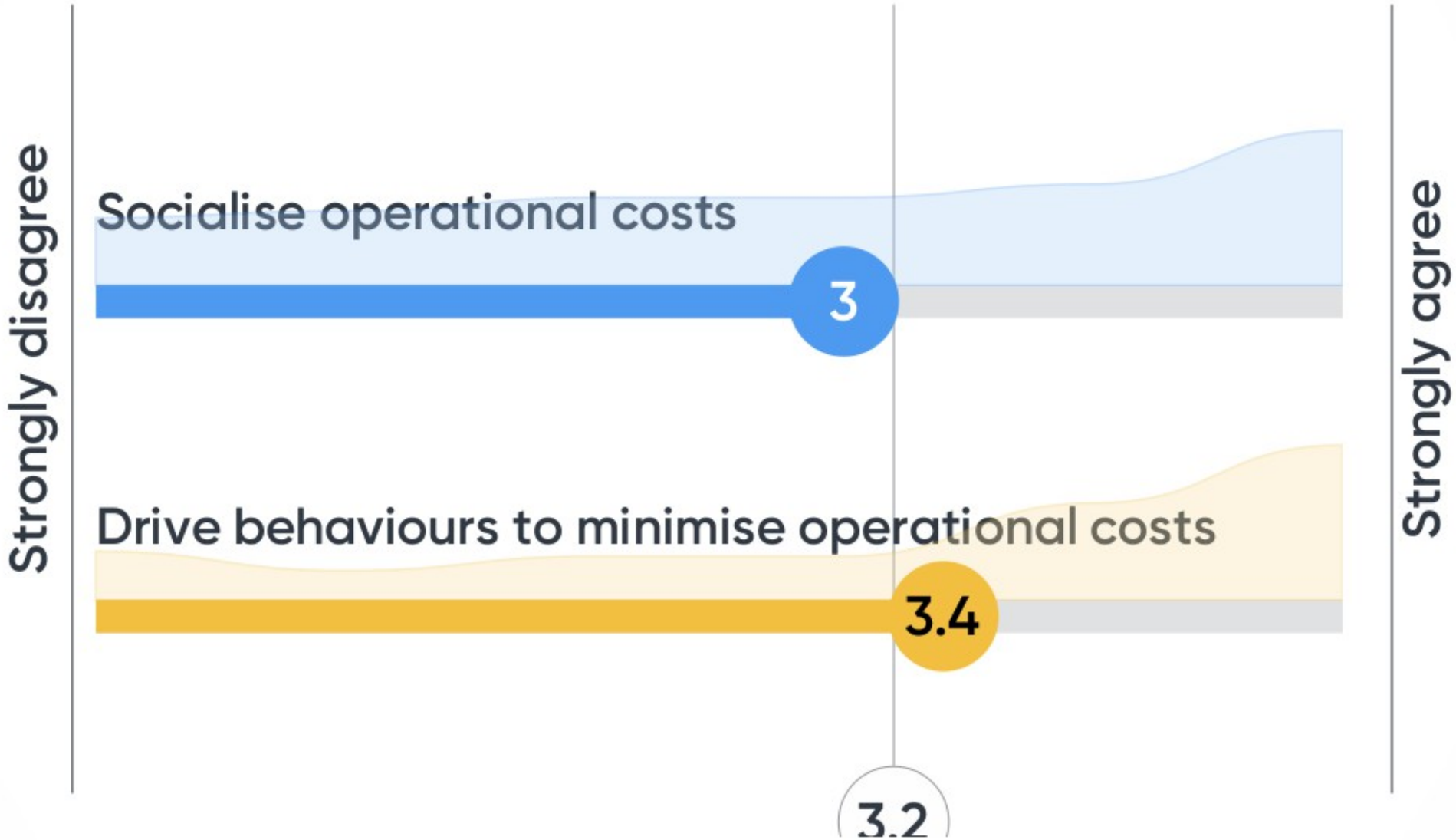

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ESO Workshop Survey Feedback

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5th October Workshop

12th October Workshop

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ESO Analysis Example

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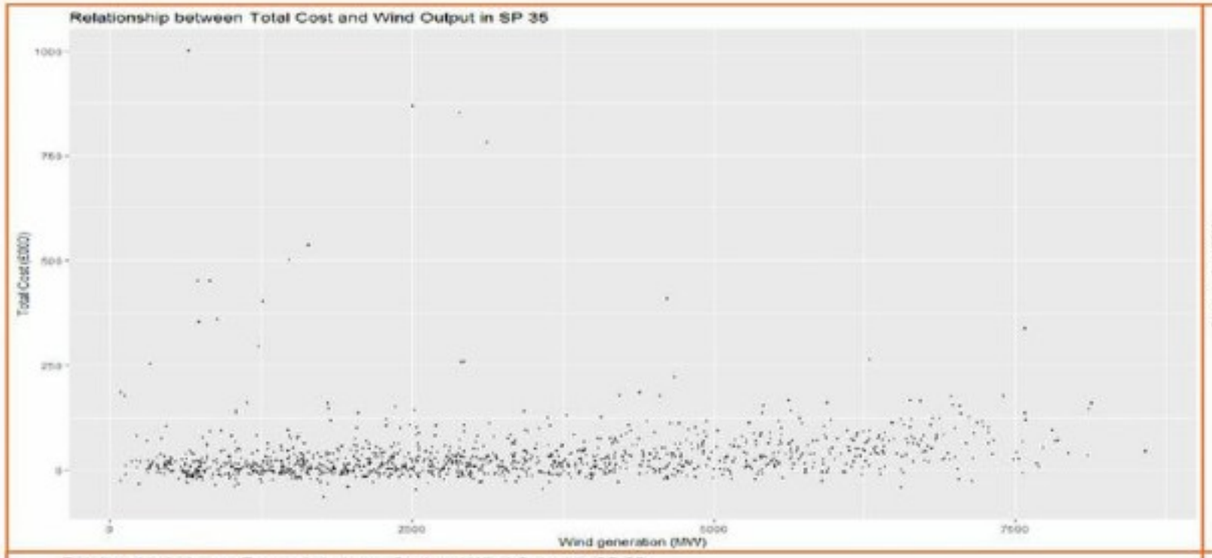

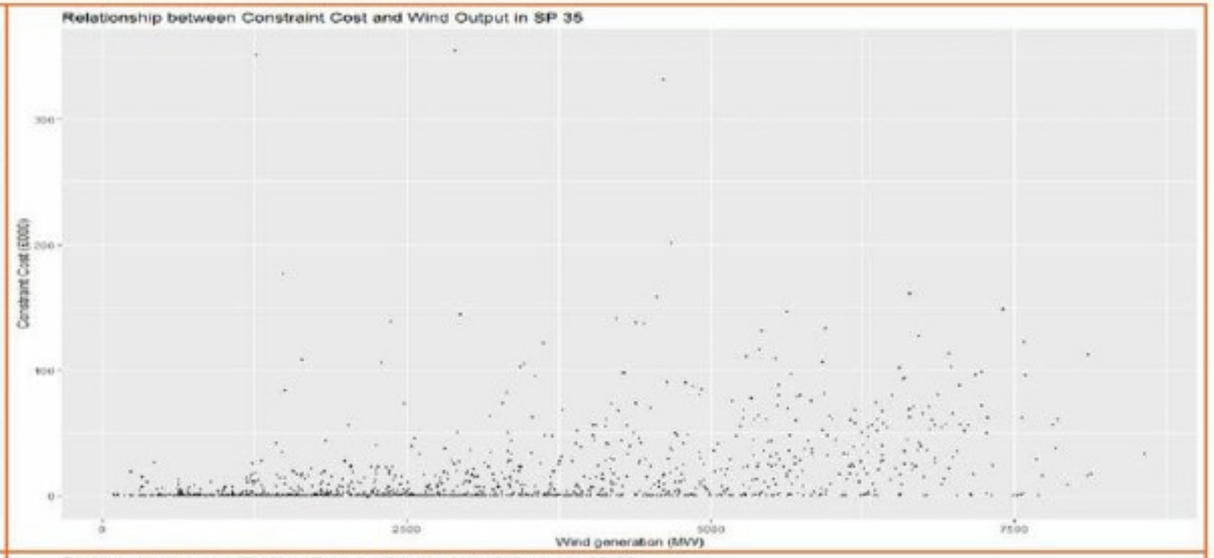

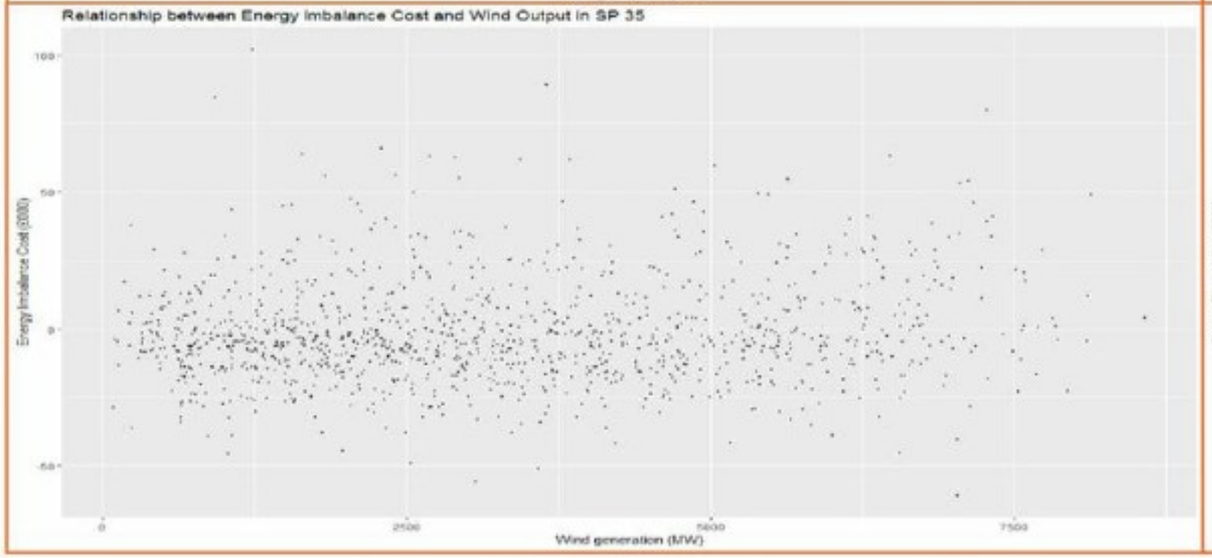

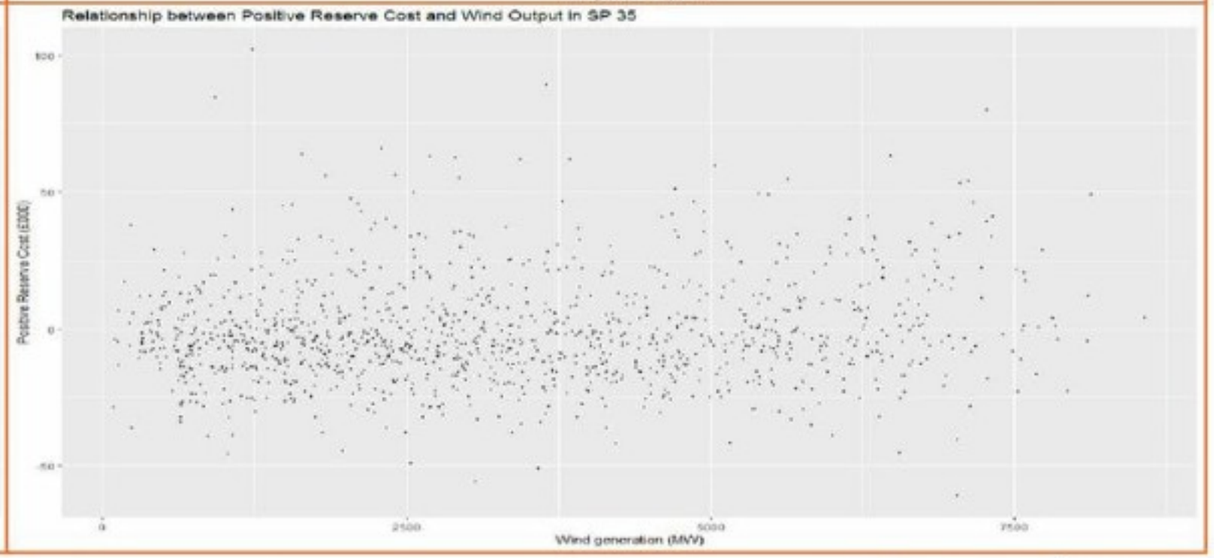

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ESO Analysis Example

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- It is sometimes assumed that there is a strong correlation between higher BSUoS costs and higher constraint costs due to higher wind generation output.

- This analysis shows there to be no meaningful correlation in the example Settlement Period (SP35) between:

    - Total costs and wind output
    - Constraint costs and wind output
    - Energy imbalance costs and wind output
    - Positive reserve costs and wind output

- We might conclude from this dataset that within current BSUoS charging there are no clear signals between BSUoS costs and wind generation output; this data-set is however limited.

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Day-Ahead BSUoS Forecast

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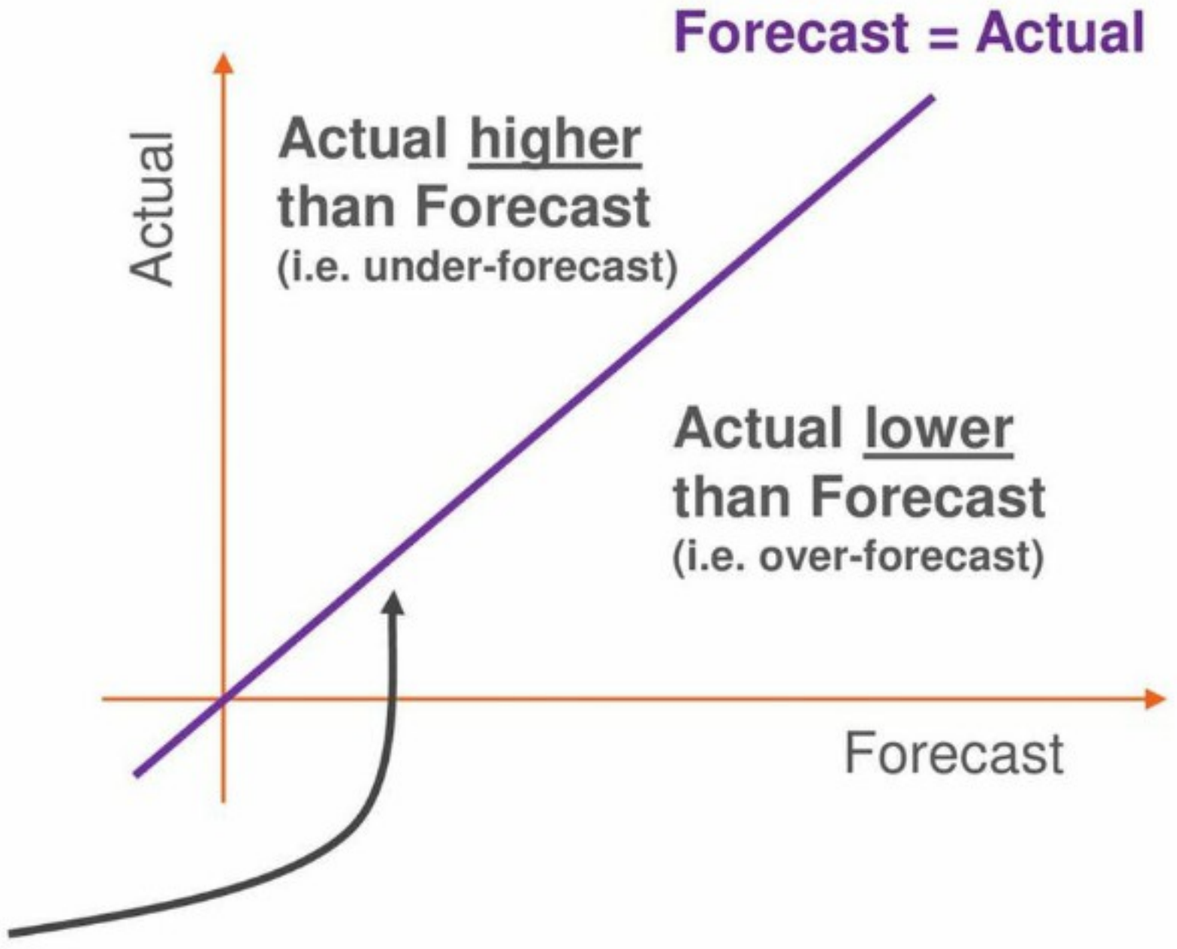
- **In December 2018, we introduced a day ahead half-hourly BSUoS forecast**
- **Using Scatterplots, we'll compare the December forecast to the actual data**



To be an effective forecast, the actual should be close to this line i.e. closer to the forecast

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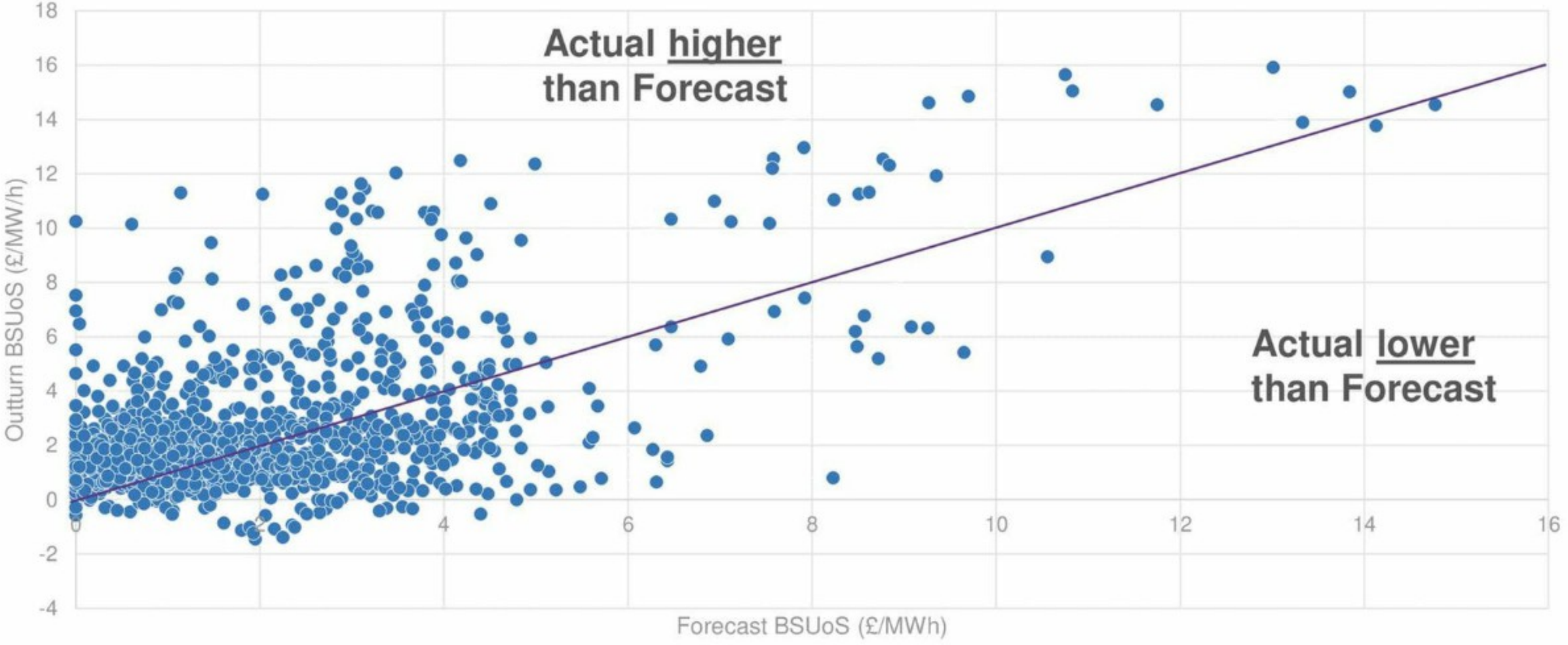
Outturn vs Day-Ahead Forecast BSUoS Tariff (Dec 2018)



BSUoS = Cost / Volumes

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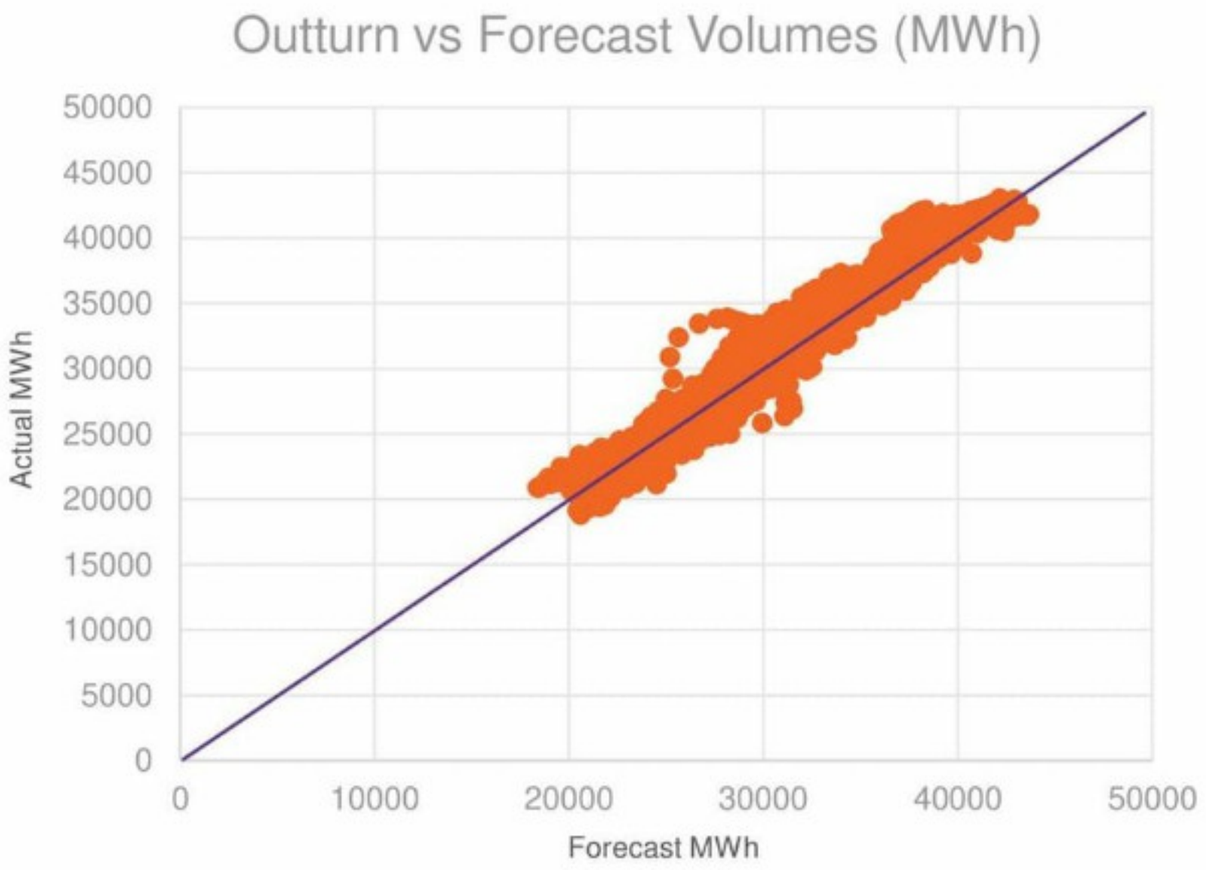

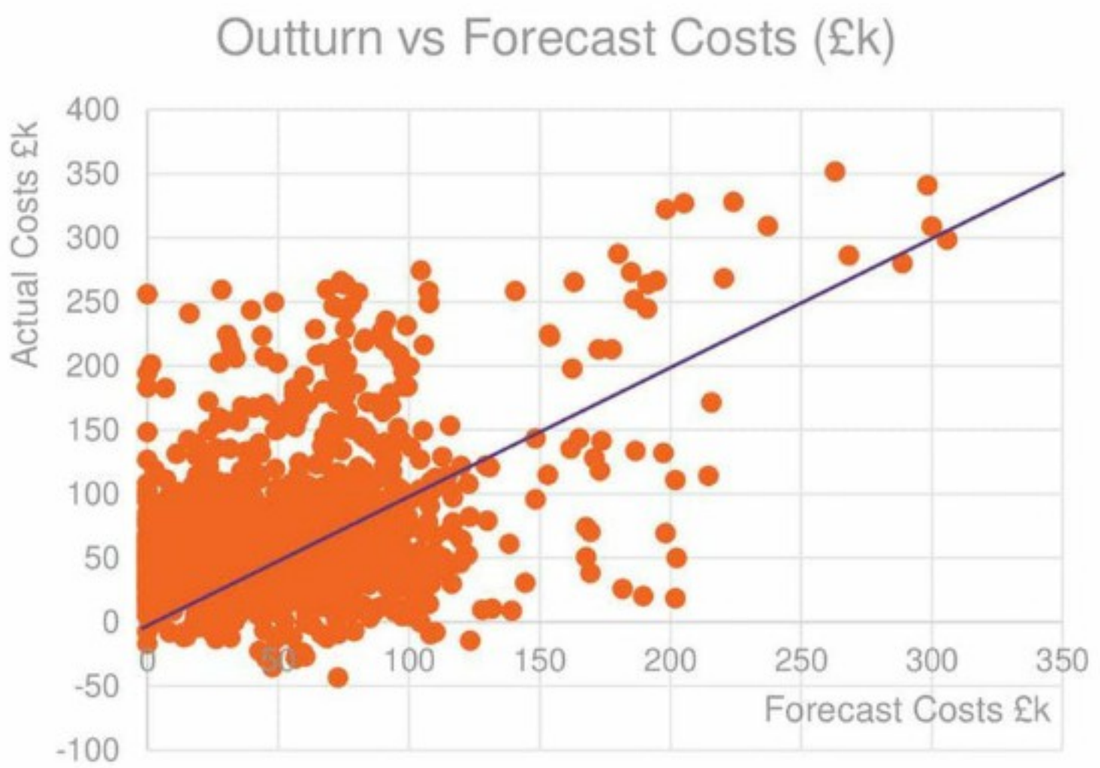

Volumes forecasts are good.

Error over the month is 1%.

Cost data is a lot harder to predict even at day-ahead.

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Your Contribution Session

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Your Contribution Session

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We thought it would be useful to provide an overview of some of the current cost components within BSUoS as follows.

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Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Test

HI Mike

No!!

NO

Too hard to forecast, so everyone makes their best guess

Absolutely not

No, this is not possible given the nature of the underlying costs and their drivers. BSUoS is best socialised.

Forecasting must improve significantly before foreward-looking signals can be provided.

Scope of BSUoS vs. information imbalance charge and following FPNs?

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Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

No the existing elements can not be reacted to - cost recovery mechanism

Very difficult To look at & therefore doesn't provide a signal

On the surface it's too volatile to forecast for this - it will depend on what the elements look like separately

High wind appears to drive some costs but it is not clear that reacting to that higher level drives behaviour which helps reduce that cost.

Selective half hour.

So many different services intermingled which are bound to have some signals but the aggregate unlikely to. How to focus costs on those driving that behaviour?

On a wider temporal basis, but not HalfHourly

No

Can you make amendments to reduce the costs of providing a service? Is it realistic to expect people to respond?

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Wind needs to be considered. Higher cost with wind, not clear if BSUOS drives behaviour. Does not provide a signal

ESO has only recently provided Day Ahead forecast. It is perhaps too early to tell whether parties are responding on a forward looking basis.

T-constraints realistic to net off but signal not split out so can't take that action. Constraints main driver of shape of BSUoS.

Duplication of signals for the same things

On an average trend basis you might see changes in behaviour e.g. time shifting of demand overnight, but not on a more granular/shorter-term basis

No, not acting as as FWL signal.

At present DUoS incentivises half hourly metered demand to be neither capacitive nor reactive, = to be net neutral as to reactive. Reactive is driven by demand, gen is solution. Would be better to DUoS-incentivise demand to be as per local need

No! The way the system operates will change significantly in the next five years, the lack of synchronous inertia will be felt regionaly and will manifest in higher voltage and RoCoF costs. Signals need to be created to identify issues

Information imbalance charge could apply minute by minute. Question whether this would work.

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Market sees what NGESO & exelon forecasts tells us. Don't know demand in distribution network. No granular info to offer assistance in balancing

As a signal, just provides more risk premium, which acts as an inverse signal

Distribution BSUoS: If it is auction based who can predict an auction outcome?

No locational element, waters down market signal

As an ex-post charge only a highly accurate forecast could provide a useful signal. This is not available at present.

Same info needed by all which should stop any Gaming.

Could give bill to those behind the constraint. Then thermal generation would react to it.

Is it up to task force to determine who pays - clarity on whether its who pays or what the charges represent is wanted

Need to be able to unpick socialisation of constraints.

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Even the entire of BSUoS is regarded as too volatile, people dislike the half-hourly component. How much more would they dislike volatile sub-components ?

Its not just wind that drives up BSUoS - it is the unavailability of the network e.g. who paid for west coast HVDC link being down in October and high BSUoS costs? Should have been network companies not generators.

Volatile charge, cannot predict,

Either lots of info required for industry or ESO needs to produce accurate forecast

Just see it as one revenue, not residual vs FWL

It would be very, very complex to disaggregate. Bid offer acceptances usually serve multiple purposes reactive, frequency response or reserve, locational - they have multiple values. How to attribute. Huge scope for disputes.

Does not drive customer behaviour, as too complex to understand.

Ex post charge currently can't forecast or react to

Constraint costs (e.g. from high wind output during low demand periods) could be made to be forward looking. This is especially important given the connect and manage policy

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Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Many variables and elements of the charge

How can a services procured ahead of time be attributed to a half hour?

The Balancing Mechanism link needs to be considered; participants generally seek revenue opportunities rather than to necessarily act in the interests of the system.

Impact of constraint will inevitably be on renewable generation who can do least to avoid it. BSUoS costs vs. carbon.

There are counterintuitive signal today, need to remove these before make it more positive. E.g demand won't come on at night when high wind as BSUOS costs too high

This should not drive behaviour, this is a cost recovery charge.

No! Constraint cost could create a signal for storage developers to develop systems that could serve a wide area. Through BSUoS people would be able to identify areas and volumes of energy creating a strong signal.

Fixed charge BSUOS mod got rejected by Ofgem/Grid.

How to integrate with other forward looking signals to mitigate constraints.

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Is ofgem comfortable that the incentives are there to reduce BSUoS rather than considering the split of how it is paid. Why have the costs increased?

From a supplier/consumer perspective, BSUOS forward pricing is generally too uncertain to respond to. Other elements take precedence: triad, CM, wholesale

No. BSUoS prices cannot accurately be predicted (even National Grid has a wide error margin!) meaning that you can't react. Constraint costs are not targeted at those who cause them but are socialised across those who help the system by generating

Remove counter intuitive signals before introducing new signals.

Can forecast in aggregate costs but not cost elements that apply to specific users

CMP250 had very strong support at Panel and workgroup and consultees

BSUoS can incentivise the wrong behaviour. Poss separate between demand and generation.

No, it's too volatile to respond to

Locational BSUoS may help.

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Better forecasting on ESO side is needed to determine if any element of BSUoS could be deemed forward-looking

Not currently

Maybe some energy elements

Yes, constraints, voltage and RoCoF

No. Cost of balancing system is signalled through imbalance price and energy market. Not BSUoS.

Risk of double counting costs reflected in other aspects of network charging.

Need to be clear what is in bsuos and what isn't before can start to answer

No as there is no one cause socialised as issues on network vary largely

Inbalance charges should already cover most, so unfair to come back and charge again. But so unpredictable not taken into consideration for investment decisions

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

No to volatile

Reactive power requirements are locational. Could a forward-looking signal be provided for reactive power requirements?

Constraint costs are the obvious thing to provide a forward-looking signal for

Demand vs distributed generation can cause confusion as all data is not available to provide clear signal

Different signals Being sent outside of bsuos which influences it for example EV charging

Can people respond to the signals is also important.

Not significantly

Cmp250 fixed charge bsuos

Volatile users of the system cause additional requirement for balancing, should bsuos charges be charged differently per users based on their volatility? Not only on demand, also generators?

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

Users behind constraint boundary targeted with BSUoS costs will factor this cost into their bid prices.

Cost are hard to predict with certainty so this limits the accuracy of forward looking charges.

Reactive Power should be predictable as demand which would impact on transmission connected generation

Look at ESO breakdown of costs and ask what behaviour are driving these costs?

Black start and SO incentives - can be removed so one less uncertainty. Still doesn't drive behaviour though. Forecast is important as need to respond to it correctly. If forecast is wrong you could make system worse

Something else may be required to drive flexibility signals rather than bsuos

No. Too complex and subjective to unravel reason particular ESO actions are taken. If signals high enough to be effective will result in many disputed charges.

Need to focus on variable costs separately

Yes, locational elements like reactive power and constaints

94

Are there existing elements of BSUoS which you believe currently provide a forward-looking signal which influences behaviour - if so, which and why?

Mentimeter

No

We need to understand what drives constraint costs. If this is mainly Scottish wind then need to consider what signals we want to send them

No

No

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

No

No. Too volatile, too interrelated with other levers

If separated out, temporal ancillary services could.

Locational, those behind constraints should be aware of that?

No, that signal better applied to TOs and charged in TNUoS

Reason for accepting an offer normally multiple, constraints and reserve and reactive and frequency response. Not one cause. Too hard to try and record reasons and split out effects, ghastly complicated and huge scope for disputes

Debate as to what cost reflective means.

If separated into those that can be forecasted

No, it is a socialized cost across the UK.

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

Need to decide who is causing cost in any given situation. Can identify marginal costs. But may be multiple players causing costs.

The volatility makes it too difficult to forecast and therefore respond to - the more complex it becomes

Cost by HH is volatile, if was cost a month / quarter may be less volatile, at the moment not possible

Possibly constraint costs. This would need to be done a way which works with locational TNUoS charges.

More transparency would improve investors ability to perform their role.

Scope to make wind contribute to some extent to constraint costs. Given they are compensated for lost revenue.

if is a residual element, does it need a locational element too?

Reactive power is locational

Locational aspects need to be cost reflective.

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

If to have a different BSUOS charge to Scotland and London, can you predict that? Are we trying to recover costs or drive behaviour.

presumption of socialisation - could make changes if this presumption then this could change how BSUoS is looked at.

Low inertia is driving much of this, including moving interconnector positions. Payments for inertia taken outside of the BSUoS would give better transparency.

ESO Internal allowance, incentives etc are not cost reflective and should be independent of demand.

Debate around if elements can be made for forward looking and that information can be provided in a simple way to embedded Generation, they would take actions (CHP)

Sentiment that intermittent renewables would broadly not be able to respond to any elements made forward looking

Cost reflective in a historical sense? Whoever generates over their constraint will be penalized.

If intent of Project TERRE is for all parties to be able to access the BM this should provide more supply, reducing balancing costs. There is a danger that the Task Force produces recommendations before the effects of TERRE on the BM have been known.

Ensure parameters are wide enough to think about issues holistic enough - terms of reference should allow for wider thinking

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

Frequency response. E.g. nuclear will have to hold extra reserve, interconnectors oftern driving lots of the cost. Smaller gens should cause far less. Scope for smaller gens to pay less.

There is a need to keep some level of socialisation but this has to be regional. BSUoS should be made cost reflective based on a regional basis to capture constraint, voltage and RoCoF costs. This has to create signals in absence of a system architec

Some elements have the potential, though is this desirable?

Wary of having incentive of making things smaller and smaller if not saving money.

Make the driver of reactive BSUS, demand in areas, correct via DUoS reactive charges (and for directly-connected, TNUoS) which should not presume ideal is neutral, but incentivise capacitive or reactive demand as appropriate to local reactive balance

Should wind be penalised, pay more as more volatile.

Net-imbalance volume is already forecast

if BSUoS is universally regarded as too volatile already, with discomfort at the half hourly varying component, how much more would parties dislike volatile sub-components ?

Should not subsidise generation, through network charges.

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

Unplanned outages currently socialised rather than on the network companies.

Huge cost from increasing Infrequent Infeed Loss Limit from 1320 MW to 1800 MW. Should new nuclear stations which haven't appeared (and don't look as though they're going to) pay this.

We should be looking at more flexible security standards

Increase granularity and accuracy of forecast by separating out constraint costs and understanding them.

No, it's socialised cost. Different tagging of elements and ESO actions would need to happen to have a better understanding on what elements could be cost-reflective

In EU (outwith GB), generators don't pay any BSUoS cost elements, interconnectors don't pay BSUoS, therefore generators in GB should not pay BSUoS or there isn't fair competition

Interconnector delays causing costs for BSUoS but not facing these.

National Grid is increasingly blind to imbalance - because imbalance and constraint is happening on the distribution network. To be cost reflective you require better forecasts - and better forecasts will need to be at the distribution level

C&M designed so can't blame TO for that. But can for unplanned outages.

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

Splitting to 2 BSUoS charges may be doable but considering what should and shouldn't go into a fixed and varying charge may be too complicated

Constraints could be targeted at those who cause them (but who is that?) and this requires further investigation. All other elements appear sensible for socialisation.

Need to move to there being a cost per MVA and a cost per MWh. Reduction in energy transferred across the transmission system means cost per MWh is rising but the benefit of the transmission is stability as well as power transfer.

Key to understanding potential is understand the overall outcome for each element - if made cost reflective would the signal be strong enough?

Who is causing the reserve costs by not following their FPNs.

It would be really useful to understand exactly what it included within this and who is paying what parts?

Counter-productive to provide half hour signal to users that cannot usefully respond (eg wind).

Sunk costs such as black start should remain residual

Least market distortion through charging final demand only

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

Is the right incentive between constraining and reinforcing at the moment?

post reform of ancillary services, will ffr and other such products be included in the Bsuos charges?

Potentially, but could this effectively be recovered by duos and/or tnuos? Is bsuos significant enough... if not, let's simplify it.

Set BSUoS long term (12months) and charge from demand only.

Lack of understanding of what is included in BSUOS, and how it is calculates

BSUOS should not be a subsidy for small generators.

Plant that lack inertia should be made to provide it, or pay for their lack which causes costs

Definition of forward looking needs to be clarified in the context of BSUoS. In distribution and transmission this refers to investment and new connections. In balancing is forward looking on a D+1 basis?

If there is to be level playing field between T and D generation should costs on D-connected generation be capped at 2.50 euros?

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Do you think any existing elements of BSUoS have the potential to be made more cost-reflective and provide better forward-looking signals and why?

Mentimeter

Yes! In nodal or regional basis. Forward looking BSUoS are mainly locatinal by nature.

A couple may but this seems extremely complicated and likely to have limited benefits

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Do you think that it would be feasible to charge any of those potentially cost-reflective elements (if any) on a more forward-looking basis and how?

Mentimeter

No. CMP308 is a good solution.

Definition of cost reflectivity

Needs a proactive DSO first, to be able to consider

No

CMP250, fixed charge is the best way to approach this.

No some elements can be forecasted in aggregate but not reacted to

Difficult as you don't know who is causing the constraint. may be that cheapest to constrain rather than causing the constraint.

It is important to integrate these with the ongoing TNUoS methodology

Provided the charge is stable/predictable. But this is unlikely

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Do you think that it would be feasible to charge any of those potentially cost-reflective elements (if any) on a more forward-looking basis and how?

Mentimeter

Thermal constraints off first as they are cheapest but ness the cause.

We struggle to determine one, and if so then the determination of who is charged becomes the question

Scope to go to Locational Marginal Pricing.

Yes - black start; Yes - reactive power. Network outages - charged to network companies. Frequency response - socialise. Constraints - socialise (if the generators have firm access rights).

Regulatory charges by its nature should not cause rapid changes or increaes in charges.

May well have unintended impacts on TNUoS.

Who should pay for being out of balance? Those who are out of balance

Practically, can it realistically be hedged?

Costs are hard to predict so this limits the accuracy of forward looking charges.

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Do you think that it would be feasible to charge any of those potentially cost-reflective elements (if any) on a more forward-looking basis and how?

Mentimeter

Are we jumping the gun? Should we wait to see what DSOs can provide to balance locally

DUOS and TNUOS, Monopoly charges, changing them so quickly under the whim of the regulator is not right. Should give more notice, of what we are going to do and a league time.

If want to penalise out of balance, should have spoiler cash out price? NIV is different to BSUOS charging base

50/50 demand/generation split could be looked at. Could be more targeted to get the response that helps.

It should be possible to target constraints on those causing them. However, how accurately can you charge this?

Important not just to shift costs round the same pot?

What are the big costs, what are they associated with, and how much is forecast? How long should the forward looking costs be charged over

May end up infeasible. Could be capacity basis to help avoid embedded benefits.

How does the BSUoS charge feed through to the signals that a DSO might be sending and how can you make sure they don't conflict with one another

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Do you think that it would be feasible to charge any of those potentially cost-reflective elements (if any) on a more forward-looking basis and how?

Mentimeter

easy access data at a simple £/MWh would be needed to react, especially as smaller embedded generator

What do we want it to do? Is it desirable?

Should we determine what parts should be socialised?

CMP 250 best way to move dorward

Ex-post calc precludes any useful forward-looking element. It is just a cost.

BSUoS has scope to send a signal to EV that helps with national balancing?

Most feasible on a FWL basis are those want to socialise more. Would not be able to for constraints.

Simpler solution is to reduce the significance of BSUoS

Need incentive for constraint management.

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Do you think that it would be feasible to charge any of those potentially cost-reflective elements (if any) on a more forward-looking basis and how?

Mentimeter

Open up markets rather than just thinking about residual vs. forward-looking charges.

Difficult to get accurate forward view as it will tend tio reflect current out turn not future.

valatile BSUoS vs investment - how to weight the benefits of investment and volatility

TNUOS, should this be taken into account on the methodology and needs to be tested and thought through.

Zonal BSUoS to help charge for constraints.

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How would you like to be updated or engaged by the Task Force leading up to their Final Report in May 2019?

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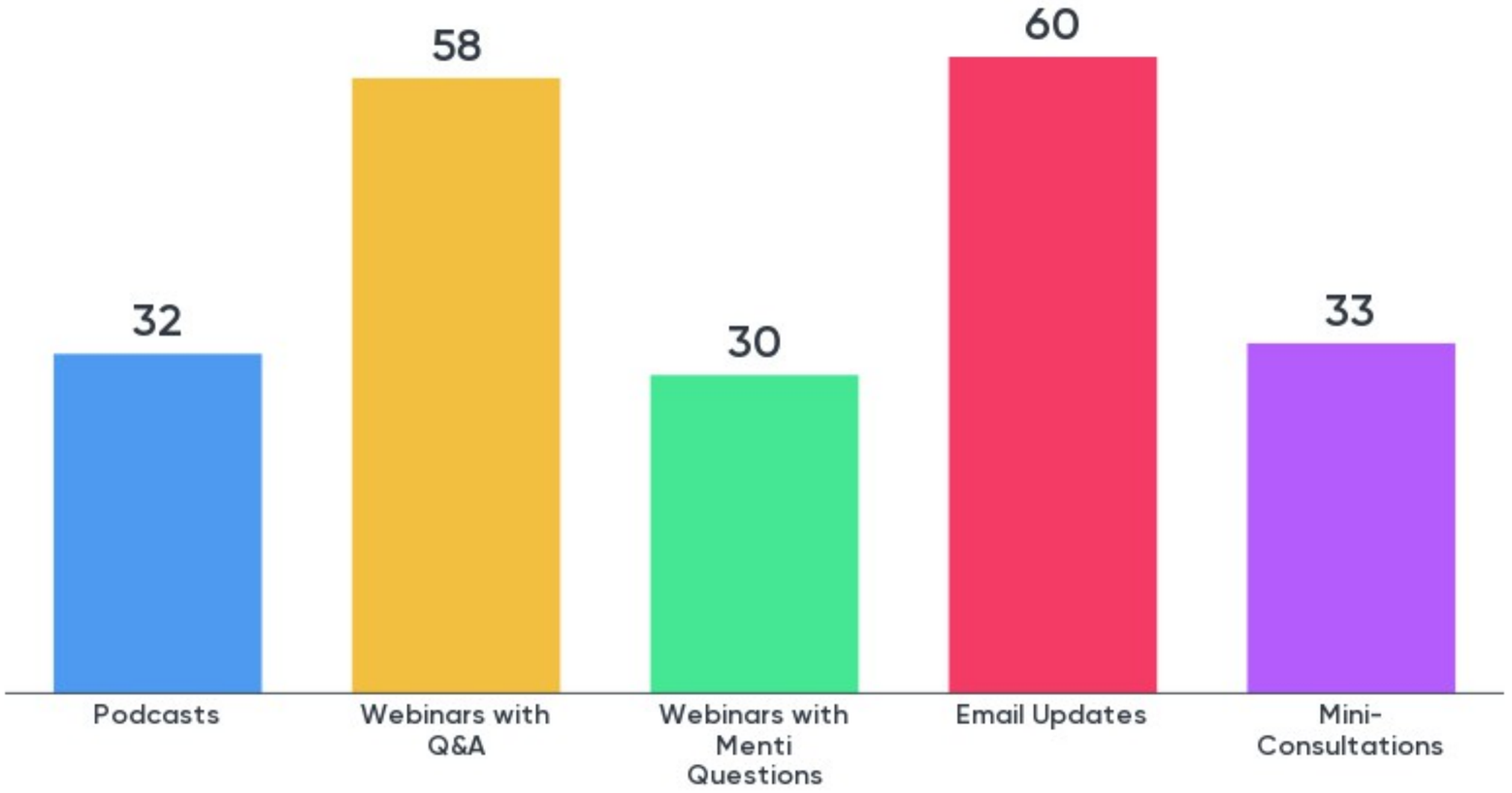

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Thanks for listening and for your views!

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Lunch Question - is there anything else you would like to share with the ESO or the Task Force, including any modelling suggestions?

Mentimeter

Updates to the short summaries on the Charging Futures Website would be useful

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Ask the experts

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Access & Forward Looking Charges	Targeted Charging Review	Balancing Services Charges Task Force
• Jon Parker • Josh Haskett	• Andrew Self • Kayt Button • Sean Hennity • Dominic Green	• Mike Oxenham

Charging Futures

Charging Futures

Reforming electricity charging together

Forum

Mentimeter

Lunch

12:25 – 13:10

Lunch Question - is there anything else you would like to share with the ESO or the Task Force, including any modelling suggestions?

Mentimeter

BSUOS should be on final demand to level playing field with European generation. Will continue to be flow over interconnecters, regardless of brexit

no

Holistic view of all charges and their interaction. Focus on resulting outcomes or behaviour, not market principles. Consider using residual charges to strengthen forward looking price signals. Clarify carbon target impact.

N/a

Hello

Stop trying to make us answer your questions with your answers.

If embedded generators need to pay BSUOS they should be dispatched fairly when in merit in the BM. It is not a level playing field if EGs have to pay charges but don't get called in the BM as grid favour large transmission connected generators

No

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