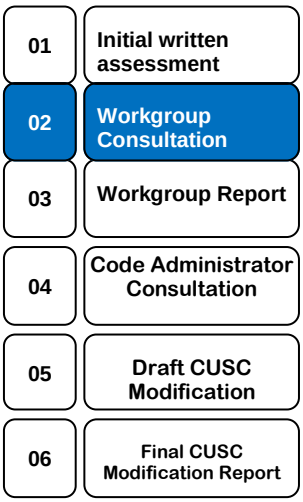
Stage 02: Workgroup Consultation

At what stage is this document in the process?

CMP281: 'Removal of BSUoS Charges from Energy Taken from the National Grid System by Storage Facilities'



Purpose of Modification: CMP281 seeks to remove liability from storage facilities for Balancing Services Use of System (BSUoS) charges on imports.

This document contains the discussion of the Workgroup which formed in July 2017 to develop and assess the proposal. Any interested party is able to make a response in line with the guidance set out in Section 6 of this document.

Published on: `22 October 2018

Length of Consultation: 15 Working days

Responses by: 12 November 2018

Medium Impact:

National Grid: Changes will be required to the BSUoS billing systems to tag out the appropriate metered import volumes for the purpose of the BSUoS charging base.

Low Impact:

Suppliers: The reduced recovery of BSUoS charges from generator parties, including storage facilities, will need to be recovered from the balance of parties liable to BSUoS. The Proposer estimates the impact to be small; In 2016/17 and 2017/18 pumped storage facilities paid £12.4m and £12.3m BSUoS on their imports. The increase in charges recovered from other Users would have amounted to £0.02/MWh (0.8%) each of these years.

Contents

Timetable

The Code Administrator recommends the following timetable:	
Workgroup Consultation issued to the Industry	22 October 2018
Modification concluded by Workgroup	December 2018
Modification Presented to Panel	14 December 2018
Code Administrator Consultation to Industry	17 December 2018
Draft Final Modification Report Presented to Panel	17 January 2019
Modification Panel Decision	25 January 2019
Final Modification Report Issued to Authority	4 February 2019
Authority Decision	1 March 2019

Any questions?

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1 Format of this report and Terms of Reference

This report contains the discussion of the Workgroup which formed in July 2017 to develop and assess the proposal.

Section 2 (Original Proposal) and Section 3 (Proposer's solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Workgroup contains the discussion by the Workgroup on the Proposal and the potential solution.

The CUSC Panel detailed in the Terms of Reference the scope of work for the CMP281 Workgroup and the specific areas that the Workgroup should consider.

The table below details these specific areas and where the Workgroup have covered them or will cover post Workgroup Consultation.

The full Terms of Reference can be found in Annex 1.

Table 1: CMP281 ToR

Specific Area	Location in the report
a). Consider co-location of generation and storage assets	Section 4, Page 20
b) Consider the practical implications of solution e.g. that all metered data is available to National Grid to support the proposed solution	Throughout Section 4
c) Consider the impacts on RCRC and BSC arrangements	Section 4, Page 18
d). Consider the interaction with CMP250	Section 4, Page 23
e) Consider impacts on foot-room, High Frequency Response and fuel equivalency (e.g. battery and conventional generation).	Section 4, Page 23

2 Original Proposal

Section 2 (Original Proposal) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Workgroup contains the discussion by the Workgroup on the Proposal and the potential solution.

Defect

Under the current Charging Methodology, storage providers pay BSUoS on both their import and export volumes (in addition to the BSUoS costs implicit in their 'fuel cost'). Storage providers are therefore contributing more towards the cost of balancing the system than other users. Storage providers, who compete with generators in the provision of ancillary services, are therefore at a competitive disadvantage, which is likely to distort market outcomes and so disadvantage consumers.

What

CUSC 14.29.4 states that all Parties with the exception of BMUs and Trading Units associated with Interconnectors are liable for BSUoS charges. This includes energy taken from the grid by storage facilities. All CUSC Parties acting as Generators and Suppliers (for the avoidance of doubt excluding all BMUs and Trading Units associated with Interconnectors) are liable for Balancing Services Use of System charges based on their energy taken from or supplied to the National Grid system in each half-hour Settlement period.

Why

Asking storage operators to make a greater contribution (at least 2-fold) towards the recovery of BSUoS charges than their competitors is disproportionate - the requirement to pay BSUoS on both of the import and export volumes should be removed from these facilities. Failure to address this issue will perpetuate a distortion to competition between storage operators and other generators. Moreover, given the nature of storage facilities and the system support role that they play, they are very unlikely to impose such balancing costs on the system when compared to other users.

How

A solution would be to change the BSUoS Charging Methodology within section 14 of the CUSC to remove the liability of BSUoS on storage facilities import volumes.

This can be achieved through defining an Exemptible Storage BMU and removing the liability to pay BSUoS on their imports from the National Grid system. Once defined, the exemption would mirror that in place for BMUs and Trading Units associated with Interconnectors.

Detail on why change

Storage operators are liable for the BSUoS on both their import and export volumes to and from the transmission network (in addition to the BSUoS costs implicit in their 'fuel

cost'). This means that storage operators make a significantly greater contribution towards the recovery of BSUoS charges than their competitors. Failure to address this issue will perpetuate a distortion to competition between storage operators and other generators, and could hinder the development of new storage that could meet the increasing demand for flexibility. Moreover, given the nature of storage facilities and the system support role that they play, they are very unlikely to impose such balancing costs on the system when compared to other users.

3 Proposer's solution

Section 3 (Proposer's solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Workgroup contains the discussion by the Workgroup on the Proposal and the potential solution.

A solution is to amend the text in CUSC 14.29.4 along the following lines (subject to legal drafting):

> All CUSC Parties acting as Generators and Suppliers (for the avoidance of doubt excluding all BMUs and Trading Units associated with Interconnectors) are liable for Balancing Services Use of System charges based on their energy taken from or supplied to the National Grid system in each half-hour Settlement period, except that energy taken from the system by Exemptible Storage BMUs shall be disregarded.
>
> For purpose of Section 14(2) of the CUSC – The Statement of the Balancing Services Use of System Charging Methodology –
>
> An Exemptible Storage BMU is a BMU that consists only of:
>
> > (a) a means of converting electricity imported from the National Grid system into a form of energy which can be stored, and of storing the energy which has been so converted; and
> >
> > (b) a generating unit which is wholly or mainly used to re-convert the stored energy into electrical energy for the purpose of its supply to the National Grid system.

Details of any potential cross-code, consumer or environmental impacts and attach or reference any other, related work.

We do not believe that there are any cross-code impacts from this Proposal.

Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

No. There is currently no Significant Code Review (SCR) underway which impacts BSUoS. In addition, Ofgem has said that it thinks that the relative disadvantage for storage from the current arrangements – whereby storage pays BSUoS as both demand and generation – is sufficiently material that it should be addressed ahead of any potential future change to BSUoS.

Consumer Impacts

Removal of this distortion should result in fairer allocation of the costs of balancing the system and hence in stronger competition, which should in turn allow discovery of new lower cost outcomes and new forms of flexibility.

4 Workgroup Discussions

The Workgroup convened 8 times to discuss the issue, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the CUSC Applicable Objectives. The Workgroup will in due course conclude these tasks after this consultation (taking account of responses to this consultation).

The Proposer presented the defect that they had identified in the CMP281 proposal and highlighted: (1) the fact that storage providers are contributing more towards the cost of balancing the system than other users; (2) the requirement to pay BSUoS on both of the import and export volumes should be removed from these facilities; and (3) failure to address this issue will perpetuate a distortion to competition between storage operators and other providers of ancillary services.

The Workgroup explored a number of aspects in its meetings to understand the implications of the proposed defect and solutions. The discussions and views of the Workgroup are outlined below.

Introduction

The workgroup discussed the proposed modification in the context of the current legislative framework for generation activities and the generation licence changes to accommodate storage facilities proposed by Ofgem and BEIS[1]. The workgroup noted that the Electricity Act 1989 includes the following provisions:

- Clause 4 (1) prohibits "*unlicensed supply*" of electricity by a "*person*" who under 4 (1)(a) "*generates electricity for the purpose of giving a supply to any premises or enabling a supply to be so given*"… "*shall be guilty of an offence unless he is authorised to do so by a licence*";

- Clause 4 (4) defines "generate" as "*in relation to electricity, means generate at a relevant place*";

- Clause 6 (1)(a) enables the authority to grant a licence "*a licence authorising a person to generate electricity for the purpose of giving a supply to any premises or enabling a supply to be so given ("a generation licence*")"; and

- Clause 6 ((9) an "*electricity generator*" "*means any person who is authorised by a generation licence to generate electricity except where that person is acting otherwise than for purposes connected with the carrying on of activities authorised by the licence*";

The workgroup noted that the provisions of the Electricity Act above allow a person with an Electricity Generation Licence to supply electricity to facilities, including storage facilities. under the terms of this licence, provided such facilities are associated with the generation activities authorised by the licence under the Act. This supply of electricity under a Generation Licence is the current practice at all large power stations, including pumped storage, operated by Generation Licensees.

[1] "Clarifying the regulatory framework for electricity storage: licensing, Ofgem, 29th September 2017

The proposed solution under the CMP281 modification was discussed in the context of the legislative framework outlined above. The proposal as originally defined required separate identification of storage facilities reflecting the proposed definition of storage under the new form of Generation Licence. In the context of the activities permissible under the Electricity Act and the generation licence it became clear the such detailed provisions may not be required as part of the CMP281 solution. Consequently the CMP281 proposal was refined. It is now based on the removal of "off taking" BSUoS charges from all generation facilities operated under a generation licence.

The workgroup noted that it would be the responsibility of the relevant party to ensure compliance with its generation licence and the Electricity Act in relation to supply of electricity under a generation licence. In this context if was felt that no additional performance assurance or auditing process was required under the CUSC arrangements (i.e. the CUSC would rely on self-compliance with the legislative framework, noting that breach of licence and/or breach of the Act could have serious consequences).

The workgroup discussed the process for enabling a party to identify the BMUs and Trading Units that are supplied under the terms of a Generation Licence. For the purpose of seeking relief from off taking BSUoS charges a new process was discussed by the workgroup. This could be detailed within the CUSC to allow parties to register with National Grid (if this is the optimal solution) those BMUs and Trading Units that are operated under a generation licence. National Grid billing processes could then be adapted to remove the offtaking BSUoS charge for the relevant BMUs and Trading Units. The NGESO representative agreed to take this away and come back to the workgroup.

The issue of small scale generation facilities in the context of the CMP281 proposal and the legislative framework was discussed. It was noted that in order to benefit from the revised CMP281 solution, parties would have to supply the associated BMUs and Trading Units under the terms of a generation licence. Provided that the CMP281 process is in place and parties have access to the relevant metered volume, then all smaller parties operating BMUs and Trading Units under a generation licence will be able to take advantage of the approach outlined[2].

The workgroup believed that the revised solution to CMP281 which relies on the current legislative framework facilitated an enduring approach to the treatment of offtaking BSUoS charges for all generation licence holders. It also was a simple solution when compared with the solution outlined in the original modification proposal. The workgroup therefore adopted the revised solution outlined above as the original proposal to be taken forward.

In light of the workgroup discussions, the Proposer indicated that he was minded to amend the Original Proposal so that BMUs and Trading Units that are supplied under the terms of a Generation Licence should be relieved from off taking BSUoS. This

[2] Note: This is not the case under P280 charges in relate to liabilities for the demand TNUoS residual where the charging base is defined in relation to parties with a bilateral agreement with National Grid.

would include the storage facilities outlined in the original proposal and extend the relief to all generators where the supply is made under the terms of a generation licence.

1. Interaction of CMP281 and Ofgem's SCR/TCR and wider issues to consider

The July 2017 statement from the Government and Ofgem is set out on pages 11 and 12 of the Government and Ofgem Smart Systems and Flexibility Plan [3]. The relevant text says:

It is important that network charges do not prevent a level playing field between different providers of flexibility. It is clear from responses to the CFE and from our engagement with stakeholders that the current network charging arrangements can create a relative disadvantage for storage when competing to provide services.

Ofgem's Targeted Charging Review (TCR) consultation re-asserted its view that while storage should pay forward-looking network charges for both import and export, there are instances where storage may currently pay more towards the residual cost of the network than other network users. The consultation sets out a number of proposals to address this. The proposals include removing demand residual charges at transmission and distribution level and reducing BSUoS charges for storage. The proposed changes would apply to standalone storage and storage co-located with generation.

Ofgem believes that the relative disadvantage for storage under the current network charging arrangements is sufficiently material that it should be addressed ahead of any wider changes that may take place as result of the TCR. Ofgem therefore proposes storage charges should be taken forward directly by industry through the code governance process, rather than forming part of a wider significant code review. Ofgem is currently reviewing responses to the TCR, which closed on 5 May, and will publish a response in the summer

Following this,Ofgem's Targeted Charging Review – Significant Code review launch statement dated 4 August 2017[4], it states that:

"The scope of the SCR excludes:

Charging arrangements for storage. Our current thinking is that industry is best placed to bring forward modification proposals to make changes within the current charging framework. We note that at the time of this letter, two code modifications have been raised to address BSUoS and TNUoS charging for storage [CMP281 and CMP280]. We reserve the option, if necessary, of bringing storage charges back into the SCR, and issuing a direction to one or more industry parties to raise modifications."

In their November 2017 update [Targeted Charging Review: update on approach to reviewing residual charging arrangements] Ofgem stated that "there are strong arguments to support recovering residual charges from demand, rather than from

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/631656/smart-energy-systems-summaries-responses.pdf

[4] https://www.ofgem.gov.uk/system/files/docs/2017/08/tcr_scr_launch_letter.pdf

generators or a combination of demand and generators." Further, Ofgem stated [1.12]" In addition, we have set out our views about potential concerns with storage charges and encouraged industry to take these issues forward. We have also indicated that it may be appropriate to consider reforming BSUoS charges in line with transmission and distribution residual charges, If more fundamental reform of BSUoS is not undertake, for example, through our electricity network access project."

In their 23 July 2018 consultation [Getting more out of our electricity networks by reforming access and forward looking charging arrangements], Ofgem stated:

[2.27] "Although users can anticipate future BSUoS charges and take action to minimise their exposure to these charges, the costs recovered through BSUoS are not targeted on those users in a forward-looking cost-reflective manner, and instead 'socialised' across all relevant users."

And

[2.31] "We consider that there may be scope to improve forward-looking locational signals sent through BSUoS and TNUoS arrangements **but do not see it as sufficiently high priority to include in an immediate review**.

The Proposer does not see any impediment to progressing with a solution to the defect identified under CMP281 pending any future review of BSUoS charging arrangements.

As Ofgem have not exercised the option to bring storage charging back within the scope of the SCR we can assume that CMP281 remains out of the scope of the SCR.

Since these publications, Ofgem has shared more material giving industry more insight into their direction of thinking regarding BSUoS:

- **BSUoS Summary Note (January 2018):**
  http://www.chargingfutures.com/media/1112/charging-futures_bsuos_summary_jan18.pdf

  This paper details that Ofgem's Electricity Network Access (ENA) project may or may not lead to changes that will affect some of the revenues recovered by BSUoS. This would be through work looking at the residual element of charges and whether elements of BSUoS will change or not. Ofgem also offer a table of 4 options which detail the possible outcomes of this work:

The possible outcomes for future BSUoS are set out below.

Decision on BSUoS	Electricity Network Access project	Targeted Charging Review
Option 1: Change recovery of constraint management cost charges	May re-design or replace BSUoS charges that recover the costs relating to constraint management	May align *remaining* BSUoS charges with our approach to network residual charges
Option 2: Keep one set of BSUoS charges	May conclude no change to the element of BSUoS that recovers constraint management costs	May align *all* current BSUoS charges with our approach to network residual charges

This information needs to be considered as part of the solution.

- **Storage charging Summary note (February 2018):** http://www.chargingfutures.com/media/1126/cf_-storage-charging-summary-note-feb-2018.pdf

  Ofgem states in this documents that "…It is Ofgem's view that storage should continue to pay forward-looking network charges for both import and export (noting that forward-looking network charges are currently under review in the Electricity Network Access project)."

  Therefore, if elements of BSUoS change and there are clear residual and forward looking elements, it will need to be considered as part of the solution to ensure it is future-proof.

- **Ofgem's Access &Forward-Looking Charges consultation document (July 2018):** https://www.ofgem.gov.uk/system/files/docs/2018/07/network_access_consultation_july_2018_-_final.pdf

  Within this document, Ofgem give further insight into their views on BSUoS:

  - BSUoS currently is more of a cost recovery charge, rather than a forward-looking charge, and does not contain a locational element.
  - Cost are recovered through BSUoS in a socialised and homogenous manner at present. BSUoS charges can be anticipated and exposure to them minimised, however charges are not targeted on these users in a forward-looking cost reflective way.
  - Ofgem are considering BSUoS as part of the TCR:SCR and they are also considering it as part of CMP250. The decision on BSC modification P344 reduces the justification for different approaches to BSUoS charging.
  - Ofgem recognise that the Connect and Manage scheme is leading to higher constraint costs for the ESO (the Western Link should help to reduce these costs once operational). Therefore, there is value in recovering costs in a more cost reflective manner. They are aware that Government would need to approve any changes to this.
  - Ofgem also note that there is scope to improve forward looking and locational signals sent through BSUoS but they do not feel that this is a high priority area that needs immediate review. However, Ofgem do see value in further work on BSUoS more generally, to consider if it can

provide forward-looking signals for the different elements it recovers and whether it can be made more cost reflective.

- Ofgem also note that BSUoS embedded benefits are under review as part of the TCR. If BSUoS remains a cost recovery charge then they will consider whether to reform BSUoS in line with reforms to TNUoS and DUoS residual charges as part of the TCR.

These points also need to be considered by the Workgroup when creating a solution for CMP281.

- **Wider defects**

  Appendix 2 details work carried out by the proposer which highlights wider defects with BSUoS as a charge:

  - It is counter-intuitive by nature. In that costs incurred by non-beneficial behaviour are picked up but others who have no impact or are acting in a beneficial way (for the system) and so are penalised for doing so. For example, when there is high wind overnight this leads to the ESO having to take actions to constrain off wind. This causes BSUoS costs to be high, due to higher constraint costs and so when pumped storage units pump overnight (providing demand on the system and times when there is low demand and higher generation) they are liable for these high BSUoS costs. Therefore, the current application of BSUoS does not provide an incentive for beneficial behaviour, costs are not allocated properly (mainly constraint costs) and BSUoS is not cost reflective, which are wider defects than catered for in CMP281.

2. **Current charging arrangements for transmission-connected and both large and small distribution-connected generation and storage**

		T Final Demand	T Generation	T Storage†	D Larger EG**	D Larger Storage**†	D Smaller EG*	D Smaller Storage*†	D Demand
Transmission residual	Generation		✔	✔	✔	✔			
	Demand	✔	✔	✔	✔	✔	Paid††	Paid††	✔
Distribution residual	Generation				Only EHV pay#	Only EHV pay#	Only EHV pay#	Only EHV pay#	
	Demand				✔	✔	✔	✔	✔
Balancing	Generation		✔	✔	✔	✔			
	Demand	✔	✔	✔	✔	✔	Paid	Paid	✔

✔ - Pay the charge Paid – can get paid the inverse of the charge when generating
* <100MW EG **>100MW EG
† - may be affected by ongoing storage modifications CMP280 & CMP281
†† - will be replaced by dedicated embedded export tariff following CMP264/5 WACM4 implementation
# - only those connected at HEV level pay distribution demand residuals. All other are exempted

3. **What type of registration process would be needed to determine those units captured under CMP281**The updated Original solution to CMP281 could require National Grid to maintain a register of offtaking Trading Units and BM Units supplied by a Generation Licensee under a Generation Licence. The purpose of this register will be to identify those parties whose metered demand volumes should be excluded from the BSUoS billing calculation. Due to the small number of parties identified to date as qualifying for exemption under CMP281 this register should be maintained on a manual basis.

   Parties seeking inclusion on the register of parties exempt from Demand BSUoS charges should contact the BSUoS billing team at National Grid providing confirmation that they hold a generation licence and that offtake for which they seek exemption is supplied under their Generation Licence.

   Any Party which erroneously registers an offtake with National Grid billing team would be in breach of its Generation Licence and subject to the sanctions available under that Licence (potentially including fines up to 10% of the licensee's turnover).

4. **View from the Proposer on why CMP281 would not be discriminatory**

   The Proposer has amended the Original proposal to extend relief from off-taking BSUoS to all supplies made under the terms of a generation licence which should result in non-discriminatory treatment of off-taking volumes from both electricity storage facilities and generation BM Units and Trading Units

5. **View from some Workgroup members on why CMP281 would be discriminatory**

   - Why CMP281 differs from CMP280 in the treatment of SVA connected storage and why this is not considered discriminatory. Liability for BSUoS charges is specified in CUSC 14.29.4 as falling on "All CUSC Parties acting as Generators and Suppliers (for the avoidance of doubt excluding all BMUs and Trading Units associated with Interconnectors) ... based on their energy taken from or supplied to the National grid system in each half-hour Settlement Period". Thus embedded storage sites do not currently directly incur a liability to BSUoS charges.
   - An importing SVA storage site will contribute to an increase in its associated Supplier's liability which may, in turn, be passed through to it. However, when exporting, an SVA storage site's output will net off its associated Supplier's BSUoS liability and this benefit may be passed through to the storage site. Regardless of the contractual relationship between the SVA storage site and the Supplier, the Supplier's BSUoS liability will be broadly based on the net of the imports and exports arising through the site's charge/discharge cycle. (The precise figure may vary slightly because the BSUoS charge could be different between importing and exporting settlement periods. Indeed, this situation is likely to be more beneficial to the SVA storage site/Supplier than that proposed

under CMP281 for CVA sites which would remain liable for BSUoS charges on their export volumes.

On this basis, the Proposer does not see a requirement to extend the scope of CMP281 to SVA storage sites at present.

6. Clarify for the numbers included in the presentation for WG1 where sourced the data from and whether excluded volume was just total import or pump storage and share the backing data

The settlement data for 2016/17 indicates that CVA storage sites imported a total of 4.05TWh. Excluding this volume from the BSUoS denominator would have resulted in an increase in average BSUoS cost of £0.02/MWh (compared to an out-turn average BSUoS cost of £2.46/MWh).

Please note that this analysis has been done using historic data and doesn't not take into account any forecast data. In the Future Energy Scenario document published by National Grid in 2018, it shows that from all 4 scenarios, the volume of storage connecting to the system is due to increase. From all 4 scenarios, the volume of storage is due to increase from 3GW (current level) to between 7GW and 10GW by 2030.

7. Consideration of the implications of BSC Mods P285 & P286

On 27 June 2013, the Authority approved BSC Modification[5] P285 "Revised Treatment of RCRC for Interconnector BM Units." Following the approval of CUSC Modification CMP202 which removed BSUoS charges/payments from Interconnector BM Units, P285 was intended to remove RCRC charges/payments from the same BM Units as BSUoS and RCRC were perceived to be "two sides of the same coin" and that an "anomalous situation" would arise if Interconnector parties continued to receive RCRC payments.

In coming to their decision, the Authority agreed "that RCRC charges/payments (to interconnector parties) could be perceived as a distortion to flows on the interconnectors" and "removal would remove a distortion to cross-border trade" and "be consistent with the development of a single internal electricity market."

Further, the Authority acknowledged that P285 would prevent windfall gains and losses thus improving competition within the EU internal electricity market. Finally the Authority concluded that allocation of negative RCRC to Interconnector users

[5] https://www.elexon.co.uk/wp-content/uploads/2012/05/P285D.pdf

could be perceived as a charge and contrary to the aims of the Electricity Regulation.

CMP281 is aimed at removing BSUoS charges from Storage parties and therefore the arguments under P285 around removing distortions to cross-border trade and better facilitating the development of a single internal electricity market are not relevant.

The argument that BSUoS and RCRC are “two sides of the same coin” may have more relevance in this case. However, since the implementation of BSC Modification P305 on 5 November 2015 which introduced a single imbalance cash-out price the value of RCRC cash-flows has reduced significantly due to the removal of imbalance cash-flows arising from Parties’ offsetting imbalances.

In 2016/17, RCRC cash-flows attributable to Storage site imports constituted around 1.4% of the total RCRC cash-flows. The Proposer considers that this amount is insufficiently material to justify a change to the RCRC calculation within the BSC and has no impact on cross border trade. However, should other Parties believe otherwise, the appropriate change may be raised under the BSC modification process.

On 2 October 2014, the Authority rejected BSC Modification P286[6] “Revised treatment of RCRC for generation BM Units” which sought to remove RCRC payments/charges from generators in parallel with CMP201 which sought to remove BSUoS charges from generators to remove perceived competitive distortions between generator and interconnector parties following the approval of CMP202.

As the Authority considered the outcome of P286 wholly dependent on the outcome of CMP201, The decision to reject CMP201 led directly to the decision to reject P286.

8. System changes – NGET to consider

To implement this modification there would need to be changes within the Charging and Billing system (CAB) to accommodate it. There would need to be a mechanism which would flag to the system that these BMUs are impacted by the mod. The core calculations of the charging system will need to be modified to treat these BMUs differently, which will then lead to changes in reporting and billing, so that these changes are implemented across the board. Costs are currently estimated to be between £500k and £1m (this may change in the future). This process would also need to be detailed within the legal text for this modification so that identification of BMUs is robust and consistent.

[6] https://www.elexon.co.uk/wp-content/uploads/2012/05/P286-D.pdf

If Elexon are responsible for maintaining the records of affected units and subsequently flagging to National Grid through existing BSUoS flows changes to the file importing mechanism would also be required.

9. Implementation Information

From a National Grid Electricity System Operator (NGESO) perspective, the earliest this modification can be implemented is April 2020. Any implementation date is dependent on gaining a decision from The Authority in the August before the start of a Charging year. Therefore, we would need a decision from the Authority by August 2019 to be able to implement this modification for April 2020. If a decision is reached later than August 2019, implementation will be pushed to the next applicable charging year (e.g. April 2021).

10. Impacts on co-locational generation/storage assets

CMP281 will not deal explicitly with storage facilities located adjacent to demand or embedded generation and behind the settlement meter for that demand/generation (BTM).

BSUoS is charged on a BM Unit basis. Therefore, a BTM storage facility will impact upon the BM Unit with which it is associated. Depending on whether BTM storage is co-located with demand or embedded generation and whether it is importing or exporting it will have a range of impacts upon the settlement meter reading and the BSUoS liability of the associated Supplier BM Unit.

BTM Storage Operation	Co-located with Demand	Co-located with Embedded Generation
Importing	Increase in metered demand Increase in BSUoS charge	Reduces metered export Reduction in BSUoS charge
Exporting	Decrease in metered demand Reduction in BSUoS charge	Increases metered export Increase in BSUoS charge

It appears that as a BTM storage unit goes through the cycle of importing energy and then exporting it again, disregarding any efficiency losses in the energy conversion process and any change in the BSUoS value between the two cycles, the costs should net to zero.

Therefore, even after the implementation of CMP281, BTM storage would still appear to be at a relative advantage to storage which is registered as its own BM unit, as it will in effect incur no liability for BSUoS while the storage BM unit will still be liable for BSUoS on its export volumes.

11. Potential alternatives

Ofgem's consultation on the Targeted Charging Review identified (in section 8.9) two potential approaches to addressing the defect identified under CMP281;

1. Gross charging: charge storage on the basis of either its gross imports or exports. Gross charging based on exports is the solution identified in the CMP281 original proposal or;
2. Net charging: define storage BM Units as either importing or exporting irrespective of their actions in any particular settlement period. Storage would then earn import/export credits to offset against instances when its power flows were in the opposite direction.

The working group may wish to consider whether to develop an Alternative which would deliver a net charging solution.

12. Impact on other Mods (CMP250 and GC0096 and definition of storage)

CMP250 seeks to reduce the uncertainty and volatility in BSUoS price forecasting by introducing a BSUoS price set in advance for a fixed period e.g. a fixed price for a 6 month period set 12 months in advance. Any over/under recovery of the fixed price against the actual BSIS costs incurred would be recovered in a future fixed price period.

The Proposer does not envisage that the implementation of CMP250 would either remove the defect identified under CMP281 or require an alternative solution to that proposed. Should the Authority direct that CMP250 be implemented, storage sites would still face BSUoS charge both on their import and export volumes placing them at a competitive disadvantage to generation sites. The only difference under CMP250 would be that the BSUoS price being applied to both import and export volumes would be known in advance.

GC0096 seeks to develop an appropriate set of Grid Code requirements with regards to energy storage and which includes a proposed definition for storage.

While delivering the aims of CMP280, the definition of a Storage BM Unit used should, as far as reasonably practicable be consistent with definitions used elsewhere in the electricity industry. In particular, it would be helpful if consistency in definition between electricity codes could be achieved to aid clarity and simplicity.

There would appear to be two definitions proposed/in use at present.

The Grid Code does not currently contain a definition of Storage but Grid Code Modification GC0096 – Energy Storage is under development at present which proposed to define electricity storage as;

"**Electricity Storage** is the conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy"

The Capacity Mechanism also uses a definition of a storage facility as follows;

"**storage facility**" means a facility which consists of—

(a) a means of converting imported electricity into a form of energy which can be stored, and of storing the energy which has been so converted; and

(b) a generating unit which is wholly or mainly used to re-convert the stored energy into electrical energy;

The Proposer has suggested using a formulation closely based on the Capacity Mechanism definition in the CUSC as this definition is already contained within UK legislation whereas the GC0096 definition is still currently under consideration.

The formulation proposed (which is designed to exclude BMUs which contain material end user load as well as storage) is:

"a BMU that consists of:

(a) a means of converting electricity imported from the National Grid system into a form of energy which can be stored, and of storing the energy which has been so converted; and

(b) a generating unit which is wholly or mainly used to re-convert the stored energy into electrical energy for the purpose of its supply to the National Grid system."

Should the above definition be adopted for CMP281, the Grid Code Review Panel may also wish to consider its adoption for use within the Grid Code to ensure consistency.

It will be important that an exemptible storage BM Unit does not include any end use (other than that for the purpose of operating the storage BM unit under (a) and (b) above) so as to prevent abuse. The most important part of this would be a metering test which demonstrated that no end user load was connected to the storage import meter. Further assurance might be provided by including a "test" of end use based upon achieving the storage cycle efficiencies corresponding broadly to the technology in question.

The BSC does not separately define a storage BM Unit. Parties are free to register storage BM units as either P - Production or C – Consumption. There would not appear to any commercial advantage from registering as either P or C. To date, the majority of BM units associated with storage sites (Dinowrig, Ffestniog, Foyers) have been recorded as P with one site (Cruachan) registered as C[7].

[7] ELEXON Portal: Registered BM Units
https://www.elexonportal.co.uk/news/latest?cachebust=0w75srneqa

13. **Consideration of impacts on foot-room[8], fuel equivalence and High Frequency Response (HFR)[9] (e.g. battery and conventional generation)?**

Conventional generators and storage operators compete for the provision of foot room and high frequency response services within the Balancing Mechanism and through the provision of Ancillary Services. The Balancing Mechanism is purely market driven and so if prices submitted are the most economic and efficient at the time, this means they will be accepted and utilised by the ESO. Therefore, storage and conventional generation compete on a level playing field, the only barrier would be plant dynamics and technical capability but this is inherent in the type of generation and not appropriate for the market to solve.

Regarding ancillary services, when NGESO goes out to tender for foot-room services (such as demand turn-up) or response services such as FFR (Firm Frequency Response), this is done in a technology agnostic way and is only again limited by the technical capability of the plant. Therefore if a storage operator could provide Super SEL (for example) by meeting the minimum technical requirements and the tender is deemed economic, then a contract will be awarded. Currently, we have storage participating in the FFR market and being successful in getting tenders accepted. They are tendering a level of high response as well as primary and secondary response. Therefore, at present there are no commercial barriers to storage in the provision of high response and foot-room services to ESO.

14. Materiality of the proposed defect?

It is important to address the defect because the dual liability for BSUoS charges increases the cost of providing services from storage units. This distorts competition to the dis-benefit of consumers.

The reduced recovery of BSUoS charges from storage operators, as a result of implementing CMP281, would need to be recovered from the balance of parties liable to BSUoS. However, we estimate the impact to be small based on current figures.

Based on the 2016/17 charging year, the pumping volume was approximately 4TWh which represents 0.78% of the total volume (520TWh) liable for BSUoS charges. The reduction in recovery of BSUoS from the pumping volume would be recovered across the remaining volume resulting in an increase in BSUoS charge of £0.02/MWh (increase from £2.44/MWh to £2.46/MWh).

The value of RCRC over the same period was approximately £0.06/MWh. Excluding storage import volumes from the RCRC calculation would have resulted in an

[8] Info on Footroom for info

http://www2.nationalgrid.com/UK/Services/Balancing-services/Reserve-services/Footroom/Footroom-servies/

[9] Info on HFR

http://www2.nationalgrid.com/uk/services/balancing-services/frequency-response/mandatory-frequency-response/

increase of £0.00051/MWh to other parties which in the Proposer's view would not appear to be a material adjustment.

15. Transitional Arrangements

The implementation of CMP281 is not expected to have a material impact on other parties and as such, it is proposed that there would be no requirement for any transitional arrangements.

The Proposal, if approved, should be implemented to coincide with the start of a Charging Year (i.e. 1 April) and should be implemented in the first practical Charging Year following a decision by the Authority. If an Authority decision is available in time, the change should be implemented in April 2018.

16. Unintended consequences

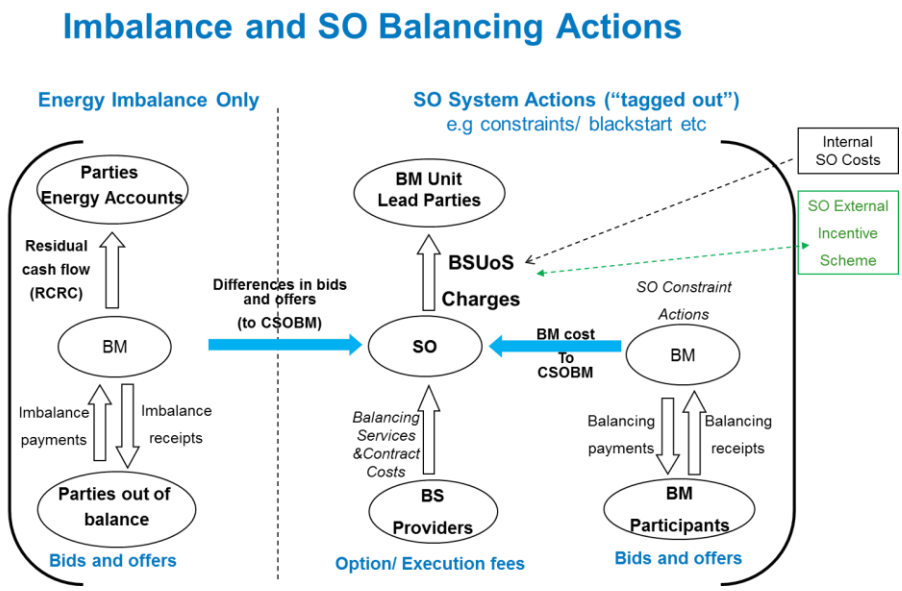
An unintended consequence of CMP281 could be the need to change the Residual Cashflow Reallocation Cashflow (RCRC) calculation due to the interaction between BSUoS and RCRC.

It has been suggested that if storage import volumes are disregarded in the calculation of liability for BSUoS that the equivalent volumes should disregarded in the distribution RCRC cashflows.

BSUoS is designed to allow the Transmission Company to recover the costs associated with operating the transmission system and procuring and using balancing services to balance the transmission system. These costs include the costs of utilising actions in the Balancing Mechanism (bids and offers).

RCRC represents the half-hourly difference between the total payments made by/ received from BSC Parties in respect of their imbalance volumes and charged at the appropriate imbalance price.

These cashflows can be represented in the following diagram:



It may be argued that there is a correlation between the cost of the actions taken in the balancing mechanism (recovered through BSUoS), the imbalance price derived from the cost of those actions and the volume of Parties' imbalances. BSUoS is charged upon the BM Unit metered volume and the distribution of any surplus /deficit under RCRC is made on the basis of Credited Energy Volumes.

Under the current baseline the charging bases for BSUoS and RCRC will be similar.

If liability for BSUoS is removed from storage sites' import volumes, then those sites will only be liable for BSUoS on their metered export volumes but will continue to receive/pay RCRC on the basis of both import and export volumes.

The total RCRC cashflow in 2016/17 was £33.5m distributed over a volume of 520.1 TWh (£0.06/MWh) compared to the total BSUoS cost of £1,266.9m charged on a total metered volume of 420.1TWh (£2.44/MWh). Excluding storage import volumes from the RCRC Denominator value would have resulted in an increase of £0.00051/MWh to other parties which in the Proposer's view would not appear to be a material adjustment.

If the RCRC cashflows were nevertheless considered to represent a material income flow to parties, and that this might represent an unfair advantage to storage parties, this could be addressed by excluding storage BM units' import volumes from the RCRC calculation in Section T.4. 10 of the Balancing & Settlement Code (BSC).

This would be outside the scope of the CUSC and of CMP281 but could be progressed via a separate modification to the BSC, should a party consider it worthwhile.

17. Impact of July 2010 Government Response to the technical consultation on the model for improving grid access

One Workgroup member noted that in considering CMP281 and the differential treatment of storage in relation to BSUoS they had reviewed the "Government Response to the technical consultation on the model for improving grid access" published in July 2010 (copy attached). This document made it clear that "constraint" costs should be socialised across all generators and suppliers on a per MWh basis as a public service obligation on an enduring basis. The following may be relevant:

> "*We consider that the key features of the Government's intervention amount to a Public Service Obligation (PSO) on transmission licence holders (National Grid and the two Scottish transmission owners) for the purposes of the EU Internal Market in Energy Directive. This is an obligation placed on electricity undertakings by Member States in the public interest, for reasons that can relate to environmental and climate protection or security of supply. As required by the Directive, a PSO must be notified to the European Commission, which we intend to do following implementation. The effect of implementing as a PSO is to create a stable access regime, enshrined in the licence*" (Page 3 of Attachment 1)
>
> "*The socialisation of constraint costs is to be fixed into the transmission licence and the Government considers that this constitutes a Public Service Obligation*

(PSO). A PSO is required to be clearly defined, transparent and verifiable. For these conditions to be met, it must be clear how the costs elements are to be treated, operating in a manner that is capable of being verified. Even if it were reasonably practicable to isolate the direct causes of Connect and Manage from other causes of constraint costs (which as we have said we do not consider is the case), this would lead to greater complexity and be more likely to lead to disputes as to the cause of costs, which would increase uncertainty in the charging mechanism". (Page 12 of Attachment 1)

"*We expect the PSO to be in place as long as it is needed to support our climate change, renewable energy and security of supply targets. We will of course need to ensure that our policy continues to operate in a manner compatible with EU law*." (Page 26 of Attachment 1)

"*It is necessary to fix the socialisation of constraint costs in order to give investors certainty as to the model for grid access – it is a key feature of the successful achievement of the policy. As a 'general principle', the socialisation of costs will fall to be applied by the regulator when fixing or approving a specific charging methodology. We are not fixing or approving any specific methodology*". (Page 26 of Attachment 1)

Socialisation of Costs

"All constraint costs, including those arising from advanced connection, will be socialised across all generators and suppliers on a per-MWh basis, as they are at present under the Interim Connect and Manage arrangements. Standard condition C26 of the transmission licence sets the principle of socialising constraint costs on an enduring basis". (Page 33 of Attachment 1)

This is reflected in C26 of the Generation licence as follows:

"6. *The licensee shall use all reasonable endeavours to ensure that in its application of the use of system charging methodology in accordance with standard condition C5 (Use of system charging methodology), use of system charges resulting from transmission constraints costs are treated by*

the licensee such that the effect of their recovery is shared on an equal per MWh basis by all parties liable for use of system charges."

CMP281 will need to be reviewed in the context of the direction from the Government, the intent to socialise costs across generation and demand on a per MWh basis, the C26 licence condition and the PSO notified to the European Commission.

A Workgroup Member raised the question on whether there was a requirement to provide a notice of change to the public service obligation. The Workgroup discussed different possibilities and considered where there is a way to look at how BSUoS is charged so that everyone is charged the same since it could be interpreted as discrimination against storage by treating it differently.

However, if you treat storage different to how they are liable import/export ie storage is not liable for import then this would also be discriminatory. It was noted that BSUoS is socialised across generation and demand without any discrimination and in accordance to the licence conditions. To get around this battery is net v settlement period if they

settle to 0 they have no BSUoS charge. This Modification would change that so you pay the charge on your exports and so there would be no netting. This would be because during this half hour you would be importing and hence no charge but when you export you will be charged the next half hour for exporting.

The Proposer added that the socialisation is not relevant as it simply means you do not charge the same person more than three times and it may be a more equal method to not charge storage.

The Workgroups view was supported by the fact that this was not a reason to reject CMP201[10] and that the Government or BEIS would be responsible for giving the appropriate notifications.

18. Impacts on consumers

Storage providers pay BSUoS on both their imports and exports volumes and therefore contribute more towards the cost of balancing the system when compared with other network users placing them at a competitive disadvantage. Removal of this distortion will place generator and storage users, who compete with each other in the provision of ancillary services and in the energy market, on a more level playing-field, better facilitating competition which will ultimately be to the benefit of the consumer via reduced pass through costs.

19. Legal text changes – updated

14.29.4 All CUSC Parties acting as Generators and Suppliers (for the avoidance of doubt excluding BMUs and Trading Units associated with Interconnectors and Demand BMUs and Trading Units which are supplied under a Generation licence by a Generation Licensee) are liable for Balancing Services Use of System charges based on their energy taken from or supplied to the National Grid system in each half-hour Settlement Period.

14.30.2 A customer's charge is based on their proportion of BM Unit Metered Volume for each Settlement period relative to the total BM Unit Metered Volume for each Settlement Period, adjusted for transmission losses by the application of the relevant Transmission Losses Multiplier.

For all liable importing and exporting BM Units in delivering Trading Units in a Settlement Period:

$$BSUoSTOT_{ij} = \frac{BSUoSTOT_j * QMBSoS_{ij} * TLM_{ij}}{\left|\sum^{+}(QMBSUoS_{ij} * TLM_{ij})\right| + \left|\sum^{-}(QMBSUoS_{ij} * TLM_{ij})\right|}$$

[10] CMP201: https://www.nationalgrid.com/uk/electricity/codes/connection-use-system-code/modifications/cmp201-removal-bsuos-charges

For all liable importing and exporting BM Units in offtaking Trading Units in a Settlement Period:

$$BSUoSTOT_{ij} = \frac{-1 * BSUoSTOT_j * QMBSoS_{ij} * TLM_{ij}}{|\sum^{+}(QMBSUoS_{ij} * TLM_{ij})| + |\sum^{-}(QMBSUoS_{ij} * TLM_{ij})|}$$

Where $BSUoSTOT_j$ Total BSUoS Charge applicable for Settlement Period j

$QMBSUoS_{ij}$ BM Unit Metered Volume (QM_{ij}) for BSUoS Liable BM Units

TLM_{ij} Transmission Loss Multiplier

$\sum^{+}$ – refers to the sum over all BM Units that are in delivering Trading Units in Settlement Period 'j'

$\sum^{-}$ – refers to the sum over all BM Units that are in offtaking Trading Units in Settlement Period 'j'

'delivering' and 'offtaking' in relation to Trading Units have the meaning set out in the Balancing and Settlement Code (excluding all Interconnector BMUs and Trading Units and Demand BMUs and Trading Units which are supplied under a Generation licence by a Generation Licensee).

14.30.3 For the avoidance of doubt, BM Units that are registered in Trading units will be charged on a net Trading Unit basis i.e. if a BM Unit is exporting to the system and is within a Trading Unit that is offtaking from the system then the BM Unit in essence would be paid the BSUoS charge. Conversely, if a BM Unit is importing from the system in a delivering Trading Unit then the BM Unit in essence would pay the BSUoS charge.

Interconnector BM Units and Demand BMUs and Trading Units which are supplied under a Generation licence by a Generation Licensee

14.30.4 BM Unit and Trading Units associated with Interconnectors, including those associated with the Interconnector Error Administrator, **and Demand BMUs and Trading Units** which are supplied under a Generation licence by a Generation Licensee are not liable for BSUoS charges.

The following discussions were held prior to the Proposer's decision to extend the relief from off-taking BSUoS charges to all supply to BMUs and Trading Units that are supplied under the terms of a Generation Licence. These sections mostly relate to the distinctions between the treatment for BSUoS charging purposes of electricity storage facilities and other generators or the method of identifying electricity storage facilities separately from other generation. Although no longer directly relevant to the amended Original solution they have been included in the working group report as a record of the discussions held and in support of the decision to amend the Original solution.

Interaction of CMP281 and Ofgem's consultation on Generation Licence.

On 29 September 2017, Ofgem published a consultation on "Clarifying the regulatory framework for electricity storage licensing".[11]

The consultation seeks views on proposals to modify the electricity generation licence to clarify the regulatory position of storage in the regulatory framework and to ensure consistency between both storage and electricity generation. This will help ensure that a level playing field exists so that storage can compete fairly with other sources of flexibility.

The proposals seek to:

- Include the definition of electricity storage in the electricity generation licence
- Clarify expectations with regard to compliance by storage with the standard licence conditions in the electricity generation licence
- Introduce new licence conditions that electricity storage providers holding a generation licence do not have self-consumption as the primary function when operating the storage facility

The consultation anticipates that storage providers that have been granted a licence:

- Will be expected to sign up to relevant industry codes only insofar as these are applicable to them and/or depending on the capacity of the storage facility; and
- Not be subject to the payment of final consumption levies

The proposed changes to the Electricity Generation Licence Standard Conditions include the following changes:

"generating station" means an electricity generating station or an electricity storage facility which:

i. has, or will have when its construction or extension is completed, a capacity of not less than 50 MW or such other capacity as may be specified in relation thereto by order of the Secretary of state under section 36(3) of the Act;

ii. Is, or will be when its extension or construction is completed, operated by or for the licensee;

SECTION E: Supplementary Standard Conditions for electricity storage

Condition E1: Requirement to export

1 The licensee shall not have self-consumption as the primary function when operating its storage facility.

2 If at any time the licensee knows or reasonably should know of any event or circumstance that has occurred or is likely to occur that may affect its ability to comply with paragraph 1, the licensee shall as soon as reasonably practicable notify the Authority in writing of the event or circumstance.

3 In this Section:

[11] Ofgem: Clarifying the regulatory framework for electricity storage: licensing; https://www.ofgem.gov.uk/system/files/docs/2017/10/electricity_storage_licence_consultation_final.pdf

"Export" Has the meaning given to it in Section K of the Balancing and settlement Code.

Note new SLC E1 will apply to both existing and future licensees.

20. Implications for CMP281 of the extension of the Generation Licence to include electricity storage facilities

There should be no need for a separate definition of electricity storage with the CUSC. The CUSC should refer to the definition of electricity storage in the amended Generation Licence.

There should be no need for a separate compliance regime within the CUSC to ensure that storage is not used as a means to exempt self-consumption for BSUoS charging. The requirement to export outlined in Section E (above) and not to have self-consumption as the primary function is enforceable within the amended generation licence.

The relief from final consumption levies arises from the definition of "supply" in section 4(4) of the Electricity Act 1989. The levies apply to electricity "supplied" and that section states that supply to a licensee's premises occupied for the purpose of carrying on the licensed activity is not to be treated as "supply" under the relevant part of the Act. It is appropriate to track this logic in CMP281, such that any electricity that is supplied within the meaning of the Act would continue to attract BSUoS in the same way as it would attract final consumption levies.

Storage with capacity below 50MW (or up to 100MW with the approval of the Secretary of State) could be licence exempted. However, where storage obtains an exemption to the requirement to hold a licence, storage would be subject to Final Consumption Levies as the meter point will need to be registered with a supplier in order to import/export electricity. This is likely to make licence exemption unattractive to storage owners.

What type of registration process would be needed to determine those units captured under CMP281

The Original Proposal has been amended to identify that the proposal only relates to storage facilities which are registered as BM Units and whose metering systems are registered in CVA.

The CMP281 Original Proposal seeks to exempt those parties classified as storage facilities and registered in CVA from payment of BSUoS on their demand volumes. The Generation Standard Licence Condition 9 (accession to and compliance with the BSC) applies to generating stations as defined in the new SLC1:

"An electricity generating station or storage facility which:

(i) has, or will have, a capacity of not less than 50MW

(ii) is operated by or for the licensee"

The requirement to accede to the BSC will not therefore apply to storage facilities of less than 50 MW. In addition, storage facilities between 50MW and up to 100MW could be exempted from the requirement to hold a generation licence with the approval of the Secretary of State under the Electricity (Class Exemptions from the Requirement for a Licence) Order 2011.

Therefore, embedded and exemptible generating stations, including storage units, could still avoid accession to the BSC and the requirement to register BM Units and register their associated metering in CVA.

However, it is expected that most storage parties will acquire a generation licence in order to avail themselves of the exemption from Final Consumption Levies. Storage parties doing so would therefore be subject to the conditions of the Generation Licence including compliance with the BSC (SLC 9), CUSC (SLC 19) and Grid Code (SLC5). In turn, such storage parties will be subject to the obligations under each of these codes commensurate with their size.

Exempt and exemptible embedded generating stations, including storage units, which do not opt to accede to the BSC would be required to register their metering systems with a Supplier in SVA and would thus be subject to Final Consumption Levies. Storage units opting to remain in SVA would be able to "net" their BSUoS liability; being billed BSUoS by their Supplier when importing energy and receiving an embedded benefit through reducing their Supplier's BSUoS liability when generating.

CUSC 14.29.4 states: All CUSC Parties acting as Generators and Suppliers ... are liable for Balancing Services Use of System charges based on their energy taken from or supplied to the National Grid system in each half-hour Settlement Period. "Generator" is defined in CUSC 11 as "a person who generates electricity under licence or exemption under the Act". "Supplier" is defined as "a person who holds a Supply Licence".

CUSC 14.30.2 states: A customer's charge is based on their proportion of BM Unit Metered Volume for each Settlement period relative to the total BM Unit Metered Volume for each Settlement Period... This would infer that BSUoS charges can only be levied on BM Units.

Storage facilities acquiring a Generation licence would therefore be classified as Generators under the CUSC and be registered as BM Units with their metering registered in CVA.

All storage facilities entitled to exemption from demand BSUoS will therefore be registered as BM Units with their associated metering registered in CVA. There will therefore be existing meter data flows to the National Grid BSUoS billing systems in respect of these BM Units.

The Workgroup concluded that it would be useful to have the process set out in the legal text so that it can be appropriately followed as it would be less complex than the data coming from the BSC.

A Workgroup Member raised the issue that if you embed storage under SVA arrangements you cannot benefit from this. An alternative to this that allows SVA storage to take advantage of this would not work and would result to being discriminatory.

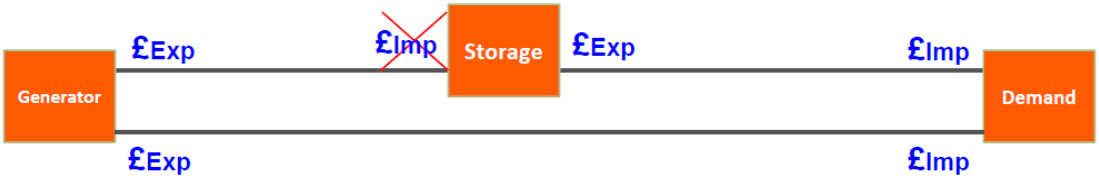
View from the Proposer on why CMP281 would not be discriminatory

Electricity storage facilities import electricity from the Transmission System in order to be able to store it. The stored energy is exported back to the system in the form of electricity for consumption by an end consumer. The storage facility does not have self-consumption as its primary function.

The current BSUoS charging regime can result in "double counting" of energy to the end consumer:

1. The energy is considered to be end-consumption when imported by the storage facility
2. The energy is considered end-consumption when exported back to the National Grid System and measured as consumption by the end-user.

This adds to the operational cost of the storage facility which makes storage facilities less competitive than other providers of flexibility services to the System Operator. This adverse effect on competition may result in additional costs being passed through to the end consumer.



The current charging regime means that storage facilities pay BSUoS on both their import and export volumes (in addition to the BSUoS costs implicit in the 'fuel cost'). Storage is therefore contributing more than other users with whom it competes in the provision of ancillary services.

In addition, when importing energy, storage facilities also pay, through the wholesale energy price, the BSUoS and transportation costs incurred by other generators when exporting onto the National Grid System.

Removal of BSUoS charges from energy imported by storage facilities from the National Grid System would go some way to levelling the playing field and facilitating competition in the provision of flexibility services between storage facilities and other flexibility providers such as generation.

The Proposer did not believe it was discriminatory to SVA storage if you do not exempt it from BSUoS on its imports and the Workgroup acknowledged not discriminating between distribution and transmission is not clear cut.

The Workgroup came to the conclusion that the Modification should be trying to level the playing field for all storage however the implication of doing so would remove the embedded benefits for storage.

A Workgroup Member concluded embedded storage would not pay BSUoS at all and SVA storage should be alleviated to paying BSUoS which would level the playing field for demand and that in their view this would not be discriminatory. However, CVA would be treated differently to SVA for demand BSUoS under CMP281 and makes it harder to

implement without discrimination. In fact, in introduces a further discrimination as SVA would be more advantageous than CVA because of the embedded benefit which arises when SVA storage export of.

21. Provide information on how could define the difference between storage and end use and how this could be captured by metering (existing or new – Settlement metering?)

The proposed definition of a "storage facility" requires that the site ***consists of***-

(a) A means of converting imported electricity into a form of energy which can be stored, and of storing the energy which has been so converted;

(b) And a generating unit which is wholly or mainly used to re-convert the stored energy into electrical energy for the purpose of its supply to the National Grid system.

It should therefore be possible to conduct a technical metering assessment of sites to determine whether they consist of only these two elements and that there is no material end-use load behind the meter.

Ofgem's consultation on clarifying the regulatory framework for electricity storage: licensing[12] proposes the following definitions within Standard Licence Condition 1 of the Generation Licence;

"electricity storage" is the conversion of electrical energy into a form of energy, which can be stored, the storing of that energy, and the subsequent reconversion of the energy back into electrical energy.

"electricity storage facility" means a facility where Electricity storage occurs

It is proposed that facilities operated by a generation licencee which meet the definition of an electricity storage facility (together with any additional detailed tests and requirements specified by Ofgem) be exempted the Demand BSUoS charge.

22. Would a BSC Change be required to support the implementation of CMP281, should it be approved?

As all Storage facilities acquiring a Generation licence would be classified as Generators under the CUSC and be registered as BM Units with their metering registered in CVA if they sign a BCA or a BEGA.

All storage facilities entitled to exemption from demand BSUoS will therefore be registered as BM Units with their associated metering registered in CVA. There will therefore be existing meter data flows to the National Grid BSUoS billing systems in respect of these BM Units. There would therefore not appear to be any requirement

[12] Ofgem, Clarifying the regulatory framework for electricity storage: licencing, 27 November 2017

for any new data flows from ELEXON to National Grid provided National Grid BSUoS billing team maintain a register of those storage facilities entitled to exemption from demand BSUoS charges and can identify the data in respect of these BM Units.

23. Clarify what is meant by storage and what the difference is between battery and pump storage in relation to CMP281

It is proposed that the treatment of battery storage and pumped storage and indeed all forms of electricity storage technology would be identical under CMP281.This would avoid any potential discrimination between technology types.

The Proposer suggested that CMP281 use the definition of “electricity storage facility” within the proposed amended Generation licence which would avoid discrimination between different electricity storage technologies

5 Workgroup Consultation questions

The CMP281 Workgroup is seeking the views of CUSC Parties and other interested parties in relation to the issues noted in this document and specifically in response to the questions highlighted in the report and summarised below:

Standard Workgroup Consultation questions:

Q1: Do you believe that CMP281 Original proposal better facilitate the Applicable CUSC Objectives?

Q2: Do you support the proposed implementation approach?

Q3: Do you have any other comments?

Q4: Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider?

Specific CMP281 Workgroup Consultations:

Q5: Can you confirm how CMP281 will impact CUSC Parties (for example, operations, billing, contractual, tariff stability, processes and information flows)?

Q6: Do you believe CMP281 original proposal would level the playing field in the way that Ofgem and Government have intended in recent publications?

Please send your response using the response proforma which can be found on the National Grid website via the following link: http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP281/

In accordance with Section 8 of the CUSC, CUSC Parties, BSC Parties, the Citizens Advice and the Citizens Advice Scotland may also raise a Workgroup Consultation Alternative Request. If you wish to raise such a request, please use the relevant form available at the weblink below:

http://www.nationalgrid.com/uk/Electricity/Codes/systemcode/amendments/forms_guidance/

Views are invited upon the proposals outlined in this report, which should be received by **5pm** on **12 November 2018** Your formal responses may be emailed to: cusc.team@nationalgrid.com

If you wish to submit a confidential response, please note that information provided in response to this consultation will be published on National Grid's website unless the response is clearly marked "Private & Confidential", we will contact you to establish the extent of the confidentiality. A response market "Private & Confidential" will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the CUSC Modifications Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

Please note an automatic confidentiality disclaimer generated by your IT System will not in itself, mean that your response is treated as if it had been marked "Private and Confidential"

6 Relevant Objectives

Impact of the modification on the Applicable CUSC Objectives (Charging):

Relevant Objective	Identified impact
(a) That compliance with the use of system charging methodology facilitates effective competition in the generation and supply of electricity and (so far as is consistent therewith) facilitates competition in the sale, distribution and purchase of electricity;	Positive. Removing a distortion in competition will better facilitate competition.
(b) That compliance with the use of system charging methodology results in charges which reflect, as far as is reasonably practicable, the costs (excluding any payments between transmission licensees which are made under and accordance with the STC) incurred by transmission licensees in their transmission businesses and which are compatible with standard licence condition C26 requirements of a connect and manage connection);	Positive/None As BSUoS charges are not intended to be cost reflective, this proposal will have little impact on cost reflectivity other than removing a distortion whereby some users pay a disproportionate amount of the costs.
(c) That, so far as is consistent with sub-paragraphs (a) and (b), the use of system charging methodology, as far as is reasonably practicable, properly takes account of the developments in transmission licensees' transmission businesses;	None
(d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency. These are defined within the National Grid Electricity Transmission plc Licence	None

under Standard Condition C10, paragraph 1 *; and	
(e) Promoting efficiency in the implementation and administration of the CUSC arrangements.	None
*Objective (d) refers specifically to European Regulation 2009/714/EC. Reference to the Agency is to the Agency for the Cooperation of Energy Regulators (ACER).	

7 Implementation

Proposer's initial view:

The Proposal should be implemented to coincide with the start of a Charging Year (i.e. 1 April) and should be implemented in the first practical Charging Year following a decision by the Authority.

8 Legal Text

The draft legal text changes are detailed in the above section 4.

Annex 1: CMP281 Terms of Reference

nationalgrid

Workgroup Terms of Reference and Membership

TERMS OF REFERENCE FOR CMP281 WORKGROUP

CMP281 aims to remove liability from storage facilities for Balancing Services Use of System (BSUoS) charges on imports.

Responsibilities

1. The Workgroup is responsible for assisting the CUSC Modifications Panel in the evaluation of CUSC Modification Proposal **CMP281 'Removal of BSUoS Charges From Energy Taken From the National Grid System by Storage Facilities'** raised by **Scottish Power** at the Modifications Panel meeting on 30 June 2017.

2. The proposal must be evaluated to consider whether it better facilitates achievement of the Applicable CUSC Objectives. These can be summarised as follows:

Charging Applicable Objectives

(a) That compliance with the use of system charging methodology facilitates effective competition in the generation and supply of electricity and (so far as is consistent therewith) facilitates competition in the sale, distribution and purchase of electricity;

(b) That compliance with the use of system charging methodology results in charges which reflect, as far as is reasonably practicable, the costs (excluding any payments between transmission licensees which are made under and accordance with the STC) incurred by transmission licensees in their transmission businesses and which are compatible with standard license condition C26 requirements of a connect and manage connection);

(c) That, so far as is consistent with sub-paragraphs (a) and (b), the use of system charging methodology, as far as is reasonably practicable, properly takes account of the developments in transmission licensees' transmission businesses;

(d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency. These are defined within the National Grid Electricity Transmission plc. License under Standard Condition C10, paragraph 1; and

(e) Promoting efficiency in the implementation and administration of the system charging methodology.

3. It should be noted that additional provisions apply where it is proposed to modify the CUSC Modification provisions, and generally reference should be made to the Transmission Licence for the full definition of the term.

Scope of work

4. The Workgroup must consider the issues raised by the Modification Proposal and consider if the proposal identified better facilitates achievement of the Applicable CUSC Objectives.

5. In addition to the overriding requirement of paragraph 4, the Workgroup shall consider and report on the following specific issues:

   a) Consider co-location of generation and storage assets
   b) Consider the practical implications of solution e.g. that all metered data is available to National Grid to support the proposed solution
   c) Consider the impacts on RCRC and BSC arrangements
   d) Consider the interaction with CMP250
   e) Consider impacts on foot-room, High Frequency Response and fuel equivalency (e.g. battery and conventional generation).

6. The Workgroup is responsible for the formulation and evaluation of any Workgroup Alternative CUSC Modifications (WACMs) arising from Group discussions which would, as compared with the Modification Proposal or the current version of the CUSC, better facilitate achieving the Applicable CUSC Objectives in relation to the issue or defect identified.

7. The Workgroup should become conversant with the definition of Workgroup Alternative CUSC Modification which appears in Section 11 (Interpretation and Definitions) of the CUSC. The definition entitles the Group and/or an individual member of the Workgroup to put forward a WACM if the member(s) genuinely believes the WACM would better facilitate the achievement of the Applicable CUSC Objectives, as compared with the Modification Proposal or the current version of the CUSC. The extent of the support for the Modification Proposal or any WACM arising from the Workgroup's discussions should be clearly described in the final Workgroup Report to the CUSC Modifications Panel.

8. Workgroup members should be mindful of efficiency and propose the fewest number of WACMs possible.

9. All proposed WACMs should include the Proposer(s)'s details within the final Workgroup report, for the avoidance of doubt this includes WACMs which are proposed by the entire Workgroup or subset of members.

10. There is an obligation on the Workgroup to undertake a period of Consultation in accordance with CUSC 8.20. The Workgroup Consultation period shall be for a period of **15 working days** as determined by the Modifications Panel.

11. Following the Consultation period the Workgroup is required to consider all responses including any WG Consultation Alternative Requests. In undertaking an assessment of any WG Consultation Alternative Request, the Workgroup should consider whether it better facilitates the Applicable CUSC Objectives than the current version of the CUSC.

    As appropriate, the Workgroup will be required to undertake any further analysis and update the original Modification Proposal and/or WACMs. All responses including any WG Consultation Alternative Requests shall be included within the final report including a summary of the Workgroup's

deliberations and conclusions. The report should make it clear where and why the Workgroup chairman has exercised his right under the CUSC to progress a WG Consultation Alternative Request or a WACM against the majority views of Workgroup members. It should also be explicitly stated where, under these circumstances, the Workgroup chairman is employed by the same organisation who submitted the WG Consultation Alternative Request.

12. The Workgroup is to submit its final report to the Modifications Panel Secretary on **7 December 2017** for circulation to Panel Members. The final report conclusions will be presented to the CUSC Modifications Panel meeting on **15 December 2017**.

Membership

13. It is recommended that the Workgroup has the following members:

Role	Name	Representing
Chairman	Caroline Wright	Code Administrator
National Grid Representative	Urmi Mistry	National Grid
Industry Representatives	Rupert Steele James Anderson Bill Reed Robert Longden Libby Glazebrook Paul Mott Andrew Colley Paul Youngman Fruzina Kemenes	Scottish Power (Proposer) Scottish Power RWE Cornwall Energy Engie EDF Energy SSE Drax Innogy
Authority Representatives	Judith Ross	OFGEM
Technical secretary	Heena Chauhan	Code Administrator
Observers	Nicholas Rubin	ELEXON

NB: A Workgroup must comprise at least 5 members (who may be Panel Members). The roles identified with an asterisk in the table above contribute toward the required quorum, determined in accordance with paragraph 14 below.

14. The chairman of the Workgroup and the Modifications Panel Chairman must agree a number that will be quorum for each Workgroup meeting. The agreed figure for CMP281 is that at least 5 Workgroup members must participate in a meeting for quorum to be met.

15. A vote is to take place by all eligible Workgroup members on the Modification Proposal and each WACM. The vote shall be decided by simple majority of those present at the meeting at which the vote takes place (whether in person or by teleconference). The Workgroup chairman shall not have a vote, casting or otherwise]. There may be up to three rounds of voting, as follows:

- Vote 1: whether each proposal better facilitates the Applicable CUSC Objectives;
- Vote 2: where one or more WACMs exist, whether each WACM better facilitates the Applicable CUSC Objectives than the original Modification Proposal*;*
- Vote 3: which option is considered to BEST facilitate achievement of the Applicable CUSC Objectives. For the avoidance of doubt, this vote should include the existing CUSC baseline as an option.

The results from the vote and the reasons for such voting shall be recorded in the Workgroup report in as much detail as practicable.

16. It is expected that Workgroup members would only abstain from voting under limited circumstances, for example where a member feels that a proposal has been insufficiently developed. Where a member has such concerns, they should raise these with the Workgroup chairman at the earliest possible opportunity and certainly before the Workgroup vote takes place. Where abstention occurs, the reason should be recorded in the Workgroup report.

17. Workgroup members or their appointed alternate are required to attend a minimum of 50% of the Workgroup meetings to be eligible to participate in the Workgroup vote.

18. The Technical Secretary shall keep an Attendance Record for the Workgroup meetings and circulate the Attendance Record with the Action Notes after each meeting. This will be attached to the final Workgroup report.

19. The Workgroup membership can be amended from time to time by the CUSC Modifications Panel.

Appendix 1 - Timetable

Workgroup Stage

22 June 2017	CUSC Modification Proposal submitted
30 June 2017	Modification Presented to the Panel
30 June 2017	Request for Workgroup Members (10 working days)
w/c 31 July 2017	Meeting 1 via WebEx to ensure Workgroup members have a fully understanding of the context of the modification
w/c 18 September 2017	Circulate draft Workgroup Report
September to March 2018	Workgroup Meetings – Develop Proposal
April 2018	Workgroup Consultation issued to the Industry (15WD)
May 2018 to July 2018	Workgroup Meeting - Workgroup review consultation responses, agree options, finalise legal text and WG vote
August 2018	Workgroup Report issued to CUSC Panel
August 2018	CUSC Panel meeting to discuss Workgroup Report

Code Administrator Stage

September 2018	Code Administration Consultation Report issued to the Industry (15 WD)
October 2018	Draft FMR published for industry comment (3 Working days)
November 2018	Draft Final Modification Report presented to Panel
November 2018	CUSC Panel Recommendation vote
December 2018	Final Modification Report issued the Authority
January/February 2019 *	Indicative Decision for the Authority
1 April 2019 or 1 April 2020	Decision implemented in CUSC

* Note to allow for system changes to be made a decision by Summer 2018 is required.

Annex 2: Work Undertake by Workgroup Member

CMP281: Removal of BSUoS Charges from Energy taken from the National Grid System by Storage Facilities

Summary

Storage operators currently pay BSUoS on both their import and export volume from and to the grid. CMP281 proposes to remove the liability from storage to pay BSUoS charges on imported volume. Engie has conducted an analysis of both the costs and benefits of such a measure for other market participants (particularly focused on consumers).

It is estimated that removing BSUoS from transmission connected pumped hydro imports pumping will increase overall BSUoS by on average 2p/MWh and by 5p/MWh if the increase is just applied to those paying BSUoS overnight.

Offsetting this increase, there will be a benefit in terms of lower peak traded prices as the pumped storage 'fuel' costs will be lower allowing it to generate in periods when it would have been 'out of the money' due to paying BSUoS on imports. This is estimated to save consumers around £36m giving a net benefit of around £15m. On top of this the cost of managing constraints arising from excess overnight generation can be expected to fall.

Estimated Cost Impact

If implemented, the storage sites that would become exempt from import BSUoS charges are the existing pumped storage (PS) sites (Foyers, Cruachan, Dinorwig and Ffestiniog) and planned battery storage projects.

Engie has examined historic BSUoS charges to understand the impact of CMP281. In 2015 the volume of imports to PS sites totalled 3,701GWh out of a total generation and demand volume of 526,408MWh (includes only generation and demand subject to BSUOS charges). PS sites contributed £10.64m to the total BSUOS charge of £1,135m. The cost of BSUoS was £2.16/MWh (£1,135m divided by 526,408MWh) and would have been £2.17/MWh if PS had been exempt from paying BSUOS on imports (£1,135m divided by 522,707MWh). The impact on average BSUOS charges across the year would have been £0.016/MWh in 2015. Similar impacts would have occurred in 2016 and 2017 YTD (see table 1).

Table 1: BSUoS Costs/Volumes since 2015

Year	PS Imports BSUoS (£k)	PS Imports (GWh)	Total BSUOS (£k)	Total Volume (GWh)	Actual BSUoS Cost (£/MWh)	CMP281 BSUoS Cost (£/MWh)
2015	10,643	3,701	1,135,132	526,408	2.16	2.17
2016	12,247	4,002	1,219,830	522,303	2.34	2.35
2017 (H1)	6,127	2,020	601,007	254,545	2.36	2.38

The overall cost to other market participants from removing BSUoS charges on imports would have been an annualised £10.6m to £12.2m since 2015. Looking just at the impact on overnight BSUoS, the impact on other market participants between 23:00 and 07:00 would be around 5p/MWh on average.

However, additional PS demand would have occurred overnight with CMP281 in place (estimate 246.4GWh of additional pumping) which would reduce the impact on other market participants. In addition, by increasing demand in regions with excess generation (particularly during high wind/low demand periods where currently PS is uneconomic due to high BSUoS charges), the additional consumption would have contributed to alleviating constraint costs. Therefore, overall the cost of implementing CMP281 would be less than the £10.6m to £12.2m range outlined above.

Estimated Benefits

Engie has investigated the potential benefit to consumers from removing the BSUOS charge from volume imported by storage sites. The basic premise is that import BSUoS increases the price at which storage sites are able to generate during demand peaks. The result is PS generates for fewer hours each year and when it is generating at the margin sets a higher wholesale price.

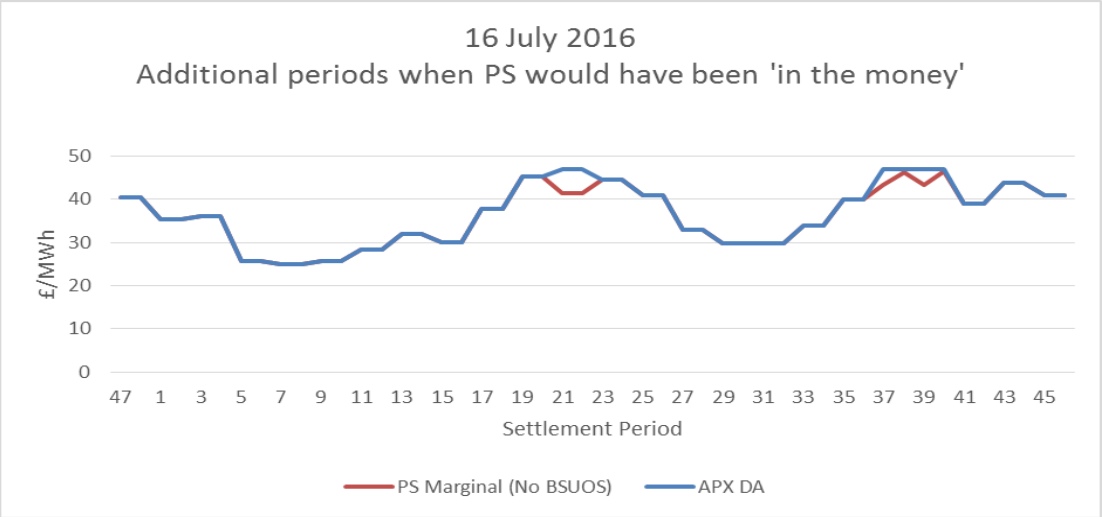
The trader's BSUOS expectation would not be a flat value across a year but would be based on wind/demand forecasts and how these drive BSUOS costs. There is uncertainty about what the overall pumping cost will be but traders will make a judgement and trade to their expectation of the BSUoS cost of replacing the stored energy (potentially with a risk premium added to cover forecast error). Removing

BSUOS costs mean traders will factor zero BSUOS into offer prices, which will reduce them compared to their previous expectation and lead to the lower extended peak prices.

To determine the benefit, ENGIE looked at a 12 month period from 14th July 2016. Engie calculated the cost of pumping using a simplified formula to create by adding BSUoS to the next day's APX DA auction price. Dividing by 0.75 (to represent a 75% efficient PS site) gives an estimate of the strike price at which PS sites could generate in the following demand peak.

Removing BSUoS charges from pumping costs changes the formula above to just the APX DA auction price divided by 0.75. This means the reduction in generation costs from removing BSUoS is amplified and has a greater impact on costs during peak demand periods.

To determine the impact of removing BSUoS charges from import volume, Engie compared the highest priced 8 hours clearing in the APX DA auction for extended peaks (Ext PK) to the cost of generation of PS. It is assumed for simplicity that pumping occurs overnight. The aim is to find the settlement periods where PS is marginal and where the reduction in pumping costs will reduce the wholesale price. Ranking the overnight periods and matching the lowest prices to the highest extended peak prices shows the half hours where PS is deeply in the money (no price impact) or out of the money even without paying BSUoS costs on imports (no price impact). Marginal periods are defined as ones that cleared between the cost of generation with BSUoS and the cost without BSUoS. These are the periods where CMP 281 would have an impact.



Removing BSUoS and assuming that PS generates at cost would allow PS to break even in settlement periods 19 to 23 and 37 to 40 in the example above (price data taken from 16th July 2016) where previously it would have been out of the money.

For the 12 months from 14th July 2016, the average Ext PK price (including weekends, settlement periods 15 to 46) was £50.05/MWh. Following the methodology above for PS means the average price falls to £49.92/MWh. Out-turn demand for the period examined is 198.4GWh meaning a total saving to consumers of £25.8m. The net benefit of this change is therefore around £15m.

An alternative way of looking at the benefit would be to look at the average BSUoS costs for the same period (£2.69/MWh) and apply the above methodology to again determine the periods when pumped storage would move to being in the money. The result is the benefit drops from £0.14/MWh to £0.09/MWh or £17.9m giving a net benefit of around £9m. Given that BSUoS costs are higher overnight to manage the excess of wind on the system, using an average value is not appropriate. Whilst it can rightly be argued that traders will not have perfect foresight of BSUoS, as noted above they would make a judgement using in house analysis tools. Their judgement would produce a more relevant value than a flat assumption.

OTHER BENEFITS

One clear benefit of this reform is that it will encourage investment in new storage assets (particularly transmission connected battery storage projects) by improving the economics of such projects. As it stands there is a strong correlation between periods of high wind and low demand (when storage sites could offer a valuable service helping to manage renewable intermittency) and high BSUoS costs (often more than

£10/MWh). Removing BSUoS costs from pumping improves the arbitrage potential in these periods and removes a major uncertainty.

Other benefits to the proposal include lower break even costs for providing ancillary services (particularly response services), which would translate into lower procurement costs and potential cost reductions in the Balancing Mechanism and Capacity Market.

If the modification was widened such that all transmission connected generation did not pay BSUoS when its net HH transmission connected metering was negative, the average increase in BSUoS to the remainder of the market would be around 4p/MWh over the same period. An assessment has not been made of the impact on overnight BSUoS as transmission connected generation may also be consuming during the daytime.

Annex 3: CMP281: Differential Treatment of CUSC Parties Under CMP291

Differential treatment of CUSC Parties under CMP281 – Removal of BSUoS Charges from Energy Taken from the National Grid System by Storage Facilities.

Summary

i. This paper considers the potential for differential treatment of CUSC parties under CMP281 Removal of BSUoS Charges from Energy Taken from the National Grid System by Storage Facilities'.

ii. CMP281 proposes the removed of BSUoS import charges from storage trading units or BMUs related to Generators connected to the transmission system. This approach will result in differential treatment of storage between:

- Generators with storage which are exempt from import costs and other generators which may import when the main units are on an outage;
- Generators connected to the electricity system which are exempt from certain network costs and other generators that pay network cost for gas or rail infrastructure; and
- Generators with storage facilities connected to the transmission system and Suppliers with storage facilities connected to the distribution system.

1. Introduction

1.1. This paper provides initial thoughts on the potential for differential treatment of transmission system users under CUSC Modification proposal CMP281 - **Removal of BSUoS Charges from Energy Taken from the National Grid System by Storage Facilities.**

1.2. These are initial thoughts on the potential issues associated with differential treatment under CMP281 for the purpose of discussion at the CMP281 Working Group.

2. Current liability for BSUoS Charges.

2.1. The principles establishing the basis for liability for Balancing Services Use of System (BSUoS) charges[13] is set out in Section 14 of the Connection and Use of System Code (CUSC) as follows:

> "14.29.4 *All CUSC Parties acting as Generators and Suppliers (for the avoidance of doubt excluding all BMUs and Trading units associated with Interconnectors) are liable for Balancing Services Use of System charges based on their energy taken from or supplied to the National Grid system in each half-hour Settlement Period*".

2.2. The liability for charges in any settlement period is summarised in Table 1 below.

Table 1: Summary of Current BSUoS liabilities

		Metered Volume in half hour	
CUSC Party	**Basis for Liability**	**Export**	**Import**
Generator	Trading unit/BMU	Metered Export	None
Generator	Trading unit/BMU	None	Metered Import
Supplier	Trading unit/BMU	Metered Export	None
Supplier	Trading unit/BMU	None	Metered Import

2.3. It should be noted that embedded generation that is registered to supplier accounts will reduce a supplier liability for BSUoS charges in any half hour if it results in a reduced import. This is, therefore, an embedded benefit.

2.4. In addition, exporting BMUs in trading units that are importing will be paid the BSUoS

[13] Under CUSC Paragraph 14.29.5 BSUoS charges comprise the following costs: (i) The Total Costs of the Balancing Mechanism; (ii) Total Balancing Services Contract costs; (iii) Payments/Receipts from National Grid incentive schemes; (iv) Internal costs of operating the System; (v) Costs associated with contracting for and developing Balancing Services; (vi) Adjustments; (vii) Costs invoiced to The Company associated with Manifest Errors and Special Provisions; (viii) BETTA implementation costs

charge by the SO (a direct embedded benefit). This is established in the CUSC as follows:

"14.30.3 *For the avoidance of doubt, BM Units that are registered in Trading units will be charged on a net Trading unit basis i.e. if a BM Unit is exporting to the system and is within a Trading unit that is offtaking from the system then the BM Unit in essence would be paid the BSUoS charge. Conversely, if a BM Unit is importing from the system in a delivering Trading unit then the BM Unit in essence would pay the BSUoS charge*".

2.5. Therefore, with the exception of interconnectors BMUs and trading units, under the CUSC the net metered volume of all exporting trading units and the metered volume of all importing trading units are liable to BSUoS charges

2.6. The CUSC removes the liability for BSUoS charges in relation to interconnectors as follows:

"14.30.4 *BM Unit and Trading units associated with Interconnectors, including those associated with the Interconnector Error Administrator, are not liable for BSUoS charges*".

3. Proposed treatment of Users under CMP281

3.1. CMP281 proposes that the CUSC is amended so that BMUs and trading units associated with "storage" are no longer liable for the BSUoS "import" charges. The draft working group report suggest the following definition (see also Annex 1);

"All CUSC Parties acting as Generators and Suppliers (for the avoidance of doubt excluding all BMUs and Trading units associated with Interconnectors) are liable for Balancing Services Use of System charges based on their energy taken from or supplied to the National Grid system in each half-hour Settlement period, except that energy taken from the system by Exemptible Storage BMUs shall be disregarded. For purpose of Section 14(2) of the CUSC – The Statement of the Balancing Services Use of System Charging Methodology –

An Exemptible Storage BMU is a BMU that consists of:

(a) a means of converting electricity imported from the National Grid system into a form of energy which can be stored, and of storing the energy which has been so converted; and

(b) a generating unit which is wholly or mainly used to re-convert the stored energy into electrical energy for the purpose of its supply to the National Grid system.

3.2. Following discussion at the CMP281 workgroup it was suggested that the proposal would apply to storage trading units or BMUs at CVA demand sites that were transmission connected. Therefore, CMP281 proposes to create a new category of party liability for BSUoS. This category is defined in relation to a particular type of BMU or trading unit and only applies to generators. This category of party would have no liability for import BSUoS for a trading unit or BMU that is importing in a half hour. The revised liability for BSUoS charges under CMP281 is set out in Table 2:

Table 2: Liability for BSUoS charges proposed under CMP281

		Metered Volume in half hour	
CUSC Party	**Basis for Liability**	**Export**	**Import**
Generator	Trading unit/BMU	Metered Export	None
Generator	Trading unit/BMU	None	Metered Import
Generator	**Storage Trading unit/BMU, transmission connected**	**Metered Export**	**None**
Generator	**Storage Trading unit/BMU, transmission connected**	**None**	**None**
Supplier	Trading unit/BMU	Metered Export	None
Supplier	Trading unit/BMU	None	Metered Import

3.3. One of the consequences of the change to the liability of parties for BSUoS is that there will be a shortfall in overall BSUoS cost recovery. Therefore BSUoS changes to under CMP281 will be adjusted for all other parties that are liable to ensure that the total amount is recovered in each half hour. This adjustment will marginally increase the BSUoS costs for all other BSUoS payers.

4. Discussion of differential treatment of transmission users.

4.1. The CMP281 proposal will result in the following outcome:

- Generator parties associated with storage trading units or BMUs that are transmission connected will be relieved of a liability for import BSUoS charges; and
- All other generator parties and supplier parties with trading units and BMUs will pay an additional charge to ensure the total revenue recovery in each half hour.

4.2. CMP281 therefore introduces differential treatment for different classes of users. This is explored below.

Different Treatment for Generator Parties

4.3. CMP281 results in differential treatment for generator parties. Certain generation types (notably pumped storage) no longer have an liability for import BSUoS while other generator parties retain the liability for BSUoS (for example where a power station is importing to provide site load when a generating unit is on an outage) There is also an incremental cost for all generator parties (including storage providers that are exporting) from the adjustments to BSUoS charges to ensure cost recovery.

4.4. The differential treatment of generators under CMP281 may result in wider impacts in the electricity or capacity markets in relation to the costs associated with certain generators types. For example, pumped storage will have lower “fuel” import costs when compared with the current arrangements. Other generators with import costs will receive no benefits under CMP281. All generators will see a marginal impact on BSUoS costs as tariffs are adjusted to ensure cost recovery.

Different treatment of “Network Costs”

4.5. Storage trading units and BMU import costs (power price plus use of system costs) may be considered as equivalent to network costs of any other generator. For example, CGGTs costs include the cost of using the gas network, while coal fired generators have the costs associated with utilisation of the rail network. Therefore relieving certain generators of certain network costs while others remain exposed to such costs may be considered to be differential treatment.

4.6. The differential treatment of generators under CMP281 may result in wider impacts in the electricity or capacity markets in relation to the “network” costs associated with certain generators types. For example, pumped storage generators will have lower costs when importing.

Different Treatment of Storage

4.7. CMP281 introduces different treatment of storage facilities connected to the transmission system and those connected to the distribution system.z`

4.8. Under the current arrangements Generation parties with storage connected to the transmission system have a liability for both import and export BSUoS. For suppliers, however, storage facilities may:

- Reduce imports where storage is exporting in a Supplier trading unit or BMU that is importing (an embedded benefit); or
- Increase imports when storage is importing in a Supplier trading unit or BMU that is import (increased supplier import BSUoS costs); or
- Increase exports when is exporting in a Supplier trading unit or BMU that is exporting (increased supplier export BSUoS costs); or
- Reduce exports when is exporting in a Supplier trading unit or BMU that is exporting (decreased supplier BSUoS export costs).

4.9. The treatment of transmission connected and demand connected storage under the current arrangements is illustrated in Table 3. It should be noted that the precise cost pass through arrangements are related to the commercial agreement between the supplier and the storage facility owner

Table 3: Summary of Current BSUoS liabilities

CUSC Party	Import/Export	BSUoS	Storage	Storage Liability
Generation	Importing	Import BSUoS	Importing Transmission connected storage	Import BSUoS
Generation	Exporting	Export BSUoS	Exporting Transmission connected storage	Export BSUoS
Supplier	Importing	Import BSUoS	Importing Distribution connected Storage	Increased Import BSUoS (Increased Supplier Cost)
Supplier	Importing	Import BSUoS	Exporting Distribution connected Storage	Reduced Import BSUoS (Embedded Benefit)
Supplier	Exporting	Export BSUoS	Importing Distribution connected Storage	Reduced Export BSUoS (Decreased Supplier Cost)
Supplier	Exporting	Export BSUoS	Exporting Distribution connected Storage	Increased Export BSUoS (Increased Supplier Cost)

4.10. CMP281 will modify the treatment of storage so that importing generation will be exempt for the importing BSUoS costs. This is illustrated in Table 4:

Table 4: Proposed treatment of BSUoS liabilities under CMP281

CUSC Party	Import/Export	BSUoS Liability	Storage	Storage Liability
Generation	Importing	Import BSUoS	Importing Transmission connected storage	**None**
Generation	Exporting	Export BSUoS	Exporting Transmission connected storage	Export BSUoS
Supplier	Importing	Import BSUoS	Importing Distribution connected Storage	Increased Import BSUoS (Increased Supplier Cost)
Supplier	Importing	Import BSUoS	Exporting Distribution connected Storage	Reduced Import BSUoS (Embedded Benefit)

Supplier	Exporting	Export BSUoS	Importing Distribution connected Storage	Reduced Export BSUoS (Decreased Supplier Cost)
Supplier	Exporting	Export BSUoS	Exporting Distribution connected Storage	Increased Export BSUoS (Increased Supplier Cost)

4.11. CMP281 will therefore result in different treatment of transmission connected storage from distribution connected storage, which will retain its liability for import BSUoS when the storage facility is importing and the relevant supplier trading unit or BMU is also importing. CMP281 will therefore result in differential treatment of storage according to the network to which the facility is connected.

4.12. The differential treatment of storage could be addressed by adjusting a supplier liability for import BSUoS for the imports related to a supplier trading unit or BMU when the facility is also importing. This is illustrated in Table 5. However introducing a change as outlined in Table 5 outside the scope of CMP281 and could be administratively complex.

Table 5: Possible treatment of supplier BSUoS liabilities

CUSC Party	Import/Export	BSUoS Liability	Storage	Storage Liability
Generation	Importing	Import BSUoS	Importing Transmission connected storage	**None**
Generation	Exporting	Export BSUoS	Exporting Transmission connected storage	Export BSUoS
Supplier	Importing	Import BSUoS	Importing Distribution connected Storage	**None?**
Supplier	Importing	Import BSUoS	Exporting Distribution connected Storage	Reduced Import BSUoS (Embedded Benefit)
Supplier	Exporting	Export BSUoS	Importing Distribution connected Storage	Reduced Export BSUoS (Decreased Supplier Cost)
Supplier	Exporting	Export BSUoS	Exporting Distribution connected Storage	Increased Export BSUoS (Increased Supplier Cost)

Embedded Benefits (Offsetting supplier import costs)

4.13. CMP281 does not address the embedded benefit associated with storage exports that offset supplier import demand. The current arrangements for BSUoS charges are based on the net export or impart of supplier trading units or BMUs. Therefore a supplier trading unit or BMU that is importing will benefit from a storage facility that is exporting at the same time (reduced cost). This results in an embedded benefit for distribution connected storage facility. This issue is related to gross charging for storage exports.

5. Summary

5.1. This paper has considered the issues associated with the recovery of BSUoS costs from storage facilities as proposed under CMP281.

The note highlights that the proposed solution results in differential treatment between generator parties to the CUSC, in relation to network costs and in relation to storage facilities connected to the transmission system and facilities connected to the distribution system.

Annex 1: Definition of Storage

DRAFT REPORT on the proposal for a directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast) (COM(2016)0864 – C8-0495/2016 – 2016/0380(COD)), Committee on Industry, Research and Energy Rapporteur: Krišjānis Kariņš, **2016/0380(COD),** 15.6.2017

Proposal for a directive

Article 2 – paragraph 1 – point 47

Text proposed by the Commission

47. 'energy storage' means, in the electricity system, deferring an amount of the electricity that was generated to the moment of use, either as final energy or converted into another energy carrier.
47. 'energy storage' means, in the electricity system, the conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy or another energy carrier.

