Title: Impact Assessment on the licence condition to prohibit potential abuse of transmission constraints by generators in the balancing mechanism	**Impact Assessment (IA)**
IA Number: n/a	Date: February 2017
Project Number: n/a	Stage: final
Division: Energy Systems Team: Wholesale Market Conduct	Source of intervention: Domestic
Type of IA: Not Qualified under Section 5A UA 2000.	Type of measure: Wholesale
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Impact of proposals on Ofgem's Strategic Outcomes

Strategic Outcomes	Overview of Impact
Lower bills than would otherwise have been the case.	The policy objective is to restrict opportunities for generation companies to exploit periods of transmission constraint resulting in lower bills for consumers through lower constraint costs. The licence condition supports effective competition.
Reduced environmental damage both now and in the future.	Not applicable
Improved reliability and safety.	The licence condition can ensure that the right signals are sent encouraging investments in areas where reinforcement of the system is most needed.
Better quality of service, appropriate for an essential service.	Not applicable
Better Social Outcomes	Not applicable

Quality Assurance Status	Peer review

Summary: Intervention and Options

Rationale for intervention, objectives and options

What is the problem under consideration? Why is Ofgem intervention necessary?

Companies with generation located in a transmission constrained region may be able to engage in exploitative behaviour which results in increased costs for the System Operator to balance the system. From the introduction of TCLC until 31 October 2016 an estimated 156 million pounds were saved, primarily by prohibiting exploitative behaviour. The licence condition expires in July 2017 but evidence shows that constraints will remain in the system. An extension of the licence condition is needed to reduce unnecessary costs which would eventually be paid by the consumers.

What are the policy objectives and intended effects?

The objective of introducing the licence condition in a new form after July 2017 is to prevent higher than necessary bills for consumers by maintaining the prohibition on generation companies exploiting periods of transmission constraint. TCLC introduced by Ofgem will ensure that it is consistent with the standard practices around licence conditions and provides certainty for managing the market in the future.

What are the policy options that have been considered, including any alternatives to regulation? Please justify the preferred option (further details in Evidence Base)

The option "Do Nothing" (policy option 1) was considered. In this case it means letting the licence condition expire in July 2017. It is not recommended because of the risk of increase in constraint costs once the prohibition expires.

Our preferred option (policy option 2) is to introduce a new licence condition to replace the existing one because it is due to expire in July 2017. This will maintain the current market conditions. The new licence condition would be permanent because analysis shows that transmission constraints are likely to be a recurring feature of an evolving system, remaining after the main reinforcement works around the Cheviot transmission constraint are completed in the mid-2020s.

We also considered extending the licence condition as set out in the Sunset Clause of the current licence condition. This would have maintained the old licence for an additional two years. However, this is not an action within Ofgem's control and has consequently not been used as the counterfactual to our preferred option.

Monetised Impacts (£m)

Business Impact Target Qualifying Provision	
Business Impact Target (EANDCB)	Not applicable
Net Benefit (Explain the basis of monetised impacts e.g. NPV or other).	We believe there is a positive net benefit of introducing this licence condition by avoiding high cost in transmission constraints. There are some monetised impacts which we are not reporting because they don't represent the full impact and there is too much uncertainty.

Hard to Monetised Impacts

Describe any hard to monetised impacts, including mid-term strategic and long-term sustainability factors Under the preferred option of extending Circumstance 2 there will be no impact compared to the current situation as the prohibition is ongoing. We expect that not extending the licence condition could have a negative impact for consumers.

Will the policy be reviewed? Yes	**If applicable, set review date: month/Year** Review will be as appropriate as part of Ofgem's ongoing market monitoring obligations.

Summary: Analysis & Evidence Policy Option 1 - Do Nothing

FULL ECONOMIC ASSESSMENT

Price base year:	Base Year:	Time Period:	Net Benefit (£m)		
			Low: optional	**High:** Optional	**Best Estimate:**

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition)(Constant Price)	Total Cost (Present Value)
Best Estimate	Not applicable		

Description and scale of key monetised costs by 'main affected groups'

There are no monetised costs.

Other key non-monetised costs by 'main affected groups'.

Letting the licence condition expire without a replacement leads to the termination of the prohibition of gaining excessive benefits in periods of transmission constraints. This can result in higher bid prices, therefore increased constraint costs. Constraint costs are ultimately paid for by consumer. Therefore this option can lead to an increase in electricity bills for consumers.
The right signals are sent encouraging investments in areas where reinforcement of the system is most needed. The risk in absence of TCLC is that wrong price signals will be sent by inflated prices driving investment away from areas where it is most necessary. This might lead to inefficient outcome for investments.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition)(Constant Price)	Total Benefit (Present Value)
Best Estimate	Not applicable		

Description and scale of key monetised benefits by 'main affected groups'

There are no monetised benefits.

Other key non-monetised benefits by 'main affected groups'.

Consumers do not have any benefits if we let the licence expire.
Businesses have savings from compliance costs if the licence condition expires. However, the cost of compliance is low and it is split between complying with the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT) and other wholesale market obligations. Therefore we expect this savings to be marginal. Ofgem has an ongoing obligation to monitor the market, but this is not directly related to TCLC. Therefore there would be no savings as the obligation to monitor remains.

Key Assumptions/sensitivities/risks	Discount rate (%)
We acknowledge that the expected impacts and our evaluation are dependent on a number of assumptions which are described in the Evidence Base section. Our main assumption is that constraints continue to exist therefore a permanent extension of the licence condition is necessary.	

BUSINESS ASSESSMENT (Option 1)

Direct impact on businesses (EANCB)	**Score £m:**

Policy Option 2 – new licence condition

Price base year:	Base Year:	Time Period:	Net Benefit (£m)		
			Low: optional	**High:** Optional	**Best Estimate:**

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition)(Constant Price)	Total Cost (Present Value)
Best Estimate	Not applicable		

Description and scale of key monetised costs by 'main affected groups'

No monetised costs. We expect the costs to be very low.

Other key non-monetised costs by 'main affected groups'.

Consumers do not directly bear any costs.
Incumbent businesses are not expected to face additional costs as systems and procedures were already implemented when TCLC first came into force in 2012. There might be costs for new entrants of setting up compliance procedures; however we expect these to be split between complying with REMIT and other wholesale market obligations. Businesses will also have one-off costs if they are investigated for a potential breach of the new condition.
Ofgem will have ongoing monitoring costs and will have one-off costs of investigations.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition)(Constant Price)	Total Benefit (Present Value)
Best Estimate	Not applicable		

Description and scale of key monetised benefits by 'main affected groups'

There are no monetised benefits.

Other key non-monetised benefits by 'main affected groups'.

There won't be any additional benefits but the already existing benefits will continue, maintaining constraint costs at a lower level. It also continues to send the right signals to encouraging investments and supports the System Operator in keeping constraint costs low.
Businesses – deterrence from exploitative behaviour increases confidence in the market which supports investment and reduces barriers to entry. The licence condition will be in line with other standard licence conditions to improve consistency.

Key Assumptions/sensitivities/risks	**Discount rate (%)**
Our main assumption is that the licence condition has a distributional impact of transferring the revenue from some generators to consumers. Generators loss of excessive profits is a gain for consumers by having lower electricity bills. We acknowledge that the impacts and our evaluation are dependent on a number of assumptions which are described in the Evidence Base section. Monetised impacts are not reported as they are indicative only and do not represent the full impact.	

BUSINESS ASSESSMENT (Option 2)

Direct impact on businesses (EANCB)	**Score £m:**

Contents

1. Background

1.1. In order to better understand the proposal, it is important to look at the relevant wholesale electricity market characteristics and the background of the current Transmission Constraint Licence Condition (TCLC). Ofgem has had longstanding concerns that the potential exists for electricity generators to manipulate and exploit market conditions and charge unduly high prices to the System Operator (SO) to balance the system in connection with periods of transmission constraint. The Energy Act 2010 gave powers to the Government to introduce a licence condition to limit behaviour by electricity generators during periods when there is insufficient capacity to transmit electricity from where it is generated to where demand is. The licence condition was introduced by the Secretary of State in July 2012 and will remain in force until 15 July 2017.

1.2. We propose the current licence condition expires and we introduce a new licence condition. This impact assessment considers the costs and benefits related to this new licence condition.

Transmission network constraints

1.3. The GB transmission system has a finite capacity to transmit electricity between any two locations. If flows on the system are too high, parts of the network can overload leading to system insecurity. Transmission constraints exist when the capacity of the network between two locations is insufficient to transmit electricity from where it is produced to where the demand is situated. An **export constraint** happens when total generation in an area exceeds the total demand plus transmission capacity to export the excess electricity. **Import constraints** occur when, given the current demand and electricity generated within an area, there is insufficient transmission capacity to import the required amount of electricity.

1.4. Constraints can arise under normal network conditions due to the patterns of supply and demand on a given day. However, they are often triggered or exacerbated by transmission and/or generation outages. The duration of transmission constraints varies greatly between a single half-hourly settlement period to several days or longer. The proposed prohibition applies to export constraints only (as does the current Circumstance 2 of TCLC).[1]

[1] Circumstance 1 of the current licence condition applies to both import and export constraints. TCLC does not prohibit excessively high offered during import constraints. The rationale for this is that (in the absence of output manipulation) such price spikes may be a true reflection of scarcity generation, and hence a reasonable investment incentive.

1.5. When TCLC came into force the major constraint area was the Cheviot transmission boundary along the Anglo-Scottish border. Constraints on the Cheviot mean there is not enough capacity on the network for production scheduled to be generated in Scotland to be transmitted to England and Wales.

Constraint costs

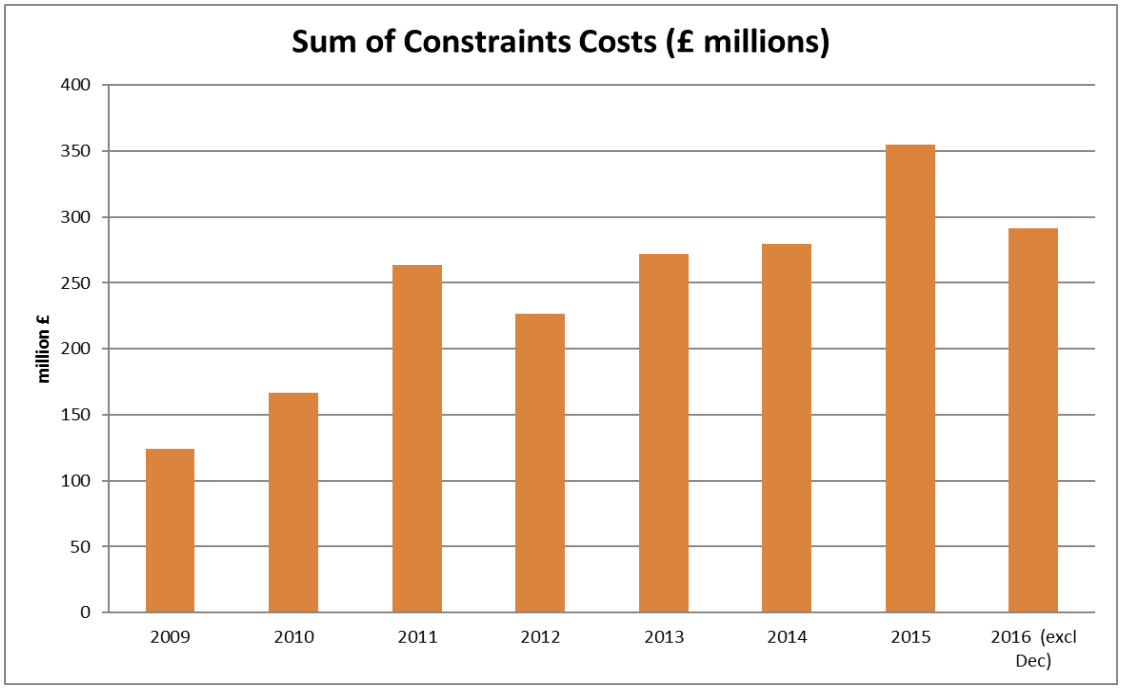
1.6. National Grid (NG), the SO, has the responsibility to ensure that the network is balanced when constraints occur. The SO can trade through the Balancing Mechanism (BM), where generators submit "offers" to increase or "bids" to decrease the amount of electricity they produce from a particular plant. During periods of transmission constraints the SO often has limited set of options to purchase increased/reduced generation from a special geographic area.

1.7. The costs that the SO incurs from managing the constraints on the network are subsequently charged to generators and suppliers in proportion to their share of the market across GB, effectively resulting in a socialised charge, called 'constraint costs' which is ultimately paid for by the consumers. The total cost for managing transmission constraints was £354 million in 2015, which was a significant increase from £279 million in 2014. In 2016 (excluding December) it cost £235 million to manage constraints.[2]

[2] Information on constraint costs is available from National Grid in the Monthly Balancing Services reports published monthly. We used the figures of Transmission Constraint - Total Management Costs, adding up the monthly figures to get the yearly total cost (calendar year, January to December). At the time of publication the December 2016 data was not yet available.

http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Report-explorer/Services-Reports/

Figure 1 – Sum of Constraint Costs (£ millions) 2011 - 2016



2. Review of the TCLC

2.1. The TCLC was introduced by government through Section 18 of the Energy Act 2010. It covers two specific behaviours. One of these, Circumstance 1, is capable of being regulated under the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT), and so we do not consider that we need to replace the current licence condition. It is proposed that the other behaviour, Circumstance 2, is extended in the form of a new licence condition introduced by Ofgem.

Overview of the current TCLC

2.2. Situations can arise where a generator has the opportunity to act in such way as to make it very likely that the SO will be compelled to accept more expensive bids in order to ensure the balancing of the network. In these situations the SO would have limited or no other options available and may have to accept the bid regardless of the price.

2.3. Circumstance 1 prohibits the manipulation of generation to create or exacerbate a transmission constraint enabling the generator to derive excessive benefit from either bids or offers in the BM. This occurs when a generator dispatches or withholds plant when it had more economic options available and the licensee is paid, or seeking to be paid, an excessive

amount by the SO in relation to increasing or reducing generation. Circumstance 1 is applicable to both import and export constraints.

2.4. Circumstance 2 prohibits licenced generators from taking advantage of being behind an export constraint. Specifically, in connection with reducing generation, it prohibits electricity generations from:

- paying or seeking to pay the SO an excessively low amount or
- being paid or seeking to be paid an excessive amount by the SO.

The impact of TCLC to date

2.5. We have collected and monitored data on the management of transmission constraint costs by the SO as part of our ongoing monitoring obligations. Our analysis below evaluates the impact of TCLC by reviewing constraint volumes and pricing from before it was introduced in 2012 until 31 December 2016[3]. In our review we looked at the impact of TCLC on prices in detail. Analysis suggests that TCLC had contributed significantly to the reduction in prices, though we acknowledge that other factors could have also influenced the price.

2.6. Our analysis of the impact considers a time period when both circumstances of TCLC could have an impact on the market. This analysis focuses on the potential impact of Circumstance 2 by looking at the change in average bid prices, not considering whether manipulation of generation was used to create or exacerbate a transmission constraint (which is covered by Circumstance 1). We focus our analysis on Circumstance 2 because this impact assessment considers the extension of only that prohibition.

Methodology

2.7. We looked at the impact of TCLC on all generation technology types: gas, coal, CHP (Combined Heat and Power), onshore and offshore wind, hydro and pumped storage. We identified the technology type of all Balancing Mechanism Units (BMU). The total accepted bids are categorised[4] into three zones, which are Cheviot (CH), England - Wales (EW) and Scotland (SC).

2.8. The average prices used in the analysis are calculated using the total amount NG paid to or received from the BMUs for constraint reasons over given periods. This number is then divided by the total volume that NG traded for system reasons over the same period. This gives a weighted

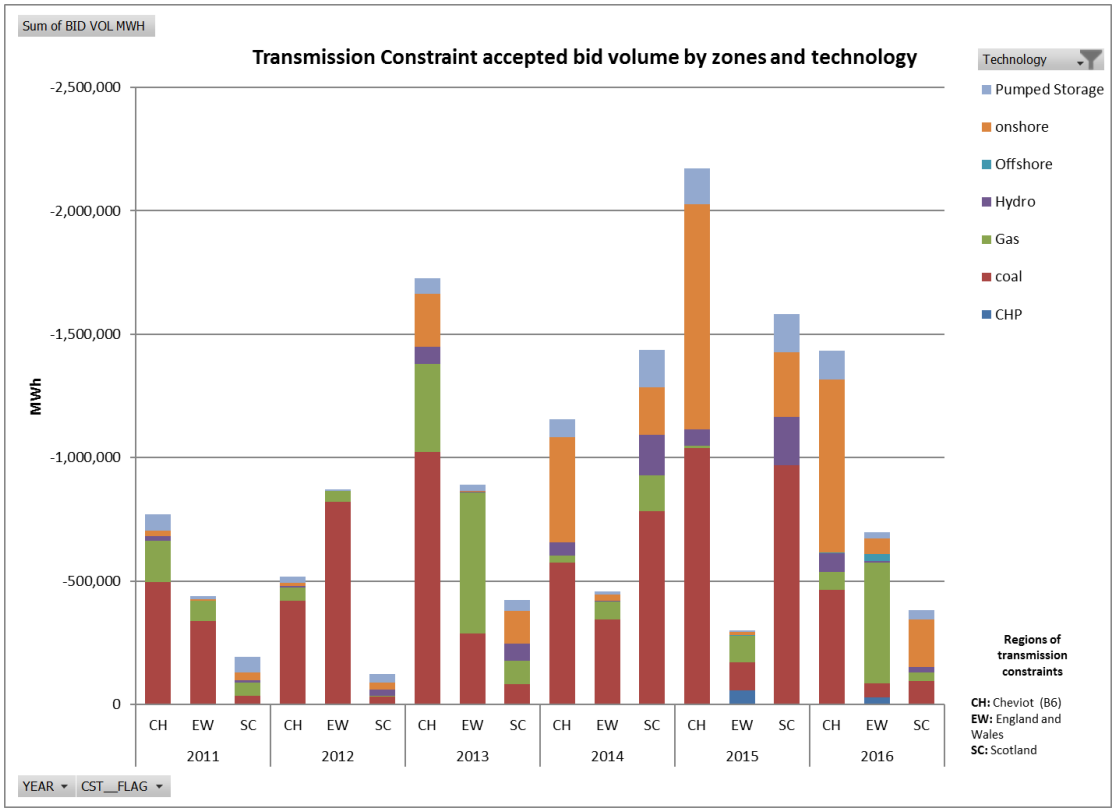
[3] The analysis covers the time between 1 January 2011 and 31st December 2016. All data used for this analysis has been provided by National Grid.
[4] This categorisation is from the original data we were provided with.

average £/MWh price for each MWh of electricity bid to turn down generation for system constraint reasons for a given period.

Volumes taken for constraint reasons

2.9. Figure 2 below presents the accepted bids volume trends from 2011 to October 2016 taken by the SO for constraint reasons. The volume is illustrated by zones and technology type. It shows that volumes follow different trends in the three zones. The Cheviot constraint volumes are typically the highest. This shows that constraints are still present in the Cheviot area and will remain until infrastructure reinforcement is completed. Constraint volumes in Scotland fell significantly in 2016 compared to the previous two years. Volumes in England and Wales moved in the opposite direction, being the highest in the last three years. This shows that constraint volumes exist in these zones as constraints are results of the current design of the transmission system. This appears to be in line with the forecasted drop in constraint volumes in paragraph 3.7.

Figure 2 – Accepted bid volumes 2011 - 2016



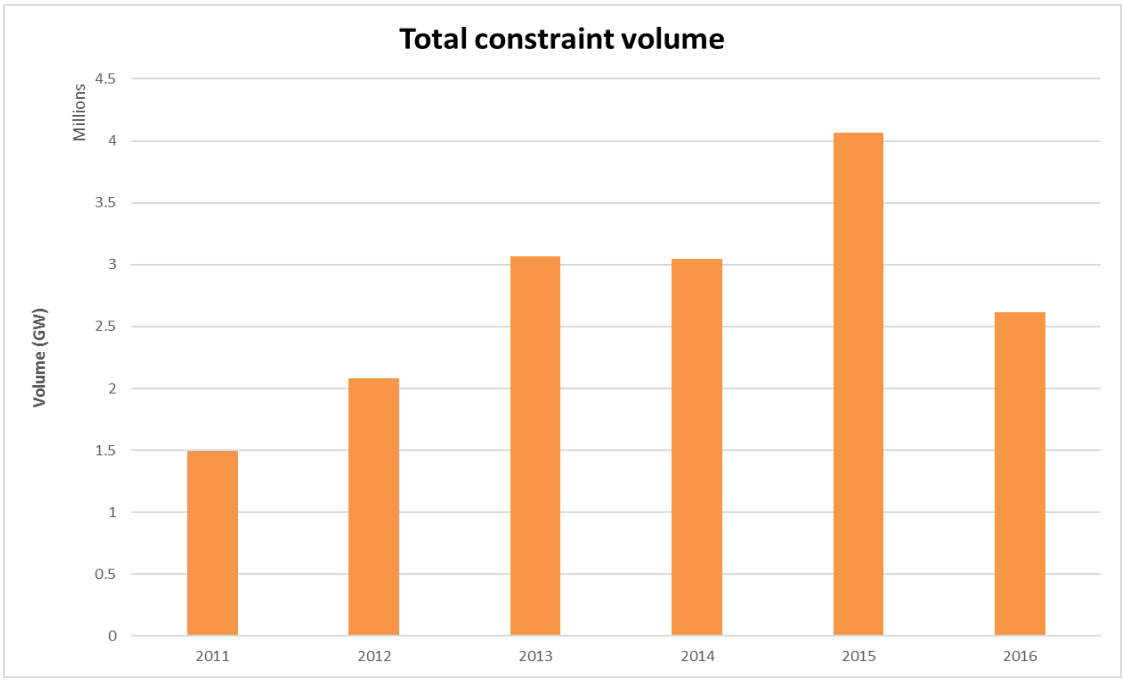
2.10. Although focus was on the Cheviot volumes as it was identified as a major contributor to transmission constraints when TCLC was introduced in 2012, data shows that constraints are significant in other areas of the network too. This supports the expectation that transmission constraints

will remain in the system after the infrastructure reinforcement is completed at the Cheviot Boundary.

2.11. For the technology types, wind units, onshore in particular, have had large proportion of the volumes reduced to manage constraints in Cheviot, followed by coal, gas, CHP, hydro and pumped storage. In addition, in Scotland the volumes accepted for onshore wind also takes a sizable share of the total volume. However, this graph shows only one dimension of the impact. Figure 4 shows the significant impact that onshore wind has on the overall constraint costs.

2.12. Figure 3 presents the total constraint volume. The total volume was increasing year-on-year until 2015 to over 4GW per year. The volume in 2016 was just over 2.5GW, a sharp fall from the previous year but it is still higher than in 2011, when the licence condition was introduced.

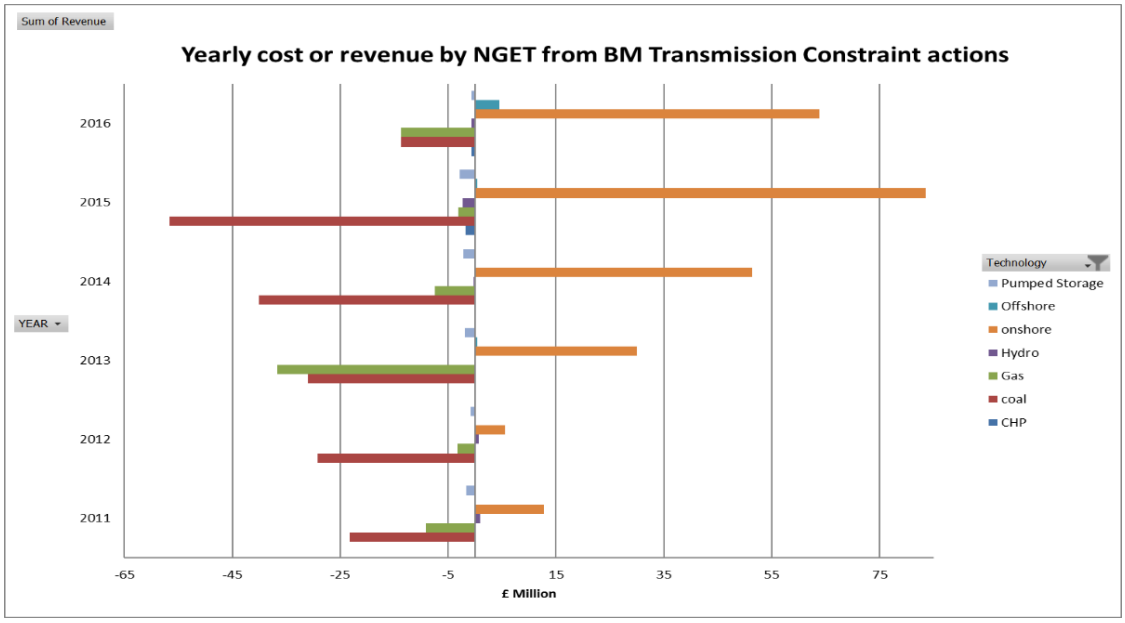
Figure 3 – Total constraint volume 2011 – 2016



2.13. Figure 4 below shows the total costs for the SO associated with actions in the BM related to transmission constraints between 2011 and 2016. Due to the different fuel types, most technologies such as gas, coal, CHP and pumped storage have negative costs (paying the SO to reduce generation), while wind (both onshore and offshore) and hydro have positive costs (the

SO pays the generators)[5]. The left side, with negative values is the total cost generators paid each year to the SO when instructed to reduce generation. The right side, with positive values, shows how much the SO had to pay generators.

Figure 4 – Value of NGET actions in the BM (in £ millions)



2.14. It is apparent that the costs associated with wind generation, considering both onshore and offshore, are significantly higher than other technologies. The graph also shows that the costs of managing onshore wind units are significantly higher than offshore; this is due to the size of the offshore installation being still relatively small. However, the cost per MWh among all technology types is the highest for offshore generators. This is because offshore wind receives the highest tariff of government subsidies in comparison to other renewables. When asked to reduce generation the loss of revenue from these subsidies is included in the total revenue lost.

2.15. Figures 2 and 4 indicate that for onshore wind, bid volumes and associated costs are significantly larger in comparison to other technologies. Therefore our analysis focuses on changes in bidding

[5] The reason for the positive costs associated with wind and hydro generation is due to the marginal costs associated with these technologies. This includes government subsidies for incentivising the renewable installations. When there are constraints on wind and hydro generation, these renewable generator owners will lose revenue from these subsidies. For traditional thermal generation, however, the bids to turn down the generation will consequently save the fuel costs for operation. Thus the thermal generation owners tend to bid with positive prices, in another word, paying the system operator to turn down the generation.
In the absence of subsidies, prices will still remain high as reducing generation is costly while it does not produce any benefits. These costs also include, for example, lost PPA revenues, costs of setting up the system, risks of failures and administrative costs.

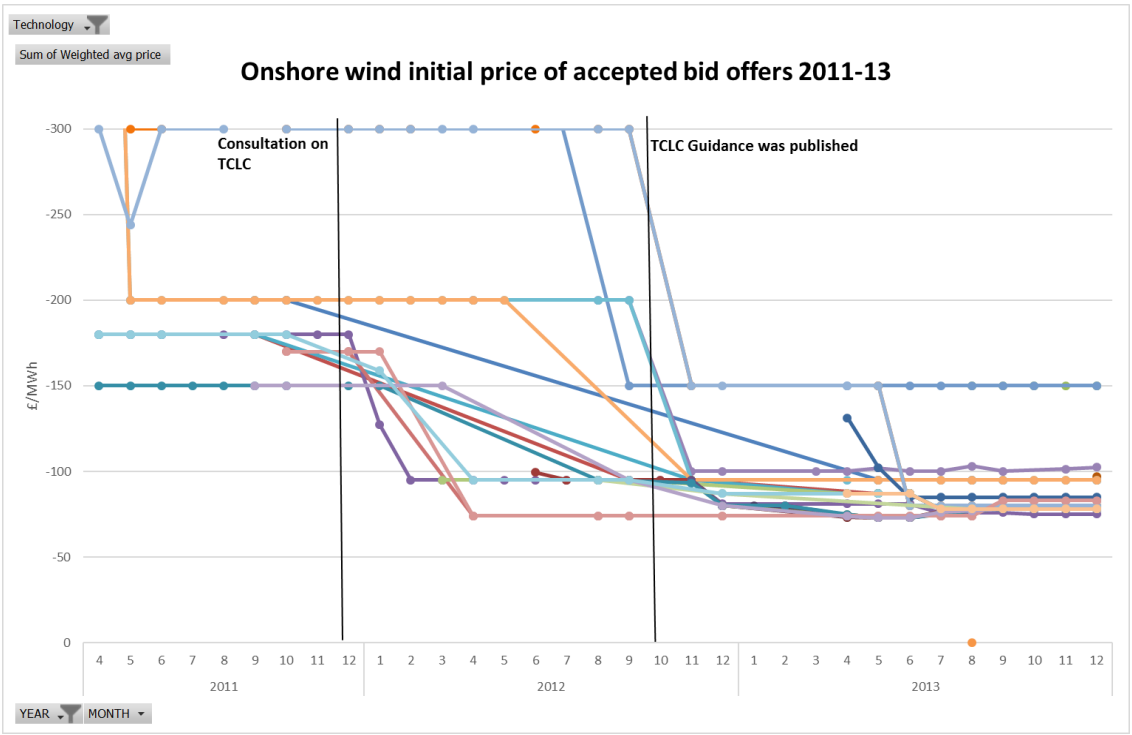
behaviour in onshore wind generation before and after the implementation of the TCLC to evaluate how the policy has impacted on the prices of bids submitted by onshore wind generators. As the expenditure on wind technology has decreased through recent years, we believe this trend should be reflected in the bid prices.

2.16. We have not identified significant impact with other generation technologies. Information on the price impact on other generation types can be found in Annex 1.

Onshore wind price change

2.17. For this analysis we focus on changes in bidding behaviour by onshore wind generation[6] before and after the implementation of the TCLC to evaluate how the policy has impacted on the prices of bids undertaken by onshore wind generation.

Figure 5 - Onshore bid prices 2011 - 2013



2.18. Figure 5 presents the onshore wind generation bid prices by all generation units (marked by the different coloured lines) from 2011 to 2013 for system constraint reasons. We specifically looked into the onshore wind generation bid prices between 2011 and 2013. We identified two main events, the publication of the consultation on TCLC in 2011 and the

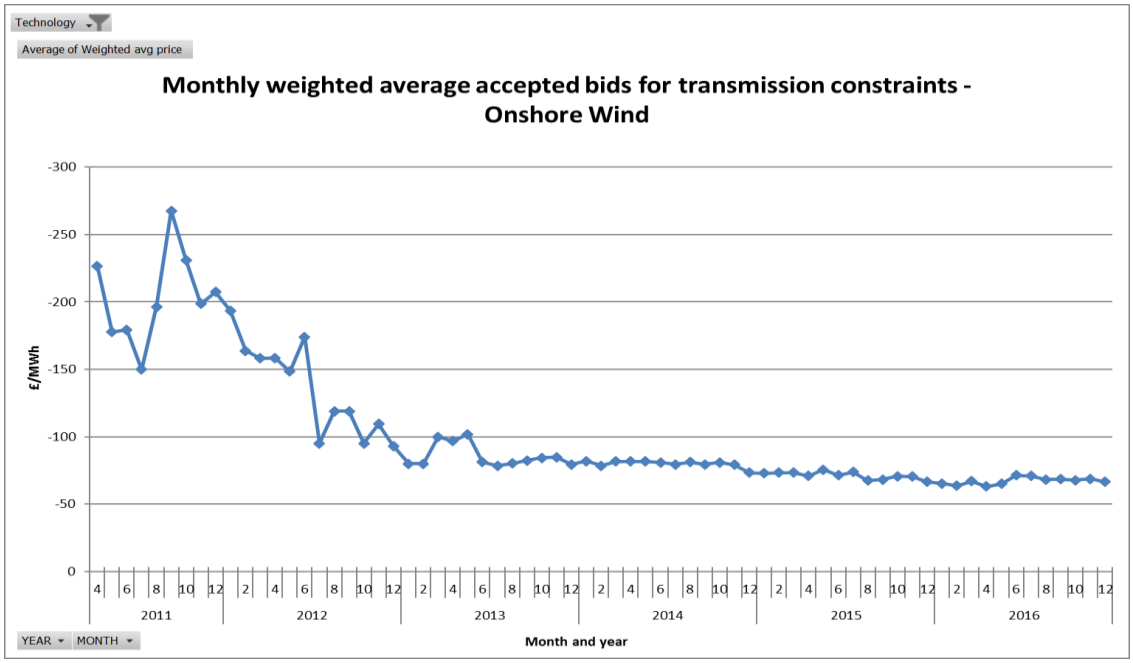
[6] To evaluate the impact of TCLC implementation, we will only analyse the onshore wind units as for offshore the first bid taken by the system operator was in 2013 after the TCLC was introduced.

publication of its guidance in 2013. We chose these as we expected these to have had an impact on licensee's behaviour. We observed an impact on prices within this period and assessed these in more detail.

2.19. The first event is the publication of the consultation on TCLC in December 2011. We found a drop in prices shortly and clearly following the publication. The bidding price range shifted from varying between -£300/MWh and -£150/MWh to between -£300/MWh and -£70/MWh.

2.20. Following the publication of the TCLC guidance in October 2012, the bidding price range shifted down further to between -£150/MWh and -£70/MWh. We also observed that the significantly low price of bids, such as -£300/MWh, was last taken by the system operator in late September 2012. The timing of these changes in bids suggests strongly that bidding behaviour was positively impacted by the implementation of TCLC.

Figure 6 – Onshore bid prices 2011 - 2016



2.21. Figure 6 presents the weighted average bid price movement for onshore wind generation from the pre-TCLC period to the end of October 2016. There is a clear decreasing trend during this period. As seen in Figure 5, in the transitionary period the bidding range for average bid prices decreased. During 2012 prices fell relatively sharply, with average bid prices moving from -200/MWh to lower than -100/MWh within a year. The average price continued to drop but at a much lower rate from 2013 to today. During 2013 the implementation of TCLC was completed and we assume that licensees have put in place the appropriate procedures by the end of the year. We saw more volatility at the beginning of the period and a lower rate

of price decrease. This is likely to be the reason behind the slowdown in the rate the price was decreasing from 2014 onwards. The average price of the year in 2016 was -£66/MWh.

2.22. The average prices used in the analysis are calculated using the total amount National Grid Electricity Transmission (NGET) paid to the wind balancing mechanism units to turn down generation for system reasons over given periods. This number is then divided by the total volume that NGET bid down for system reasons over the same period. This gives a weighted average £/MWh price for each MWh of wind-generated electricity bid down for system reasons for a given period.

2.23. To conclude, our analysis shows that system constraint issues continue to exist and have become more significant year on year. The overall costs associated with managing constraints for the system operator have inevitably increased at the same time because of the simultaneous expansion of generation in less well connected parts of the network, a significant portion of this being wind generation. Meanwhile we have observed the bid prices of onshore wind unit decreased since the implementation of TCLC. The analysis supports the case of the need for the extension of TCLC for a longer time period.

3. Rationale for intervention

3.1. This section considers the rationale for Ofgem to extend the prohibitions of TCLC after its current expiry date by introducing it as a new licence condition. TCLC appears to have been effective in deterring exploitative behaviour at periods of transmission constraint. An enforcement case for breach of Circumstance 2 was concluded in 2015[7]. Evidence shows that constraint volumes are expected to be significant in the medium-term therefore action is required to ensure that costs of managing these constraints remains as low as possible.

TCLC expiring in July 2017

3.2. TCLC was intended to cover the period of high transmission constraints, mainly around the Cheviot boundary, which were expected to reduce around 2017 following infrastructure upgrades. It was therefore introduced as a time-bound licence condition for 5-years to expire on 15 July 2017 with an optional 2-years extension if considered necessary.

[7] SSE had submitted and had bids accepted for hydroelectric units for several months during 2014 at prices which were above an economically justifiable level. SSE admitted that they had failed to comply with TCLC for a period of time under consideration. See https://www.ofgem.gov.uk/publications-and-updates/sse-pay-100000-energy-action-scotland-over-constraint-payments

3.3. The review of TCLC during 2016 showed the positive impact that Circumstance 2 of TCLC had on prices (see above "Problem under consideration"). The limited number of enforcement cases[8] suggest that it has been effective in deterring the described abusive behaviour, whilst at the same time being effectively enforceable.

3.4. In line with the Government's better regulation guidelines we have reviewed whether there is potential overlap of TCLC with other regulations. We judge that the behaviours prohibited by TCLC have significant parallels with Article 5 of REMIT[9]. In relation to Circumstance 1 we consider REMIT to be the most effective tool. For Circumstance 2 TCLC appears to remain the best placed to deter and enforce this behaviour.

3.5. When TCLC was initially consulted on in 2012 it was considered whether these behaviours could be enforced under Ofgem's competition powers. At the time it was decided that a specific and targeted licence condition is more likely to achieve the intended objectives (of savings to consumers) at lower resource cost (in terms of investigations). The recent review of TCLC showed that these circumstances have not changed as the likelihood of an infringement under the Competition Act 98 remains low and TCLC is still best placed to enforce against these exploitative behaviours. Therefore the recommended option is to let the current licence condition to expire and extend Circumstance 2 only in the form of a new licence condition.

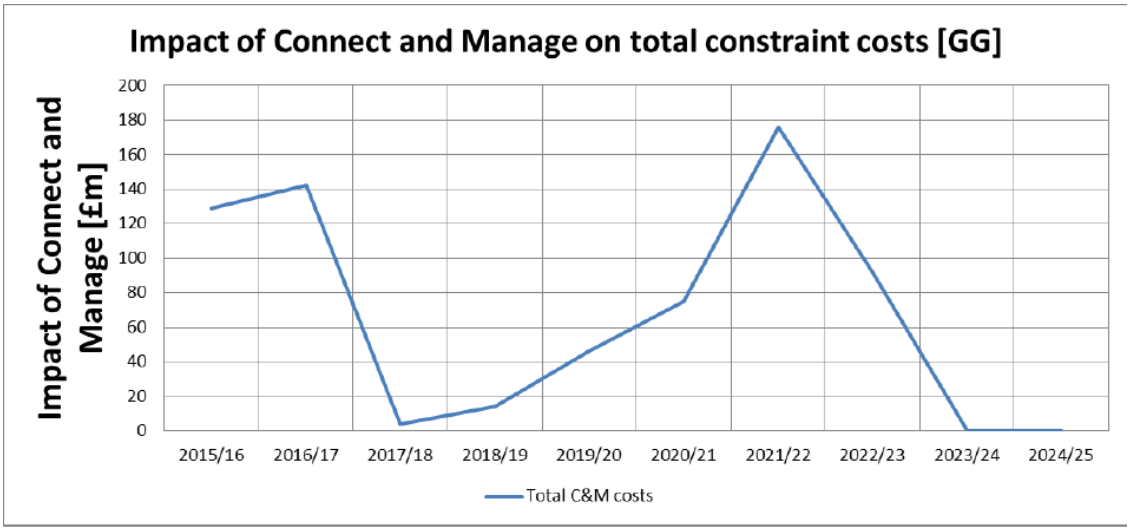
Constraint costs beyond 2017

3.6. Transmission constraints are a natural feature of the way the system is currently designed. Current evidence suggests that periods of transmission constraints are likely to continue to exist beyond 2017. Figure 7 below, taken from NG's latest available Connect and Manage forecast[10] shows expected impact of the Connect and Manage policy on constraint costs. NG forecasts for constraint related costs to the SO suggest an initial drop in costs in 2017. These costs are then expected to continuously increase from 2018/19 peaking in 2022. The drop in 2017 is expected due to the completion of the Western HVDC link, improving transmission capacity between Scotland and England-Wales. Then it is expected to rise again, until it decreases from 2023 when the Eastern HVDC link is expected to be completed. Connect and Manage is only one factor impacting on constraint volumes and costs.

[8] The case described about brought against SSE is the only enforcement case to date.
[9] Article 5 of REMIT is the prohibition of market manipulation. The REMIT Regulation is available here: https://www.acer-remit.eu/portal/document-download?documentId=2650

[10]The original graph is available at http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=41538

Figure 7 – National Grid's expectation of the impact of Connect & Manage on constraint costs



3.7. Analysis on the impact of TCLC shows (see Figure 2) that the largest constraint volume is due to the Cheviot constraint between Scotland and England & Wales. The two infrastructure reinforcement projects mentioned above are expected to ease pressure off the Cheviot boundary. However, constraint volumes in the other regions, Scotland and England & Wales are also significant and will continue to exist.

3.8. Constraint costs can be expected to remain at a relatively high level until these significant network upgrades are completed. We also expect transmission constraints to remain in the system as a result of the way it is currently designed. Given the likelihood that periods of transmission constraints will continue to exist, having a licence condition such as TCLC could continue to ensure that the price of managing generation due to transmission constraints remains as low as possible for consumers.

4. Policy objective

4.1. The objective of introducing the licence condition from July 2017 to replace Circumstance 2 of the existing condition, is to prevent higher than necessary bills for consumers by maintaining the prohibition on generation companies exploiting periods of transmission constraint. Evidence suggests that transmission constraints are expected to remain in the system after the planned reinforcements and are part of the current system design.

4.2. Ofgem is continuously monitoring the market as part of its ongoing obligations. We do consider it important to continuously review whether there is a need for regulation, including in response to stakeholder feedback, and if so, whether it needs amending to ensure it meets its

objectives. This new TCLC being introduced by Ofgem and not the government enables reviewing and updating the licence condition when necessary, including to maintain consistency with other conditions.

5. Options under consideration

5.1. As part of the review of TCLC during 2016 we considered the following options for the future of the licence condition:

5.2. The "Do Nothing" option was considered. In this case it means letting the licence condition to expire in July 2017 without an extension in any form. This would mean that the prohibition on obtaining excessive benefit in periods of transmission constraint is lifted. This option forms the counterfactual in our cost/benefit analysis, though it is not recommended because of the risk of an increase in the price to manage constraints once the prohibition expires.

5.3. We also considered extending the licence condition as of the current Sunset Clause until 2019. This would have maintained the prohibition of both Circumstance 1 and Circumstance 2 for an additional two years. It is not a recommended option because it only covers the time up until 2019 while temporary transmission constraints are not expected to be fully relieved until the mid-2020s and ongoing constraints are expected to remain after that time. We also do not consider this option to be in line with better regulation principles as it would also extend Circumstance 1. For these reasons we decided not to take this option forward and we have not analysed it further.

5.4. The recommended option introduces a new licence condition by Ofgem from July 2017. This removes Circumstance 1, a behaviour also covered by REMIT, in line with better regulation principles. Extending Circumstance 2 ensures that the prohibition of obtaining excessive benefit from bids made to reduce output at periods of transmission constraint remains, keeping the costs of managing transmission constraints lower. The new licence condition would be permanent because analysis shows that transmission constraints are likely to remain after the reinforcement works are completed in mid-2020s.

5.5. The prohibition of Circumstance 2 will be included as a new standard condition in generation licences by Ofgem's powers under the Electricity Act 2010. This option improves consistency by bringing TCLC in line with the standard licence procedures. Ofgem has powers under the Gas and Electricity Acts to require information when it appears that there may be a breach of a licence condition. If a company were found to be in breach of its licence obligations, Ofgem has the power to impose a financial penalty.

6. Cost-benefit analysis

Summary

6.1. This section examines the costs and benefits of the licence condition, comparing Ofgem's recommended option to the counterfactual. Our main assumption is that as Circumstance 2 is introduced unchanged from the current licence condition, we consider it to be an ongoing obligation. The prohibition does not change therefore there are no new obligations for firms to comply with. The obligation to comply with Circumstance 2 of TCLC has been in place since 2012.

6.2. Our counterfactual scenario is that TCLC will expire in July 2017 without extension in any form. TCLC is expected to continue to deliver benefits to consumers (and society), with limited impacts on investment. TCLC is expected to continue to result in a transfer of income from some generators to NG via reduced constraint payments. NG's savings will result in benefits to consumers.

Table 1 - High level summary of costs and benefits

		COST	BENEFIT
GENERATORS	**Recommended option**	Ongoing cost of compliance is very low Low cost of setting up procedures for new entrants	Improved consistency
	Counterfactual	No costs	Savings from reduced obligations - minimal because of the overlapping wholesale market obligations
CONSUMERS	**Recommended option**	No costs for consumers	Savings from lower constraint costs
	Counterfactual	Increased constraint costs	No benefits for consumers
OFGEM	**Recommended option**	Ongoing cost of monitoring as part of Ofgem's duties	Clear set of expectations to assess potential abuse
	Counterfactual	Ongoing cost of monitoring as part of Ofgem's duties remains as it is part of our general monitoring obligations	

One-off costs

6.3. Companies are expected to already have in place the appropriate policies and procedures to ensure compliance with the prohibition. We assume that licenced generators who participate in the BM are all compliant with TCLC by now. So there are no one-off implementation costs for companies already in the market.

6.4. New entrants to the market who obtain a generation licence will have to implement procedures to comply with TCLC. Responses to our Consultation in May 2016[11] provided answers to a question on the costs of complying with TCLC. Respondents said that the costs for implementing compliance with TCLC were low because they were already compliant with competition regulations. These costs were also low compared to other regulations and the costs and resources overlap with other wholesale market obligations. Respondents have not provided monetised estimates of their costs. Some respondents mentioned an extra burden because of the overlap between REMIT and TCLC. With TCLC Circumstance 1 expiring in July 2017 any extra burden is expected to greatly reduce. We accept that regulations are a barrier to entry for potential new entrants but TCLC helps to create a level playing field in the BM which provides benefits for all participants. When compared to the scenario of TCLC expiring without replacement, this is an extra cost. But we assume there is a low one-off cost for new entrants to the market. We also expect that this cost would be shared with setting up the other wholesale market obligations.

6.5. Companies can have additional one-off costs when there is enforcement action against them. We do not have robust estimates of these costs because there was only one enforcement case of Circumstance 2 of TCLC so far since the licence condition was introduced. There was no enforcement case of Circumstance 1. The licence condition appears to be a good deterrent from obtaining excessive benefit in periods of transmission constraint. We expect that the number of enforcement cases will be similar in the next five years. Therefore the overall one-off costs for companies from compliance action is estimated to be very low.

6.6. Similarly, based on the assumptions above, the one-off costs for enforcement by Ofgem is expected to be very low.

[11] https://www.ofgem.gov.uk/publications-and-updates/extension-transmission-constraint-licence-condition

Ongoing costs

6.7. We expect that companies will have similar ongoing costs for complying with TCLC as they had in the first 5 years. The ongoing cost for generators to comply with TCLC is estimated to be very low.

6.8. Ofgem has an ongoing responsibility to monitor the BM and the market. This includes, but not limited to, monitoring compliance with TCLC. So Ofgem incurs ongoing costs of monitoring. But, as Ofgem has been monitoring compliance with TCLC since 2012 there is no need to set up new systems and the existing procedures will continue to be used and enhanced as systems evolve. Therefore the ongoing costs for the regulator are estimated to be negligible.

Benefits

6.9. The distributional impact of the licence condition is that it transfers revenue from generators to consumers. Generators are disincentivised from seeking to charge "excessive" prices under TCLC.

6.10. Consumers get the main benefits from TCLC. Since TCLC was implemented, to the end of 2016, we estimate that total savings are in the region of £156 million[12]. We note that some of this benefit may be attributable to other factors, such as the introduction of REMIT. However, the decline in prices directly following the introduction of TCLC strongly suggests it has significantly contributed to these savings. As discussed in relation to the impact of TCLC, the main driver of these savings was the fall of bid prices by onshore wind generators.

6.11. We expect that by ensuring that the Circumstance 2 prohibition in TCLC remains in place there will be continued savings for consumers. We think that these savings may be lost in the future if Circumstance 2 of TCLC ceases to exist. We estimate that the growth rate of total savings will slow down or stagnate as the most significant changes occurred early after TCLC was introduced (as seen in Figure 4). This is based on our assumption that licensees had completed the implementation of their internal procedures to comply with TCLC by the end of 2013. However, we do expect the decreasing trend to continue as the costs associated with reducing generation are decreasing. This is driven by better understanding of uncertainties about new technologies and assets than before.

6.12. Removing the prohibition of TCLC has the risk that these prices would increase again. We expect that by extending TCLC, the decrease in price - and therefore in constraint costs - can continue and remain at a low level.

[12] The detailed methodology is in Annex 2.

Extending TCLC minimises the risk of the price increasing in the future. Lower prices mean lower constraint costs for the benefit of the consumers.

6.13. Industry can benefit from TCLC by the increased level playing field it creates between the generators affected by the constraint and the generators not affected. This is because TCLC ensures that those generators within a constraint zone cannot take advantage of gaining excessive revenue compared to their competitors.

6.14. Having a well-functioning market can ensure that the right signals are sent, encouraging investments in areas where reinforcement of the system is most needed. The risk in the absence of TCLC is that wrong price signals might lead to inefficient outcome for investments. Misleading price signals sent by inflated prices risks driving investment away from areas where it is most necessary, with normal market prices.

6.15. Ofgem introducing the licence condition will also benefit licensees by bringing TCLC in line with practices around the other standard licence conditions. Procedures, such as the appeal route, will be consistent with the other licence conditions[13]. This provides more certainty in managing the market in the future.

7. Risks and assumptions

7.1. We acknowledge that our monetised impacts and our evaluation are dependent on a number of assumptions (for example not accounting for other factors like competition or inflation but solely TCLC). One of our main assumptions, based on the currently available evidence, is that constraints will continue to exist in the long-term. We expect TCLC to continue to have a positive impact on constraint costs in the future.

7.2. Our other main assumption is that the licence condition has a distributional impact of transferring the revenue from generators to consumers. Generators loss of excessive profits is a gain for consumers by having lower electricity bills.

7.3. We acknowledge the risk that the abusive behaviour prohibited by TCLC is covered by other regulations, such as REMIT. There is a small risk of introducing unnecessary burdens for generators. In line with better regulation principles we assessed the overlap between the two regulations. We found that Circumstance 1 covers the same prohibitions also present in

[13] Under the power of the Energy Act 2010, the current TCLC, unlike other licence conditions, requires that appeals on enforcement orders, including those imposing financial penalties, are heard by the Competition Appeal Tribunal (CAT). Our introduction of the new licence condition will have the same enforcement procedure as other licence conditions via the High Court not via the CAT.

REMIT therefore we propose not to include Circumstance 1 in the new licence condition.

8. Specific impact tests

Competition impacts

8.1. We received feedback that TCLC might result in some restrictions on a generator's ability to price in offering constraint reduction services to NG, which could be seen as having negative impact on competition. However, pricing behaviour during transmission constraint should be the same as pricing in the wholesale energy market when there is not a constraint. This limits the risk of negative impact on competition.

Microbusiness impacts

8.2. The businesses directly impacted by TCLC are National Grid and licenced generators who participate in the BM. We do not expect microbusinesses to be active participants in the BM as they are likely to be licence exempt[14] generators with small generation capacity.

[14] Licence exempt generators are exempt from holding the licence based on The Electricity (Class Exemptions from the Requirement for a Licence) Order 2001 which lists three classes of generators which are exempt from Section 4(1) (a) of the Act. This includes small generators, whereby generation exemption is granted to: persons (other than licensed generators) who do not at any time provide more electrical power from any one generating station than 10 megawatts; or 50 megawatts in the case of a generation station with a declared net capacity of less than 100 megawatts.

Annex 1 - Price impact of TCLC by technology type (2011 – 2016)

Below we present the figures on weighted average bid prices submitted by generators shown separately by each generator types. The methodology used for these assessments is the same as what we used for onshore wind in the main body of the impact assessment, see paragraph 2.23.

Figure 8 – Offshore bid prices 2011-2016

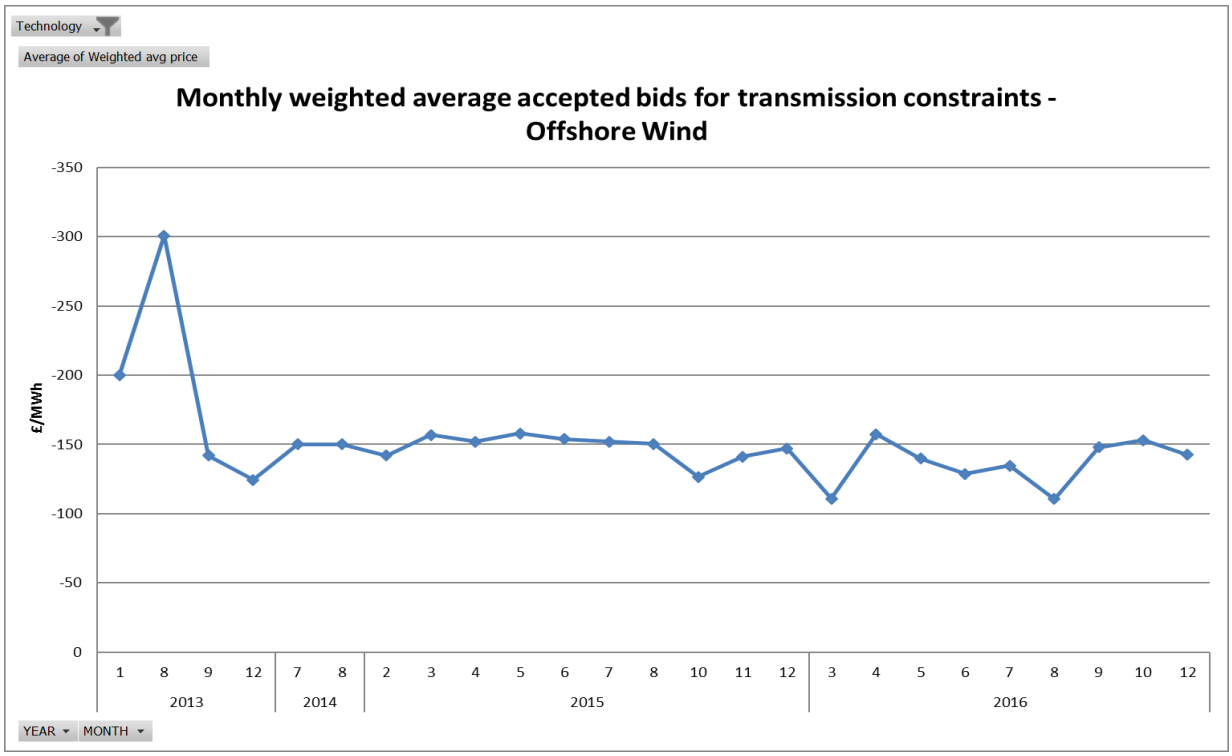


Figure 9 – Hydro bid prices 2011-2016

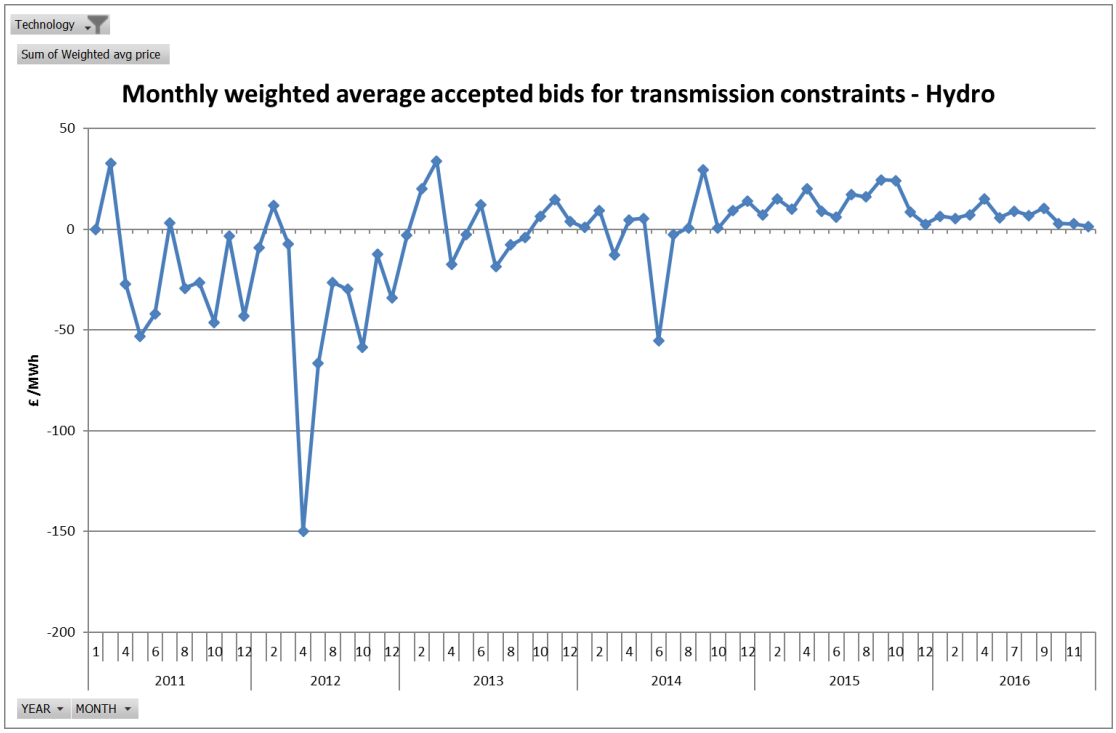


Figure 10 – Combined heat and power bid prices 2011-2016

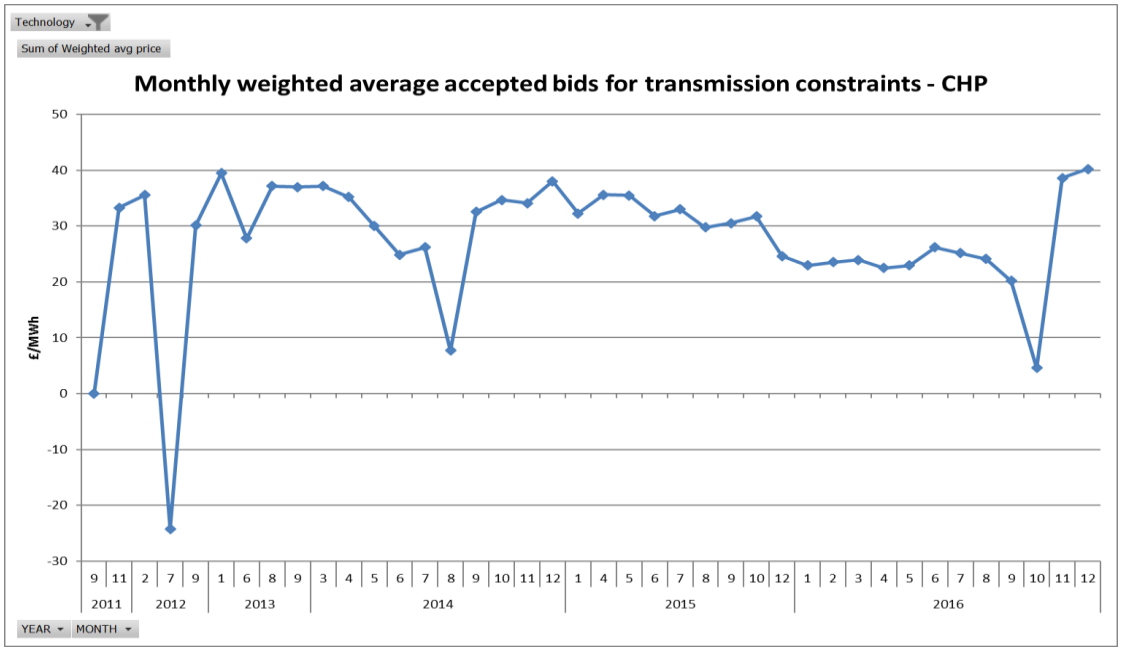


Figure 11 – Coal bid prices 2011-2016

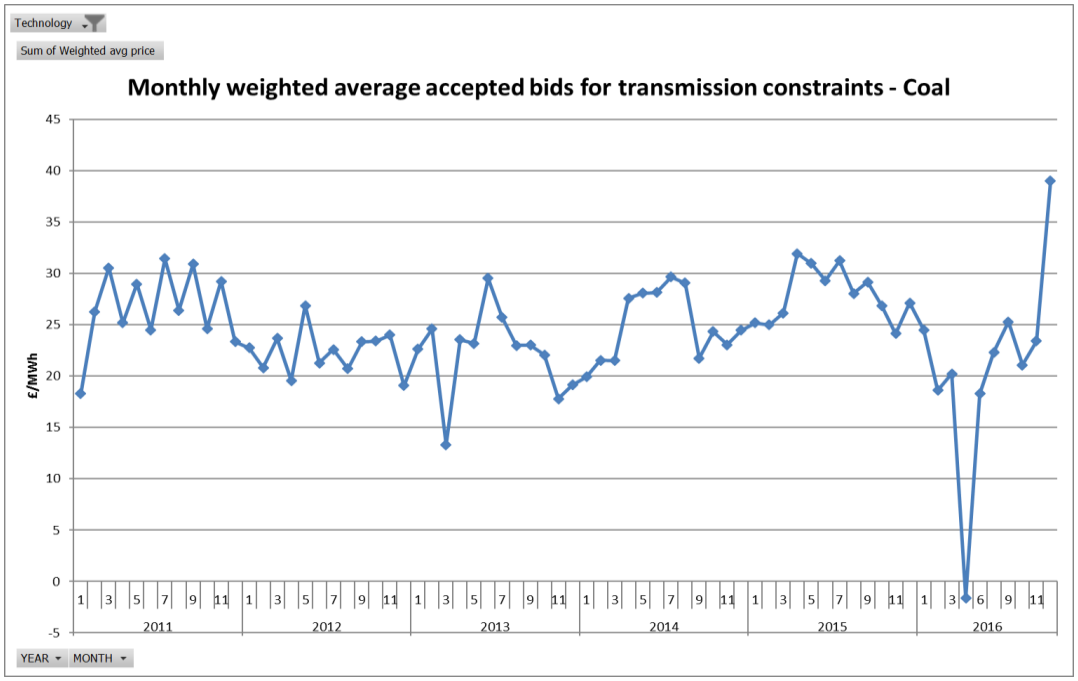


Figure 12 – Offshore bid prices 2011-2016

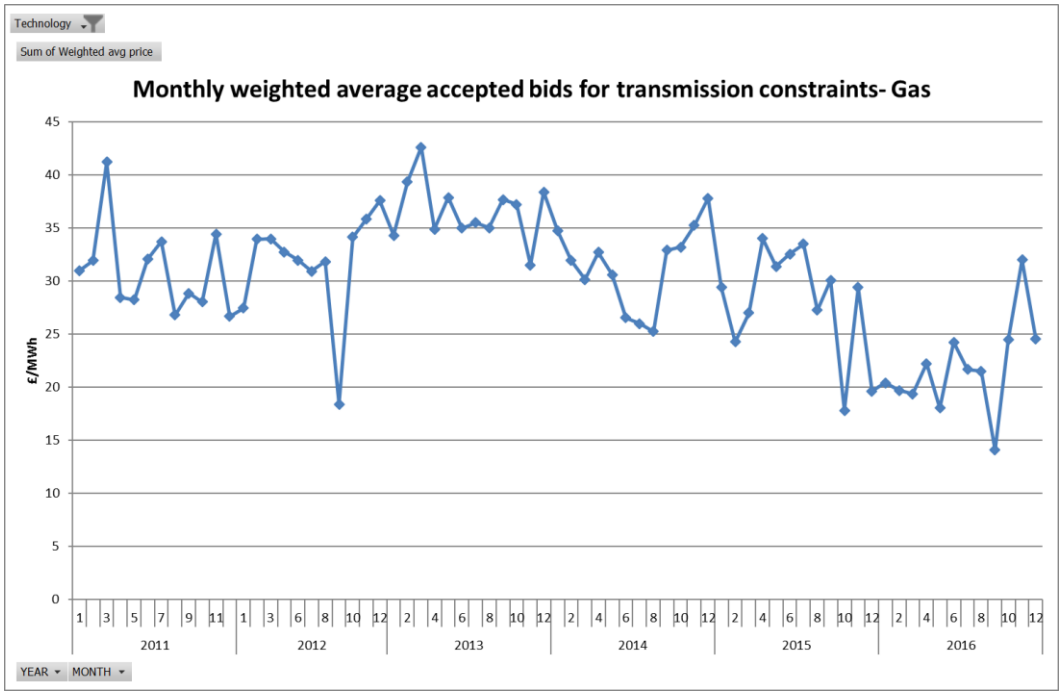
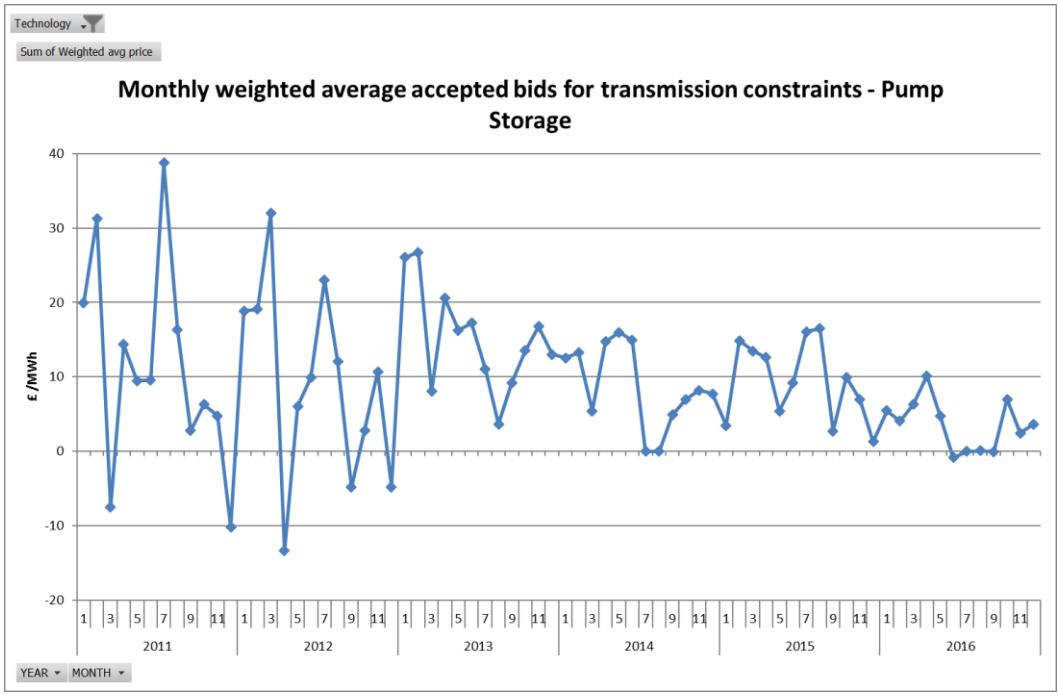


Figure 13 – Offshore bid prices 2011-2016



Annex 2 - Methodology of the analysis of estimated savings

1.1. The assessment of the estimated savings for consumers, referred to in paragraph 6.10, determines a Volume Weighted Average Price (VWAP) for accepted bids to reduce volume of wind farms up to 15 July 2012. This is done by multiplying for any given settlement period (SP) the accepted bid volume by the accepted bid price, summing the results for all SPs and dividing by the total accepted bid volume. This is done for each wind farm participating in the balancing mechanism before 15 July 2012, excluding wind farms which only had bids accepted at anomalously high prices (i.e. above £500/MWh)– for these wind farms a VWAP is assigned based on the VWAP for all other wind farms.

1.2. The assessment then determines a VWAP for accepted bid volume from 29 October 2012. The methodology is the same as above.

1.3. The assessment then multiplies the volume of accepted bids for each wind farm since 29 October 2012 by each of the pre and post TCLC accepted bid VWAPs. The difference between the pre-TCLC cashflow and the actual cashflow is taken to be the saving for a given windfarm. The savings for each windfarm are then summed to give total savings.

1.4. The estimate is based on the following assumptions:

- The pre 15 July 2012 accepted bid volume weighted average prices (VWAPs) are representative of the price at which each wind farm would have continued to bid had TCLC not been introduced.
- The reduction in post 29 October 2012 accepted bid VWAPs is solely attributable to TCLC and not other factors (e.g. competition).
- The increase in VWAPs between 15 July 2012 and 29 October 2012 was excluded from the assessment because it was not representative of where VWAPs would have been had TCLC not been introduced.
- That pre 15 July 2012 VWAPs would not have increased in line with inflation (not accounting for inflation provides an underestimated figure).
- The wind farms where the pre 15 July 2012 VWAP was above £500/MWh were not representative and including these prices would generate excessive savings, so using the VWAP of all other wind farms is more appropriate.