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Dear Colleagues

Decision to extend the System Operator incentive scheme for the period 2018/19 - 2020/21 and proposal to change National Grid Gas plc's gas transporter licence by inserting new dates to reflect this.

This letter sets out the Authority's[1] decision to extend the three System Operator (SO) incentives described below until the end of the RIIO-T1 price control period. [2] To do this, we are seeking views on modifying National Grid Gas plc's (NGG's) gas transporters licence by inserting new dates into Special Conditions 3D and 8K as set out in the Notice that accompanies this letter.

Background to the licence modifications

NGG, as the SO for Great Britain, is responsible for balancing the gas transmission system on a continuous basis. We regulate it to ensure its operational costs are optimised, delivering value for money to the consumer.

Ofgem sets incentives on NGG to operate the system efficiently, supporting three of our five consumer outcomes:

- lower bills than would otherwise have been the case;
- reduced environmental damage both now and in the future; and
- improved reliability and safety.

There are currently ten incentives on NGG covering areas such as residual balancing, demand forecasting, shrinkage and maintenance. These were established for the RIIO-T1 price control which began on 1 April 2013 and most are in place for the price control period. Where we introduced new incentives or substantially changed the form of incentives, we set them for a shorter period so we could assess how effective they were before committing to longer timescales.

Three of these incentives were reviewed in 2015 and were set to expire on 31 March 2018, namely:[3]

[1] The terms "the Authority", "Ofgem", "we" and "us" are used interchangeably in this letter. The Authority is the Gas and Electricity Markets Authority. Ofgem is the office of the Authority.
[2] RIIO-T1 applies between 1 April 2013 and 31 March 2021
[3] A copy of our final decision and final proposals pertaining to the 2015 review can be found here: https://www.ofgem.gov.uk/publications-and-updates/decision-gas-system-operator-incentives-review-2015-18

- **Two-to-five days ahead (D-2 to D-5) demand forecast**
- **Maintenance and outage planning**
- **Greenhouse Gas Emissions (GHG)**

When the D-2 to D-5 demand forecast and maintenance incentives were introduced they were largely based on the existing frameworks and previous consultation in 2015 on the parameters and benefits which the incentives could deliver.

In addition to some changes to the incentive parameters to increase their effectiveness, we introduced a new mechanism on GHG as part of the 2015 review. NGG reviewed these schemes in 2017.

Review of the three incentive schemes by NGG

Between August and September 2017, NGG consulted on a Final Proposals document that set out changes to extend the incentives, and to amend the schemes.[4] This resulted in one written response from a stakeholder (known the "respondent" hereon). [5] Prior to the Final Proposals document, NGG also engaged with stakeholders in industry forums, bilateral discussions and published an initial consultation document in June 2017 that set out high-level proposals to amend the incentives.[6] NGG intended this initial stakeholder engagement to capture views on the incentives including what outputs were valued and what NGG should deliver over the next three years.

Two-to-five days ahead demand forecast (D-2 to D-5)

How the incentive works
NGG publishes national gas demand forecasts to assist industry in making efficient decisions in balancing their supply and demand positions.

The D-2 to D-5 demand forecast incentive was introduced in 2013 to make these demand forecasts more accurate. Incentives were already in place (and continue to be in place) for day-ahead demand forecasts. More accurate forecasts should allow shippers to better balance their positions, improving market efficiency and reducing the need for NGG to balance the system. This should result in lower costs to consumers.

This incentive sets a target for the average forecast error for the year for D-2 to D-5 forecasts. For every day of the year, the average forecast error across these four forecasts is produced. These errors are then averaged giving greater weight to the periods of higher demand, when there is greater value to parties having accurate information to assist in balancing their position.

NGG's performance
NGG outperformed the incentive target of 13.7 mcm in both 2015/16 and 2016/17. However, the average forecast error increased from 11.99 mcm in 2015/16 to 12.06 mcm in 2016/17. This had a corresponding impact on the revenue NGG gained through the incentive, which fell from £1.17 million in 2015/16 to around £950,000 in 2016/17.

[4] A copy of NGG's proposals can be found here: https://www.nationalgrid.com/uk/gas/system-operator-incentives

[5] A summary of this response is available here: https://www.nationalgrid.com/uk/gas/system-operator-incentives
[6] This was open for comments between 15 June 2017 to 7 July 2017. A copy can be found by contacting National Grid Gas.

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Table 1: D-2 to D-5 incentive performance since 2014/15

Incentive year	Incentive target (mcm)	Average forecast error (mcm)	Financial performance (£M)
2014/15	16	11.78	£2.17
2015/16	13.7	11.99	£1.17
2016/17	13.7	12.06	£0.95

When we last reviewed the incentive, we tightened the target from 16 mcm to 13.7 mcm. This was to reflect improvements in NGG's forecasting actions. Since then, NGG's forecasts have become less accurate.

NGG stated maintaining forecast accuracy is more difficult because supply and demand on the network is more changeable, which has made it more difficult for it to improve forecasting demand. It estimates that while its average forecast error performance has decreased by 2.3% between 2014/15 and 2016/17, supply and demand volatility over that time period has increased by 9.6%. NGG believes this means its absolute performance has increased by 7.3% over that period.

NGG says there are many factors responsible for making the network more volatile including:

- continued growth in fast-cycle storage further impacted by the closure of Rough which is changing how these points are operated
- increased flows across interconnectors in response to European price spreads
- operation of Combined Cycle Gas Turbine (CCGT) power stations to balance out increased use of renewable energy
- uncertainty over Liquefied Natural Gas (LNG) supply.

NGG's System Operator External Plan document contains more information on the impact these factors have had on network supply and demand volatility since 2014/15.[7]

NGG's Proposal

During NGG's initial engagement with its stakeholders, they expressed a desire for improved accuracy in its D-2 to D-5 forecasting. They commented that the D-1 demand forecast continues to be the most important forecast. However, some stakeholders have said that the D-2 to D-5 forecast delivers value and some have explored the possibility of other forecast horizons.

The respondent to the Final Proposals document stated their membership do not widely use the D-2 to D-5 forecasts and would prefer effort was directed to improve the accuracy of the D-1 demand forecast. They also stated that, should this incentive be retained, the target should remain at the current level along with other parameters.

NGG proposes retaining an annual financial incentive scheme on the D-2 to D-5 demand forecast. It argues that the increased volatility in supply and demand patterns both now and in the future, for example the closure of the Rough storage site, changes in storage behaviour and other factors, makes the current target challenging. NGG proposes that the target for the scheme should remain at 13.7 mcm.

Our view

The last review in 2015 indicated the intention to engage with stakeholders before 2018 to assess whether there is enough benefit to the industry and consumers to maintain this incentive until the end of the RIIO-T1 period. The initial stakeholder engagement activities undertaken by NGG received varied feedback about the D-2 to D-5 forecasts.

Many stakeholders believe that the forecast delivers a useful metric and some would like more improvements in accuracy. We believe that the current scheme provides sufficient

[7] A copy can be found in the link contained in footnote 4.

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incentive for NGG to look at ways of continuing to improve accuracy. For these reasons, we agree with NGG's proposal to extend the scheme for a further three years with the same parameters and framework.

Maintenance

How the incentive works

Operation of the NTS periodically requires maintenance work to be undertaken to ensure the safe, reliable and economical functioning of the network. This maintenance involves some outages which reduce the flexibility of the network and which may have an impact on connected parties.

The maintenance incentive was developed at RIIO-T1 in response to sustained concerns raised by stakeholders regarding NGG's maintenance planning and in particular, the potential for stakeholders to incur financial loss because of NGG making short term changes to its maintenance plan.

Under Section L of the Uniform Network Code (UNC), NGG is required to publish its maintenance plan twice each year. NGG's maintenance plan sets out a timetable for the work that is required on the NTS, taking into account affected parties' outage plans. Then, any requests for changes from stakeholders or NGG are assessed for potential impacts.

The UNC contains processes for exit related planned maintenance that enable NGG to inform stakeholders of intended maintenance days where work has an impact on a specific site connected to the NTS. This provides stakeholders with an opportunity to discuss the timing and impact and for NGG to respond to any stakeholder requests for further information.

The overall incentive consists of two targets: the Maintenance Days Target and the Maintenance Change Target. The first seeks to minimise the number of days taken to complete routine maintenance works, especially Remote Valve Operations (RVOs) and the second seeks to minimise the changes NGG makes to its maintenance plan.

The concept of maintenance days only applies to system exit points and each maintenance day covers a 24-hour gas day.[8] The number of maintenance days for system exit points (excluding Distribution Networks) and the notice period for issuing notices varies and is depends on what is set out in the Network Exit Agreement (NExA) or legacy agreement for each site and the UNC.

When we reviewed the incentives in 2015 we reduced the maintenance change target to 7.25% and reduced the maintenance days target for RVOs to 11 days per year. This reflected both the outperformance against the incentive and the limited historical information available.

We also realigned the incentive revenue for the maintenance days target to increase the reward if NGG takes fewer than five maintenance days for RVOs (£25,000) while lowering the potential gains for performance between 5 and 10 maintenance days for RVOs (£15,000). This increased the incentive for NGG to further reduce the impact of RVOs on consumers. To maintain a balanced risk/reward profile, we reduced the floor in this incentive to £500,000. The realignment of incentive revenue and tightening of targets outlined above sought to achieve this aim.

NGG's performance

[8] There is no provision for maintenance days for entry related planned maintenance. Network Entry Agreements can facilitate outage information sharing to enable mutually beneficial co-operation. Otherwise, capacity management tools such as capacity buybacks are used to enable maintenance activities where they affect flows.

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NGG has performed well against this incentive. It did not request any changes to its maintenance plan or move any maintenance days in 2015/16 or 2016/17. This meant it earned around £200,000 in 2015/16 and £500,000 in 2016/17 – this is the maximum amount, or 'cap', it can earn through avoiding changes to its maintenance plan.

Table 2: Maintenance incentive performance since 2015/16

	2015/16	**2016/17**
Maintenance days		
Maintenance plan size	55	232
Target days (7.25%)	3.98	16.82
Days changed	0	0
Revenue (£M)	£0.199	£0.500[9]
RVO operations		
Target (days)	11	11
Days used	2	1
Revenue (£M)	£0.165	£0.190
Total revenue (£M)	**£0.364**	**£0.690**

NGG has a target of 11 days for RVO maintenance. In 2015/16, it used two days which earned a revenue of around £165,000. In 2016/17, it used one day which earned a revenue of around £190,000.

This means that NGG has earned a total revenue for performance against the maintenance incentive of around £364,000 in 2015/16 and around £690,000 in 2016/17.

NGG emphasises it has worked hard to align its maintenance activities with its stakeholders. Its actions include:

- engaging with stakeholders at events to discuss maintenance schedules
- proactively approaching stakeholders to discuss outage plans
- reviewing public information to identify possible causes of outages
- working with stakeholders to align work following the publication of notices at the end of January

NGG's Proposal

NGG has assessed its business process changes and operational experience gained since the new incentive was introduced. It has also taken into consideration feedback received from stakeholders about its performance and the value this incentive provides.

In summary, its proposals are:

- continue with the reputational elements of the incentive, relating to the publication of maintenance plans, to provide stakeholders with a maintenance programme that covers three years, facilitate reasonable requests from stakeholders for changes to maintenance days and ensure stakeholders are aware of the Minor Works Agreement which enables parties to contract for working flexibly outside normal working practices

- continue the current incentive to encourage NGG to minimise changes to published maintenance days and Advice Notices

- continue the current incentive to minimise the number of maintenance days for RVOs (penalty for each day above target, benefit for each day below target)

[9] This is maximum scheme profit allowed – the 'cap' level

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- introduce an incentive to encourage National Grid to align a portion of asset replacement & reinforcements works to customer outages

Many stakeholders NGG engaged with during its initial engagement supported the introduction of an incentive for the use of maintenance days for other maintenance activities. The respondent to the Final Proposals consultation welcomed the improved performance the incentive has delivered and extending it to other maintenance activities.

NGG's proposal is to set a target for alignment at 10% of the overall size of the plan, excluding RVOs. It argues that at this 10% alignment, it would make no revenue nor suffer any loss.They suggest a mechanism which would reward it by £20,000 for each additional day aligned above the target with a cap of £500,000 and a similar penalty of £20,000 for each day under the target, with a collar of £500,000.

Our view

The current targets are formulated on both historical performance and an understanding that there is limited data on NGG's performance against this incentive. They are designed to provide value for NGG, as well as encourage continuous improvement against the baseline of strong performance that NGG has achieved.

The evidence of the performance in its maintenance planning to date has shown that NGG may have potential to improve its planning in other maintenance activities. However, it acknowledges that although there is potential to deliver value here, there are factors which make alignment difficult. We believe there is insufficient evidence to demonstrate whether 10% is an appropriate target or whether setting a separate financial target for a percentage of other activities would represent a good outcome for consumers.

Although we welcome the improvements that NGG has delivered to date, we believe that further analysis is needed to demonstrate a clear benefits case for a revamp of the current incentive in the ways suggested.

For these reasons, we do not propose any changes to the current incentive. We consider that the current targets represent a fair risk/reward framework that provides an appropriate level of challenge for NGG, and will continue to drive improvements that benefit consumers.

Greenhouse Gas Emissions

How the incentive works

The GHG emissions incentive creates an incentive for NGG to minimise emissions of greenhouse gases from compressors during the operation and maintenance of the NTS. Under this incentive, NGG can face a penalty if emissions exceed the target, but there is no financial reward for emitting less than the target. The incentive penalty is calculated as the volume of emissions above the target priced at the BEIS non-traded carbon price.

The GHG Emissions incentive was introduced in 2010/11. The current design of the incentive is downside only which means that there is no upside benefit to NGG if it emits fewer emissions than the target level.

When we reviewed the incentives in 2015 we introduced an additional incentive for NGG to (i) carry out further work to understand the underlying causes and drivers in this area and (ii) research cost effective mitigations of venting events within the sphere of control of the SO, underpinned by a cost-benefit-analysis. To support this research, we proposed an

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additional incentive, the GHG Investigative Mechanism (GHGIM) whereby NGG can be rewarded if it delivers research that is in the interest of consumers.

The project aims to increase the understanding of both planned and unplanned venting events by improving monitoring of known and unknown emissions on the NTS. The expected benefits relate to the accurate identification of methane fugitive emissions from compressor stations and the resulting targeting of 'controllable' emissions to be reduced. The outcome of this work was submitted to us towards the end of December 2017 and we are considering our response to it.[10]

NGG's performance

When we last reviewed the incentive in 2015, we increased the GHG performance target from 2,744 tonnes per annum to 2,897 tonnes per annum from 2016 in order to reflect the technical difficulties of managing system vents in a more variable supply and demand environment. However, NGG has still struggled to perform well against this incentive.

Table 3: GHG incentive performance since 2014/15

Incentive Year	GHG target level (tonnes)	Performance (tonnes)	Venting price (£/tonne)	Incentive revenue (£M)
2014/15	2,829	2,857	£1,393	-£0.039
2015/16	2,744	2,882	£1,417	-£0.195
2016/17	2,897	3,592	£1,455	-£1.00

In 2014/15, NGG emitted 2,857 tonnes of gas against a target level of 2,829 tonnes. This incurred a penalty of around £39,000. Performance since then has deteriorated. In 2015/16, it emitted 2,882 tonnes of natural gas leading to a penalty of around of £195,000. In 2016/17, it emitted 3,592 tonnes leading to a penalty of around £1 million. This continued a trend of NGG missing its target emissions level since 2012/13.[11]

NGG has given a number of reasons for poor performance since 2015. These include:

- higher levels of demand and supply volatility requiring more use of compressors
- an increase in within-day flexibility requirements from stakeholders causing greater linepack swings. This increases compressor emissions through leakage and switching the use of different parts of the network
- venting through seal leaks over which it has no control.

NGG's Proposal

NGG proposed introducing a symmetrical incentive arguing that this would give it an incentive to drive further reductions in GHG emissions and not just limit GHG emissions to the target. It has proposed extending the scheme for three years but with revised parameters. It argues that the incentive is to remain focused on compressor emissions, although only around five of the venting mechanisms:

1) Planned Vents
2) Emergency Shutdown Vents
3) Fuel Gas Vents
4) Starter Vents
5) Start up Purge Vents

It wants two types of seal leakage to be removed from the calculation on the basis that this venting is largely not in its control:

1) Dynamic Seal Leakage
2) Static Seal Leakage

[10] Special Condition 3D.48 gives us until 31 March 2018 to make a decision on the level of reward NGG should obtain through the GHGIM

[11] Note that 2012/13 was the last year of the TPCR4 price control. This incentive was restructured for RIIO-T1 beginning on 1 April 2013.

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Static seal leakage is concerned with static joints on the compressor such as the inlet. The technology must leak in order to create maximum seal and to maintain the integrity of the unit. Dynamic seal leakage is concerned with the seal and level of suction between rotating and static parts within the compressor. Leakage is necessary to ensure a vacuum which creates the tightest seal. At the current point in time, NGG argues that it is not economic to consider replacing the seals that are designed to leak.

If we accept this argument, NGG has proposed reducing the targets we set and introducing a symmetrical incentive capped at +/- £1m at the RPI-adjusted value per tonne (the penalty or gain would be linked to BEIS non-traded price of carbon reflecting the social cost). NGG suggested setting the target at 2,330 (a reduction from the current target of 2,897 tonnes) followed by a further 5% reduction in total over the remainder of the incentive period. NGG calculated the proposed target by removing the proportion for the static and dynamic seal leakage from last year's results, as it argues that this most accurately reflects the operation and potential uncertainty over the remainder of RIIO T1.

Our view
In its submission, NGG acknowledged that feedback from its initial stakeholder engagement highlighted the need to review the incentive once the implications of proposed compressor replacement projects were more certain. However, it considers that the current timeline expectation is that the majority of this work would not affect its emissions in the RIIO-T1 period.

The respondent who responded to NGG's Final Proposals consultation supported the changes NGG had outlined.

We remain of the view that further data and analysis would be necessary to establish if changing the target in the way suggested still represented a good outcome for consumers. The work on GHGIM which concluded last year will also provide more data to inform future decisions on the possible structure of incentives around controlling GHG emissions.

We propose maintaining a financial penalty only incentive, in its current form and without any changes to its parameters, on GHG emissions as it encourages NGG to incorporate venting into its operational decisions. This is aligned with the interest of current and future consumers. At this point, we are not sufficiently persuaded that it would be appropriate to move to a symmetrical incentive.

NGG's consultation

NGG undertook initial stakeholder engagement at industry forums, bilateral meeting and an initial consultation document as part of its review of the three incentives. It also published a Final Proposals consultation on the specific changes it wished to make to the incentives. It received one response from a trade association to the Final Proposals consultation.

Consultation response
The respondent expressed broadly positive views about NGG's performance in these areas and thought that financial incentives can be a useful way of encouraging certain behaviours for regulated companies. It commented specifically on each incentive area.

(1) *D-2 to D-5 demand forecast*
It said these forecasts are not widely used by its membership (the D-1 forecast being significantly more important) and that it would prefer to see efforts to improve the D-1 forecast. It also questioned the value of this forecast given the increase in day-on-day supply/demand volatility and thought that volatility is likely to increase further in the future. However, if this incentive was extended, it considered the target and other parameters should remain at the current level.

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(2) *Maintenance*
The respondent commented positively on NGG's improved working practices and engagement with stakeholders and it welcomed the proposed introduction of other activities within the incentive scheme.

(3) *GHG emissions*
It was pleased to see progress in this area with better quantification and understanding of emissions via the various mechanisms. It thought that the proposals seemed reasonable and that it was timely to introduce a symmetrical incentive, as downside-only incentives do not seem entirely fair.

Summary of our views
Whereas the D-2 to D-5 demand forecasts may not be as widely used as the D-1 forecast, we believe the comments NGG received from stakeholders in its initial engagement work demonstrates that there is broad interest from parties for the D-2 to D-5 incentive to continue. We agree that improving the accuracy of forecasts (including D-1) is desirable, and we think the current incentives encourage this.

The maintenance incentive has delivered benefits for network users and we agree that there may be potential to consider extending this to other areas. However, we do not think that the evidence provided in NGG's proposal is sufficient to justify extending the incentive at present in the way suggested.

We are not sufficiently persuaded with the suggestion that the GHG emissions incentive should be symmetrical. In setting the incentive we wanted to encourage NGG to consider the environmental impact of its activities. We welcome the work being undertaken to better understand sources of emissions but we have not seen enough evidence that changing the parameters nor introducing an upside in the ways suggested, would help to deliver improvements in this area.

Our decision

We welcome the efforts that NGG has made to engage widely and in a variety of ways with its stakeholders and other industry parties to understand their views on their SO performance. The views expressed to NGG in its consultation and industry engagement work in relation to three shallow incentives were broadly positive and there is support for maintaining all three incentives.

We believe that by extending the current schemes for a further three years, and without compelling evidence to justify changing the schemes, the incentives will continue to encourage NGG to improve its SO performance. We will examine the evidence available and consider the need to review the incentives which should be put in place for RIIO-2 as we develop the approach for the next price control period.

Next steps

We have published a statutory licence change consultation alongside this decision letter that sets out the proposed changes to NGG's gas transporter licence to put this decision into effect.

If you have any questions regarding this letter, please contact Bogdan Kowalewicz on 020 7901 7293 or soincentive@ofgem.gov.uk.

Yours faithfully

Cathryn Scott
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