



Making a positive difference
for energy consumers

Interested parties and
stakeholders

Direct Dial: 020 7901 7105
Email: paul.branston@ofgem.gov.uk

Date: 31 July 2015

Dear colleagues,

RIIO-T1: Consultation on draft decision on National Grid Gas Transmission's application under the RIIO-T1 Compressor Emissions uncertainty mechanism

The purpose of this letter is to set out our draft decision on National Grid Gas Transmission (NGGT)'s price control re-opener application for an additional £41m to comply with emissions legislation and to seek your views on our proposals. We would especially welcome responses to the specific questions which have been set out below:

Q1. Do you agree with the conclusions of the Pöyry Management Consulting report?

Q2. Do you agree with the conclusions of the Penspen report?

Q3. Do you agree with our draft decision not to allow NGGT additional funding under the RIIO-T1 Compressor Emissions uncertainty mechanism based on the information provided?

We welcome the views of interested parties in relation to any of the issues set out in this document. Responses should be addressed to Gas.TransmissionResponse@ofgem.gov.uk no later than 1 September 2015. Unless clearly marked as confidential, responses will be published on our website.

We will consider any response as part of our final determination which we will publish by the end of September 2015.

Our minded-to position

Subject to consideration of consultation responses, we are minded to reject NGGT's application for the additional £41m. Full details of our assessment and minded-to position are set out in the following sections.

Our approach for RIIO-T1

When we made our decision on the RIIO-T1 price control¹ for National Grid Gas Transmission (NGGT) we set out our approach to non-load related capital expenditure

¹ This was the first price control to be conducted under our new RIIO model (Revenue = Incentives + Innovation + Outputs). Through RIIO-T1, we set the price control framework to apply to electricity and gas transmission companies from 1 April 2013 to 31 March 2021.

(NLRE), which principally comprises expenditure required to replace² existing primary and secondary assets on the Transmission Owner's (TO) network. It includes expenditure relating to the reduction of direct emissions resulting from the operation of the National Transmission System (NTS). The amount of NLRE required depends on the age and condition of existing assets and their criticality to the operation of the network. Because this type of expenditure can be forecast with greater accuracy than load-related capex, it is generally funded through ex ante expenditure allowances.

However, at the time of our Final Determination³ in December 2012 there was uncertainty about some of the non-load related capex. Specifically, requirements under new legislation, the Industrial Emissions Directive (the IED)⁴, were expected to be implemented in GB after Ofgem concluded its RIIO-T1 Final Proposals. Hence, we introduced an uncertainty mechanism, in order to provide more time for NGGT to develop its approach in response to this new legislation. This would ensure that funding was matched to the needs case and improved deliverability by better alignment of funding with actual project expenditure.

Our decision at RIIO-T1 Final Proposals for NGGT's capex forecast for complying with emissions legislation

In its RIIO-T1 business plan NGGT forecast spending of £813.5m to ensure compliance with two environmental directives: the IPPCD⁵ (Integrated Pollution Prevention and Control Directive) and the IED, which are explained further below.

We engaged with the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA) who are responsible for enforcing this legislation. This enhanced our understanding of the background and the implementation process of the relevant environmental legislation (IPPCD and IED).

In our RIIO-T1 Initial Proposals⁶ we said that the "two environmental agencies (EA and SEPA) place an obligation on operators of permitted processes, such as NGGT, to apply Best Available Techniques (BAT) to the way in which an installation is designed, built, maintained, operated and decommissioned. BAT is considered to lead to the most effective and advanced stage in the development of activities and methods of operation. This indicates the practical suitability of particular techniques and provides, in principle, the basis for emission limit values. These techniques are designed to prevent and, where not practicable, to reduce emissions and the impact on the environment as a whole. That means that compressor sites need to have implemented a BAT solution in order to have the necessary permits".

The IED strengthens the principle of applying BAT to the way in which a compressor installation is designed, built, maintained, operated and decommissioned. The most significant impacts of the IED are the setting of (i) a new Emission Limit Value (ELV) for Carbon Monoxide (CO) and (ii) a more stringent ELV for Nitrogen oxides (NO_x) for all Large Combustion Plant (LCP). All gas turbines with thermal input greater than 50MW are considered as LCP. NGGT has several gas turbines, driving compressor units at various sites, which are classified as LCP and need to comply with the new ELVs for CO and NO_x.

² This replacement expenditure is not driven by changes to loads connected to the network.

³ <https://www.ofgem.gov.uk/publications-and-updates/riio-t1-final-proposals-national-grid-electricity-transmission-and-national-grid-gas-%E2%80%93-overview>

⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:334:0017:0119:en:PDF>

⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:024:0008:0029:EN:PDF>

⁶ For more information please refer to the "Cost assessment and uncertainty Supporting Document" of our RIIO-T1 Initial Proposals (https://www.ofgem.gov.uk/sites/default/files/docs/2012/07/riio-t1-nggt-and-nqet-cost-assessment-and-uncertainty_0.pdf)

We explored the IED to understand its provisions and applicability to the operational profile of the NTS. In doing so, we evaluated information provided from NGGT regarding the compressors' future utilisation in a world of changing flow patterns. Furthermore, we analysed proposals from other European TSOs facing the same obligations under the IED and we evaluated NGGT's proposals alongside the incremental capex forecasts to identify potential savings that would result from streamlining and combining projects.

The operation of compressor stations as a fleet has reduced considerably, because of (i) the decline in gas coming from the United Kingdom Continental Shelf (UKCS) and (ii) the introduction of gas from new supply points (Milford Haven, Isle of Grain, Bacton, etc). As a result of these developments, on average gas now travels smaller distances from supply to demand points than in the past. The aggregate level of compressor stations' operation demonstrates this clearly. Whereas in the past compressor units were operated in total more than 100,000 hours per year, this has reduced to below 50,000. In some cases it has dropped even lower. More specifically, several compressor sites operate currently below 1,000 hours per year and several compressor units operate far less than 500 hours per year.

Although the IED sets stringent ELVs, it also includes some derogations and exemption clauses. One of these allows a compressor unit to be exempted from compliance with the ELVs, if it is operated less than 500 hours per year. Additionally, all compressor sites have two or more units, which allows NGGT to consider several options without restricting its operational capabilities.

However, RIIO-T1 NGGT's business plan did not take this exemption into account, despite its own forecasts for low future operation at several sites. Additionally, it did not provide further evidence that low utilisation sites will face increased operation either within or after RIIO-T1. Consequently we considered that overall NGGT's proposal in relation to the funding of IED compliance related investment was not sufficiently justified. More specifically, NGGT had not explored all available options in terms of technical solutions, legal provisions and exemptions. In addition, we found that it had not justified its proposed unit costs.

Based on the above, our RIIO-T1 Final Proposals provided baseline funding of £142.7m for specific projects, whereas some projects were rejected. We welcomed NGGT's revised approach, following publication of our initial proposals, to consider potentially more cost-effective solutions in order to deal with the environmental legislation, similar to those considered by its European counterparts. We also acknowledged that NGGT would still be required to undertake works for both IPPCD Phase 4 and the remaining sites considered within the IED (second phase) and to optimise its portfolio of options.

Mindful of future circumstances regarding flow patterns, and consistent with our approach for future flexibility capex, we proposed a baseline of £9m for emissions abatement optioneering. This would enable NGGT to develop an integrated and cost-effective plan to comply with the requirements of IPPCD Phase 4 and IED Phase 2.

Additionally, we allowed £269.3m for the IPPCD Phase 4 and IED Phase 2 projects, to recognise NGGT's obligation to incur expenditure to comply with this legislation. The level of this baseline was based on the information at the time, where capex projects were forecast. If NGGT's expenditure set out in its plan was different to this amount, we reserved the right to adjust the baselines up or down. We expected that NGGT's integrated plan would include opex solutions as well as capex projects. As a result, we divided the baseline between capex (75 per cent or £202.0m) and opex (25 per cent or £67.3m).

Criteria for the re-opener

Our RIIO-T1 Final Proposals document⁷ set out the further work that we expected NGGT to undertake in order to justify the additional provisional expenditure of £269.3m⁸ and we set out the timetable for re-opener submissions in its gas transporter licence.

We required NGGT to use the baseline expenditure related to the emissions abatement optioneering to develop an integrated plan of investment to comply with emissions legislation⁹. We said that this plan would need to demonstrate comprehensive cost-benefit analysis of all the engineering and commercial options available to NGGT. The plan would need to consider compression requirements on the network as a whole, not just at individual sites, as well as performance against other incentives such as venting. It would also need to take into account any guidance on IED issued by the EA and SEPA, as well as finalised IPPCD Phase 4 requirements. We said we would evaluate the proposals included in this plan and adjust the relevant part of the baselines upwards or downwards if necessary.

NGGT's emission's re-opener submission

We received NGGT's submission on 15 May 2015, under Special Condition 5E of NGGT's gas transporter licence for the uncertain cost category of Industrial emissions. Below is NGGT's executive summary setting out the basis of its revised plan.

The EU has agreed targets and directives that determine how we should control emissions from industrial activity. The IED is the biggest change to environmental legislation in over a decade, with implications for everyone who relies on the NTS.

The IED impacts our operations heavily. It has two principle elements that affect our compressor fleet, the Large Combustion Plant (LCP) directive and the Integrated Pollution Prevention and Control (IPPC) requirements. On our network, we have 64 gas driven compressor units at 24 sites. In terms of the LCP directive, 17 of these units do not comply with the requirements so we have to decide on a unit by unit basis what to do. In addition to this there is upcoming legislation, the Medium Combustion Plant (MCP) directive, which we anticipate will affect a further 26 of our compressors which we may have to make compliant by 2025. With this in mind, the main options we are considering at the sites affected by the IED are:

- *Retain the unit(s) under Limited Life Derogation – which means they will cease operation on 31st December 2023, or after 17,500 hours, whichever is sooner*
- *Retain the unit(s) under an Emergency Use Derogation – which means retain the units beyond 2023 but we cannot run them for more than 500 hours per year from 2016*
- *Replace the unit(s) at a site, either with like for like or with different network capability*

Where the chosen option is not to replace units, the capacity that we make available to customers and the costs of taking constraining actions need to be factored into RIIO-T2; for example through reductions in obligated capacity (baseline) levels or an increase to the cost target for the constraint management incentive scheme that would apply in

⁷ The RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas - Cost assessment and uncertainty Supporting Document is published on our website, <https://www.ofgem.gov.uk/ofgem-publications/53601/3riiot1fpuncertaintydec12.pdf>

⁸ In 2009/10 prices

⁹ This was for compliance with IPPCD Phase 4 and IED Phase 2.

RIIO-T2 (this is the incentive scheme to manage situations where we are unable to meet our capacity obligations).

Against the backdrop of these options, stakeholders have helped us to build the Gas Network Development scorecard to identify the network capability criteria that is most important to them. Following stakeholder feedback we built upon our analysis included in the IED Investments: Initial Consultation document to include a detailed commentary to explain our reasoning as well as a recommended option for each site in the IED Investments: Proposals Consultation. This evolved following stakeholder feedback that we should, where practicable, prioritise the use of the derogations available; to enable us to keep our options open with the uncertainty around the upcoming legislation.

With regard to the IPPC requirements, we have an overarching strategy as agreed with the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA) which allows us to review our compressors as a fleet on an annual basis, targeting sites emitting high levels of NOx to maximise the environmental return. This process is managed through the Network Review which culminates in an annual report. In alignment with this strategy, we are currently undertaking work at five sites and are now proposing three further sites as part of an IPPC Phase 4 programme.

Under RIIO-T1, we received an up-front allowance to create an integrated and cost efficient plan setting out how we will ensure our units comply with the requirements of the IED. The plan must therefore comply with the IED, meet the future requirements of the network and represent best value for our customers.

The table below summarises our recommended option for each site and the associated cost.

Station	Recommended option	Recommended option - anticipated allowance (outturn prices)
St Fergus (LCP)	17,500 hour derogation on units 2A and 2D and then decommission by 31 st December 2023	<£10m
Kirriemuir	Unit D - 17,500 hour derogation and then decommission Unit E – De-rate and re-wheel (electric unit) Unit C – Decommission and install one new unit (MCP unit)	£50-100m
Moffat	500 hour derogation both units	£10-20m
Carnforth	Unit A - 17,500 hour derogation and then decommission Unit B – 500 hour derogation Site reconfiguration	£10-20m
Hatton	17,500 hour derogation on 3 affected units and then decommission by 31 st December 2023. Install three medium sized units	£100m+
Warrington	500 hour derogation both units	<£10m
Wisbech	Unit A - 500 hour derogation Unit B – Maxi Avon conversion to Avon	<£10m
St Fergus (IPPC)	Two replacement units and decommission two units	£50-100m
Peterborough (IPPC)	Two replacement units and decommission three units	£50-100m
Huntingdon (IPPC)	Two replacement units and decommission three units	£50-100m

We believe, based on our analysis and stakeholder feedback that this programme represents an optimised set of investments to deliver the network that will best meet users' needs and future challenges. A like for like replacement programme would have cost over £900m, assuming a similar IPPC programme.

Our engagement with stakeholders and the development of the range of options has enabled us to make the above recommendations at each site. The total of the recommended options is approximately £470m (outturn), of which £420m (outturn) is within RIIO-T1. The maximum impact of this programme on customer bills, compared to a base case of no investment, is approximately 50p in any year compared to 2014/15 price levels.

In aggregate this represents an increase of £41m to the provisional allowance agreed for RIIO-T1 of £280m; this equates to £269.3m in Final Proposals plus real price effects¹⁰ (RPEs).

Our assessment of the submission

In order to evaluate the revised plan we sought input from two external consultants; Pöyry Management Consulting and Penspen. We asked Pöyry Management Consulting to comment on the overall approach and needs case for particular compressors based on NGGT's forecast future flows and system operation. We asked Penspen to critically evaluate the engineering solutions and the costs attributed to them.

We have published both Pöyry Management Consulting's report and Penspen's report on our website.

Below we provide the consultants' main conclusions as taken from their reports' executive summaries.

Pöyry Management Consulting:

Pöyry Management Consulting have undertaken a high-level review of the National Grid Gas (NGG) submission to Ofgem which requests additional funding to mitigate the impact of new legislation pertaining to the emissions performance of their assets (the Industrial Emissions Directive, 'IED'). The review was designed to consider the submission from a high-level, and was not intended to provide a deep dive and thorough investigation of the details of the submission.

NGG operate a fleet of compressor stations, which form part of the National Transmission System (NTS), to ensure the safe operation of the gas network. Many of these compressor stations are subject to the IED which seeks to limit certain gaseous emissions from industrial applications. Whilst NGG was provided an initial allowance for the impact of the IED on their fleet during RIIO-T1, it was recognised that there might be a need to adjust the level of funding as emerging issues became clearer.

Pöyry has undertaken a high-level review, referring not only to the submission, but also to the requirements for the submission indicated during the RIIO-T1 process. The RIIO-T1 process placed a clear set of requirements on the need for analysis to support any resubmission of the IED requirements.

Pöyry considers that NGG's analysis is not as thorough as perhaps should be expected by the wider industry, and that because of this failing, the work undertaken to date does not provide a comprehensive set of evidence on the need for the investment. The submission does not appear to provide a general economic context for the proposed investment, and therefore fails to thoroughly consider the wider impacts of the proposed investment and to compare the proposed investment against other alternatives.

¹⁰ We describe our approach to RPE's in RIIO-T1/GD1: Real price effects and ongoing efficiency appendix, published on our website, <https://www.ofgem.gov.uk/ofgem-publications/48159/5riiogd1fprpedec12.pdf>

Penspen:

National Grid Gas Transmission (NGGT) has supplied Ofgem with a proposal regarding continued investment into the National Transmission System (NTS) compressor units in order to comply with the Industrial Emissions Directive (IED). Penspen have been tasked, by Ofgem, to analyse the proposal to corroborate NGGT's conclusions from a technical and cost perspective.

A brief overview of the relevant legislation is given, and the NGGT decision process used within their proposal is outlined and critiqued. The NGGT proposed solutions for the affected stations are presented and technically analysed, and alternatives are given where applicable.

In terms of the facilities which fall under the LCP (Large Combustion Plant legislation), there is not enough technical information available to confirm that the most appropriate solution has been chosen for each station. However, many of the final decisions which NGGT has made to derogate could be acceptable if the historic running hours are low and the useful design life of the unit is nearing its end.

In terms of IPPC Phase 4 proposal there is not enough evidence to support the choice of stations to upgrade, and no analysis is provided to support the decision to replace the units.

Generally, where replacements have been proposed NGGT have not presented a thorough assessment of alternative options. Under the IED regulation NGGT should have performed BAT (Best available Techniques) assessments to identify the best options for each unit, which it would then take forward to the stakeholder consultation stage. There is not enough evidence in the submission to justify the rejection of DLN/DLE (Dry Low NO_x/Dry Low Emissions) retrofit and SCR (Selective Catalytic Reduction) solutions, especially since they are considered BAT in the BREF (Best Available Techniques Reference document). Quotes for retrofit should have been obtained, and SCR should have been considered for each unit individually. There is no emissions data available to support the NGGT decision to only use CO (Carbon Monoxide) catalysis at the Aylesbury site.

Savings of over £90 million are predicted if SCR or retrofit technologies are utilised at the Hatton site instead of replacement. Please note that this prediction is made within the limitations of this report based on incomplete information.

The total NGGT estimated costs are presented and interpolation is used to corroborate them, with any discrepancies highlighted. Replacement costs are compared with figures for the construction of Felindre Compressor Station on the Milford Haven Pipeline Project, and there is general agreement between the two. NGGT have provided a reasonable representation of potential expenditure for the works which it proposes. Exceptions to this include Hatton which may have additional expenses, and the 100% contingency used for the Kirriemuir and the IPPC phase 4 facilities.

We have discussed the conclusions with our consultants and consider that there is insufficient information in the NGGT submission to satisfy the criteria set out in Final Proposals.

Our draft decision

We acknowledge the work that NGGT has undertaken to develop its revised plan. In particular we welcome the stakeholder engagement and recognise that NGGT has considered the views of network users as part of the process. We believe that this is an

important part of any business plan that we have to evaluate and has improved the quality of the submission overall, compared to the RIIO-T1 business plan.

We also recognise the efforts made by NGGT to consider some alternatives to investment more actively, especially the use of the available exemptions and derogations which may allow continued use of some compressors and represents a good outcome for consumers.

However, we do not believe that NGGT has fulfilled the specific requirements we set out for the re-opener submission. In particular it has not included a cost benefit analysis of its revised plan to justify the additional expenditure, clearly identifying all assumptions made we think full demonstration of the costs and benefits of each option is an important part of the stakeholder engagement. Also, where it has discounted the consideration of other solutions, such as the use of catalysts to treat exhaust stacks, it was unable to quantify this decision and indicated that it would need to undertake an innovation project to assess the technology. As a result we believe that NGGT has not demonstrated quantifiable analysis that shows all costs and all benefits nor demonstrated that these have been shared with stakeholders to assist in informing their views.

Whilst NGGT submitted proposals based on the outcomes of stakeholder engagement as part of this process we consider that:

- It did not fully take on board the comments from all stakeholders;
- The omission of more detailed cost data of the options considered and underlying assumptions from the stakeholder engagement process as limiting the stakeholders' ability to engage effectively;
- Although we specifically required cost benefit analysis as part of this process, NGGT has stated it only costed the final solution to take forwards based on the feedback from stakeholders. We expected NGGT to include the costs and benefits of all considered options as part of its submission.

Additionally, some of the funding NGGT has identified is also linked to anticipated future legislation (Medium Combustion Plant Directive) and whilst this may be a prudent action on some sites, NGGT has not quantified the benefit of the suggested approach and shown how this approach compares to the alternatives.

Based on the above we conclude that whilst NGGT has undertaken some good work, developed better detail, and engaged with stakeholders, the submitted plan does not meet the criteria we set out in our Final Proposals and hence the justification for the expenditure is not adequate. We are therefore minded to reject the request for additional funding at this stage.

Whilst there are specific sites where there is more certainty of the need for NGGT to intervene we consider the allowance already given in RIIO-T1 facilitates NGGT to complete the current profile of works up to at least 2018.

Taking into account the conclusions of our consultants and the potential for further reductions in cost which they identified, we will want also to consider whether there is a case to revise downwards the provisional allowance of £269.3m made in RIIO-T1 Final Proposals.

Next steps

We welcome the views of interested parties in relation to any of the issues set out in this document. Responses should be addressed to Gas.TransmissionResponse@ofgem.gov.uk no later than 1 September 2015. Unless clearly marked as confidential, responses will be published on our website.

We will publish our decision in September 2015.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Paul Branston', is centered on the page. The signature is stylized with a large loop at the top and a vertical stroke extending downwards.

Paul Branston
Associate Partner, Gas Networks