



HIGH LEVEL REVIEW OF NATIONAL GRID'S IED SUBMISSION

A report to Ofgem

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EXECUTIVE SUMMARY

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.

The submission indicates a lack of clarity of the requirements for an analysis of the impact of proposed investments by a regulated monopoly. We understand that guidance has been given to Gas and Electricity Distribution Networks during the RIIO-GD1 and RIIO-ED1 processes on what needs to be included in submissions such as these, and we would recommend that NGG and Ofgem agree on a similar set of guidance in respect of the gas transmission network, so that cost-benefit analysis can be undertaken with the requisite quantification.

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1. INTRODUCTION AND SCOPE

1.1 Pöyry Management Consulting

Pöyry Management Consulting provides leading-edge consulting and advisory services covering the whole value chain in energy, forest and other process industries. Our energy practice is the leading provider of strategic, commercial, regulatory and policy advice to Europe's energy markets. Our energy team of 200 specialists, located across 14 European offices in 12 countries, offers unparalleled expertise in the rapidly changing energy sector.

1.2 High level review of National Grid's IED submission

This document reflects a high-level review of the National Grid Gas (NGG) submission to the Gas and Electricity Markets Authority ('GEMA', represented by the Office of Gas and Electricity Markets, 'Ofgem'), requesting additional funding to mitigate the impact of new legislation pertaining to the emissions performance of their assets. 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.

The scope of work included the consideration of:

- the replacement options at each site, to ensure that all suitable options have been examined by NGG;
- the assessment criteria, to understand whether they are balanced and avoid bias or distortion in the assessments;
- any information on the need for system flexibility into the future;
- whether options have been considered on a holistic basis; and
- whether appropriate consideration has been taken of future needs.

Pöyry provided engineering consultancy support to Ofgem during the RIIO-T1 process. This work included a detailed and thorough examination of many of the substantive issues included within this submission.

This review looks at the robustness of the needs case of the NGG submission, but not the cost efficiency of identified solutions.

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2. BACKGROUND

2.1 National Transmission System

The National Transmission System ('NTS'), is a set of interconnected pipelines and compressors owned and operated by NGG¹ under their Gas Transporter's licence which is granted by Ofgem.

The NTS is designed to operate at pressures in the approximate range of 30 barg to 100 barg, and transports gas to both downstream network operators (Distribution Networks, 'DNs'), and directly connected consumers (power stations and industrial consumers). The precise operating range varies throughout the network depending on local maximum design pressures and downstream contractual obligations. Operating the network outside of its specified ranges is potentially unsafe.

The NTS receives gas at entry points and allows gas to be off-taken at exit points. The commercial arrangements that facilitate this are primarily contained within and governed by the Uniform Network Code (UNC), which contains the substantive contractual arrangements between NGGT and Shippers and Distribution Networks, and defines certain provisions contained in contractual arrangements with other, physically connected, counterparties. These arrangements provide for a certain amount of flexibility in the rate of entering and exiting gas from the NTS.

The compressor fleet maintains the pressures on the network within safe ranges, and comprises a mix of electrically driven and gas turbine driven compressor units, of various ages and of various degrees of asset health. These assets are crucial to the operation of the NTS.

2.2 IED

The Industrial Emissions Directive is European legislation that is designed to limit environmentally damaging gaseous emissions from industrial applications, including gas transportation. It is therefore expected to impact on the operability of NGGs compressor fleet, and may require investment – be it remedial or replacement – to ensure continued compliance.

2.3 RIIO

Commencing in 2008, Ofgem undertook a review of the way that it regulates the gas and electricity network monopolies – the RPI-X@20 project. It was intended to ensure that the regulation of them would enable them to deliver the networks required for a sustainable, low carbon energy sector. The result of the project was the development of the RIIO ('Regulation = Innovation + Investment + Outputs') approach to network monopoly regulation.

RIIO is designed to encourage network companies to:

- ensure stakeholders are a key component of the decision making process; and

¹ Where necessary to draw distinction from the gas Distribution Network assets of NGG, we will refer to NGG Transmission (NGGT).

- invest efficiently, innovate, and to play a full role in delivering a low carbon economy and wider environmental objectives.

The RIIO process puts the onus on the network companies to deliver well-justified business plans, so as to benefit consumers and earn additional returns. Depending on the quality of these business plans, Ofgem will determine the level of scrutiny required. Well-justified, articulate, thorough and holistic business plans therefore have the potential to require only light-touch regulatory scrutiny.

A well-justified plan, “needs to be transparent and focused on what is to be delivered, providing relevant evidence that the approach proposed is likely to deliver long-term value for money”². The RIIO-T1 assessment undertaken by Ofgem during 2012 that led to the Initial Proposals did not consider that the business plan surrounding the IED compliance related investment was sufficiently justified. The Initial Proposals provided additional feedback to NGG on how to improve their business plans in this area.

The outcome of the RIIO-T1 process was to provide a cost allowance which was to be reviewed in a specific re-opener window commencing in May 2015. This cost allowance covered some specific expenditure at specific sites, the costs of developing options (“to develop an integrated and cost-effective plan to comply with the [IED] requirements”³), and a provisional (not final) allowance which was intended to be reviewed in the May 2015 window.

² “Open letter consultation on Transmission Price Control Review 5 (TPCR5) – the way forward”, Ofgem Ref 100/10, 30 July 2010.

³ “RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas – Cost assessment and uncertainty Supporting Document”, Ofgem Ref 169/12, 17 December 2012.

3. HIGH-LEVEL REVIEW

This section sets out our high-level review of NGG's submission. Firstly we set out our expectations of the document based on the requirements set out in the RIIO-T1 proposals and the typical assessment techniques used in policy making and industry. We then consider the overall structure of the submission and the pertinence of the evidence contained within the submission. We then consider the dimensions used to assess the options and justify investment choices, and consider the consultation process that has been undertaken before drawing broad, high-level conclusions on the submission.

3.1 Requirements of the document

At high-level, we would expect the NGG submission to unambiguously demonstrate that the selected options and associated expenditure were absolutely necessary to ensure legal compliance. We would also expect NGG to show whether and if other commercial services could be made available and the extent that these might or might not lower risks and costs to consumers.

3.1.1 RIIO-T1 requirements

RIIO-T1 Final Proposals⁴ stated:

- “We require NGGT to ...develop and integrated plan... [which] will need to demonstrate comprehensive cost-benefit analysis of all the engineering and commercial options available to NGGT. The plan will need to consider compression requirements on the network as a whole, not just at individual sites, as well as performance against other incentives...”

Specific funding was allowed for the purposes of generating this analysis. There are a number of features of this requirement that warrant further consideration to understand the possible requirements for the May 2015 IED submission. In particular:

- ‘comprehensive cost-benefit analysis’ – whilst not strictly defined, a cost-benefit analysis (CBA) is an analytical tool typically used in the assessment of regulatory and policy intervention. Notwithstanding the typical interpretation in regulatory and political decision making (which we discuss at 3.1.2 below), conceptually there are similarities with typical investment decision making practices (which we discuss at 3.1.3 below). From this we would expect NGG to present analysis that contained many of the features of both of these practices;
- ‘all the engineering and commercial options’ – which implies a need to consider commercial options for solving the problems which we would expect to include consideration of users’ network flexibility requirements and the value thereof, the impacts on capacity obligations/buy-backs and the value thereof, etc. (although, we acknowledge the enormity of this task);
- ‘consider compression requirement on the network as a whole...’ – which indicates that an analysis should at least consider holistic requirements, although we would expect holistic requirements to form a basis on which specific commercial and engineering options were explored; and

⁴ ibid

- 'performance against other incentives' – which we would expect to see assessment of identified options against relevant incentive mechanisms (e.g. buy-back costs).

3.1.2 *Typical cost benefit analyses*

Part of Pöyry's service offering to clients, in particular energy regulators and policy makers, is to provide cost-benefit assessment and regulatory impact assessments. Pöyry has developed its own approach to undertaking such analysis which draws from and/or is compatible with other approaches such as the European Commission's Impact Assessment Guidelines⁵, HM Treasury's Green Book⁶, and Ofgem's own Guidance on Impact Assessments⁷.

In our opinion, the key features of cost benefit analyses (which we believe to be typical features of comprehensive analyses) include:

- the establishment of the 'baseline counterfactual': normally the 'business as usual' option which sets out the future vision of the world;
- the statement of the potential problems and the identification of potential policy options and interventions which might improve outcomes (i.e. the solutions to the problem);
- the specification of metrics and measures, the monetisation and quantification of these for each identified option, and where monetisation/quantification is not possible, an exposition of the qualitative impacts;
- the collation and comparison of these metrics in a standardised framework, incorporating the range of potential outcomes presented by each option and the impact of time;
- analysis of the risks – be they internal risks associated with the analysis or external factors that could influence the solutions or their impact; and
- analysis of potential unintended consequences.

Such analyses can then lead to the ability to draw conclusions on the best course of action to undertake.

We understand that Ofgem has provided guidance to networks during RIIO-GD1 and RIIO-ED1 on the requirements for cost-benefit analysis. Whilst we have not specifically reviewed this guidance we understand that it is based on the Treasury Green Book and would therefore expect it to have some of the above features.

3.1.3 *Typical investment proposal assessment*

Whilst comprehensive cost benefit analyses are used for the assessment of policy, where costs and benefits are not necessarily financial, they are not normally used for considering purely commercial individual investment proposals. Commercial investment proposals are normally subjected to financial analysis which combines a study of uncertainty and risk within a time-value-of-money framework. One of the standard metrics of investment appraisal – the internal rate of return (IRR) – forms the basis for comparison with other investment proposals.

⁵ 'Impact Assessment Guidelines', European Commission, SEC(2009) 92.

⁶ "The Green Book: appraisal and evaluation in central government", HM Treasury

⁷ 'Guidance on Impact Assessments', Ofgem Ref 151/09, 15 December 2009.

Simply put, the approach would be to provide a base case as well as an upside and a downside case for the future revenues of a given investment (the costs of which may also be subject to some uncertainty). The resultant IRRs provide cost of capital comparators: where the IRR is greater than the associated cost of capital, the investment proposal is sound at that level and the investor is encouraged to invest. The downside case is typically used to underpin debt financing decisions, with the central and upside cases used to inform equity and premium decisions.

When comparing two or more investment proposals, assuming their risks have been subject to similar scrutiny, the option with the higher IRR generally presents the better investment opportunity. A decision maker, deciding between two options, would require evidence of the additional factors that should be considered when comparing options, and this supporting evidence (which may be purely qualitative in nature) would ordinarily need to be very strong to sway an alternative response.

3.2 Structure of the submission & supporting evidence

The primary document submitted by NGG is the 'IED Investments: Ofgem Submission'. It was accompanied by some supporting documents – a data risk assessment, extracts from engineering documents explaining costings, and an independent review document. Subsequent to the submission, various questions have been responded to by NGG, providing a wide range of very detailed supporting engineering documentation and clarifying elements of the main submission. In addition to this, NGG presented their submission to Ofgem and Ofgem's advisors in early June.

Prior to the submission, NGG published the 'IED Investments: Proposals Consultation' document. Pöyry had read this document prior to being engaged by Ofgem to undertake this high-level review. The document stated that stakeholder engagement on system flexibility – a key element of the considerations in IED – would 'commence' on 19th March. The first system flexibility stakeholder workshop was held on 14th May 2015, and has not fed into the submission.

Pöyry has focussed its attention on the main submission document, but has also considered the independent review.

The submission document:

- starts by considering how the NGG considers the relevant legislation impacts their operations/assets;
- provides some historical background;
- explains the RIIO-T1 outcome;
- reports on progress at three specific sites where urgent investment was considered necessary in RIIO-T1;
- discusses the interaction with other investment programs, although this is limited to the interaction with 'system flexibility' and maintaining Scotland's 1 in 20 obligations;
- presents some very high-level results of a benchmarking against four other European TSOs;
- describes the stakeholder engagement process undertaken, and presents the results of that stakeholder engagement process;

- outlined at high-level the potential solutions that could be used to ensure compliance with the legislation (we note that this includes some consideration of commercial solutions within the two retain & derogate options);
- provides a scorecard assessment for each compressor station impacted by IED;
- discusses the candidates for replacement under IPPC Phase 4 and their interaction with the potential MCP legislation;
- places the recommended options for the individual sites within a very high-level 'holistic assessment'; and
- then includes a view of the subsequent outage plan, summarises the financial costs, and estimates the impact on consumer bills of the proposed investments.

The independent review followed a narrow scope which is included within it.

3.3 Dimensions of justification

NGG have considered the following impacts when assessing the investment options:

- Does this option allow National Grid to meet future flexibility requirements?
- Does this option remove barrier for encouraging new investment?
- Does this option have a negligible impact on customer charges?
- Is this option future proof?
- Can National Grid meet Exit Capacity obligations considering this option?
- Does this option allow National Grid to retain current capability?
- Does this option represent an appropriate level of resilience on the network?
- Can National Grid meet Entry Capacity obligations considering this option?
- Does this option allow the network to be operated in sensitivities beyond FES?

We note that these are primarily assessed on a qualitative basis, with the exception of the impact on customer charges which is expressed in terms of a range of outturn cost impacts.

3.4 Stakeholder engagement process

NGG have tried to engage stakeholders throughout the process of proposing this investment. This has involved a series of surveys, questionnaires, interactive workshops designed to tease out stakeholders' views, bilateral meetings and formal consultation documents. In one sense, it has been a very thorough process, with ample opportunities for engaged stakeholders to contribute. The engagement process has provided some useful guidance as to what the engaged stakeholders would like to see in the justification of the investment proposals.

3.5 Pöyry opinion

In general, we feel that the process to generate the submission has been undertaken at too high a level to know to any degree of certainty whether the proposed investment is needed. Whilst an extraordinary amount of detail has been invested in understanding the detailed costs involved in the investment based solutions, very little information has been made available by which to assess non-investment based solutions, and the submission fails to justify the investment in a wider context.

3.5.1 Requirements of the document

We note that there appear to be very few features in the NGG submission that we would ordinarily expect to see in proposals of this nature. This robs the submission of a much needed framework in which to present underlying analysis. Such a framework would also show where there are informational deficiencies, which would work to:

- highlight the requirements for particular stakeholder engagement;
- direct the construction of independent and complete dimensions for assessment; and
- allow the construction of a holistic view which considered wider consequences and policy objectives.

We note that little has changed between the final consultation document and the Ofgem Submission and, in particular, the information on system flexibility is scant and remains elusive. At the time of the RIIO-T1 Final Proposals, 'network flexibility' (as it was then called), was considered to have a very important interaction with the IED investment requirements. Stakeholders have not changed this view, yet the much needed clarity (i.e. quantified assessment) of the potential impacts of IED on flexibility is still not available. Instead, the document uses unquantified, generic qualitative assessment.

We also note that there is no consideration of different combinations of commercial and investment options – selection is done on an individual site by site basis, apparently without reference to the wider consequences and policy objectives, interactions throughout the network, or the relative costs and risks of different stakeholders. This lack of thorough analysis would be much more apparent if the analysis was undertaken within the right economic framework.

3.5.2 Independent review

We feel that the independent review addresses the questions put to it and that NGG appear to stand up to that scrutiny. However, we note that the scope of the review was narrow and focussed on answering the specific questions. We note that the review was commissioned so as to comply with the Data Assurance Guidance⁸, which we understand requires an 'independent challenge to the process to produce the submission'. We note that the review referred to 'the various proposals documents, to the relevant legislation and by consideration of informal interviews with members of staff within National Grid'. It therefore appears that it did not refer to the RIIO-T1 documentation which might have highlighted the need for a more thorough analysis.

3.5.3 Dimensions of analysis & assessment criteria

There appears to be little quantification of many of the dimensions, and therefore there is no consistent way to judge the relativity of each dimension. Indeed, even within the same dimension it is difficult to distinguish the relative impact of each description. Notwithstanding the lack of quantification, some analysis on the criteria measurements is presented below.

Does this option allow National Grid to meet future flexibility requirements?

The first three measures ('Reduces system flexibility and will impact on users' current requirements' to '...but this is unlikely to affect users' future requirements') appear to span

⁸ 'Data Assurance Guidance for Electricity and Gas Network Companies', Version 1.1 issued 03/02/2015.

a likelihood of impact which decreases by virtue of an apparently unqualified assessment of users' requirements. The lack of quantification makes it impossible to verify the appropriateness of the analysis underpinning this.

Generally, here is no exposition of whether users' requirements for flexibility would be diminished if they were exposed to the costs of providing it, and indeed whether the provision of increased flexibility would be valuable.

Does this option remove barrier for encouraging new investment?⁹

This measure is based on the premise that reduced capability introduces such a barrier; whilst this might be true the corollary, that increased cost (for example, due to the investment required to maintain or enhance capability) does not cause such a barrier, is not true.

Does this option have a negligible impact on customer charges?

This is a narrow interpretation of the impact on customer charges, and does not consider the wider impacts of alternatives, e.g. a commercial option restricting CCGT behaviour might impose costs on electricity consumers which are less than the proposed investment cost where, for example, the electricity market has access to alternative forms of flexibility.

Is this option future proof?

This criteria is restricted to the consideration of BREF and MCP, and appears to be well defined, however the future need is uncertain and therefore risky, and sufficiently far into the future to warrant discounted consideration. The qualitative nature of the assessment makes discounting difficult to achieve, and there is no evidence that less weight is provided to this dimension.

Can National Grid meet Exit Capacity obligations considering this option?

We note that only the first measure – that existing obligations will not be met – should provide a negative outcome.

We also note that it is unclear what this criteria is attempting to measure, as exit capacity obligations are usually considered within a 1 in X context (i.e. the ability to meet the 1 in 20 criterion).

Does this option allow National Grid to retain current capability?

This appears to repeat the dimensions of flexibility, new investment, exit capacity and entry capacity obligations and does not appear to be independent.

Does this option represent an appropriate level of resilience on the network?

This option appears to consider only the impact at the station, rather than on a holistic, total network basis (although we consider that this is consistent with 'normal' capacity planning practices).

⁹ In this context, NGG refer to an external investment barrier, i.e. that the solution might prevent third parties from accessing or using the NTS because it does not facilitate their entry.

Can National Grid meet Entry Capacity obligations considering this option?

As per exit capacity, we note that only the first measure – that existing obligations will not be met – should provide a negative outcome.

Again as per exit capacity, entry capacity is usually framed within the context of baselines, network capability and constraint management options. There is therefore a large interaction with potential commercial options, and the measurements appear to disregard the capability of NGG to quantify the impacts of constraint management actions.

Does this option allow the network to be operated in sensitivities beyond FES?

We note that exceeding FES might indicate that there is an over-provision of system capacity, and the latter two measures should possibly be disregarded

3.5.3.1 General observations

We also observe that the dimensions are not necessarily independent. Whilst this may not impact the analysis presented (because the qualitative nature of the assessment allows for a degree of interdependence), it does increase the potential for misinterpreting the relative merits of the dimensions' assessments, and increases the lack of clarity of the analysis.

Whilst these dimensions are discussed for each individual compressor site impacted by the IED obligations, they are not really considered 'holistically'. Whilst one option might be the best at one site, and a similar option at another site, considered together the two sites might be better served by an alternative overall option which comprises an alternative at both sites. However, whilst we make this observation, we also recognise that, because of the number of impacted sites and potential solutions, there would be a large number of combinations that could be considered.

3.5.4 Stakeholder engagement

As noted above, we feel that while the stakeholder engagement process appears to have been thorough and has provided lots of opportunities for engaged stakeholders to input into the process, the lack of an appropriate analytical framework has meant there has been a missed opportunity to engage all relevant stakeholders at a detailed level (with detail that is important to them) and explore the costs and benefits to them of the potential options.

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4. OPTIONS IDENTIFIED

In this section we consider the options identified in the submission. We have not exhaustively considered each site, but we have considered the generic options identified to test them for completeness, before examining some specific samples to test the thoroughness of the assessment.

4.1 Coherence of options

The submission identifies a number of generic options that are subsequently prescriptively considered for each site. These are:

- retain under the 'limited life' derogation and subsequently decommission;
- retain under the 'emergency use' derogation;
- retrofit;
- catalytic converter;
- replace with the same capability; and
- replace with different capability.

The first two options (the derogation options) state that there are risks which would need to be addressed using one or more of the following:

- improve resilience elsewhere on the network;
- reinforcing the network elsewhere;
- managing commercial risk through long term contracts;
- managing commercial risk through locational buy and sell actions on the day;
- managing commercial risk by reducing baselines;
- changing the UNC rules to manage constraints; and
- reflecting the risks in the constraint management incentive cost targets in RIIO-T2.

The derogation options are therefore the placeholder for any commercial options to solve the problem, but also, as with the non-derogation options, contain solutions requiring investment. NGG has therefore identified a range of different options and, as can be seen from the subsequent analysis presented for each site, has to an extent considered these options alongside each other.

However, there are two levels of detail which is not evidentially articulated – firstly, how each commercial option (i.e. commercial risk management options, UNC change options) might interact with all the other options, and secondly, how one or more of the investment options at one site might provide wider benefits which allow the selection of non-investment options at another site. These levels of detail in the interactions of the options might be complex, or might be obvious non-starters, but there is no attempt at describing them. In addition, we would expect that range of outcomes of 'changing the UNC rules' is wide; relying on this catch-all does not expose all potential options. This appears to leave a gap in the options identification process, and the reader of the submission document is left with the impression that the commercial options are not viable but this is not supported by meaningful evidence. We believe that the commercial options have not been examined in sufficient depth to know definitively that they can be discarded.

4.2 Specific sites

We have examined the options identified at a sample of the specific sites. Many of the sites appear to have a suitably exhaustive set of investment options identified and assessed. As noted earlier, this assessment is qualitative in nature. It therefore does not provide any meaningful analysis of benefits against costs; neither does it provide any meaningful way of comparing alternative options.

We note our specific site observations below.

4.2.1 *St. Fergus*

St. Fergus is used specifically to compress gas entering the NTS from the Total sub-terminal. Whilst there is a specific charging arrangement that applies to flows from the Total sub-terminal, the compressors (for historical reasons) are part of NGG regulated asset and so the costs of St. Fergus compression can be recovered generally.

There is therefore a potential for adjusting the charges at St. Fergus so that the costs involved in ensuring IED compliance are borne by the users of this specific facility, and not recovered generally from consumers. The wider impacts of incurring costs could be limited, and the various costs and benefits could be explored with those stakeholders who would be impacted by the costs and better inform the choice of solution.

Whilst we have received a verbal indication from NGG that a charging review would be challenging because of ongoing Ofgem work in this area (which itself is complicated because of anticipated European legislation), the submission does not indicate whether specific engagement has taken place with all the specific stakeholders (i.e. the upstream and downstream users of the St. Fergus sub-terminal). It is not clear therefore whether all stakeholders have had the opportunity to shape the decision.

That said however, the identified solution (derogate then decommission) does appear to deliver compliance at a relatively low cost which stakeholders would likely conclude is the appropriate choice.

4.2.2 *Kirriemuir*

NGG appear to state as fact that the Avon compressor units at Kirriemuir will need replacing as part of proposed legislation relating to 'medium combustion plant' ('MCP'). We note that this legislation is not in force yet. The recommended option includes this as a part of the decision making criteria.

We note that the comparison of Option 3 and Option 5 suggests that Option 5 is a more expensive solution than Option 3 (noting that there is no detail provided on the costs of Option 3), and the justification for this selection is that it would 'assist' in the 'likely' end-state, post-MCP, of the station, but that the understanding of this end-state is still subject to further analysis. Additional justification relies on the observation that 'outage planning [will] be very challenging' – although there is not analysis of the commercial impacts of these outages (i.e. the potential costs of capacity management). We believe that these reasons do not form a valid, robust or reasonable justification for the selection of Option 5 over Option 3.

4.2.3 *Hatton*

Hatton has a new unit, unit D, which is not yet fully commissioned. It is electrically driven, and was designed to take up primary bulk duty from the existing gas-fired units. The

analysis presented includes historical information pertaining to Hatton's running hours, and also suggests that unit D was intended to take up the duty from one of the existing units. The running hours' data is presented as an aggregate figure, and therefore it is not possible to see how often unit D requires back-up or coincidental support from another of the units. Hatton is described as 'one of the most critical stations on the NTS', so we would expect that significantly more can be quantitatively articulated regarding the requirements for running it.

Given recent running-hours at Hatton of less than 3000 hours, we would expect that with the new unit taking up bulk duty, the existing units could operate under a restriction of 500 hours, thereby making the use of the emergency use derogation feasible. The analysis presented suggests this is not possible, but fails to articulate why. The justification relies on a series of qualitative observations:

- The impact on flexibility: the selected option provides 'additional flexibility', whereas cheaper options 'severely reduce' flexibility – to properly justify the provision of additional flexibility, we would expect the value of the benefits and costs (noting that reduced flexibility might induce a variety of costs on different stakeholders, and increased flexibility might provide a variety of value to different stakeholder) to be quantified.
- Barrier to new investment: the selected option 'largely replicates' existing capability, whereas cheaper options decrease baseline capability at Easington – we note that the impacts on entry capability and capacity could be quantified within the framework of the existing entry capacity regime.
- Exit obligations: the cheaper options are presented as either 'reducing our ability to meet these obligations', or that it 'may not satisfy future needs' – what is missing in this analysis is whether such reductions take exit capability beyond prescribed limits (e.g. the 1 in 20 criterion), or what the future needs might be in quantitative terms.
- Resilience: the cheaper options are presented as not being resilient for a 'reasonable period of time' – there is no exposition as to what is a reasonable period of time against the hours available from the derogations.
- Future Energy Scenarios: it is stated that one option 'significantly reduces our ability to exceed FES' – which would query whether the ability to exceed FES is a suitable measure.

In addition to this, one particular investment option – use of the emergency derogation on two units whilst installing one new medium unit – does not appear to have been examined. We find that the justification around Hatton is lacking in detail, and do not feel that the case for the chosen solution has been made.

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5. SYSTEM FLEXIBILITY

Following the RIIO-T1 submission requiring investment in 'network flexibility', Pöyry were, and understand the wider industry were expecting to see quantification of the issues surrounding 'system flexibility'¹⁰. The RIIO-T1 Final Proposals considered 'it appropriate for NGGT to initiate some preliminary work' such as further analysis and modelling of gas flows', and a specific allowance was provided for..

Whilst in the July 2014 workshop there was an exposition of the general need for Hatton compressor to provide flexibility to respond to wind generation changes, there was no quantification as to how of this situation might be expected into the future (e.g. by way of statistical analysis of wind generation profiles). The September workshop noted that work had commenced to quantify within-day/linepack issues, and the Initial Consultation yielded the observation that consultation respondents 'need a better understanding of the impact of investment decisions on system flexibility'. The Final Consultation document noted that NGG 'are currently undertaking a project to review the future flexibility requirements for the NTS, considering how different events or factors across gas days and within day might affect the way that the system is managed'. The submission document makes note of the stakeholder workshop that was held immediately prior to the submission.

The requirement to provide some quantification and to clearly articulate the metrics and measures surrounding the system flexibility concept has been known for a significant period of time, and yet there is still nothing being made available by NGG in this regard. This makes it impossible to understand whether the right choices – notably to not pursue commercial options – are being made.

System flexibility appears to be the most or second significant issue for stakeholders in understanding the impacts of the proposed IED mitigation options. The costs and benefits of providing for a higher or lower level of system flexibility remain unquantified. Whilst stakeholders appear to place an emphasis on ensuring that system flexibility is not degraded into the future, we note that they are immune to the costs of this (as the costs of providing more flexibility are not targeted) and therefore will not be placing the consumer centrally in their consideration. As noted above, with an appropriate cost-benefit framework, this element of the proposals can be properly considered and the full picture of the system flexibility understood.

The value to the consumer of the NTS providing flexibility comes from the value within the electricity market to flexible gas generation, the value to distribution networks of not having to build/maintain local short-term gas storage (such as linepack and holders), and the value of reliability in upstream production. The costs of producing flexibility within the NTS are the costs of more flexible compression arrangements (and potentially pipeline upsizing), however there might be alternative sources flexibility (e.g. fast-cycle gas storage facilities, LNG terminal regasification facilities) that are prevented from accessing the value. Whilst these points are often contentious within the industry and there have been various unsuccessful attempts at reform (e.g. hourly balancing & exit reform), the industry still lacks a quantified understanding of the costs and benefits of these elements.

¹⁰ Whilst we acknowledge that there might be a technical difference between the definitions of 'system flexibility' and 'network flexibility', in the context of a cost-benefit analysis of the mitigation of IED impacts and the proper justification of this investment plan, they have very similar considerations and are ostensibly the same concept.

We would expect that the RIIO-T1 funding on network flexibility should be at the very least facilitating the exposure of these costs and impacts.

6. CONCLUSIONS

Pöyry was engaged by Ofgem to undertake a high-level review of NGGs IED submission. This has included:

- The replacement options at each site, to ensure that all suitable options have been examined by NGG.
- The assessment criteria, to understand whether they are balanced and avoid bias or distortion in the assessments.
- Any information on the need for system flexibility into the future.
- Whether options have been considered on a holistic basis.
- Whether appropriate consideration has been taken of future needs.

The analysis we have undertaken has reviewed the submission, and compared the submission with the requirements set out in RIIO-T1, and our interpretation of those requirements. The submission appears to be significantly lacking in a number of areas, in particular:

- it does not appear to be constructed as a cost-benefit analysis, therefore misses the opportunity to construct a holistic analytical framework, set a context for analysis, and fails to identify and obtain and analyse requisite information from stakeholders;
- it therefore fails to compare the proposed investment properly against alternative options, fails to identify and describe all viable alternative options, does not examine the risks of the solutions and does not consider unintended consequences; and
- it relies too heavily on qualitative analysis, and fails to challenge the pain-free cost burden imposed by stakeholders.

On the face of the submission, Pöyry does not consider that a case has been made for the investment proposed – there are too many unknowns to usefully conclude anything about which of the various options delivers the best value for consumers. Moreover, the submission indicates a fundamental misunderstanding of the requirements for analysis stemming from RIIO. RIIO-T1 included a specific (and substantial) allowance for investigating and analysing the need for network flexibility which, in Pöyry's opinion, should have provided very useful quantitative input into this IED submission.

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QUALITY AND DOCUMENT CONTROL

Quality control

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Document control

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