

LTS Futures consultation response

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1 LTS Futures consultation response

The LTS Futures Project forms part of the UK's national hydrogen research programme to deliver a Net Zero decarbonisation solution for customers. The project seeks to research, develop, test and evidence the compatibility of the Local Transmission System (LTS) Assets, pipelines, associated plant and ancillary fittings, culminating in a 'first of a kind' repurposing trial and demonstration.

The aim of the project is to demonstrate that the LTS can be repurposed and potentially uprated to convey hydrogen, providing options for the decarbonisation of power, industry, heat and transport by delivering a safe supply of energy to all customers both during, and after, the energy transition.

2 LTS Futures consultation questions

1. Do you agree that this project should be approved, and at the value proposed?

Yes, we agree that the project should be approved, and we agree with the value proposed (on a real price basis). Please note that we do make observations on the contribution and RPE methodology later in the response that should be considered alongside the value proposed.

In June 2019, the UK became the world's first major economy to legally commit to cutting greenhouse gas (GHG) emissions to net zero by 2050. The Scottish Government has committed to net zero GHG emissions by 2045. A major system transition away from natural gas to hydrogen gas is required for these ambitious targets to be met.

The LTS is currently fundamental to transferring natural gas within Local Distribution Zones (LDZ's). In system transformation of the gas system to 100% hydrogen, there will be a requirement for LTS infrastructure either repurposed or new. Due to the significant cost for replacement of LTS infrastructure to new (£19bn for all GDN LTS), repurposing of existing LTS infrastructure offers the most expedient option due to its extent, easements and planning complexities in comparison to replacement of LTS pipelines.

The programme design provides multiple long-term benefits and has been designed to maximise learning and minimise cost. In addition to the selection of project partners that can bring most knowledge and experience to the project we have also used competitive procurement practices and reviewed the allocation of risk between contracting parties to reduce costs wherever possible. A key element of the project is the selection of the Grangemouth to Granton pipeline, a mothballed asset that removes any potential diversionary cost if a live section of LTS pipeline had been selected for testing to ensure security of supply. The pipeline route encompasses a collection of key features including river, road, rail crossings etc removing the requirement to undertake further live trials on other sections of live pipeline that have certain key features that the route interacts with. Having all features included on the pipeline is also extremely beneficial for emergency response simulations involved in the live trial of the pipeline.

The proximity to existing hydrogen supply at Grangemouth refinery offers a low-cost hydrogen supply connection and reduces risk of hydrogen supply availability, logistics and planning to the Grangemouth to Granton pipeline. There are a selection of tests to be undertaken on the Grangemouth to Granton pipeline including the validation of linepack capacity and uprating for hydrogen. The characteristics of the pipeline provide the opportunity to undertake these tests in addition to a close proximity source of hydrogen that allows multiple tests to be ran without a substantial increase in cost for delivery of hydrogen to site.

Where possible, the project has retained redundant LTS pipe and fittings for off-site and laboratory testing, removing the requirement for diversions to acquire vintage LTS components, whilst still ensuring representativeness. The representative nature of the Grangemouth to Granton pipeline to GB LTS and the conclusion that the pipeline offered the upper bound (worst) case for repurposing and uprating of LTS, ensures testing covers the majority of other LTS assets (X52 and lower strength steels).

The project will develop offsite testing at DNV Spadeadam facility that is the location of previous and ongoing hydrogen trials including FutureGrid, H21 and DNV Hy4Heat. Integration of LTS Futures will offer a full beach to meter system for testing of hydrogen off site and provides an excellent facility for future training. Siting of LTS Futures at DNV Spadeadam means the project can also take advantage of existing rigs for testing ensuring value for money.

Finally, there is potential for the Grangemouth to Granton pipeline to become a critical strategic asset connecting Grangemouth refinery, a future source of blue hydrogen to Edinburgh a centre of future hydrogen demand. Hot work validation testing on the pipeline as part of the Live Trial also offers the opportunity for early hydrogen consumers to connect to the line and utilise low carbon hydrogen. However, it should be noted that the connection currently planned

under this project between the Grangemouth refinery and the pipeline is of limited capacity in order to minimise costs for this innovation project. This connection would need to be upgraded should the full capacity of the Grangemouth – Granton pipeline be required.

2. Do you agree with our assessment of and additional requirements for SGN's project plan?

SGN understand the requirement for further analysis from Ofgem and are happy to provide this. The Health and Safety Executive (HSE) has completed a gap analysis and review of the National Hydrogen programme, at the request of the Department of Business, Energy and Industrial Strategy (BEIS). 65 safety considerations were identified by HSE across all asset categories/activities. These have been assessed to determine if and how they are addressed in the LTS Futures Programme. Our HSE mapping analysis is currently with HSE for review.

Through development of the project, key stakeholders have been identified in addition to a structured plan for engagement. This is vital for the overall success of the programme. It is crucial that we identify appropriate stakeholders in relation to the programme of work, ranking them in order of interest/influence, level of engagement and proposed method to engage. We have developed a stakeholder engagement plan illustrating our communication activities with key stakeholders for the programme. The document will continue to develop and grow with the project. This was provided to Ofgem on the 24th January 2022 with the PESTLE analysis.

There are a number of critical stakeholders throughout the project that require co-operation, sign off, approval etc to elements of the LTS Futures programme. This has the potential to cause delay or disruption the project if not effectively mapped by the project team. Analysis on the critical path and key external dependencies has been carried out and currently under review by the HSE.

3. Do you agree with our proposals on how we will hold SGN to account for the project deliverables?

Within Appendix 1 of the consultation document Ofgem have requested further clarifications on the project outcomes evidence. The table within the consultation document is illustrated below.

Table 1-Consultation document Appendix 1 proposed delivery requirements for project outcomes table

SGN stated project outcomes	Proposed Ofgem requirements
<p>Provide evidence to determine the safety and suitability of LTS network assets for hydrogen culminating in a live trial to prove the practical and operational aspects.</p> <p>a) Develop a methodology (blueprint) for future repurposing and uprating projects, ensuring safety, efficiency and applicability throughout the GB.</p> <p>b) Determine wayleave suitability, access and landowner engagement requirements</p> <p>c) Determine the suitability of LTS materials for 100% hydrogen</p> <p>d) Validate the operational strategy for operating a hydrogen network, identifying any differences from operating a natural gas network</p> <p>e) Develop the skills and competencies for managing, operating and maintaining assets in the hydrogen economy, with the procedures required to support it.</p>	<p>All of these outcomes will be addressed with the blueprint.</p> <p>The closedown report will demonstrate that these goals have been met, as follows:</p> <ol style="list-style-type: none"> 1. Provide confirmation that all of these learnings have been captured within the blueprint. 2. Provide confirmation that the peer review reports demonstrate third party acceptance that these requirements have been met.

<p>Provide the technical foundation and investor confidence to support delivery of industrial cluster decarbonisation.</p> <p>a) Develop knowledge and acceptance of hydrogen within the public, industry, standards bodies and regulatory agencies</p> <p>b) Optimise and validate the cost model for future repurposing projects</p> <p>c) Provide visibility of the commercial and regulatory aspects for future operation of conversion hydrogen networks, this insight will support future regulatory models.</p> <p>d) Understanding interface and commercial arrangements with hydrogen suppliers</p>	<p>For each of these outcomes, SGN should provide further detail on how they will demonstrate this has been delivered, including third party validation. This should be included as part of their response to this consultation.</p>
<p>Define the role of LTS in system transformation and facilitate industrial clusters.</p> <p>a) Develop and test the regulatory (safety, commercial and environmental) framework required for the GB Hydrogen network</p> <p>i. Compliance with Pipelines Safety Regulations</p> <p>ii. Identify any modifications required to the Gas Safety (Management) Regulations or other legislation</p> <p>iii. Land Use Planning and Planning consent</p> <p>b) Confirm a repurposed LTS will deliver the required operating pressures, flowrates and linepack to facilitate the green recovery</p>	<p>a) The closedown report should provide details on how this has been achieved. This should include confirmation that the HSE agree that the 31 evidence gaps have been satisfactorily addressed.</p> <p>b) SGN should agree with BEIS on the form that this evidence should take, in order to provide the greatest value.</p>

SGN stated project outcome: Provide evidence to determine the safety and suitability of LTS network assets for hydrogen culminating in a live trial to prove the practical and operational aspects.

We agree that all outcomes (a – e) as set out in the consultation document will be demonstrated in the blueprint and confirmed in the closedown report.

SGN stated project outcome: Provide the technical foundation and investor confidence to support delivery of industrial cluster decarbonisation.

Ofgem have requested further detail on how we will demonstrate the four outcomes (A-D) have been delivered, including third party validation, this is to provide the technical foundation and investor confidence to support delivery of industrial cluster decarbonisation. It is planned that all reports will be peer reviewed throughout the project.

Outcome A: Develop knowledge and acceptance of hydrogen within the public, industry, standards bodies and regulatory agencies

We recognise the importance of collaboration and effective learning dissemination. The project has been designed to provide transparent critical evidence for the decarbonisation of heat, and detailed validation of the safety and technical aspects of the LTS network specific to network operation. A key element of the LTS Futures project is the repurposing of a mothballed LTS asset running from Grangemouth to Granton. Although the pipeline will not supply any customers, the pipeline runs across public and private land and repurposing the pipeline to hydrogen will require and involve extensive engagement with landowners and local authorities (More details can be found in our stakeholder engagement plan). Extensive engagement on the objective for the LTS Futures project and the benefit this will provide for at scale decarbonisation through transition of the gas networks to 100% hydrogen will provide valuable input into the public perception of high-pressure hydrogen pipelines facilitating decarbonisation.

All Network Licensees support the LTS Futures programme. The LTS Futures programme has been developed with the input from the GDNs and National Grid Gas Transmission and we are working closely with FutureGrid to ensure alignment and minimise overlap between the two projects. By selecting statistically representative assets, we have ensured that the findings of the LTS futures programme will encompass the majority of GB LTS pipelines. The process of developing a hydrogen supply pipeline from a hydrogen source within Grangemouth refinery to the Grangemouth to Granton pipeline under the LTS Futures programme will be valuable learning for all GDN's looking to tie in with future decarbonising industrial clusters. This will be particular benefit to the development of industrial clusters as the driver for hydrogen production and decarbonisation.

We recognise the important contribution the LTS Futures programme can make to future industry skills diversification and future Science Technology Engineering and Mathematics (STEM) career opportunities. We will lead an external Technical Group, with representatives from the other Network Licensees, Project Partners, Project Suppliers and other Industry, Consumer and Skills bodies. There will also be a complementary Stakeholder Group to ensure the project stakeholders are kept well informed on the project progression, to share emerging outcomes and next steps. Included within the project are a collection of hydrogen training courses to provide knowledge on hydrogen operation. These include:

- Hydrogen general awareness course
- Hydrogen detection training course
- Hydrogen emergency preparedness/emergency response
- Hydrogen operational training course-e.g., operating valves
- Hydrogen maintenance activities training course
- Hydrogen gas entry facility training course

Institute Gas Engineers and Managers (IGEM) have been involved in the project since the LTS Futures workshop in February 2020 sharing phase 1 findings on LTS repurposing. We have since set up IGEM LTS Futures Group and partnered with IGEM to set up HyTechnical where we have developed hydrogen supplement standards. We are continuing to work with IGEM on other standards for hydrogen.

Given the importance of the LTS Futures project to the hydrogen pathway and the impact on the regulatory environment, we would propose regular meetings are set up with Ofgem to discuss project updates and ensure they are kept well informed on how the overall programme is developing. Critical path items have also been identified where specific Ofgem engagement is required to pass through Go/No Go stage-gates.

Close engagement with the HSE through the programme will provide the opportunity to disseminate outputs and learnings on hydrogen operation and management within repurposed LTS infrastructure. The HSE have set up the technical review groups which will allow for evidence to be reviewed. Evidence gathered within the LTS Futures programme will be independently peer reviewed. The design of the LTS Futures programme with repurposing of a LTS pipeline running from Grangemouth to Granton ensures that we engage with all stakeholders and develop knowledge and acceptance of hydrogen as a low carbon energy vector to drive decarbonisation.

Outcome B: Optimise and validate the cost model for future repurposing projects

If the LTS cannot be readily converted, then the LTS would require replacement which is estimated to cost £19bn for all GDN's. Our current estimate is that if the LTS can be converted to transfer hydrogen then the cost of repurposing the network will be between 15% and 30% the costs compared to replacement, significantly reducing the cost of decarbonisation through the hydrogen pathway. The live trial will give us a much greater understanding of the actual cost and potential for repurposing and uprating the network, and in doing so, inform the system transformation.

LTS Futures consultation response

The cost model for future repurposing and uprating projects will be constructed using the specific case studies for pipelines and installations categorised as:

- i. Large / complex
- ii. Medium
- iii. Small / simple

The minimum requirements for repurposing and uprating of high-pressure pipelines required to meet current legislation (PSR, PSSR) are addressed in pipeline and installation standards. The primary activities to be addressed, project work and the cost model requirements for the pipeline and installation categories i), ii) and iii) above are given in the table below. The bounding cost model with upper and lower limits for each pipeline and installation category will be constructed for each primary activity for each category of pipeline and installation.

The optimised cost model will be based on the bounding cost model. This model, and the variations defined as upper and lower bounds will be validated through facilitated review and challenge workshops including i) gas industry operators, ii) independent UKOPA pipeline operators and iii) independent expert consultants.

Table 2-LTS Futures project work to optimise and validate cost model

Cost Item	Primary Activity	Project Work	Requirements for cost model
1	Design and construction review	Identification and review of design, construction and as-built records, including addressing incomplete records	Records retrieval, analysis and population of record gaps
2	Generic system data	Deterministic fitness for purpose assessment for nominal system details, typical material certification and QA documentation, hydrotest records, design code deviation documentation.	Time and resource for typical desk study
3	Asset description data	Asset specific data - strip maps, special crossing drawings, general arrangements drawings, discipline detail drawings to identify asset specific special studies and tests	Scope of and cost for asset specific studies
4	Operational records	Operational history, Assessment of existing condition, inspection, modifications and repairs, approved deviations	Definition of typical base and bounding (upper and lower) operational history for input to pipeline and installations activities 2 and 3
5	Route survey, site survey	Current route survey to identify population and building infringements within the pipeline hazard route corridor. Site survey to assess layout and change in hazardous area, confirmation of site boundary	Construction of generic infringement models for pipeline and installation risk assessments
6	Risk and ALARP Assessment	Individual and societal risk assessments to be carried out in accordance with standards and industry procedures. Identification and costing of measures required to ensure risk are ALARP	Typical QRA and ALARP study costs for generic pipeline and site models
7	Upgrading and risk mitigation measures	Design and costing of upgrading modifications, revalidation requirements and risk mitigation measures	Development of typical cost register
8	HSE Liaison and Inspection	Preparation of required reports, organisation and facilitation of inspection visits	Resources and costs for typical reports and inspection visits

Outcome C: Provide visibility of the commercial and regulatory aspects for future operation of conversion hydrogen networks, this insight will support future regulatory models

The commercial and regulatory insights from the LTS Futures project can be attributable to the operational characteristics of the network, the extent to which new LTS pipelines investment will be required and the implications for different funding mechanisms and the contractual structure that determine the flow of hydrogen onto the network.

By having greater clarity on the operational characteristics of the network when operating with hydrogen and an improved understanding the role and potential of linepack for diurnal storage of hydrogen this will create a clearer definition of the storage capability of the network and the extent to which diurnal storage is intrinsic to the network itself, or additional to the network. Where it is additional to the network then the basis on which that storage is provide and the benefits of alternative regulatory and commercial structures and models of providing that storage can be more clearly discussed.

Secondly by having greater clarity on the extent to which existing networks can be converted to hydrogen will provide greater clarity on type of remediation work required to enable that conversion and give a clearer understanding on the extent to which new network assets will be required. Where there is a clearer understanding of the need for new network then, as with storage, the regulatory and commercial structures and models for delivering those assets can be more clearly discussed.

Finally, the preparatory work on the regulatory aspects regarding the future operation of hydrogen networks and integration between future hydrogen producers is close to being finalised. There has been continuous on-going engagement with the hydrogen producer for the Live Trial to develop project agreements, shippers contract and network entry agreement. Project agreements will cover aspects such as:

- Volume
- Calorific Value
- Metering
- Security of supply
- Compliant gas
- Change in value (Δ) between NBP of Natural Gas and Hydrogen indices

Ofgem had been identified as a key stakeholder for the LTS Futures programme. We have continuous ongoing engagement with Ofgem and will set up regular meetings to discuss project updates and ensure they are consulted on how the overall programme is developing.

Outcome D: Understanding interface and commercial arrangements with hydrogen suppliers

The LTS Futures programme will understand blue hydrogen deployment and the growth of hydrogen at Grangemouth refinery and how this integrates into the existing gas network. The LTS Futures team are in final discussions for terms with Ineos Group regarding hydrogen supply for the live trial of the Grangemouth to Granton pipeline. The project will be the first to integrate hydrogen production with Ineos refinery providing key learnings that can be applied to other regions of heavy industry with plans for the development of blue hydrogen supply.

SGN stated project outcome: Define the role of LTS in system transformation and facilitate industrial clusters

We agree that outcomes A and B will be delivered within the closedown report and agree to work with BEIS to identify the form that this evidence should take to provided greatest value. Within the consultation document we note that the expectation is that the HSE should agree that the 31 evidence gaps have been satisfactorily addressed. We would like to discuss this further with Ofgem, as whilst the HSE is a key stakeholder within the project, they be unwilling to confirm that the evidence gaps have been satisfactorily addressed. HSE are currently undergoing restructure and in the process of developing technical review groups to review evidence from research and development projects. These groups will provide input and guidance to outline if any further work is required.

4. Do you have any views on the appropriate funding approach for this project?

SGN proposed a hybrid approach to the funding mechanism with approx. 55% being collected from all GB customers via NGGT, similar to the funding method for Network Innovation Competition (NIC) in RIIO-GD1, and the remaining 45% being recoverable from Scottish consumers by being put into the regulatory asset value (RAV). This was proposed to recognise that the asset will have an enduring value to future and current customers in expectation that it will provide an enduring asset for the transportation of hydrogen.

We note Ofgem's consideration that confidence around the future of hydrogen as a valid pathway is yet to be confirmed and therefore, we accept it may be premature for the LTS Future Projects to have a RAV funding component. However, we think that RAV funding is an important consideration as we move towards larger scale developments such as the hydrogen village and the development of industrial clusters. Whilst these projects will maintain a strong component of innovation, the confidence in that innovation will increase alongside the scale of the investment.

As this is one of a number of projects that will be considered under the Net Zero reopener mechanisms, SGN are of the view that each project needs to be considered on its own merits and that the chosen funding approach here is not deemed to be the agreed upon approach for all future applications. As the future of hydrogen develops it must be ensured that there is flexibility within the re-opener process to align the funding mechanism to the specifics of the project, enabling projects with interventions that create an enduring value to be appropriately recognised.

We also note that one consideration identified by the consultation document is that the capitalisation rate for reopeners is fixed at 70%. We accept that whilst it would require a statutory consultation to change this component of the price control financial model (PCFM), it is SGN's view that it would be beneficial to make this attribute of the PCFM model a project specific variable to be determined by Ofgem in consultation with stakeholders. Such a change would enable the capitalisation rates to be set according to the characteristics of the reopener rather than a generic assumption. It is our view that such a change would improve the accuracy of the model for many reopeners not only the NZASP reopener.

5. Do you agree with our assessment of SGN's proposed level of contribution and treatment of benefits in kind?

Proposed level of contribution

We disagree that a 10% contribution is appropriate for this project. We note that a mandatory 10% contribution was originally introduced in the 2017 Network Innovation Review with the removal of the ability to recover the successful delivery reward with an equivalent value at the same time that contingency funding was removed.

The reason provided in that review was that an independent evaluation of the LCNF identified that 40% of the benefits arising from innovation projects flowed directly to the networks. This is clearly not the case for the LTS future projects, where the project is providing critical evidence to the policy decision on the most cost-effective pathway to decarbonise heat. As such the primary benefit is for the UK consumer of an alternative heat decarbonisation pathway that may be more cost effective than alternatives.

The benefit for the network will only arise if cost-effective pathway is demonstrably the case and demonstrable within 2026 policy horizon (assuming that is when a decision is made). Furthermore, projects such as LTS Futures are only one component in that decision. The decision will equally depend upon the cost of transportation, the cost of hydrogen production, and cost of end user hydrogen conversion, two of which are outside of networks' control. Accordingly, the benefits rationale originally stated for the 10% contribution does not align with the project characteristics of research into hydrogen and the LTS Future projects.

We also note that within the consultation document reference was made to other NIC projects supporting a 10% contribution in the past. We do not consider this comparison valid, as there are significant differences in both the scale and the delivery risk associated with earlier NIC projects (which were more focused on bench-studies and controlled trials) compared to the current projects of H100, LTS Futures and the hydrogen village that involve the delivery of significant infrastructure assets. Where delivery of significant infrastructure assets are involved the delivery risk associated with the project is substantial and the project has a greater exposure to cost over-runs.

Finally, we note that in the submission, we proposed a split between the value of the project to be recognised as asset based and to go onto the RAV and the value of the project that was innovation based and to go through innovation funding. The proposed company contribution was 10% of the innovation component. By categorising the asset component as innovation not only does the company contribution have to double to deliver a 10% contribution but the RAV component no longer goes through the totex sharing mechanism so any cost over-runs are borne by the network company. This creates a double penalty of increased risk and increased contribution.

We remain very concerned that the overall balance of risk for investing in large asset based ‘innovation’ projects, coupled with a 10% contribution being required by networks, could disincentivise networks from fully participating in the research necessary to demonstrate whether or not hydrogen can provide a lower cost pathway to the end consumer. This increases the incentive for companies to become less active and minimise investment, this will lead to a poorer customer outcome. It should be noted that the contingency fund of 5% across the whole project is significantly lower than the target band 1 contingency suggested by the Infrastructure and Projects Authority¹ of 10%, the point of reference set out in the most recent reopener guidance documentation.

If the valid arguments provided above are not accepted by Ofgem, due to time and criticality of this project as a minimum Ofgem should include Benefit in Kind (BIK) towards any contribution. However, we do not believe this should be seen as a precedent for future GDN projects which should be assessed on case by case basis. The BIK has been adjusted in line with discussions with Ofgem on 24th January.

Benefit in Kind

The table below illustrates the proposed Benefit in Kind (BIK) for the LTS Futures programme included within the submission submitted to Ofgem on the 31st October 2021. Within 2.22 of the consultation document Ofgem state they are content with the use of BIK to make up part of network contribution. We accept Ofgem’s position on accepting the time of Les Harris for PRS testing support, academic journals and grouted tee provided by DNV.

Table 3-LTS Futures October Submission Benefit in Kind (BIK)

Company	Description	Value £	Total £
SGN	SGN are providing over 100m of pipe for testing associated with elements 2 and 3 (lab testing, burst and fatigue testing, hot works testing).	115,000	165,000
	Technical articles into Academic Journals	50,000	
Cadent	Cadent are providing a PRS (becoming available summer 2022) and a section of pipe for testing in element 2.	259,000	259,000
WWU	WWU are providing a PRS	248,500	426,734
	Les Harris (TD13 chair/PRS expert) has allocated 5 days a month to the LTS Futures Programme, primarily supporting the PRS testing.	178,234	
DNV	Purchase and installation of the grouted tee, Video and drone footage of LTS Futures trials at Spadeadam to support knowledge dissemination and stakeholder engagement and use of the Lord Cullen Centre for meetings and stakeholder events.	250,000	250,000
Total			1,100,734

Within 2.22 of the consultation document, Ofgem challenge the valuation of gifted PRS’s from Cadent and WWU for offsite testing. As the PRS’s have been in service for some time, Ofgem do not believe they should be valued at full replacement cost of the asset and should instead have a depreciated value. To fully understand the viability of repurposing the existing LTS pipelines and associated assets for hydrogen, the programme must test vintage existing assets that are present on the network today.

¹ [IPA_Cost_Estimating_Guidance.pdf \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/98444/IPA_Cost_Estimating_Guidance.pdf)

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If the PRS gifted by Cadent and WWU were not available to us for the programme, we would need to purchase a new PRS specifically for the project. As such the benefit in kind to the project is the difference between the two alternative sources of PRS of either being gifted for free or purchasing as new. It is our view that depreciated value of the asset is not the appropriate point of reference, as this would have no relationship or bearing on the actual value of the asset, which is determined by the residual life of the asset and itself is a function of the quality of the inspection and maintenance regime. It should also be noted that the age of the PRS does not matter for the testing as we are testing the functionality with higher hydrogen flow rates.

In addition, PRS's for testing must be transported from current storage locations to DNV Spadeadam for testing. For transportation of the asset, SGN will require to insure transportation in the unlikely event that the asset is damaged in transit and cannot be used for off-site testing. Insurance is valued at full replacement cost of the asset. There will also be the requirement to pay for the cost of transportation of gifted PRS's in addition to any maintenance, upgrade or repair costs throughout the programme that the assets may potentially require. Through development of the programme, we have actively sought to gather PRS's to ensure that a new PRS would not be required and therefore included into the programme cost. We accept the cost risk in part for PRS's for the programme and agree a split of cost risk of 50% with Ofgem as discussed on 24th January 2022 on refinement to Benefit in Kind PRS value. The table below shows the revised BIKs.

Table 4-LTS Futures Revised Benefit in Kind (BIK)

Company	Description	Value £	October Total £	Revised Total £
SGN	SGN are providing over 100m of pipe for testing associated with elements 2 and 3 (lab testing, burst and fatigue testing, hot works testing).	115,000	165,000	165,000
	Technical articles into Academic Journals	50,000		
Cadent	Cadent are providing a PRS (becoming available summer 2022) and a section of pipe for testing in element 2.	259,000	259,000	134,750
WWU	WWU are providing a PRS	248,500	426,734	124,250
	Les Harris (TD13 chair/PRS expert) has allocated 5 days a month to the LTS Futures Programme, primarily supporting the PRS testing.	178,234		178,234
DNV	Purchase and installation of the grouted tee, Video and drone footage of LTS Futures trials at Spadeadam to support knowledge dissemination and stakeholder engagement and use of the Lord Cullen Centre for meetings and stakeholder events.	250,000	250,000	250,000
Total			1,100,734	852,234

RPE's

On the 24th January we discussed the application of RPE's for the LTS Futures programme and agreed to assess two options on RPE application to mitigate against future market volatility in the project.

Option 1 – Ofgem look to provide funding inclusive of RPEs aligning to those currently applied to the Totex allowances.

- To align to the current RPE process applicable to the Totex allowances, whereby RPEs are awarded based on forecast of input price indices with a subsequent "true-up" adjustment annually based on the out-turn difference between actual CPIH and input price indices. By adopting this approach, it would enable an annual adjustment to the project funding to address any movements in RPEs. It should however be noted, that in line with baseline allowances, if there are subsequent aggressive movements in the RPEs there will be a timing delay between the costs being incurred and the funding adjustment taking place.
- This approach would however require a funding provision to be made on annual basis for the RPE true up, with a funding direction required, and associated consultation process undertaken.

Option 2 – Ofgem provide a ringfenced RPE and inflationary contingency fund that is paid up front with subsequent review and “true-up” of the ringfenced fund to be made at project close out.

- To maintain consistency with the Totex Allowance funding process SGN would again support the use of the forecast input price indices already selected by Ofgem. However, SGN recognise that, as there is no set structure in place to carry out an annual “true up” to the NIC type funding structure, as applied to the totex allowance. We would propose completing the ‘true-up’ adjustment at the end of the project as a part of the close-out process, this would reduce the administrative cost of an annual “true up” adjustment.
- At the project close out stage we propose that the outturn RPEs would be compared to forecast RPEs as applied to the forecast expenditure timeline submitted with the reopener application². This would provide a balancing mechanism through which outturn RPEs can be reflected and to ensure the project allowances are consistent on a real price basis.

When considering this mechanism SGN also consider this ‘true-up’ mechanism is an appropriate mechanism for accommodating differences between forecast and out-turn CPIH inflation. The original project submission used the forecast as set within the PCFM model at the start of 2021. We have now updated these forecasts to align to the inflationary rates included within the published November PCFM. This was published with an updated CPIH forecast of 3.6% for financial year 22/23 reducing to 2.1% for financial year 24/25.

Since the PCFM rates were finalised the ONS CPIH published inflation figures for the year-to-date November 2021 showed CPIH at 4.6%³, and for the December publication CPIH was shown at 4.8%⁴. Whilst these are not directly comparable in terms of time periods, this demonstrates the likelihood of a significant disparity between forecast and actual outturn CPIH values. A 1% shortfall between forecast and actual CPIH values in the first year of the LTS futures project, will impact reduce real prices by an equivalent of approximately £300k, if left unadjusted.

We therefore propose that Option 2 should be adopted for both RPEs and CPIH inflation under the LTS Futures programme. We propose an upfront adjustment to use the November PCFM inflationary and RPE assumptions. If market volatility exceeds or is lower than the implied inflationary and RPE indices then this upfront adjustment would be trued up after the delivery of the LTS Futures programme, expected in 2025. The process of carrying out a close out review and true-up of project funding provides a more consistent approach with the existing NIC framework.

Application of CPIH

Within the original submission, we proposed that 55% of the funding would be collected through an NIC type mechanism from GB customers and 45% would be funded from the RAV. As a result, the original submission treated inflation according the anticipated funding mechanism. With Ofgem’s proposal to collect 100% through an NIC type mechanism from GB customers it is important to make the inflation treatment consistent across the project. In our original submission;

- Under the NIC type funding mechanism, we presented values in nominal values (i.e., including forecast inflation rates as published in the PCFM released at the time of the Final determination) these have been updated to reflect the latest PCFM model forecasts.
- Under the RAV funding mechanism, we presented value in real 21/22 prices (i.e., excluding forecast inflation rates). If these are going to be included under NIC type funding mechanism, then they need to be resubmitted as nominal values.

The table below sets out the nominal values with all funding brought into line with both the NIC type funding mechanism and the November PCFM.

² We propose to apply the true up to forecast expenditure profile rather than actual expenditure profile for administrative ease and simplicity.

³ <https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/november2021>

⁴ <https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/december2021>

Table 5-LTS Futures programme cost in nominal prices

Project Element	October Submission Total £000's (inclusive of RAV (21/22 prices) and R&D (nominal) components)	Total project assessed at Nominal prices (inflation per the November PCFM) £000's
1 Live Trial Design	7841.28	7933.25
2 Lab Testing	2939.66	3093.43
3 Offsite Testing	8674.09	8361.24
4 Live Trial	5665.53	5950.13
5 QRA and Case for Safety	995.14	1318.61
6 Knowledge Dissemination	692.87	1041.92
Sub Total	26808.57	27698.58
Contingency	1340.43	1384.93
Project Cost	28148.99	29083.50
Benefit In Kind (BIK)	1100.73	852.23
Total Project Cost including BIK	29249.72	29935.73

By applying the CPIH forecasted inflationary values detailed in the November PCFM, the CPIH nominal increase would represent £1.4m of the revised project costs of £29.9m detailed in the above table.

Application of CPIH and RPE's

It is important that a project that extends of several years needs to appropriately account for both RPEs and CPIH. We have set out above a proposed adjustment mechanism which allows the forecast inflation rates to be trued-up against actuals as the end of the project.

As of February 2022, our submission values are:

- Real 2021/22 base price: £27,725 (£k)
- Forecast CPIH as of November PCFM to convert real into nominal prices: £1,358 (£k)
- Forecast RPEs as of November PCFM: £1,432 (£k)
- BIK: £852 (£k) has not been subject to uplift for CPIH and RPEs

This gives real to nominal adjustment of £2.8m to account for inflation and RPEs over the 4 years from project submission. It is this £2.8m value that we propose will be adjusted through the true up mechanism to account for actual inflation change.

3 Exploring asset transfer

On the 24th January we discussed the potential for exploring options regarding asset transfer of the Grangemouth to Granton pipeline to our unregulated entity SGN Futures (H100) Ltd for the purposes of undertaking Live Trial of the LTS Futures project. This is illustrated in figure 1 below.

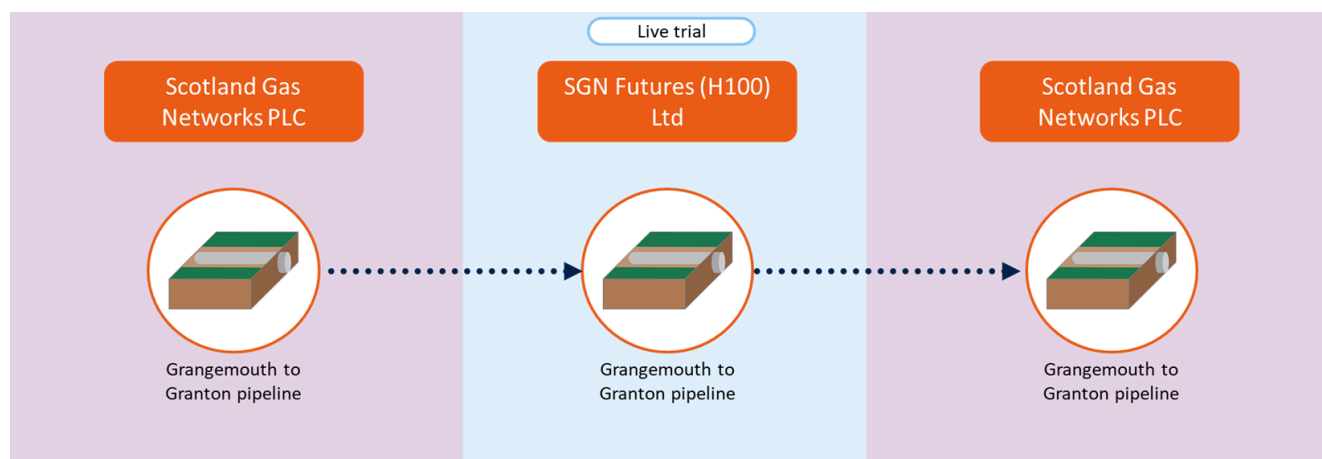


Figure 1-Exploring asset transfer

We are currently investigating the regulatory treatment of the pipeline and currently have a number of options that include:

1. Transfer of the Grangemouth to Granton pipeline to SGN Futures (H100) Ltd in line with Standard Special Condition A27: Disposal of Assets and restrictions on charges over Receivables.
2. The Grangemouth to Granton pipeline stays as a regulated asset within Scotland Gas Networks PLC and receives derogation from the Uniform Network Code (UNC) through disapplication of Standard Special Condition A11: Network Code and Uniform Network Code
3. The Grangemouth to Granton pipeline stays as a regulated asset within Scotland Gas Networks PLC and receives carve out from the UNC. This option is expected to require significant resource to identify modifications required to facilitate the Grangemouth to Granton pipeline live trial.

The initial option that we would like to explore with Ofgem is option 2, securing a derogation from the UNC for this section of the network.