Consultation

Proposed change to gas distribution entry charging arrangements

Publication date: 24th June 2022

Closing date: 19th August 2022

Cadent Your Gas Network

WALES&WEST UTILITIES

Northern Gas Networks

SGN Your gas. Our network.

Contents

Consultation details

Consultation basis	This consultation is drafted on behalf of all the Gas Distribution Networks with input from National Grid Gas.
Why we are consulting	Gas distribution networks (GDNs) are publishing this consultation to seek views from stakeholders, to support the development of our case to Ofgem on changes to the GDN entry charging arrangements. These aim to remove barriers to entry gas through a change to the connection charging boundary, in which wider network users would fund a proportion of the reinforcement costs, from no contribution under current arrangements.
Who the consultation is for	We would value input from anyone interested or impacted by the reform proposed in this consultation
Timetable	• Industry webinar – July/Aug 2022 • Close of distribution entry connections consultation – 19th Aug 2022 • Assess responses and incorporate feedback – Sep 2022 • Formally approach Ofgem to change Connection Charging Methodology – Oct/Nov 2022
Consultation response deadline	19th August 2022
How to respond	Email responses to Priya Punj, Senior Regulatory Economics Analyst at Cadent Gas - priya.punj@cadentgas.com Register interest for the industry webinar to the same email address above. Please leave your contact details including name and email address so we can estimate numbers of interested stakeholders.

Executive Summary

Context

The Government acknowledge that the journey to heat decarbonisation will be facilitated by a mix of energy solutions, which, for the gas industry means transitioning to greener gases. To support this transition, Government is setting the policy direction by supporting potential alternatives to natural gas such as increasing levels of biomethane in the gas grid.

More than 80% of homes as well as businesses, public services and industry in Great Britain connected to the gas grid, and in supplying to these customers the GDNs (Gas Distribution Networks) have a central role to facilitate the transition from natural gas to low-carbon alternatives. New injections of green gas into the gas grid will mean a greater volume of entry connections compared to today. Given this expectation, it is important to keep the charging arrangements associated with entry connections under review, to ensure that networks are best enabling green gas entry and removing any blockers that may hinder this development.

The challenge

If connectees request to connect onto the gas grid where existing entry network capacity is not available, reinforcement is required to create the additional capacity to accommodate these future requirements. In the current charging arrangements for entry, the reinforcement cost associated with connecting falls entirely on the connecting party. The deep connection cost and lack of cost socialisation is a disincentive to entry and acts as a barrier to new entrants who are unable to secure network capacity at an affordable price. This is inconsistent with achieving net zero aims that are seeking to increase the proportion of green gas in the network.

Previous stakeholder sentiment across the industry have reinforced the view that current arrangements present a barrier to entry gas and are focused on demand, not accommodating for large scale decentralised production.

Additionally, the gas distribution networks are required to keep their connection charging arrangements under review and propose changes that better meet the relevant objectives in Standard Condition 4B of the gas transporter licence.

Options and our proposed position

In this consultation we set out our preferred position that GDNs think is most effective in removing the barrier to green gas entry and enables us to better meet our relevant objectives, particularly, facilitating competition in the supply of gas, whilst maintaining cost reflectivity in charges. **Through this consultation we are seeking views to ensure that our approach can be tested and revised where necessary.**

We have developed four different options that reduce the extent of this barrier by socialising a proportion of reinforcement costs (see Table 1). The options consider a change to the connection charging boundary similar to that in gas distribution (GD) exit and electricity distribution (ED) entry where specific characteristics of a particular connection determine the level of contributions made to reinforcement costs. As such, the approaches provide options for how costs could be apportioned between the connecting party and socialisation across a wider community of gas distribution network users. This transition is also supported by previous stakeholder views across the industry who agreed that entry reinforcement costs should be shared across entry and exit customers.

To develop and assess different options we have structed our approach to consider the relevant objective that has driven the starting point in this review which is to:

i. *take account of developments in GTs (Gas Transporter) businesses*.

The transition to net zero and energy policy steering this for the sector means there is likely to be a larger volume of entry gas connections in future. This is a development in GDNs businesses, and the current arrangements create a barrier for distributed entry gas. Therefore, any change to existing arrangements needs to meet this objective.

The options are then assessed based on a qualitative assessment against two key relevant objectives:

ii. *facilitating competition in the supply of gas* and,
iii. *cost reflectivity of charges.*

We have taken these as the primary criteria against which any proposal will be measured, and have been used to differentiate between all options, relative to current arrangements. Facilitating greater levels of entry should increase competition and this should be achieved without considerable burden for any network user. The options should seek to appropriately balance the cost of triggering reinforcement and the benefits from entry gas connections, especially for economic connections.

The other relevant objectives must also be fulfilled, and the preferred option is assessed on how well it meets these.

Table 1: Options that reduce the connectee contribution to reinforcement costs

Option	Brief description
Reinforcement Prices	Gas distribution networks would publish detailed prices ex-ante to users connecting, having already factored in a proportion of reinforcement costs to be socialised, depending on the demand and capacity in that location. Different prices would be set at different locations.
High Cost Cap	Consists of a uniform cap applied nationally, such that reinforcement costs are socialised up until the cap level, and the connectee would cover the increment above the cap. The level of the cap would be set so that existing customers are protected from costs that would be excessive and uneconomic to bear.
All or Nothing Cap	A common cap would apply across all potential entry sites. This would need to be set at a higher level than the HCC to allow sufficient entry. Below the cap all costs would be socialised, and if reinforcement costs are above the cap, the connectee would pay the full cost.
Entry Test	An entry test applicable to all connectees which values the carbon offset from connections as a benefit and compares this to the reinforcement costs of connection using BEIS carbon values and considering the volume of gas injected. Where the social benefit of connections exceeds the cost of connection, the reinforcement costs are socialised, and where the cost of connection is greater than the social benefit the connectee pays the difference between the excess cost and benefit.

Our assessment of these options against two critical relevant objectives leads us to two highest scoring options: the Entry Test and High Cost Cap. These two options are qualitatively weighed on their benefits and limitations on factors such as robustness of the models, the role of GDNs in the approaches, and whether there is any precedence that can be taken from other energy sectors. A

more detailed account of the assessment can be found in Section 3.2. in view of the advantages and disadvantages of each approach and considering this in the round has led to our **preferred position to implement a High Cost Cap (HCC) for distributed entry.**

By socialising costs across all sites, the HCC supports greater green gas entry, a crucial driver for change in entry charging arrangements. It also ensures a balance in costs shared between connectees and wider network users, whilst protecting demand customers from excessive reinforcement costs. It offers a number of practical advantages that put it ahead of other options in implementing change relatively quickly. For example, it requires only a change to the GDN Connection Charging Methodology in terms of charging governance framework which can be processed fairly speedily, alongside other consequential changes for which processes and agreements would need to be in place.

The approach is transparent for customers and would require less frequent operational updates. It also has the flexibility to be adapted in future to differentiate on key factors such as geography, or to be amended should there be evidence that the current level is too low or too high. We note as well that a High Cost Cap approach is in place for the equivalent power generation connections in electricity distribution. Consistency with other regimes is a considerable advantage, especially as the proposed approach is deemed acceptable and workable in the electricity sector.

We propose to set the High Cost Cap initially at £200kW, just below the 90th percentile (£235kW) of data on recent connection requests. This would ensure that beyond this when costs begin to increase at a faster rate particularly from the 90th percentile and 95th percentile, these are payable by connectees and excluded from cost socialisation.

Implications and wider considerations

Implementing our proposed solution will need consideration for the potential funding sources that would need to be agreed to finance the reinforcement cost not recovered directly from the connectee. This is expected to be via an appropriate RIIO-2 re-opener to reflect the reduction in directly funded connection costs which are equal to a net increase to totex allowances.

Often when we are trying to make a single change within a system there is a possibility that this could cause unintended or undesirable consequences. We are mindful that the proposed charging change would benefit all types of GDN gas entry connections whilst energy policy is seeking to support low carbon gas. Other consequences will need to be carefully thought through when determining the level of the proposed High Cost Cap.

The scale of change is expected to be fairly small in initially launching and implementing the proposed change but will have a bigger relative positive impact to entry connections. There will be wider consequential changes that would need to be considered ahead of implementation. For example, ensuring safeguards are in place to deal with possibilities of stranding risk and maintaining financial security, and clear terms for asset replacement and maintenance.

The change recommended in this consultation is targeting a specific problem in current GDN entry charging arrangements and without wider changes to distribution network tariffs, our proposed solution results in the reinforcements costs (below the cap) being socialised across demand customers. To indicate the scale of impact, expected reinforcement expenditure of c.£50-£100 million over the coming years for entry reinforcement would only amount to an increase in pence

per year for customers in their bills.[1] While this may be appropriate in meeting net zero and the relevant Licence objectives with costs being relatively small, in the longer term it may be necessary to review network tariffs more widely to ensure the higher costs are distributed appropriately across entry and exit. The magnitude of the wider changes would be broader than the scope of this consultation requiring modifications to the Uniform Network Code (UNC) and changes to billing systems for Xoserve and Shippers. Previous stakeholder sentiment across the industry supported this multi-phased approach where initial proposals could be implemented more quickly before more fundamental reviews are undertaken later on.

Request for responses to the consultation

We are inviting views from stakeholders with an interest in this area. Please refer to the consultation questions in Section 5.2. Following the feedback from the consultation responses, we aim to review our methodology and submit a proposal to Ofgem for consideration. If approved, we expect implementation at the earliest in 2023/2024 aligned with landing any required reopener.

[1] Based on £50-100mn of upfront reinforcement expenditure (e.g., for 'in-grid' compression) depreciated over 45 years and shared among c.24 million domestic customers each year. Reported in 18/19 prices

1. The context and need to review entry charging arrangements

1.1 The net zero energy challenge and transition to greener gases

As transporters of gas to 23 million customers in Great Britain, the gas distribution networks (GDNs) have an important role to play in the decarbonisation of heat, which accounts for approximately a third[2] of total UK carbon emissions. Decarbonising heat is one of the biggest energy challenges and is a key area of focus for Government in reaching UK's net zero ambition to 2050. The scale of action needed is huge, requiring change in millions of individual homes. The transition for GDNs will involve replacing natural gas with greener alternatives by maximising the use of green gases such as biomethane, and introducing hydrogen-methane blends, with the longer-term aim of distributing 100% hydrogen where practicable.

The Government, through their various strategy documents (for example, The Ten Point Plan, The Energy White Paper, Heat and Buildings Strategy, Hydrogen Strategy) recognise a role for low carbon alternatives in gas and have set out key energy related measures to scale up the net zero ambition in this regard. For example, the Government committed to increasing the proportion of biomethane in the gas grid[3], building on the success of biomethane to date with over 100 facilities operational across the UK injecting green gas.[4] The Climate Change Committee think biomethane could meet up to 10% of UK gas demand and estimate biomethane injection into the gas grid will more than treble in the next 10 years.[5] With the Government's recently launched Green Gas Support Scheme providing financial incentives for new anaerobic digestion biomethane plants, this sector is set for continued growth.

1.2 The challenge for entry gas and case for change

To support Government ambitions to connect greener gases, there is a need to facilitate an increasing number of low carbon gas entry connections onto the gas grid. Gas distribution networks agree now is timely to review current GDN connection charging arrangements to ensure these are consistent with supporting these aims.

Presently, under charging arrangements for entry, when a party requests a connection onto the gas distribution network, they are effectively applying for capacity to meet a level of injection, and the relevant gas distribution network will consider whether spare network capacity is available. If there isn't any available, the gas distribution network can investigate whether work is required to enable the connection. Work is in the form of upgrading or expanding the capacity of the existing shared network assets to facilitate the new connection (reinforcement). Alternatively, the connectee could seek connection at other locations. If neither of these options are viable, the project is terminated.

Finding spare capacity on the gas grid is already difficult as it is a function of demand and is highly seasonal. Existing spare capacity is likely to become increasingly scarce as it is taken up by new entry gas connections. So, it is envisaged that to support an increasing level of biomethane and other green gas entry connections in the future, reinforcements will be required.

With respect to charging connectees for connections, GTs (Gas Transporters) follow a Connections Charging Methodology which each GT must produce in accordance with SLC (Standard Licence Condition) 4B of the GT (Gas Transporter) Licence. The GT Licence enables GTs to legally distribute

[2] BEIS estimates derived from ECUK 2018; House of Commons, Business, Energy and Industrial Strategy Committee, Decarbonising heat in homes, 2022.
[3] BEIS, 2020. Energy White Paper. *Powering our net zero future*.
[4] Energy Networks Association
[5] Climate Change Committee, 2020. *The Sixth Carbon Budget Fuel supply*.

gas and contains conditions that GTs must comply with. The Connection Charging Methodology is broadly similar across GTs and states that when an entry connection triggers reinforcement, the costs of that reinforcement will be charged to the connecting customer. This deep connection cost in which connectees fund the full cost of reinforcement is likely to be prohibitive to achieving UK Government's net zero aims to connect green gas, as indicated by previous stakeholder engagement (see Section 1.4).

This charging arrangement for entry was not perceived a barrier historically because distributed entry connections were rare, and they were predominantly for fossil gas. Early connections of biomethane worked around the barriers, finding spare capacity or in some cases accepting curtailment in periods of lower demand. However, for new distributed entry gas projects, particularly of green gas, this deep connection cost presents a barrier, requiring a rethink into alternative approaches which appropriately share connection costs across network users.

As gas transporters we are required to keep charging arrangements under review and propose changes that allow us to better meet relevant objectives set out in Standard Condition 4B of the GT Licence. Hence, we have developed options that move the connection charging boundary between connectees and wider customers with the objectives to improve competition and cost reflectivity, and the options have been assessed on that basis.

Our proposal is only dealing with the cost of reinforcing shared assets rather than all the cost of the transportation assets (including sole use assets such as the connection to the main) required to connect the entry site. As in gas distribution for exit connections, this is funded by the connecting party and is out of scope for this consultation.

The move towards greater socialisation of costs to support biomethane has in some ways been addressed within the Green Gas Support Scheme in which biomethane production costs are recovered from gas suppliers via the Green Gas Levy, which are anticipated to be ultimately passed onto gas bill payers. The main argument for Government to take this approach is that benefits of decarbonisation through green gas injection will be shared by all users of the gas grid, therefore it is considered appropriate for gas users to fund the next stage of this transition. This benefit reflectivity argument is one of the principal arguments that we think justify the transition to a shallower charging regime. This would result in costs being recovered largely through transporter charges, at least for the medium term. A benefit of this shallow regime is that a big proportion of the cost will be played through the RAV (regulatory asset value), which has the effect of allocating the cost across generations, softening the impact to exit in any particular year. We have based all options on this principle that an element of socialisation will be required to facilitate the next stage of the net zero transition.

To provide a sense of scale of impact on demand customer bills, expected reinforcement expenditure of for example c.£50-£100 million over the coming years for entry reinforcement would only amount to pence per year for customers.[6] Therefore, this change would have minimal impact on customer bills, but would considerably enable the connection of green gases on the network, ultimately contributing to the achievement of Net Zero.

[6] Based on £50-100mn of upfront reinforcement expenditure (e.g., for 'in-grid' compression) depreciated over 45 years and shared among c.24 million domestic customers each year. Reported in 18/19 prices

1.3 Evidence to justify a change to the charging methodology

The gas distribution networks have been connecting biomethane for over 10 years, and to date, under the existing charging arrangements, no projects have gone ahead where significant network reinforcements have been required.

Each distribution network has received large numbers of entry connection enquiries and for many of these the initial enquiry has confirmed there is no immediate spare capacity available at their chosen connection point. In Table 2 below we present the recent history of network enquiries in the period 2020-21. Additionally, we show the number of enquiries by connecting producers that did not go ahead because the GDN sites were not able to provide the year-round capacity requested.

Table 2: Connection enquiries, 2020-21

Network	Total number of enquiries	Number that could not provide the year round capacity requested	Percentage of missed opportunity
Cadent - West Midlands	18	9	50%
Cadent - East of England	43	25	58%
Cadent - North West	23	13	57%
Cadent - North London	12	1	8%
Northern Gas distribution networks	34	9	26%
SGN (Scotland)	17	7	41%
SGN (South East)	14	5	36%
Wales and West	28	4	14%
Total	**189**	**73**	**39%**

Where follow up conversations take place after the initial confirmation of insufficient network entry capacity, once there is an appreciation of the reinforcement required and its cost, the customer will either decide to explore other options, or to continue, but with variable flow non-firm capacity rights. Figures relating to projects that have been connected by networks are summarised in Table 3 below:

Table 3 Number of entry and variable flow connections

Network	Number of entry connections	No of variable flow connections
Cadent - West Midlands	11	5
Cadent - East of England	26	17
Cadent - North West	3	1
Cadent - North London	1	1
Northern Gas distribution networks	18	0[7]
SGN (Scotland)	18	1
SGN (South East)	18	0
Wales and West	20	5

[7] NGN do not have any 'variable flow connections' in place, it's not a term they use in any of their processes. Capacity is offered in line with the volume analysed at the detailed study stage, or any subsequent NEA increases, but never guaranteed as a firm right. 13 sites were flagged as having capacity issues in relation to reduced system demand overnight in the summer months and the potential influence that industrial customer(s) might have on injection if their demand decreases.

From the network conversations with developers, the cut-off point where reinforcements costs become excessive is in the order of low £100k. This is an average figure and is dependent on the scale of the project. **We would welcome responses to this consultation from developers providing evidence on how reinforcement costs for shared assets impact their project's progress** (please refer to Question 1 of the consultation in Section 5.2).

1.4 Stakeholders' Perspectives

In 2019 the gas networks ran an industry event in Birmingham to help understand the sectors' views on the current approach to distributed entry gas. A survey was conducted during the day with the results summarised below:

- Over 90% agreed (77%) or strongly agreed (14%) that the current network pricing methodologies were a barrier to entry gas.
- Over 90% agreed (68%) or strongly agreed (23%) that the current charging arrangements focussed on demand and did not accommodate large scale decentralised gas production
- 87% supported a change to the methodology where exit took a share of entry reinforcement costs.
- 79% supported a multi-phase approach where initial proposals could be implemented more quickly with more fundamental reviews following on.

In addition to this feedback in 2019, as part of the RIIO-2 stakeholder engagement process, Ofgem ran a series of decarbonisation sessions for stakeholders. At one event, the focus was biomethane, and the two primary trade bodies presented their issues and requests for the new price control period. Both ADBA (Anaerobic Digestion and Bioresources Association) and the REA (The Association for Renewable Energy and Clean Technology) highlighted that practical access to network entry capacity was a primary concern to their members.

In 2021 the gas networks through the Energy Networks Association established the Entry Customer Forum, as a body to enable entry gas customers and networks to raise and address industry issues collectively. The current priority activity for this group is the development of a common approach to the provision of in-grid compression. In-grid compression is generally seen as the most economic and flexible solution to provide large increments of entry capacity. This work is underway, but there is a clear expectation that developers and operators are expecting costs in the order of low £100k, if they are to consider funding them under the current charging arrangements. If the basic specification cannot deliver at this price point, without a level of cost socialisation, this option to meet the customers' needs may not be feasible.

1.5 National Grid Perspective

Input from National Grid Gas Transmission was sought through the development of this consultation. At the request of National Grid, direct input has been limited to general feedback on approach and potential implementation risks, and to provide collaborative challenge and review in the formulation of the consultation, with a preference to opine on specific options and proposals as part of stakeholder consultation. National Grid provided the following points regarding its position on this consultation document:

- It is supportive in principle to initiatives that enhance the achievement of charging objectives stated in the licence and UNC, and that ultimately create greater consistency in charging regimes across energy vectors (provided such consistency is appropriate at sector level)

- Under the current Gas Transmission charging regime, incremental capacity costs are effectively split between the triggering user (those ultimately holding the capacity) through User Commitment (and therefore required capacity charges) and shared wider to all Users (Entry and Exit) through transportation capacity charges over time. Ultimately all allowed revenues will be recovered. Any amount not focused or targeted (e.g., through User Commitment arrangements) will be levied on all other Users. For incremental investment there is no separation to isolate Entry or Exit, therefore all else being equal any amount not committed to will be equally split between Entry and Exit Users. The intention of the GDN consultation would at a conceptual level reflect similarities in that, where there is an argument for wider benefits to be received and therefore paid for in part by all users, some of this is recovered by others and not wholly on the triggering party.
- Any charging methodology should consider if, over time, any more fundamental changes may be beneficial to review, develop and implement. This would enable wider development to address any inherent issues alongside new developments, providing opportunities to enhance the charging framework to keep it fit for purpose.
- Assessment of the applicability of the GDN charging proposal to the NTS charging regime would need to be the subject of separate consultation reflective of differences in relevant stakeholder groups. This is because:
    - Responsibility for the ongoing review of relevant charging methodologies rests at system level
    - The NTS charging regime already has entry arrangements in place whereas the gas distribution networks do not, and the adaptation of these would need to be considered in the context of the broader NTS charging regime
    - The respective GDN and NTS charging regimes reflect the particularities of each system, their Users and how the networks are accessed and utilised, and represent many years of evolution and industry engagement. It would be incorrect to overly assume homogeneity of the systems. In particular, the NTS charging methodology employs a different and greater range of commercial products within its regime, and the impact to these of structural changes to the charging methodology would need to be assessed.
    - Achievable production scale, physical network characteristics, and appropriate pressure tier for connection make the NTS a different proposition with regards the facilitation of competition.
    - The NTS charging methodology has undergone, from October 2020, a recent fundamental change on Capacity charging to implement a Postage price system (one Entry and One Exit price) as its underlying method for recovering Transmission Costs / Revenues. Any change to a methodology should always consider how and if changes and refinements could enhance the suitability of the charging framework to appropriately recover the required revenues. Changes to who pays, especially if further ‘socialisation’ were to be considered, needs time to engage stakeholders to develop suitable solutions.
- Robust impact assessment is a vital part of stakeholder engagement and consultation, and this should include broad upstream (i.e., impact to NTS charges) and downstream (i.e., impact to GDN exit customers), and the likely scale of impact over time.

2. Our approach to options development and assessment

2.1 The approach

Evidently, our case for change shows there is a need for a revised charging regime that alleviates the current barrier to entry connections and apportions costs for reinforcement between both connectees and wider network users.

Our approach to developing and assessing options has focused on ensuring that the options allow GDNs to be compliant with our Gas Act duties and to better meet the relevant objectives in our GT Licence.

There are various layers to the charging governance framework starting with the Gas Act. The Gas Act 1986[8] is the overarching legislation which governs gas supply in Great Britain and sets out the rules by which GTs must legally abide. It is the Act that establishes a licensing regime which requires gas transporters to hold a Gas Transporter Licence.

Section 9 of the Act defines the power and duties of GTs as relevant to connections:

> *1) It shall be the duty of a gas transporter as respects each authorised area of his-*
>
> > *a) **to develop and maintain an efficient and economical pipe-line system** for the conveyance of gas; and*
> >
> > *b) subject to paragraph (a) above, to comply, so far as it is economical to do so, with any reasonable request for him*
> >
> > > *i) to connect to that system, and convey gas by means of that system to, any premises, or*
> > >
> > > *ii) to connect to that system a pipe-line system operated by an authorised transporter.*
>
> *1A) It shall also be the duty of a gas transporter to **facilitate competition in the supply of gas**.*
>
> *(2) It shall also be the duty of a gas transporter to **avoid any undue preference or undue discrimination**—*
>
> > *(a) in the connection of premises, or a pipe-line system operated by an authorised transporter, to any pipe-line system operated by him; or*
> >
> > *(b) in the terms on which he undertakes the conveyance of gas by means of such a system.*

The relevant objectives from the GT Licence SLC 4B are:

(a) *compliance with the connection charging methodology **facilitates the discharge by the licensee of the obligations imposed on it under the Act and by this licence**;*
(b) *compliance with the connection charging methodology **facilitates competition in the supply of gas, and does not restrict, distort, or prevent competition in the transportation of gas conveyed through pipes**;*

[8] Gas Act. https://www.legislation.gov.uk/ukpga/1986/44/contents

(c) *compliance with the connection charging methodology* ***results in charges which reflect, as far as is reasonably practicable (taking account of implementation costs), the costs incurred by the licensee in its transportation business and, where the Act enables, to charge a reasonable profit****;*

(d) *so far as is consistent with sub-paragraphs (a), (b) and (c), the connection charging methodology,* ***as far as is reasonably practicable, properly takes account of developments in the licensee's transportation business****;*

(e) *compliance with the connection charging methodology ensures that* ***the licensee shall not show any undue preference towards, or undue discrimination against, any person who operates, or proposes to operate, a pipe-line system in relation to the connection of that system to the pipe-line system to which this licence relates****; and*

(f) *the connection charging methodology is* ***compliant with the Regulation and any relevant legally binding decisions of the European Commission and/or the Agency for the Co-operation of Energy Regulators****.*

Below we describe how a transition to a shallower connection boundary in which reinforcement costs are predominantly funded by wider network users over connectees, would enable GDNs to better achieve these relevant objectives.

Relevant objective	How a shallower entry connection charging boundary could support better achievement of GTs relevant objectives
a) Compliance with the Gas Act and Licence	Relating to compliance with the Gas Act, there is a general duty in 1a to develop and maintain an efficient and economical pipe-line system. The proposed change to entry charging arrangements would be developed such that costs are socialised until it impacts the transporters' ability to operate an economic pipeline system. 1b imposes a duty where economical and reasonable, to connect to that system and convey gas to any premises. The natural reading of this is that the duty to connect relates to the premises and that the duty is to convey gas to the premises, hence this only applies to exit connections and there is no duty to connect entry connections, although there is nothing to prevent this. The proposed change would ensure compliance with this duty. Duties 1A and 2 are covered within the relevant objectives of the Licence and are discussed below.
b) Facilitates competition in the supply of gas	A degree of socialisation will enable new sources of gas to connect to the network which supports competition in the supply of gas. It would also remove the barrier of a triggering party bearing the cost of a reinforcement even where it is the cumulative impact of entry connections that has driven the reinforcement. Socialisation would also better recognise any potential benefits a reinforcement may provide to a future entry connection. It would not restrict, distort or prevent competition in the transportation of gas conveyed through pipes because another transporter could build a pipeline to connect the producer to the network. Our proposal would facilitate greater flexibility and choice for connectees in being able to find suitable locations for their projects.
c) Charges which are cost reflective	Overall network charges will remain cost reflective as they are set to recover the total allowed regulated revenues. Exit charges will increase but only by a very small amount as any cumulative entry reinforcement costs are only expected to be in the order of low tens of millions of pounds at most over the first few years these

	arrangements would be live. The wider charging arrangements can be reviewed in future should the costs reach a significant level. The proposed entry charging arrangements follow the principle that it is appropriate to recover costs from wider network users today as the costs incurred drive benefits for existing customers as well as future customers by removing barriers to new sources of low carbon gas. But by not completely socialising costs the proposal aims to strike a balance in cost sharing between the connecting customer and wider network users.
d) Takes account of developments in the GTs businesses	The gas distribution networks are experiencing significant change and are dealing with distributed entry flows that until fairly recently were never a consideration. Increasing levels of distributed entry gas are expected over the coming period. Current charging arrangements present a barrier to entry for connectees and therefore hinder developments in reaching the net zero ambition.
e) Does not show undue preference or discrimination	The proposed entry charging arrangements are designed to make it easier to connect with rules applying equally to all potential connectees, so the proposed change would not have a negative impact on this objective. More generally neither the Gas Act nor licence explicitly makes achieving Net Zero an obligation or objective so all entry connections whether of low carbon or fossil gas have to be treated in the same way. Government energy policy will determine in large part what types of gas production are developed and seek connection to the gas distribution network.
f) Compliant with wider regulations	The proposed entry arrangements do not impact this objective

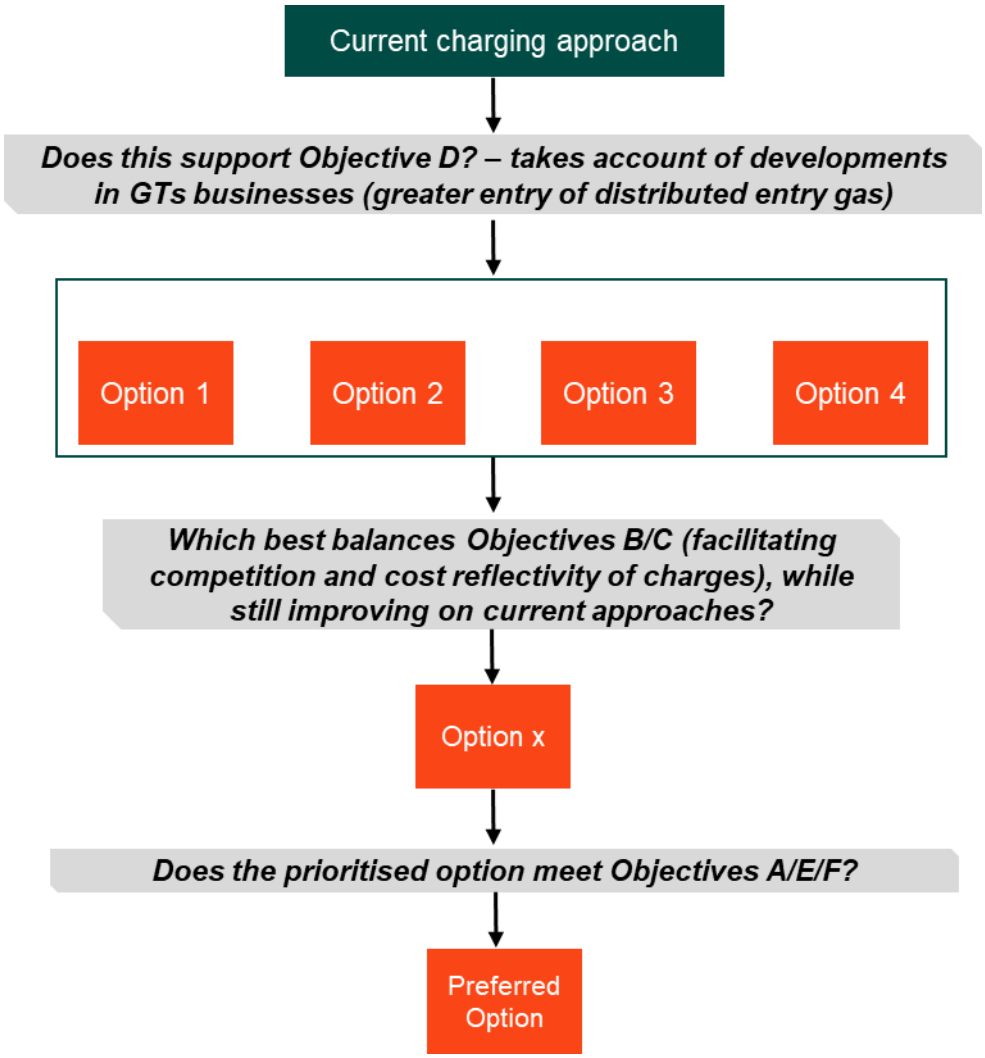
Practically, the next step in our approach has been to structure the objectives to determine those important to consider at the start of the process, those particularly key to assessing different options, and the remaining which are equally important and are necessary to fulfil. See Figure 1.

Objective D is **to take account of developments in GTs businesses** and has represented our starting point in this process and has effectively provided the case for change. The way we have interpreted this objective in the face of current developments is that gas distribution networks are experiencing an enormous change with increasing levels of distributed entry gas, and the current charging arrangements present a barrier to green gas entry. Distributed entry gas will become a bigger feature of our activities going forward, and it is therefore necessary to review the current arrangements. The change must at minimum be supporting connections of distributed entry gas.

Objectives B and C are concerned with **promoting competition in gas supply and cost reflectivity in charges** and have been treated as the primary criteria for differentiating between new options. We have taken these to be critical principles that the new suggested options should better support compared to current arrangements. By removing barriers to entry through the proposed change, we expect a greater level of entry that would otherwise be hindered. This should increase the level of competition to locate required network capacity on the network. Any change proposed should also be cost reflective and not overly burdensome for any one party. It should seek to balance the cost of triggering reinforcement and benefits of connecting distributed entry gas.

Objectives A, E and F **to ensure that approaches meet the Gas Act and GT obligations, wider regulations, and do not unduly discriminate** have been considered as 'stage gates' for options (i.e., pass/fail) and any preferred option(s) should fulfil each one.

Figure 1: Approach to developing and assessing options against Licence relevant objectives



2.2 Key considerations and cross sector approaches

This section sets out considerations we have been mindful of in forming our options.

This consultation has been designed for GDN entry gas in general. Additional considerations would be required for hydrogen into a blended network, but we expect any impact on charging arrangements will require limited adjustments to calibrate higher volumes of hydrogen in the charging base for entry capacity. For a longer-term transition to full hydrogen networks in the future we would expect to build on the conclusions of this consultation.

2.2.1 Trade-off between charging principles

In developing new options, it is necessary to trade-off between the two fundamental relevant objectives in the GT Licence, namely:

- **To facilitate competition in the supply of gas and not restrict, distort or prevent competition in the transportation of gas** by supporting new entry connections, including for different types of gas, and;

- **To support charges that reflect (as far as practicable) costs incurred by GTs** (and a reasonable profit).

For example, a credible way to facilitate competition is to introduce cost socialisation as this would remove barriers to entry for entrants requesting network capacity on the gas distribution network. A shallower charging regime with wider network users paying a contribution towards reinforcement costs can be more or less cost reflective depending on which perspective is considered. On one hand, wider network users funding a large proportion of the reinforcement costs where appropriate, can be argued as being less cost reflective. On the other hand, it can also be argued that removing a direct charge from a triggering party is more cost reflective if it is recognised that it is a cumulative impact of multiple parties that trigger a reinforcement further downstream of the connection boundary. It may not simply be the connecting party that triggers the need for incremental network capacity. The deep connection boundary implies that the connectee is the only beneficiary, so there is an inherent existing problem with that arrangement, as it does not capture all beneficiaries of the connection.

Our task has been to design options to try to balance these competing objectives, at a reasonably broad level. The primary driver for change, is, however the need to support an increasing number of green gas entry and facilitate greater competition by removing barriers for connectees. It may therefore be appropriate to trade-off against cost reflectivity because:

- It would support greater competition in the supply of gas
- Greater green gas entry will support the delivery of wider benefits to all gas customers through reduced fossil fuel use enabling the UK to meet net zero targets
- Introducing green gas to networks would support greater consumer choice and the potential for lower long-term energy and decarbonisation costs for customers
- It is consistent with the approach taken in electricity distribution, where greater amounts of entry reinforcement have been and are continuing to be socialised. Being aligned with the electricity sector is important to achieve whole energy system decarbonisation
- The potential benefits of net zero are expected to outweigh the expected expenditure on entry reinforcement over the coming years further justifying the reform towards greater socialisation in the medium term
- A more flexible and accessible network should enhance how users can access and utilise it

2.3 Cross Sector Insights

Based on this trade-off we have considered approaches in gas distribution exit and particularly electricity distribution entry where alternative approaches to determine the connection boundary are used.

2.3.1 Gas Distribution – exit

When a new demand connection requires reinforcement, under the current Connections Charging Methodology the Economic Test is triggered. The Economic Test is a financial assessment tool designed to ensure GTs meet their Gas Act obligations, namely, to maintain an efficient and economical system, and to comply with any reasonable request to connect to its system.

The Economic Test determines whether the customer connecting on to the network should pay a contribution towards the cost of reinforcement of shared use assets, upstream of the charging point, required for a new connection.

The Test is designed to protect existing customers from having to subsidise expensive new requests for capacity on the gas distribution network that would be considered 'uneconomic'. That is the principle that existing customers shall not be made worse off by the new connection. It is worth noting however that this test does not factor in any wider benefits accruing to existing customers.

Where the reinforcement cost is greater than the expected lifetime transportation revenue, the Economic Test is failed, and the cost is considered uneconomic; in this case the connecting customer pays the difference between the excess cost associated with the new connection and the transportation revenue.

Where future lifetime transporter charges are greater than reinforcement costs, the cost is considered economic; all costs are socialised, and no connectee customer contribution is payable towards the reinforcement. In this case the Economic Test is passed, and reinforcement costs are effectively socialised.

The amount contributed by existing customers to the funding of the reinforcement is no more than the discounted reduction in charges they expect to receive due to the new connection paying transportation charges once connected. The effect of the policy is that the existing customers fund the upfront cost but are compensated in subsequent years making them no worse off than if the connection had not been made.

2.3.2 Developments in the Electricity Distribution sector

The journey to net zero will require a whole systems approach that considers the wider energy system with gas and electricity at the centre of this debate offering low carbon alternative solutions. We recognise that final energy demand will look different by 2050 and gas alone cannot provide all the solutions, with electricity making a huge contribution. It is important therefore that developments in both electricity and gas are coordinated and consistent, to ensure the right incentives are in place. The electricity sector is further along the net zero transition than the gas distribution sector and we can therefore learn from their experiences.

Over the past few years, the electricity sector has progressed a Significant Code Review (SCR) into charging arrangements which has been initiated by Ofgem. The review has been aimed at ensuring charging and access arrangements continue to support an increasingly decentralised, decarbonised, and digitalised energy system at least cost, while ensuring that the interests of consumers continue to be protected.

In May 2022 Ofgem published conclusions on the SCR with the decision to reduce the contribution to reinforcement for generation connections by introducing a 'shallowish' connection charging boundary. This would involve connectees paying for extension assets and a contribution towards reinforcement at the voltage level at point of connection, meaning a larger proportion of the cost would be funded by the DNOs (Distribution Network Operators) via DUoS (Distribution Use of System). For demand connections they have decided to move to a fully shallow connection charging boundary which removes the contribution to reinforcement for demand connections.

The main case for change is the view that current connection charging arrangements may be holding back efforts to achieve net zero by failing to provide an effective signal to some connection customers, while presenting an up-front financial barrier to investment. Ofgem argue their decision

to reduce contributions from connectees will serve to bring forward investment in low carbon technologies and allow DNOs to reinforce the network more strategically, ahead of customer need, where it is in the interests of customers to do so. They also believe that their position strikes the right balance between maximising benefits, such as removing barriers and limiting the cost impacts on wider network customers.

The primary read across from electricity is for generation connections where a High Cost Cap (HCC) is in operation. Having accepted the need to socialise reasonable reinforcement costs, the HCC protects customers from excessive contributions towards very high-cost individual connections, such that only reinforcements costs above £200/kW are funded by the connectee.

2.3.3 Implications from alternative approaches

The approaches in GD (Gas Distribution) exit and ED (Electricity Distribution) entry to determine the connection boundary from the point at which connectees must contribute to connections, recognise specific aspects of connections via a formulaic basis, to provide predictability and transparency.

We think the same should apply to GDN entry gas as these approaches socialise costs but allow the connectee to understand when a contribution may be payable, recognising the specific nature of a connection and avoids a 'one size fits all' regime that may not drive desired behaviours.

The Economic Test in GD exit regards the economic impact of exit reinforcements so that the connectee contributes to reinforcement costs of connection that are considered uneconomic. We are seeking to apply this same principle to our entry proposals.

Implementing an analogous Economic Test for GD entry is impossible at present since there are no entry capacity revenues that could be used to set against reinforcement costs, a key component in the current demand side Economic Test to determine costs to be socialised. In the absence of entry capacity revenues, applying a similar Economic Test would require a GDN entry capacity charge. This would involve a major amendment to the current charging framework (requiring changes to the Connection Charging Methodology and Uniform Network Code), and therefore would not allow for implementation of a solution at pace. This could be an option though for the future as part of more holistic reviews of entry and exit charging.

Based on difficulties with applying a similar Economic Test for GD entry in the near team, and to promote consistency between electricity and gas, following an ED like approach for gas entry represents a more credible way forward. We have however outlined in Section 3.1 below an alternative approach to derive an entry economic test.

In ED the charging framework apportions costs based on a set of engineering/economic rules so that those that are not 'economic' are put on to the connectee. To implement this approach this would require a simpler change to the Connections Charging Methodology so could be implemented fairly quickly. While this approach would not require an entry charge, it would support one if necessary, in future. Additionally, while introducing an Economic Test analogous to the existing exit test is not possible, following an approach similar to electricity distribution entry would allow for an Economic Test like approach that has a formulaic basis.

3. Our proposals for distribution entry connection charging

3.1 The options

Following a similar principle to ED entry we have developed four high level approaches that could be used to determine the connection boundary and split reinforcement costs between entry connectees and wider network users. These options have been designed to take account of specific characteristics of a particular connection, to set the level of charges that connectees must contribute towards reinforcement costs. We have also set out the level of socialisation that we think would be required under each option.

Option	Description	Practical implications	Level of socialisation
Reinforcement Prices	• This approach is similar to charging approaches for entry today, but the main difference is that different prices (or the connectee contribution to reinforcements) would be published upfront, set at different sites ex-ante (having factored in a portion of costs to be socialised) • The approach could operate similar to Security and Fault Level Cost Apportionment Factors (CAFs) as in ED, so that the connectee contributions could be calculated depending on what is driving the need for reinforcement and would be dependent on the demand in the location (e.g., in locations with higher demand price would be lower), and capacity/volume basis (e.g., if more capacity is available then price would be lower). • Through this approach the costs to the connectee can be minimised depending on which site they connect at meaning this approach sends locational signals.	• GDNs would need to determine and publish a detailed 'price list' of network sites requiring significant implementation resources and time. • Moreover, the GDNs managing the sites would need to regularly update the prices to take account of connection and wider network updates. • This approach also relies heavily on accurate ex-ante forecasts.	• Medium – supports facilitating competition objective but connectees also contribute a fair level to reinforcement costs
High Cost Cap	• This option of a High Cost Cap (HCC) functions in a similar way to the current HCC in ED, with reasonable typical costs socialised, but with customers protected from extreme costs. In this option all reinforcement costs are socialised up until a cap where costs become uneconomic for existing customers to bear as they are unreasonable and excessive, based on location/demand. • The connectee pays the increment above the cap, while the rest is socialised and funded through transporter charges.	• The cap would be set at a general figure initially, applying equally across geographies. But there is scope to develop and make the HCC more nuanced and differentiated over time for different geographies, pressure tiers or other criteria. This option would require less frequent updates due to a general level being set.	• Medium - supports facilitating competition objective but connectees also contribute a fair level to reinforcement costs. The level of socialisation would be dependent on where the cap is set.

All or Nothing Cap	• This option is a mix of the Reinforcement Price and High Cost Cap approaches. A common cap would be set for all potential entry sites (although this could be set by geography, pressure tier or other criteria at a later date to be made more specific). Below the cap all costs are socialised. If the connectee connecting has reinforcement costs above the cap level, the connectee pays all costs. • The 'all or nothing' nature of the cap sharpens the locational signals of the HCC, but it is crucial the cap is set at the right level to incentivise entry. The cap will likely have to be set higher than the HCC to allow sufficient entry.	• This option will also require significant resource and time to implement and update due to the importance of setting the cap at the right level and ensuring it is consistent with updated costs.	• High - especially relative to the HCC to support the connectee entering
Entry test	• This approach essentially performs a cost benefit analysis to compare the reinforcement costs of connection vs. the social benefit from the carbon avoided in the atmosphere. In doing so, it takes into account the planned volume of gas injected and considers whether the injection of gas is low carbon. • The Treasury's Greenbrook values of the cost of carbon (which are also used by BEIS) are used to value the carbon that would be offset from connections. • Different emissions factors are applied to biomethane and natural gas entry (based on BEIS' greenhouse gas conversion factors) to determine differences in social benefit (i.e., carbon avoided) • The social benefit is based on 16 years discounted at the cost of carbon that is currently in the gas distribution network's regulated Cost Benefit Analysis calculations. • The social benefit would be set such that it would cover the capital investment and the operating cost of connectees. A figure of 0.5% of value of carbon has been selected applying equally to all connectees and would be reviewed subject to change depending on actual market developments. • Where the social benefit is greater than the reinforcement cost, the connection is considered economic, and the reinforcement costs are socialised. Where the social benefit falls below the reinforcement cost, the connectee pays the increment above the social benefit, while the rest is socialised.	• The model could be left simple initially and can be expanded upon to include global carbon values and other advanced elements. • The selection of 0.5% is not based on any specific justification making it harder to argue for any future change up or down.	• Medium/High – the way the model is currently developed, the value of carbon for biomethane connections quickly exceeds a plausible cost of reinforcements and therefore the majority of biomethane connections would be socialised

3.2 Options assessment and our proposed position

Our options assessment has involved conducting a qualitative assessment of the four options at a high level to derive at the preferred option before doing more detailed assessment.

As mentioned in our approach the options have been developed, and then compared and evaluated, particularly in how well they meet the two primary relevant objectives, facilitating competition in gas supply and cost reflectivity in charges, relative to leaving the charging regime as is, i.e., Do Nothing. The ratings are based on a Red-Amber-Green (RAG) rating system. The practical advantages and disadvantages of each option have also been considered as part of this assessment.

Objectives/ options	Reinforcement Prices	High Cost Cap	All or Nothing Cap	Entry Test
Facilitate competition in the supply of gas	• Socialises greater amounts of costs than the Do Nothing option • But would be more complex for connectees to understand and evaluate	• Socialises greater amounts of costs than the Do Nothing option • Encourages entry at sites that would otherwise not be viable to connectees.	• Unlikely to support significant volumes of entry in comparison to HCC • Does not support competition across the board as connectees with very high reinforcement costs will see no change, but this option is still improved relative to the Do Nothing option	• Encourages the most economic and efficient option in terms of volume and location
Support charges that reflect costs	• For parties causing the reinforcement it supports the balance between costs socialised (on exit customers) and those paid by connectees	• For parties causing the reinforcement it supports the balance between costs socialised (on exit customers) and those paid by connectees	• No balance is struck between connectees and customers	• Aims to achieve a balance by socialising costs for connections with carbon benefit and charges contributions from other connectees
Practical advantages/ disadvantages	• Significantly more resource and time intensive to implement and operate from a GDN perspective • Interactive connections would not be straightforward and would be difficult to manage.	• Can be implemented most quickly out of all options • Requires less updates operationally as there is one uniform cap across the distribution system. • Flexible and can be adapted to other differentiating criteria in future such as pressure of pipes or regional variations.	• Likely to be the most difficult to implement and operate given the crucial importance of having the level of the cap set at the right level at all times.	• Uniform model, that once agreed and established with Ofgem could be updated once a year with new carbon costs • It gives connectees certainty on what the likely contributions would be • Would need a justification for the 0.5% value which can be used to assess the need for future variations

Based on this assessment, the two options that score the highest are the Entry Test and High Cost Cap.

The Entry Test has the benefit of identifying the economic value of connections and effectively recognises the injection of greener gas which has a strong link to transitioning to net zero. It also has further advantages of being a systematic way to apportion costs and providing certainty on likely contributions.

However, there are limitations of the approach which could limit its effectiveness. For example, the arbitrary percentage of 0.5% which associates the value of carbon benefit to reinforcements is a critical component of the model, yet there isn't enough evidence or rigour that justifies this being the appropriate proportion to set. The Entry Test approach of associating carbon value to reinforcements is also a fairly new concept which is not adopted anywhere else in the energy sector from which we can learn and follow. Across electricity and gas network charging arrangements, it is highly unusual to favour a certain type of energy production, as this is generally the responsibility of energy policy, and could create a potential issue of discrimination.

The High Cost Cap on the other hand meets our two critical objectives of facilitating competition and cost reflectivity and by enabling entry it supports net zero aims. It also has many practical advantages of implementation and with a well justified basis, can be more easily adapted in future once more data is available.

Weighing up levels of socialisation, the High Cost Cap would be set such that excessively high reinforcement costs are not covered below the cap. Whereas the Entry Test model in its current form socialises the majority of entry connections of green gas with the value of carbon quickly exceeding a plausible cost of reinforcement.

While the HCC approach would be new to gas distribution it is already in operation in ED for generation connections and is the chosen way forward for demand connections. Ofgem's position for ED continues to be that the generation HCC prevents excessively high costs from being socialised. This gives strong precedent to apply a similar approach in gas where any lessons learnt can be taken on board. Maintaining consistency among the two sectors is important to create a level playing field that allows a balanced course of action to net zero.

Taking these arguments into account, on balance it is our preference at this stage of the consultation to recommend the High Cost Cap approach for implementation.

Below we show how this option also continues to meet other relevant objectives A, E and F.

Objective A is concerned with supporting GTs in discharging their duties and activities in line with The Gas Act (1986) and Licences. We are not aware of any impediments which the High Cost Cap would introduce to GTs in discharging their duties as set out in the Gas Act or Licences. On the contrary we believe that this change would better support GTs in doing so.

For example, Section 9 of the Gas Act requires GTs to develop and maintain an efficient and economic pipeline for the conveyance of gas and, subject to doing this, comply with connection requests and convey gas to customers so far as it is economical to do so. Currently the entry barrier connectees face leads to little reinforcement being undertaken by networks limiting their development when it may be efficient and beneficial to do so. The High Cost Cap would support greater green gas entry, driving benefits for new and existing customers through development of networks to support net zero, while still considering whether it is economical to do so for specific connections. In particular, by placing costs on connecting parties in cases where reinforcement costs relative to the gas being injected becomes excessively high.

As noted above, for gas demand connections to the distribution network, an Economic Test is applied, built on the interpretation that a connection is economical if it can be demonstrated that existing customers will not be worse off as a result. If this same approach is applied to entry connections, when seeking to move from a fully deep connection boundary, any change will result in

an element of socialisation and other network users paying more, and could therefore be regarded as uneconomical. This is clearly not the intention or desirable.

A broader approach to determining what is economical is required when considering changes to the entry connection boundary. This would however be the first time this has been considered for gas distribution and there could very well be read across to the demand side economic test, not least because determining what is economical will need to consider both gas entry and exit perspectives. Entry gas is also a different proposition than the demand side, as in most case the new sources of energy production will be dictated by Government energy policy.

It would therefore be prudent to develop the principles for a coherent approach to exit and entry Economic Tests as part of a wider review into distribution charges. This could also consider whether network tariffs also need to be modified for entry gas customers. This would clearly be a significant exercise, and could interact with other emerging pieces of policy in the coming years such as hydrogen blending, or the decommissioning of parts of the gas distribution network.

We would welcome views on whether there is sufficient value in initiating such a piece of work across the industry at this time (See Section 5.2, Question 8). At this stage, in light of the very low level impact this change is likely to be on customer charges over the next 5 years, our current view is that this further work in this area could be considered in the next price control period from April 2026.

We would recommend setting a review stage based on cumulative capital expenditure in any network, whereby the impacted GDN will engage with Ofgem, the other networks and wider industry to determine how best to proceed. It is proposed at this stage to set the cumulative capex threshold per Licensee network of £10m. Dependent on the capitalisation and other regulatory factors, we would expect this to ensure action is taken before the impact on customer bills would exceed £0.50 per annum.

Objective E is concerned with ensuring GTs do not show any undue preference towards or unduly discriminate. The High Cost Cap is a uniform approach that would apply equally to all potential distribution entry gas connectees to the network therefore there is no possibility of undue preference or discrimination.

Objective F is concerned with the consistency of wider applicable regulations and legislation. We are not aware of inconsistencies that this new charging approach would introduce, particularly given it is in place in an analogous setting, the electricity market. We would welcome any views on our interpretation of this (Refer to Question 9 in Section 5.2).

3.3 Proposed level of the High Cost cap

To effectively implement our proposed HCC solution, we need to determine where the level of the cap should be set.

To form a view on this, we have analysed data on recent applications from connectees wanting to connect onto the gas distribution network where it has not been possible to offer firm year-round reinforcement capacity.

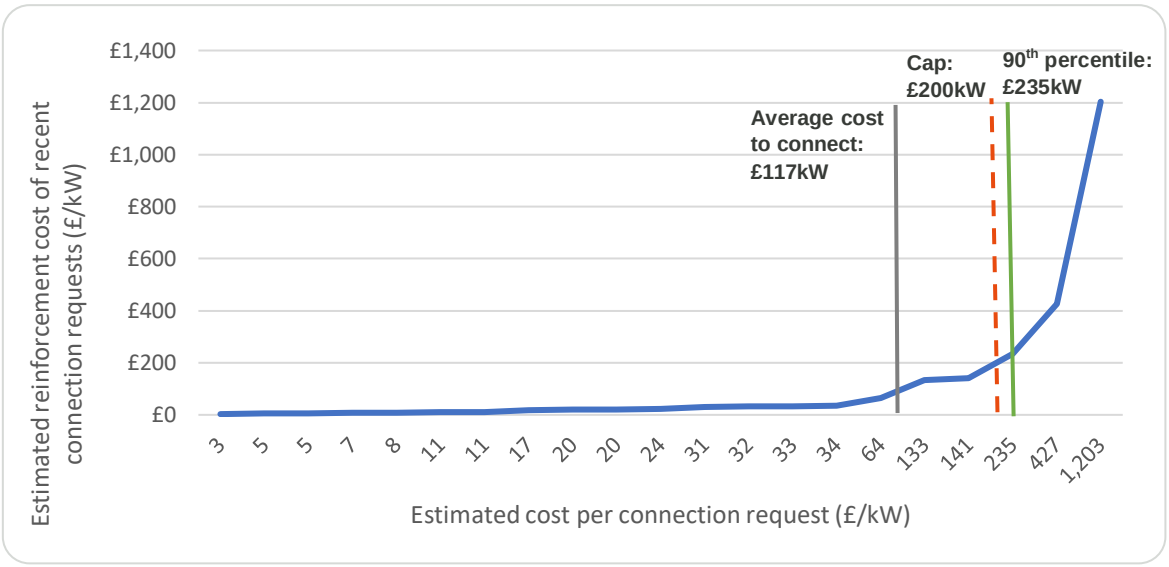
Taking a sample of these requests of 21 projects from the Cadent Gas distribution network we have studied each of these cases and considered the most economical option for reinforcement such as an in-grid compressor for example. Then, we have calculated an estimate for what the potential cost of this reinforcement would be dependent on the type of reinforcement considered most suitable

for the connection request. We have taken a lower limit of these estimates as we are aiming for an economically efficient cost for reinforcement assuming these connection requests had been accepted.

Using estimates for customer numbers that would be connected we can calculate the incremental capacity that would be created by the reinforcement.

Figure 2 illustrates the reinforcement cost per unit of capacity. This is referred to as either scm/h which is a volume unit or kW as a power unit. For ease of comparison to electricity we have used kW for our analysis. The reinforcement cost per unit of capacity has been ordered from least to most expensive to demonstrate the distribution of costs across the sample of entry connection requests. This information has been used to calculate a threshold for setting the HCC.

Figure 2: Expected reinforcement costs associated with recent entry connection requests



Our analysis shows that costs are fairly consistent up to circa £50kW, beyond which they begin to increase at a faster rate. Reinforcement costs increase particularly rapidly from £400kW per unit of capacity created.

Using the percentile measure we can determine the proportion of data that falls below the given percentage. This data is distributed with an average cost to connect of £117kW and a minority of connection projects at a very high cost. Therefore, we have looked at high percentiles to ensure the cap excludes excessive costs from being socialised. The 90th and 95th percentile of the data shows a drastic difference in the unit capacity costs varying from £235kW to £427kW respectively (see Table 4 and Figure 2).

As our analysis is based on estimated costs rather than real cost information, **we are proposing to set the HCC initially at a lower level so that wider network users are protected from high costs.** It is also the first time a High Cost Cap or similar would be implemented in gas distribution hence the preference to take a more cautious approach to begin with. Hence, **we suggest the High Cost Cap should be set at £200kW.** This is slightly below the 90th percentile and ensures particularly high reinforcement costs are not socialised under the cap, while allowing for a more conservative approach initially.

We welcome views on the level of the High Cost Cap proposed. See Section 5.2, Question 4.

Table 4: Summary analysis of data

Split of connections request data	Reinforcement cost (£) per kWh
Average cost to connect	117
85th percentile	141
90th percentile	235
95th percentile	427
Suggested cap level	200

As a comparator, the High Cost Cap in electricity distribution of generation connections is £200kW and if applied to a large 1000scm/h biomethane connection, would result in reinforcements below £2m being socialised.

Once implemented, we would suggest that this level is reviewed once actual reinforcement costs become available which could be after the first few connected projects or at the end of the price control period.

4. Wider implications

4.1 Transitional risks and mitigations

It is important to consider the key transitional issues and consequential changes that may arise as a result of implementing a revised charging regime. These are possible circumstances for which transitional arrangements will need to be developed. These issues would be common across the four options. Below are some of the main implementation risks we foresee.

- ***Stranding Risk***

  Risk

  If a change to the connection charging arrangements is approved, this would result in connection capacity offers becoming contingent on the completion of reinforcement works. There is also the risk that should a developer not be able to proceed with their project, then there is likely to be a level of stranded cost associated with the reinforcements.

  Mitigation

  In other areas, financial security is provided to mitigate this risk, and this may also be appropriate for distributed entry gas connections. This in itself can be a complex matter, with numerous questions to address including what forms of security, does the level change, and when should it fall away.

  These matters may also need to be subject to consultation and inclusion in a revised connection charging methodology statement. We believe this could take between 12-18 months from start to finish including having the process changes, the live contractual terms, and the forms of security all ready for use.

  There are well established rules for exit called ARCAs (Advanced Reservation of Capacity Agreement) that should suffice to mitigate this potential issue and could be mapped across to entry.

- **Replacement and Maintenance**

  Risk

  It is expected that different reinforcement asset solutions will be deployed over time, and each will have their own replacement and maintenance cycles. When a reinforcement asset is unavailable due to failure or maintenance, the full entry capacity may not be achievable. The commercial terms will need to cover what happens in these situations.

  Mitigation

  Some reinforcement assets may need to be replaced whilst the distributed entry gas facility is still operational. It would be expected that safeguards are in place to ensure that a replacement cost does not become stranded soon after completion due to the commercial decisions of the entry gas facility. It may therefore be appropriate to consider what protections and supporting processes are required to manage this type of situation. Disconnection/decommissioning clauses should be part of the operator agreements to mitigate some of this risk, where arrangements set out that capacity would be lost if not used for a stated period. The provisions could be broadened depending on what assets were deployed to get the project away.

- **Relocation of Reinforcement Assets**

  Risk

Some reinforcement assets may be relocatable such as an in-grid compressor. Under certain conditions, the networks should have the flexibility to relocate these items of equipment or capacity to be lost if capacity has not been used for a stated period.

Mitigation
The commercial arrangements will need to cover this type of situation.

Existing provisions allowing unused network capacity to be removed may be applicable to this type of scenario.

- **Enhanced Resilience**
  Risk
  Different types of reinforcement assets will have different levels of reliability and resilience. A section of pipeline for example will be more reliable than a compressor unit.

  Mitigation
  A connecting customer should have the right to request an enhanced level of redundancy such as by the installation of back up equipment to avoid prolonged downtime and unplanned outages. The connection charging methodology statement should set out clearly how this can be requested as well as the treatment of the capex and opex costs and how they would be recovered.

4.2 Implications of our proposed position

If our preferred position is implemented there are important broader considerations that we need to have in place to ensure a successful transition to a revised charging regime.

4.2.1 Potential funding routes

With the transition to a shallower connection boundary, in which reinforcement costs are socialised to a greater degree, there is need to consider the potential funding sources that could finance the socialised element of the cost. Below we discuss the main regulatory reopener options.

A reopener may be the most suitable option for RIIO-2 impact but for future price controls this change may be better funded through a **revenue/volume driver** mechanism. It is anticipated there will be more connections to the gas grid facilitated by this change. But there is a degree of uncertainty around the impact of the proposed change, and with connections being customer-driven it is important this risk is managed appropriately. A volume driver mechanism can help manage this volume risk, providing a cost allowance based on the number and size of new connections to the network. In particular it removes the risk of networks receiving significant over-or under-remuneration for connections work. Alternatively, it may be that an ex-post adjustment needs to be introduced to deal with volume uncertainty and the specifics of reopener submission requirements such as materiality thresholds.

The **heat policy and energy efficiency reopener** is a directly relevant option that could fund these capital and operational costs. This reopener allows the increase or decrease in allowances in response to changes to specific connection charging methodologies that support the transition to low carbon heat. One of the triggers of this reopener is changes in connection charging arrangements for distributed entry connections, exactly the area we are targeting with the suggested change. Therefore, to achieve change at an overall gas distribution industry level this reopener would be highly appropriate.

The materiality threshold for triggering this reopener is for costs incurred to exceed 0.5% of the network annual base revenue. There is one remaining reopener window in which this reopener must be triggered which is between 25-31 January 2023. The licensee needs to submit a re-opener application in writing to trigger this mechanism.

Another reopener that we might choose to utilise is the **new large load connections reopener**.

This reopener is an ongoing reopener modified from RIIO-GD1, providing the networks the opportunity to recover efficient costs directly incurred as a result of specific network reinforcement required by new large entry connection(s).

We only have one opportunity to trigger this reopener which is 25-31 January 2024.

The **Net Zero pre-construction and small projects re-opener** may also be an option, which is an Ofgem triggered uncertainty mechanism.

Alongside the finalisation of this charging proposal, and confirmation of likely implementation timescales, the GDNs will engage with Ofgem on the most appropriate re-opener mechanism and the timetable to follow to put the necessary funding mechanisms in place.

4.2.2 Mitigating unintended consequences

When making a change in a more complex integrated system there is the possibility that reform can have unintended consequences. We should be aware of potential issues and take action to mitigate.

With our preferred High Cost Cap option, initially a uniform cap would be applied nationally. This would mean all reinforcement costs at different sites would be partly socialised. There is a risk that this approach could lead to entry of natural gas as well as green gas, benefiting all types of connecting producers.

Gas Transporters are obligated by the Gas Act and GT Licence to not unduly discriminate against any party wanting to connect, so GTs cannot decline requests based on the type of gas. Given the unlikely occurrence of significant levels of distributed entry fossil gas because of their impact on carbon emissions and bills such as the prohibition on fracking, we don't think this will be a major issue in future. Additionally, energy policy direction is key to incentivising particular types of entry connections through initiatives such as the Green Gas Support scheme.

There are also risks with not setting the cap at the right level. For example, there is a risk that the cap could be set too high; this would support a greater than optimal amount of entry with more cost on exit customers and spend greater than our reinforcement allowances. Equally there is a risk that the cap could be set too low, which would not encourage enough connectees to enter, the key driver for reforming the charging approach. To get around this potential issue we would seek to have frequent review points to guard against the cap not being at the right level. It is however not a precise science, and at this stage we would seek to take a more cautious approach and set the HCC at a slightly lower level, noting that it would be easier to justify and implement a future increase in the level, than to impose a lower level.

A further risk is that the HCC could lead to more reinforcement/growth of the networks where it is already saturated rather than using flexibility where there is more capacity. This is unlikely to be a major problem; it is what we have today and it's clearly not enough to bring forward greater entry. Also, in many cases biomethane plants' locations are determined by factors such as proximity to feedstock. The HCC approach provides that optionality allowing connectees to connect at different locations. New developments also have many other constraints to manage to deliver a successful

project, with land, planning permission, and access to feed stocks rightly having a greater weighting in early project development.

With regard to the general proposition of entry cost socialisation with the GDN charging methodology, we have noted a potential risk that the effect may be to attract larger volumes of smaller scale connection which may not provide an optimal Net Zero outcome. It could however be argued that smaller scale connections are in fact, more likely to find capacity on the network because the volumes of gas they connect are significantly smaller than some of the large-scale producers. These connections may therefore be less likely to need reinforcement. Nonetheless even if smaller scale connectees benefit, there are many of these that are biomethane producers and removing barriers for these connectees will unlock benefits to net zero by allowing green gas entry.

4.2.3 Long-term implications

If a High Cost Cap or similar approach is implemented to determine the connection boundary, then all socialised costs would fall primarily on exit customers. While this may be appropriate in progressing with net zero objectives in the nearer term, a longer-term question that will inevitably need considering is whether a transporter entry charge is required.

The introduction of a transporter entry charge has broader implications than changing the connection boundary, including major UNC modification and changes to billing systems for Xoserve and Shippers. It would also need to be constructed carefully to support existing obligations. The advantages and disadvantages of this approach would need to be weighed up to determine if it is the best way forward. This is beyond the scope of this consultation.

5. Next steps and request for responses

5.1 Next steps and timeline

We are planning towards the following milestones for concluding this work and having the change implemented:

- Industry webinar – July/Aug 2022
- Distribution entry connections consultation to close – 19 Aug 2022
- Assessing responses and incorporating feedback – Sep 2022
- Formally approach Ofgem to change Connection Charging Methodology – Oct/Nov 2022

The industry webinar would be held between July and August (before the close of this consultation), subject to the level of interest we receive. The purpose of this will be to inform stakeholders of our proposals, and provide the opportunity for parties to engage, ask questions and gain clarification on the detail as well as provide any views.

Please get in touch if you are interested in participating by emailing priya.punj@cadentgas.com with your contact details including name and email address so that we can register interest and estimate potential attendee numbers. Any personal data that you provide will be subject to the GDPR (General Data Protection Regulation) (Regulation (EU) 2016/679) as retained in domestic law following the UK's withdrawal from the European Union (UK GDPR).

Having completed a review of the methodology, Licensees must submit a report to Ofgem setting out the proposal for modification and explaining how it would better achieve the relevant objectives, along with a timeline for implementation. Unless an Impact Assessment is required, the Regulator then has 28 days to veto the decision, with the publication of a decision letter.

5.2 Consultation questions

We are seeking views on all aspects of the consultation to inform our final recommendation. We welcome your views on how we can strengthen our proposal to Ofgem, and we will ensure our conclusions report sets out the responses and views received and how they have been addressed in the final proposals.

1. Do you recognise the need for changes to current connections charging methodology to support greater entry gas? a. Explain your reasoning b. Supporting evidence
2. Do you agree that the preferred option better achieves the relevant objectives as set out in Standard Licence Condition 4B compared to the current framework or other options? a. Explain your reasoning b. Supporting evidence
3. Are there any alternative approaches to the High Cost Cap that address the barrier and achieve our relevant objectives that we have not considered?
4. Do you think the High Cost Cap level that we are proposing to set initially is the right level? a. Explain your reasoning b. Supporting evidence that can help inform the cap
5. Are there any other unintended consequences that you foresee with this approach that we have not already considered?

6. Are there any significant implications of the proposed changes that we have not identified? What impact do you think these could have and how could they impact our preferred option? a. Explain your reasoning b. Supporting evidence
7. Do you agree with the proposed implementation approach, or have you identified any additional steps that would need to be undertaken to implement the preferred option? a. Supporting evidence
8. Do you think there is value in initiating a broader review across industry at this time into distribution charges that could address both entry and exit?
9. Do you have any other information relevant to the subject matter of this consultation that we should consider in developing our proposal for Ofgem?

5.3 Confidentiality of responses

Responses may be placed on Cadent Gas' website and incorporated within the consultation conclusions report. If you wish your response to be treated as confidential then please mark it clearly to that effect.