

Appendix 07.04.08

Entry Capacity Enablement

This output case describes the way in which we can make the entry of gas from different sources easier, to support the future decarbonisation of heat.

We will establish:

- distributed entry gas commercial arrangements that are robust, sustainable and scalable, by leading an industry review, with the ambition of presenting initial change proposals to Ofgem prior to the commencement of RIIO-2
- a flexible funding regime for entry gas reinforcements, supported by an appropriate uncertainty mechanism (UM)
- an Entry Gas Connection Standards Methodology statement and a supporting voluntary governance arrangement to enable customers and stakeholders to propose value adding improvements
- an Entry Gas Customer and Stakeholder Forum to allow customers and stakeholders to raise issues, for the gas network to test issues we have identified, to identify and action knowledge sharing, and to establish and maintain an activity schedule of framework changes.

We will deliver:

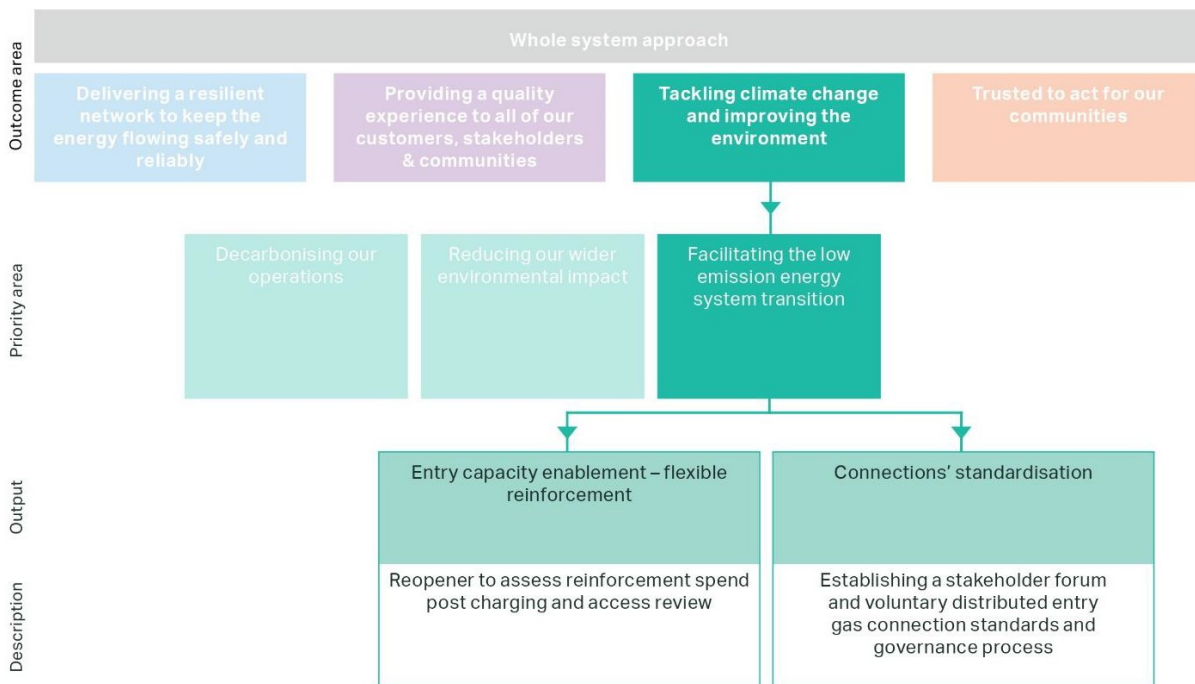


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How we have developed our proposals

1. **We considered the context** – Heat accounts for over a third of the UK’s greenhouse gas emissions¹. Decarbonisation of heat will be required in order to meet the UK’s commitment to reduce all greenhouse gas emissions to net zero by 2050. Greener sources of gas (such as biogas and landfill gas) are typically smaller and more decentralised and, as a result, gas injections directly on to the distribution networks are increasing.
2. **We recognise that green gas producers currently face barriers to entry** – One indication that improvements could be made is the relatively low conversion rate between enquiries about biomethane connections and actual connections across all Gas Distribution Networks (GDNs). Stakeholder engagement has confirmed that barriers to entry exist, including: the lack of a universal, coherent connections system; a lack of network capacity and flexibility; requirements around the calorific value of gas that they inject; and our speed of response to contact from potential entry customers.
3. **This provided us with a clear problem statement** – How can we make the entry of gas from different sources easier, to support the future decarbonisation of heat?
4. **We looked at best practice** – The installation of assets to provide incremental entry capacity is a basic principle underpinning the development of the electricity networks. Electricity networks are at a more mature stage of decentralisation and provide two key lessons relating to entry:
 - o Getting the basic framework in place early enables the market to grow with minimal disruption from framework interventions.
 - o the process for connections should be as clear as possible, with useful information shared and accompanied by engagement to find out what entry customers need e.g. electricity networks provide Tnformation such as capacity ‘heat maps’ indicating areas that can more readily facilitate connections and hold ‘open surgeries’ for distributed generation customers.
5. **We are considering changes required to the commercial framework** – Network entry is necessary to provide entry capacity where customers require it. However, at present, the cost is recovered from a single ‘triggering’ party rendering many projects economically unviable. Network investment should therefore be supported by a commercial regime that socialises the costs to some degree. We have initiated an industry consultation to support a major review of the pricing arrangements. We are also working with the other GDNs to build support for a single connections methodology statement.
6. **We considered two options for network reinforcement to support entry:**

¹ BEIS – Clean Growth – Transforming Heating overview of current evidence, December 2018

- Option 1 – proactive investment whereby the gas network builds compression ahead of need to match anticipated biomethane potential for an area, minimising delays but risking stranded assets if the entry gas does not materialise.
 - Option 2 – reactive investment, with reinforcements only initiated once entry capacity is committed, minimising the risk of asset stranding but risking the inefficient expansion of the network and/or delay.
7. **We considered a range of research and analysis** – Recent experience with biomethane, and the criticality of the supporting Renewable Heat Incentive, suggest that there is a high degree of uncertainty regarding the levels of entry gas that will connect and the location and timing of such connections. At an industry workshop in August 2019, there was overwhelming support for the regime review process with over 90% agreeing that the current methodologies represented a barrier to smaller scale decentralised production. 87% indicated a preference to socialise the entry reinforcement costs to some degree.
 8. **We finalised our proposal** – Our proposal, given the uncertainty of connections, is option 2 above i.e. to only conduct reinforcement when there is a firm and specific customer commitment. We have also included a bespoke uncertainty mechanism to allow us to respond to the outcome of the commercial regime review process.
 9. **We estimate that the entry of green gas could deliver a net present value to customers of £51.9m for the whole of RIIO-2.** While we are not including any significant additional costs in our plan to deliver these commitments, although we include an uncertainty mechanism separately to account for the costs of reinforcement if these arise, with a ‘most likely’ cost of £84m.
 10. **What will the future look like after we embed our RIIO-2 commitments?** – There will be an increased volume of green gas entering our network as a result of the elimination of barriers to entry, contributing to the decarbonisation of heat and the UK’s environmental targets for greenhouse gas emission reductions.

The table below summarises our commitment in this area:

Table 1 Our commitment

Output: Entry capacity enablement	
Common / Bespoke	Bespoke
Output type	ODI(R)
Comment	Establish an entry gas connection standards methodology statement and supporting voluntary governance arrangements to enable customers and stakeholders to propose value adding improvements.
Target	N/A
Cost implications (annual)	N/A (although with UM for reinforcement costs)
Incentive range	N/A
CVP	£51.9m

1. Defining our customers' needs



1.1. What is the area?

Heat accounts for over a third of the UK's greenhouse gas emissions². Meeting the UK's climate obligations, not least the legal commitment to bring all greenhouse gas emissions to net zero by 2050, will require decarbonisation of heat. One of the potential routes to decarbonising heat is the greater use of low and zero carbon alternatives to fossil natural gas to heat homes and businesses.

The Natural Gas we deliver is primarily methane. However, in recent years, there has been significant innovation in relation to other forms of gas production, including greener sources of gas. These sources create significantly lower emissions:

Fuel	Kg CO ₂ e per kWh ³
Natural gas (net CV)	0.20428
Biomethane	0.00038

Gas is introduced to our distribution networks under long-standing governance arrangements, a process known as **gas entry**. The arrangements are designed with the premise that gas enters our network from the gas transmission system.

However, greener sources of gas are typically smaller and more decentralised than the traditional sources of methane. We are increasingly receiving gas injections directly into the distribution networks. This means that the current arrangements for gas entry can create barriers to green gas producers, making it more difficult for them to inject gas into our network.

Our Uncertainty Mechanism case 10.10 Entry charging and access review contains details of our proposals relating to the cost of the uncertain level of entry gas over the course of RII0-2. This output case concerns steps we could take to make entry of gas from different sources easier, which is one way that gas distribution networks can support the decarbonisation of heat. There are also potential economic benefits, as this could offer the least cost option for the UK to decarbonise heat.

1.2. Why is it important to customers and stakeholders?

With increased levels of decentralised gas sources with injections directly onto the distribution network, our customers need to be able to access the network in an economically and environmentally effective way. To facilitate this, we need to provide the network capacity where it is required, when it is required, supported by a robust, sustainable and fair network pricing regime. Our customers need us to become quicker and more responsive in our connections process in this effort to ensure an efficient system.

The current arrangements mean that customers are typically only able to pursue realistic connections where there is existing capacity within the gas network to transport additional gas volumes.

Investment cases for biomethane production can also be undermined because our network experiences very low consumer demand during the summer. In these circumstances there can be insufficient year-round capacity available to accept the flow rates that would be required to make the investment in biomethane production economically sustainable. This has led to some projects accepting seasonal variable capacity connections, which at times are well below their full commercial capability.

² BEIS – Clean Growth – Transforming Heating overview of current evidence, December 2018

³ BEIS- Greenhouse gas reporting: conversion factors 2019 – using GJ to kWh factors included in the same document

Consequently, our customers consistently ask us to help them find ways of maximising the amount of gas they can inject into our network and we share their ambition.

1.3. What insights are shaping our thinking?

Sources of insight



5,757

Stakeholders and customers engaged



18

Sources of insight



17

Tailored RIIO-2 engagement activities

The full list of sources of insight is below.

Table 2 Engagement activities

Phase	Date	Source name	Source description	Questions asked	# of stakeholders	Score
Historical Engagement	May-18	Connections transformation: industrial customer interviews	We interviewed four connections customers to discuss what could be improved in our approach to connections.	Customers were asked about their views on our connections process and what could be done to improve it for them.	4	1.5
Discovery	Nov-17	2017 regional stakeholder workshops	We held four workshops in different regions to seek feedback from key stakeholders on the early development of our business plan. Each workshop began with a short presentation, followed by roundtable discussions. Electronic voting was also used to ask stakeholders about preferred options.	The workshops explored a number of topics, including: safeguarding (e.g. Priority Services Register (PSR) awareness, partnerships and innovation opportunities); the future role of gas and the decarbonisation of home heating. Cadent's general approach to its business plan was also discussed, for example the importance and coverage of the four outcome areas identified, the extent to which the plan should respond to the needs of specific customer groups or regions. - How strongly do you feel that networks should collaborate?	127	3.0
	Aug-18	Ofgem GD2 decarbonisation workshop August 2018	Ofgem held a RIIO-2 Decarbonisation Workshop where key future issues were discussed and identified. The attendees included Ofgem, GDNs, Department for Business, Energy and Industrial Strategy (BEIS), Citizens Advice, the Committee on Climate Change (CCC), Energy Networks Association (ENA), the Welsh and Scottish Governments. The importance of green gas was further discussed at the Ofgem and GDN Outputs Workshop one month later with ten attendees from all the GDNs, Ofgem and the ENA.	N/A	20	3.0

Discovery	Sep-18	Deliberative workshops	We delivered full day deliberative workshops in each of our regions to discuss what services customers find important, find our customer expectations of GDNs and gather feedback on our (at the time) four draft customer outcomes. The sessions began with information-giving and building knowledge of Cadent, then eliciting participants' views of services and priorities.	Participants were asked about their awareness of Cadent and expectations of a GDN. Participants were also asked for their views on the four draft outcomes in Cadent's business plan: keeping your energy flowing safely, reliably and hassle-free; protecting the environment and creating a sustainable energy future; working for you and your community safeguarding those that need it most; value for money and customer satisfaction at the heart of all our services. The aim of the discussions was to shape these draft outcomes and identify any gaps.	206	2.0
	Sep-18	Ofgem RIIO-2 outputs workshop	We attended Ofgem's RIIO-2 outputs workshop.	N/A	10	2.0
	2018	Ernst & Young (EY) report into BioSNG commercials	Cadent commissioned a report into BioSNG commercials from EY to identify commercial barriers in this area.	N/A	0	3.0

Discovery	Feb-19	ENA and Accent RIIO-2 stakeholder engagement (decarbonisation)	<p>A broad range of stakeholders from across the country, across different areas of the sector and representing a range of organisations were brought together by all GDNs to understand their views of how the gas networks should individually and collectively support the decarbonisation of heat through their RIIO-2 business planning. Most stakeholders preferred taking a broad definition of 'whole systems' and wanted future-proofed assets and decision-making with the longer-term end goal in mind. But they emphasised the need for urgency in putting the stepping stones in place to reach decarbonisation targets.</p>	<p>Stakeholders were asked what a whole energy system approach should look like, and what gas network RIIO-2 business plans should focus on in the context of decarbonising the gas system. The impact on customers in vulnerable situations, collaboration between gas networks and the funding of, and barriers to, decarbonisation were also discussed.</p>	37	2.5
	May-19	Wales and West Utilities (WWU) regional community workshops	<p>WWU hosted a series of regional workshops to seek feedback from stakeholders on its current and future business activities. These deliberative workshops explored: stakeholder priorities, value for money, mains replacement and the theft of gas, future energy solutions and social obligations.</p>	<p>These deliberative workshops explored: stakeholder priorities, value for money, mains replacement and the theft of gas, future energy solutions and social obligations.</p>	52	2.0

<p>Discovery</p>	<p>May-19</p>	<p>Business interviews</p>	<p>We commissioned Traverse to interview 18 businesses with a view to understanding specific business customer wants and needs in order to inform our proposed services for our RIIO-2 Business Plan. The interviews explored the general characteristics of the business and its gas use before establishing their existing knowledge of Cadent. The effects of interruptions and business expectations were explored. In addition, views on delivering our four outcomes were also discussed: delivering a safe, resilient network; supporting the energy transition; providing high quality and reliable service; and acting in a fair, transparent and responsible way.</p>	<p>The interviews explored the general characteristics of the business and its gas use before establishing their existing knowledge of Cadent. The effects of interruptions and business expectations were explored. In addition, views on delivering our four outcomes were also discussed: delivering a safe, resilient network; supporting the energy transition; providing a high quality and reliable service; and acting in a fair, transparent and responsible way.</p>	<p>18</p>	<p>2.5</p>
<p>Business Options Testing (BOT)</p>	<p>Aug-19</p>	<p>Distributed entry gas review event</p>	<p>We hosted a stakeholder industry event to gather industry views for the appetite and depth for an entry pricing methodology review; understand if the industry feels a commercial review should be conducted now and what should be included; and share initial thoughts on alternative options to recover the costs of entry infrastructure development.</p>	<p>Initial discussions were facilitated regarding the need for, and scope of, an entry pricing methodology review. Initial thoughts were shared regarding potential options for cost recovery and cost reflective charging.</p>	<p>N/A</p>	<p>2.5</p>

Acceptability Testing	Oct-19	Phase 4 - Business interviews and surveys	<p>We commissioned Traverse to test the acceptability and affordability of Cadent's proposed plan amongst business customers. This consisted of an on-line / face to face survey of 504 business customers and in-depth qualitative telephone interviews with 45 business customers. This showed that the plan had achieved high levels of acceptability and affordability from a business customer perspective.</p>	<p>Business customers were asked about the acceptability and affordability of Cadent's overall plan. If they said that the plan was unacceptable, they were asked to explain their response. If they said that it was neither acceptable nor unacceptable, they were asked what they would like to see in order to find it acceptable. Business customers were also asked to rate the acceptability of the outcome areas (environment, quality experience and resilience). Then, having learnt about the outcome areas, customers were asked as "informed customers" to rate the overall acceptability and affordability of the plan.</p>	549	2.0
	Oct-19	Acceptability testing - final survey report on domestic customers,	<p>We commissioned Traverse to test the acceptability and affordability of Cadent's proposed plan amongst domestic customers. This consisted of surveying 4,446 domestic customers through on-line and face to face methods. This showed that the plan had achieved high levels of acceptability and affordability amongst domestic customers, including those who are fuel poor.</p>	<p>Customers were asked about the acceptability and affordability of Cadent's overall plan. If they said that the plan was unacceptable, they were asked to explain their response. If they said that it was neither acceptable nor unacceptable, they were asked what they would like to see in order to find it acceptable. Customers were also asked to rate the acceptability of the outcome areas (environment, quality experience and resilience). Then, having learnt about the outcome areas, customers were asked as "informed customers" to rate the overall acceptability and affordability of the plan.</p>	4,446	2.0

Acceptability Testing	Oct-19	Acceptability testing - focus groups with the general population	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 79 members of the public in regional focus groups. Participants were supportive of our plans for quality experience and resilience, but no consensus was reached on our environmental plans.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	79	2.0
	Oct-19	Acceptability testing - customer forum	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 109 customers who had attended previous customer forums. Overall, participants found our plans to be both acceptable and affordable.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	109	2.0
	Oct-19	Acceptability testing - focus groups with future customers	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 20 "future customers" (16-18-year olds) in 2 focus groups. Participants were supportive of our plans for the environment and resilience but questioned whether helping vulnerable customers was part our remit.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	20	2.0
	Oct-19	Acceptability testing - interviews with Customers in Vulnerable Situations (CIVs)	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) by interviewing 20 CIVs. Overall, our plans were supported, and all found the plans affordable.	Throughout the interviews the CIVS were explained the elements of the plan, asked to comment on whether they found each outcome acceptable, which particular elements were important to them, and whether they had any additional comments. They were also asked whether the new business plan was affordable.	20	2.0

Acceptability Testing	Oct-19	Acceptability testing - fuel poor focus groups	We commissioned Traverse to explore the acceptability of our plans and commitments in each of the three outcome areas (environment, quality experience and resilience) with 35 customers in fuel poverty in regional focus groups. Overall, participants were supportive of our plans in all three areas.	A group discussion was facilitated to discuss views on Cadent's plans in each of the three outcome areas and participants were also asked to complete a survey to rank levels of acceptability and affordability.	35	2.0
	Oct-19	Verve business plan consultation	We commissioned Verve to gather views on our plans to reduce our carbon footprint from 25 customers and 10 experts. We did this through an online forum with customers and stakeholders to discuss the key components that we shared on our Environmental Action Plan (EAP). This included our intentions to support our employees to make a positive difference to tackling climate change.	Participants were asked about their awareness of cadent, discussed the three outcome areas (environment, quality experience and resilience), discussed the bill impact breakdown (both at present and as a result of the plan), risks and uncertainties and innovation funding.	25	2.0

Key to scoring

Criteria	Robustness		Relevance
The score shown is based on a combination of the robustness of the source information (judged on whether it was recent, direct and representative) and the relevance to this area.	<1.5	One or zero criteria met	Limited relevance
	1.5 – 2.0	Two criteria met	Significantly relevant and contributory
	>2.0	All criteria met	Highly relevant and contributory

From our engagement, research and Ofgem workshops, we know our stakeholders and industrial consumers value the ability to use greener gas. We also know they expect the importance of being able to do this to rise significantly in the future. However, there are many challenges in relation to new connections that are being felt by stakeholders and industrial consumers that we need to address to enable entry to our network effectively.

Enthusiasm for greener gas

Participants across all of phase 1 deliberative workshops with 206 customers showed enthusiasm for using greener sources of gas.

During Ofgem's outputs workshop with GDNs, green gas was identified as an area requiring a new bespoke output, highlighting its future importance.

Most recently this issue has been reiterated at the Joint Gas Networks stakeholder event, and by the Renewable Energy Association and Air Liquide at an Ofgem Decarbonisation workshop.

Government have also indicated support for green gas, with the Chancellor's Spring Statement in 2019 committing to introducing policies to encourage an increased proportion of green gas in the UK. This was supported by organisations such as the CCC in their response to the statement.

The ENA commissioned Navigant to explore the role that the gas sector could play in decarbonising the energy system. Increasing low carbon gases was one of the 5 aspects of the pathway to 2050 they identified, including expansion of both biomethane and hydrogen.

As part of NERA's triangulated willingness to pay report, domestic and non-domestic customers also indicated they were willing to pay for a percentage of the gas in our network (see section 5.3 below for more details).

However, there are challenges we need to overcome

Across our regional workshops with 127 customers, there was a consensus that disruption and cost were the two biggest obstacles to decarbonising home heating and there needed to be a step change in public opinion through education about the short-term benefits.

In the Manchester workshop, biogas stakeholders said that working with the energy companies to make new connections presented significant challenges, particularly the lack of a universal, coherent connections system.

In the Birmingham workshop, stakeholders working with new connections said the connections process was both overly complicated and long-winded, and that having to add propane to green gas was problematic for renewables schemes.

In the Norwich workshop, stakeholders working with green gas stated that the calorific target of gas they were injecting was an obstacle.

The four industrial consumers that we interviewed viewed Cadent as slow and unresponsive and doubted whether it had the ability or drive to adequately exploit biomethane opportunities.

EY's BioSNG report identified commercial barriers such as revenue uncertainty and stated that market intervention would be required. The Ofgem decarbonisation workshop noted support for gas entry and flexible gas networks as critical issues for the future. However, they also highlighted the need to understand demand uncertainty and that they would not expect this to have much bearing in RIIO-2, but rather in RIIO-3.

The topic of customers asking us to help them maximise the amount of gas they can inject into the network was reiterated at the Joint Gas Networks stakeholder event.

At the ENA's workshop with 37 participants, there was a call for urgency concerning learning from and implementing low carbon gas solutions, e.g. options testing to provide the evidence on which subsequent network decisions will be taken - benefits of 100% hydrogen vs blended options. Gas companies need to take a stronger look at the inability to inject biomethane into the grids in summer months which could transform the economics of some Anaerobic Digestion (AD) plant projects. Future billing methodology was seen as critical to reduce the barriers to injections of gases into the distribution system. The most significant, and most

consistently cited, obstacle stopping gas networks successfully working towards a decarbonised heat system through RIIO-2, was the perceived lack of a clear heat policy and absence of schemes to deliver low carbon heating post FITs (feed-in tariffs) / RHI (Renewable Heat Incentive).

At the May 2019 WWU stakeholder workshops with 52 participants, there was strong support for WWU to do more to encourage green gas to enter the network. When asked to vote on this, over three quarters of stakeholders agreed, with 35% saying they 'strongly agree' and 44% stating that they 'agree' with this proposition. The majority of stakeholders were of the view that this was the right thing to do in order to help the UK meet its target for reducing emissions. It was also noted that a further benefit is that it can provide a source of income for farmers and landowners who provide the raw materials needed to make biomethane.

There wasn't consensus, however, on who should pay for this. The majority of stakeholders were of the view that this should be funded by a combination of government, gas consumers and developers. The point was made that government subsidies should be part of the solution in order to encourage the production of more green gas, as it would help to meet emissions reduction targets, but it was added that developers would inevitably benefit from this, so they should, of course, shoulder some of the burden in terms of upfront costs. This contrasts with the feedback from our willingness to pay research mentioned above.

The 18 businesses that we interviewed emphasised that we should:

- Engage fully with businesses and landowners over how Cadent can work with them to enable low carbon energy projects.
- Be aware that, right now, a lack of network capacity and flexibility is preventing some low carbon projects from going ahead.
- Ensure that research and engagement on how to support the energy system transition feeds into decisions made regarding improving the network and its operation, and to ensure that the network has the flexibility and capacity to enable low carbon energy projects.

2. Assessing the measurement options



2.1. How is it currently measured?

Biomethane production in the UK is well established with over 30 production facilities connected to Cadent's networks. We are also working with shale gas customers to accommodate their requirements to input gas onto our network and hydrogen injection into the gas network is at an early stage of innovation.

We currently report the number of enquiries, studies and connections we made for biomethane each year to Ofgem. In RIIO-1 we have a reputational incentive to provide Ofgem with this information, although our achievement of the output is not affected by the overall level. There was no incremental funding provided for biomethane connections in RIIO-1.

Figure 1 Cumulative biomethane connections (number)

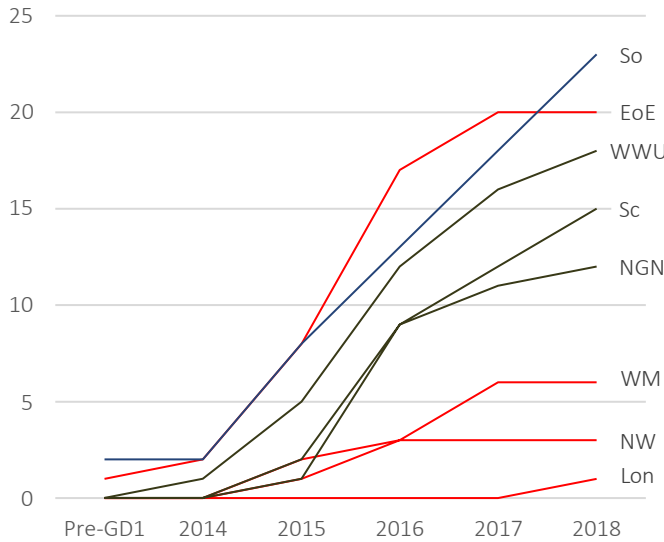
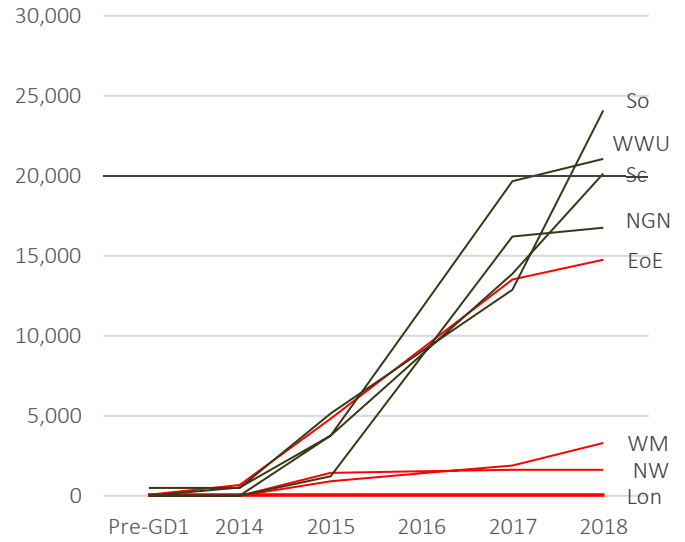


Figure 2 Cumulative biomethane connections (capacity)



Both the number and capacity of connections is determined by a wide range of factors, including the rules of the Renewable Heat Incentive Scheme, or arrangements with the electricity network. Ofgem agree with this position, stating “much of what determines the number and capacity of biomethane connections lies beyond GDNs’ control”⁴. Therefore, Ofgem are not proposing a new output relating to biomethane connections. However, our EAP and subsequent reporting will partly be judged on our support of biomethane entry customers. Our stakeholder engagement with biomethane related stakeholders will also be part of Ofgem’s assessment.

2.2. How does current measure deliver against customer outcome / priority?

We agree with Ofgem’s position not to introduce a performance measure directly relating to the amount of entry capacity connecting to our network, since factors outside our control determine much of this.

However, we want to consider the steps we could take to make the part of the process we control easier for entry customers, and so encourage a greater level of connection.

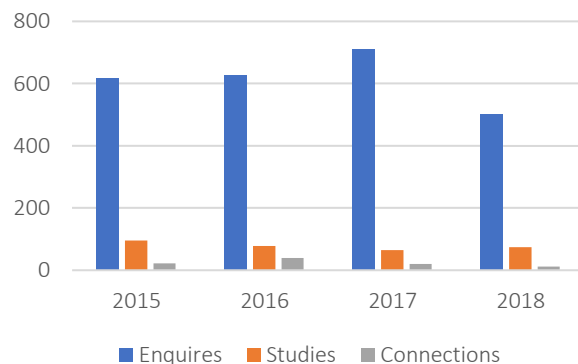
One indication that improvements could be made is the relatively low conversion rate between enquires about biomethane connections, detailed studies of the proposal and actual connections.

This is a common feature across all GDNs.

We also know from our engagement that customers and stakeholders consider there are barriers to them connecting to our network that are at least partially in our control (see section 1.3), including:

- The lack of a universal, coherent connections system

Figure 3 All GDNs - biomethane enquiries, studies and connections



⁴ RIIO-2 Sector Specific Methodology Decision

- A lack of network capacity and flexibility is preventing some projects from going ahead
- Requirements around the calorific value of the gas they inject
- Our speed of response to contact from potential entry customers

However, the current regulatory framework does not support reinforcements to support entry capacity.

2.3. External good practice

Gas networks

To date, best practice across the GDNs has been to publish information detailing where there is greatest year-round capacity available to accept entry gas. Feedback from customers demonstrates that this is helpful. However, there are still sites that could produce more gas if there was the capacity to accept it.

Other sites are converting the gas they produce into electricity to avoid this problem. This is an inefficient use of energy when compared to the provision of heat for customers by injection into the gas network.

Where connection to a nearby higher-pressure pipeline is an option, some customers have opted to compress gas so that it can be injected into the higher-pressure tiers of the network where demand is more sustained throughout the summer.

In some cases, it would be more efficient, from a whole system perspective, if we installed compression at strategic points in the network that would support a number of current and future production sites. Such an approach would facilitate cost sharing and would prevent each site from having to build its own dedicated compression.

Electricity networks

The installation of assets to provide incremental entry capacity is a core network role, and whilst currently not supported for gas distribution, it is a basic principle underpinning the development of the electricity networks. Reinforcement to support power generation is one of the largest cost drivers for these networks and is accepted as vital to removing barriers to a healthy and flexible energy market.

There is an order of magnitude difference to be noted between electricity and gas, with the electricity network experiencing many thousands of power generation connections at different scales. To date, gas distribution networks have connected ~100 distributed entry gas production facilities.

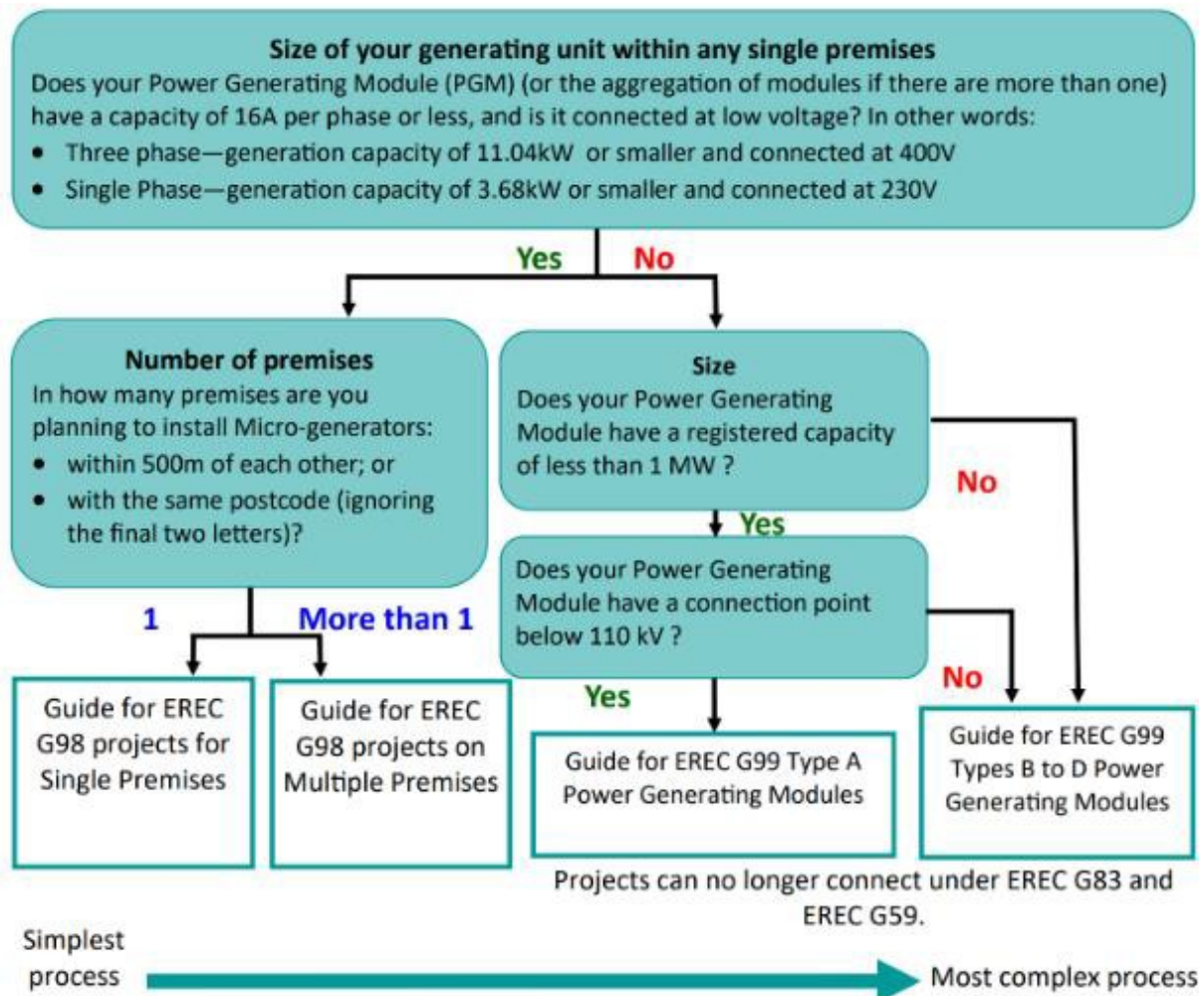
Information provision and guidance

The Energy Networks Association publish summary guides to introduce the process and requirements for new distributed generation connecting to the network⁵.

These begin with a flowchart to help potential connection customers understand which requirements apply to them.

⁵ <http://www.energynetworks.org/electricity/engineering/distributed-generation/dg-connection-guides.html>

Figure 4 ENA flowchart



It also includes basic information on the parties connections customers will need to involve, for example, working out which monopoly network company covers their region, and the role of independent distribution network operators.

This guide then helps potential customers find information on Distribution Network Operator (DNO) websites that could influence their project, including:

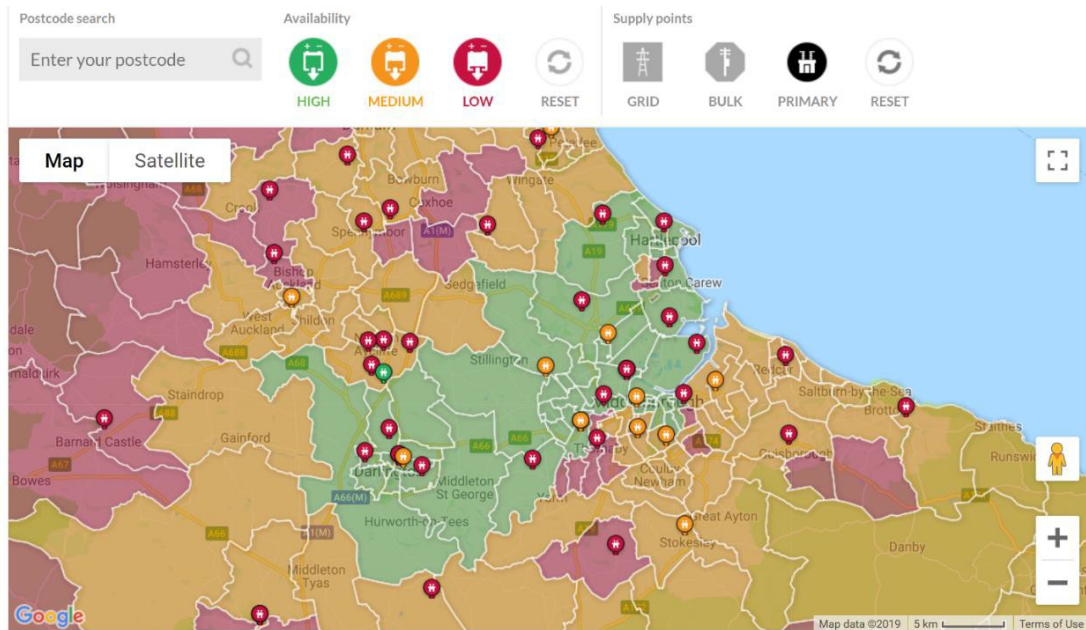
- Development plans for the network
- Connection charging statements
- Information on guaranteed standards of performance (GSOPs)
- Work plans for supporting distributed generation

Some companies also provide further information:

- Web portals and decision support tools/application hotline
- Capacity “heat maps” indicating areas that can more readily facilitate connections
- Holding events such as “open surgeries” for Distributed Generation customers

- Details provided on outages (planned and historic)
- Publishing full contact details of named individuals who are responsible for connections in each area, and offer visits to potential customers

Figure 5 Northern Powergrid's capacity heatmap



The ENA guide then describes the responsibilities of the customer and network at each stage of the connections process.

Incentivising performance for generation connections

The ED1 price control includes an incentive on connections engagement (ICE), in addition to GSOPs, CSAT and the time to connect incentive. ICE includes performance for distributed generation connections.

Each company makes an ICE submission each year, which describes their activities in the previous year and plans for the next (known as a looking back and forward report).

The report typically includes:

- The company's overall strategy and approach to engaging connections customers
- The number of events the company has hosted and attendees
- Improvements and changes made to the connections process already, and those planned for the future
- Feedback received from customers, and how this has been addressed

Once initial plans are published, Ofgem run a formal consultation with larger connections customers for feedback on the submissions.

An Ofgem panel then assesses the submissions in light of feedback and decides whether a licensee has not met the required standard. A penalty of up to 0.9% of base revenue may be applied if the standard is not met.

Commercial framework for distributed generation

Charging arrangements for distributed generation (also known as embedded generation) was one of the focus of a major intervention from Ofgem in 2017⁶. Ofgem were concerned that the benefits available to small distributed generation constituted a market distortion.

Ofgem’s decision to reduce these benefits significantly affected the business models of existing owners of distributed generation, which they invested in under the previous regime. Embedded generators applied for a judicial review of the decision on the grounds that it discriminated against embedded generators compared to other generation (a further ground that Ofgem’s decision was irrational was rejected early in the process). The judicial review ultimately upheld Ofgem’s decision.

This process nevertheless caused significant disruption for embedded generators and highlights the value in building a framework that is robust and sustainable from initial low levels of connection, to very high levels as the sector matures.

Water industry

Water companies are in a different position from gas and electricity networks in that they abstract water in their own right, acting like a shipper or generator in gas or electricity. Ofwat require companies to allow third parties to submit bids for their own solutions to meet future water needs⁷.

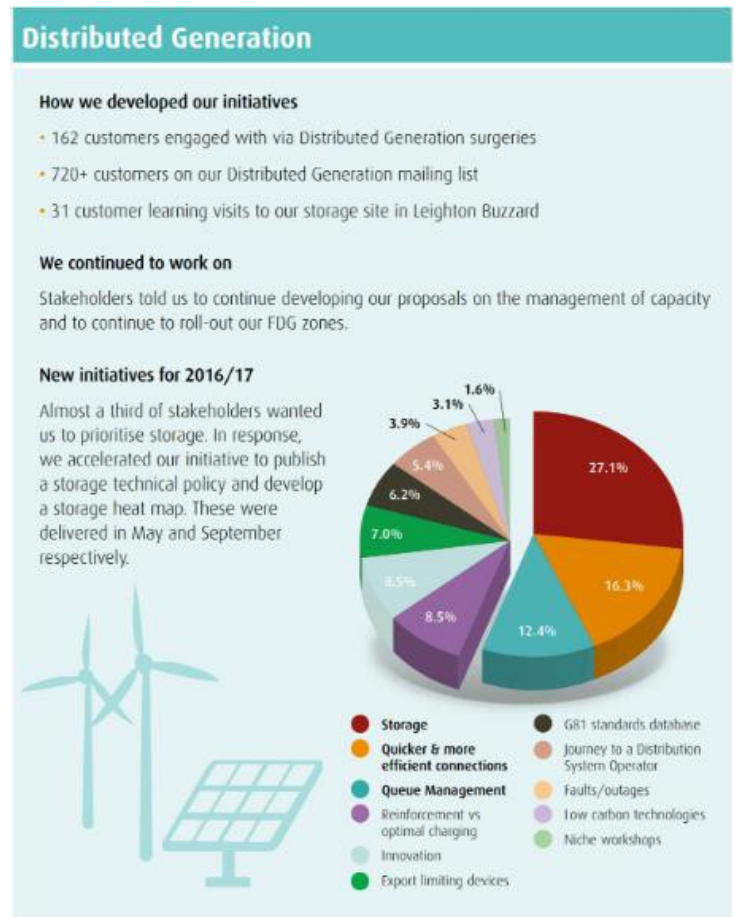
As part of their ‘Water 2020’ preparation for PR19, Ofwat thought that third parties interested in identifying trading opportunities were deterred by lack of information, search costs and incumbents’ bias towards in-house solutions.

Companies are now required to:

- Publish Water Resource Management Plans, including how they will manage supply and demand over a 5-year period
- Engage with third parties who could provide solutions at lower cost or better value (e.g. through advertising or contacting parties directly)
- Publishing a bid assessment framework to explain how decisions on third party solutions are made

Other industries

Figure 6 Example section of UKPN’s ICE report



⁶ <https://www.ofgem.gov.uk/publications-and-updates/embedded-benefits-impact-assessment-and-decision-industry-proposals-cmp264-and-cmp265-change-electricity-transmission-charging-arrangements-embedded-generators>

⁷ <https://www.ofwat.gov.uk/regulated-companies/markets/water-bidding-market/>

Examples from outside utilities relevant to entry gas are limited, because of their different context from gas networks. However, some roughly similar examples provide ideas:

- Payments networks (e.g. Visa⁸ and MasterCard⁹) offer software developers controlled live access to their systems to develop new payments and financial products. They offer opportunities to test new products in a sandbox before launching them.
- Online marketplaces such as Amazon¹⁰ provide support to organisations that want to sell goods on their platform, such as allowing them to use Amazon's own shipping service, support to understand tax and regulations, and putting organisations in touch with service providers that might help them.

Conclusions

Electricity networks are at a more mature stage of decentralisation, and provide two key lessons relating to entry:

- Laying foundations early in the development of decentralised entry will support growth, and avoid the situation experienced in embedded benefits, with sunk investments, polarised positions and contractual rights to protect. Getting the basic framework in place early enables the market to grow with minimal disruption from framework interventions.
- The process for connections should be as clear and easy to follow as possible, with useful information shared and engagement to find out what entry customers need.

Learning from PR19 supports the second point. The process should be set up in such a way as to provide easy access to the information entry customers need to make their own investment decisions. Considering some related services in other sectors, we could also consider whether there are value-added services we could provide alongside connections to make the entry connections process easier for customers.

2.4. What options have we considered?

We are already addressing customer and stakeholder feedback in RIIO-2 as part of ongoing initiatives. As described in further detail in our Environmental Action Plan (Appendix 07.04.00), we have:

- Worked with Government to establish the Renewable Heat Incentive almost 10 years ago
- Supported a pilot project at Swindon to demonstrate the viability of BioSNG
- Commissioned research to better understand the potential of green gas and potential issue

Our Future Billing Methodology project also seeks to explore how to update the commercial framework around how gas is billed, to reduce the operating costs of biomethane plants.

The ideas we have explored for RIIO-2 fall into three parts:

1. Funding reinforcement to support entry

It is more economically and environmentally efficient to strategically move gas around the network to facilitate biomethane and other entry gases than to require each production site to build its own compression.

This addresses customer feedback that network capacity can be a blocker to deployment of biomethane.

To deliver this investment, we have two options, and two primary objectives to balance:

- Delivering an efficient solution
- Reducing the risk of asset stranding if entry gas capacity does not materialise

⁸ <https://developer.visa.com/>

⁹ <https://developer.mastercard.com/>

¹⁰ https://services.amazon.co.uk/services/sell-online/international-selling.html?ld=SEUKSOAAAdGog_2023263780_75431176441_kwd-297245416734_b_372735923228_c_asret_&ld&id=go_cmp-2023263780_adg-75431176441_ad-372735923228_kwd-297245416734_devc_ext-prd-

Table 3 Options for funding reinforcement

Option 1: Proactive investment		
Description	Pros	Cons
The gas network could build compression ahead of need to provide a level of entry capacity to match the anticipated biomethane potential for an area.	<p>Could deliver the most efficient solution provided that there was full take-up of the entry capacity created.</p> <p>Might also minimise the risk of delays for developers.</p>	Stranding risk should the entry gas capacity not materialise.

Option 2: Reactive investment		
Description	Pros	Cons
Entry capacity could be provided on a reactive basis, with the reinforcements initiated only once entry capacity is committed.	Stranding risk would only be for any excess capacity the reinforcement provided (this could however be signposted to other projects via the pricing methodology).	<p>May not deliver the most efficient solution because reinforcement takes place as and when entry gas capacity is committed and would build over time.</p> <p>Might result in risk of delays for developers.</p>

2. Commercial framework and reinforcement

While the two options above concern the way Cadent funds reinforcement to support entry, the way these costs are recovered from customers is also critical.

Currently, commercial arrangements mean that the cost of network investment to support entry capacity is recovered from a single “triggering” party, e.g. a developer wanting a connection to the network. This means that projects are unlikely to be economically viable and will not proceed.

Therefore, we believe network investment should be supported by a commercial regime which socialises the costs to some degree.

Our licence also requires us to review pricing arrangements if they fail to meet the relevant objectives, which include responding to changes in the transportation business. The rapid growth from a zero baseline of distributed entry gas is clearly a significant change in the transportation business, requiring a review of the charging arrangements.

The manner in which Entry Reinforcement costs will be recovered from customers, and the potential to socialise all or part of the costs across a wider customer base will require changes to the commercial framework. The development of a commercial regime to support entry will be under the governance of the Uniform Network Code and the Connection Charging methodology licence condition. These industry consultation processes would consider the credible options against the relevant framework objectives.

Ahead of RIIO-2, we have initiated an industry consultation required to support such a major review of the pricing arrangements, and subsequently propose changes to the relevant framework documents. This process should also consider the scope of the review, including whether it is limited to network pricing, or whether other aspects should be considered such as access arrangements and capacity management.

Dependent on the scope agreed by stakeholders, this review could conclude with changes to socialise entry reinforcement costs across a wider customer base, deliver cost reflective charges that signpost spare capacity, introduce a compensation regime for withdrawal of network capacity, establish a process to deliver firm entry capacity connection offers, and initiate incentives for network operators to manage capacity effectively.

There are no firm options in relation to this aspect of our proposals yet; these would emerge during the engagement and consultation process under the Uniform Network Code (UNC) governance.

3. Connections Standardisation

To address the issue of connections standardisation, we will establish a voluntary Distributed Entry Gas Connection Standards which can then be revised through an agreed industry change process.

Whilst we can make this commitment for our own networks, it is a single coordinated approach across all networks that our customers need. We are therefore working with the other gas distribution networks to build support for a single methodology statement common to all networks, in place by the start of RIIO-2.

As part of our enduring engagement strategy we will establish stakeholder forums for a number of key customer segments, including distributed entry gas. These forums would enable issues to be raised for which Cadent could then develop and take forward changes to the wider commercial framework on our stakeholder's behalf e.g. the UNC. The forum will meet regularly to:

- Allow customer/stakeholders to raise issues.
- Allow Cadent to test issues we have identified.
- Identify and action knowledge sharing.
- Establish and maintain an activity schedule of framework changes.

We would use the distributed entry gas forum to also oversee any changes to the Connections Standard going forward.

2.5. Customer and stakeholder preference

Solutions must consider both supporting efficient investment, and the development of a robust and sustainable entry commercial regime. Both of these are necessary to remove barriers to deployment of biomethane.

For the development of the commercial pricing regime for entry gas, further options will be raised and assessed through the UNC governance process.

For entry reinforcement, recent experience with biomethane, and the criticality of the supporting Renewable Heat Incentive, suggest there is a high degree of uncertainty regarding the levels of entry gas that will connect. There is also uncertainty regarding the exact location and timing for new entry gas projects.

Therefore, the preferred option is to conduct reinforcement only when there is a firm and specific customer commitment to trigger it. The exact form would need agreement by Ofgem, and we'd expect this to form part of the suite of framework changes developed as part of the review of the entry commercial regime. In other sectors, the signing of a connection agreement with the provision of robust and proportionate financial security are used to demonstrate customer commitment.

Subject to the approval of the new commercial regime in accordance with the industry governance framework, we would envisage providing the following type of support to facilitate entry gas:

- There are a range of commercial terms we can enter into with entry developers, with different arrangements for compensation in the event of delays or non-delivery. Our proposed option of reactive investment (see above) would result in the full firm capacity only being available once compression works

are completed. This means we may be required to compensate developers in the event we cannot meet their agreed requirements.

In committing to a firm capacity regime for all new connections, we believe customers will want confidence in the likely timescales for the works. This would be subject to the consultation process under Code and Licence but could be set at 3 years after the customer accepting the connection terms. An incentive could then be established to maximise the output ahead of this date should the customer wish to become operational earlier. We would provide all entry connection offers with a firm connection for their desired capacity within 3 years of accepting their connection terms, subject to planning risk and other factors outside our control.

- Following receipt of an application to modify their existing variable flow agreement, we would invest to convert the variable entry gas connections to a firm year-round capacity within 3 years.

For connections standardisation, we do not believe there are any variations that are significantly different to enable an informative options assessment. The proposed establishment of a Connections Standard with industry governance will enable the process itself to evolve, influenced by the customers and stakeholders directly involved.

3. Assessing performance levels



As described in section 2.1, while we measure the number and capacity of connections of biomethane made to our network, this is substantially driven by factors outside our control.

Therefore, we are not proposing to include any specific performance measures on the amount of entry gas connected to our network.

Our performance will be measured by whether we have delivered the commitments set out in section 2. Our Entry Gas Stakeholder Forum will also provide feedback and challenge of Cadent's performance.

We are not proposing any additional costs for customers to deliver these commitments, which will be delivered as part of our existing business as usual activities.

Once a new regime is implemented any costs associated with its enduring operation, including both investments and operational costs, would be addressed by the Uncertainty Mechanism.

4. Customer testing



Given the uncertainty regarding the levels of entry gas that will seek connection, and that the new regime will be developed and consulted on within the established industry framework independent of the RIIO-2 process, the scope for further customer testing is limited and potentially inefficient.

We have started this process however ahead of RIIO-2, with the initiation of an industry consultation process to support such a major review of the pricing arrangements and associated framework changes. This would lead to change proposals being raised to the relevant framework documents.

4.1. Testing for a new commercial regime

To launch this review process, Cadent held an industry workshop in August 2019, to test the preliminary conclusions we had reached, and to gauge the support for different options. The feedback at this event showed an overwhelming support that the review was required, with 100% supporting either a single or multi-phase approach. Over 90% agreed that the current methodologies represented a barrier, and that the methodology was designed to accommodate large scale centralised gas entry, rather than smaller scale decentralised production. 87% indicate a preference at this stage to socialise the entry reinforcement costs to some degree.

We are currently planning the next steps in light of the feedback from stakeholders and in consultation with the other gas networks. There was the largest support for taking forward changes that can be delivered quickly, even if they do not necessarily address fully all the issues, so subsequent changes may be needed in the medium term.

4.2. Testing reinforcement to support entry for a new commercial regime

Our new commercial regime would be implemented only after a consultation and the decision process under the governance for a code or methodology modification. Therefore, we are not proposing any additional testing of these options with customers at this stage but will consider the scope for further engagement in parallel with any code modification process. There may also be Ofgem led consultation to confirm the terms for the deployment of the Uncertainty Mechanism required to provide funding for entry investment and enduring operation. It may be necessary to establish a supporting methodology to enable the effective enduring operation of the UM, both in RIIO-2 and beyond. This could for example describe how unit cost are calculated and updated as more entry gas connects and increasing levels of entry capacity provided.

As the key changes are under external governance, with the decision making outside of Cadent control, our ability to commit to specific connection and reinforcement outputs is limited. The commercial regime would be subject to a period of consultation and approval before being implemented.

4.3. Acceptability testing of our environmental commitments

In our acceptability testing, the environmental aspects of our business plan were generally found to be acceptable:

- Of domestic customers surveyed, 83% of those surveyed found the environment section of the plan acceptable, and only 1% found it unacceptable. When asked what would make it acceptable, those who had answered that they found it neither acceptable nor unacceptable suggested a further reduction in prices (11%) or wanted even more to be done for the environment (7%). This was broadly consistent across the regions.
- 36% of business customers surveyed said that they found the environmental aspects of Cadent's business plan "very acceptable" and 47% "fairly acceptable". The breakdown across business sizes was broadly consistent, but overall acceptability was lowest for sole traders, with the percentages finding the plan either very acceptable or acceptable being 73%, 88% and 86% for sole traders, businesses with 1-9 employees and businesses with 10-49 employees respectively. Many customers

supported the environmental commitment, and some said it should have a higher profile and a few said that they would be willing to pay more for this area. However, some felt that it was not as important as a resilient network or quality experience as these were Cadent's core purpose. Many customers explained that improving and safeguarding the environment was a personal priority and many felt that it was a duty and obligation for businesses, particularly given the impact that they can have and the resources at their disposal

Our commitments relating to the environment were supported in most qualitative acceptability testing:

- Participants in our acceptability testing customer forum were generally supportive of the plan. The environment outcome was not without its critics who thought Cadent was not going far enough. Participants were discerning few fell into the 'anything environmental is good' camp. They readily discussed the pros and cons of the commitments. However, across all locations participants felt that assessing the environment commitments required expert knowledge, especially on topics as complex as hydrogen. Overall, participants thought the environment outcome was ambitious, especially if it is delivered within the 5-year business plan period. Participants wanted Cadent to provide clarity around how they would check progress.
- At our acceptability testing focus groups with the general population, there was no consensus on Cadent's environmental commitments. People who thought the plan was outstanding sat alongside people who thought Cadent, as a gas distribution network focusing on improving the environment, was "like a turkey asking for Christmas". However, many participants were happy that Cadent is moving in this direction. Critical participants urged Cadent to think more about who it was as a company, and whether Cadent would genuinely be able to tackle climate change. This was in contrast to a significant number of participants who were 'very impressed' that Cadent was acting on the environment. Improving the Environment was ranked the most important (97% said very important or fairly important) across all locations. One participant in London was happy to pay more in order to support more environmental initiatives.
- At our acceptability testing focus groups with future customers, there was a mix of opinion on how ambitious Cadent's environmental plans are. Some believed that Cadent was setting a positive example, encouraging their staff and customers to change behaviours, believing that 'one small change can make a huge difference'. Others were sceptical, believing that the government should take the lead and that Cadent should set earlier deadlines for the targets, even if they are smaller targets. The vast majority (90%) found that Improving the environment was either very important (65%) or fairly important (25%), and many saw this as the key to the acceptability of the plan.
- Participants in our acceptability testing interviews with CIVs found the proposals for Improving the Environment acceptable. This support was often phrased with reference to the importance of the environment and future generations. Many customers argued that the plans were ambitious, with 'lots to do by 2026', and that Cadent should be lauded for 'leading the way' for others in the utilities sector. Some customers, however, thought that these proposals could be achieved sooner. Some suggested that Cadent should have more frequent intermediate targets to keep them on track.
- In general, participants at our acceptability testing focus groups with those in fuel poverty approved of the plans for improving the environment. At all events participants felt that Cadent should be leading the way for other large organisations, setting the precedent for how to improve the environment. The vast majority felt that the environment was very important (85%), where more of those unsure were in Liverpool (2 said it was fairly important, 2 said it was neither important nor unimportant and 5 said it was very important).

As part of the Verve business plan consultation, customers saw the environment as a high priority, derived from increasing call-to-action pressures from society to make changes. Customers viewed Cadent as a leading contributor to carbon emissions due to the nature of the product, and thus a clear responsibility to take action. Focusing funding on decarbonisation was felt to be a step in the right direction. However, customers felt that specific priorities throughout the plan seemed very ambitious (e.g. carbon neutral by 2026 and zero avoidable waste to landfill) and were concerned that not all commitments were realistically achievable. Some would be willing to pay a further sum on their annual bill to subsidise environmental initiatives. Using

hydrogen/biomethane to make Cadent's operations more sustainable were seen as futuristic, 'hero' innovations, generating excitement. Furthermore, encouraging external providers to reduce their emissions suggested Cadent is going above and beyond.

Entry specifically was not mentioned often in comments during acceptability testing. However, a few participants at our acceptability testing customer forum pointed out that methane or biomethane had knock on effects that could negatively impact the environment.

5. Our commitments



5.1. What are our performance commitments?

There are four commitments we are able to make at this time, ahead of the development and delivery of a new entry regime. These are included in Part 3 of our Environmental Action Plan (Appendix 07.04.00).

Table 4 Our commitment

Output commitment (EAP action)	Measure definition	Benefits to current customers	Benefits to future customers	SROI/WTP value over RIIO-2 period
Review of distributed gas entry arrangements	Commitment to support consultation through established industry mechanisms	<ul style="list-style-type: none"> Reduced emissions as a result of increased green gas in our network 	<ul style="list-style-type: none"> Reduced emissions as a result of increased green gas in our network 	£51.9m
Funding for entry gas reinforcement				n/a
Entry gas customer and stakeholder forum	Establishment of forum	<ul style="list-style-type: none"> Improvements to process and further engagement with entry customers Further reduced emission as a result of increased green gas in our network 		
Entry gas connections methodology	Establish standards for our own networks and support a common methodology across other GDNs			

We have considered connections standardisation and entry capacity enablement and flexible reinforcement separately in terms of regulatory outputs (see below). The work we are doing to develop funding and commercial arrangements for entry for our plan is a key aspect of our EAP.

5.2. Definition of measure

We have evaluated these proposals against our outputs framework to determine the most appropriate and effective option to support these commitments:

Table 5 Regulatory treatment (flexible reinforcement and commercial regime)

Regulatory treatment	Criteria	Rating	Further explanation of assessment
Reputational Output Delivery Incentive (ODI)	Demonstrate this is important to customers and/or stakeholders	Green	This output has strong support from customers who want to be able to maximise the amount of gas they are able to inject into the network.
	Funded elsewhere in our plan, or inappropriate for funding	Red	This output is not funded elsewhere in the plan.
	Can robustly measure performance improvement	Yellow	For this output, we can measure the number of reinforcements works we undertake, alongside the total additional capacity provided through the regime. However, this is not an appropriate measure if our performance, since it is largely outside our control.
Financial ODI	Demonstrate this is important to customers and/or stakeholders and they are willing to pay	Green	As described for Reputational ODI.
	Not funded elsewhere in our plan	Light Green	This output is not funded elsewhere in the plan.
	Can robustly measure performance improvement	Yellow	As described for Reputational ODI.
Price control deliverable	Specific deliverable with clear timeline and targets	Yellow	While there are specific steps we can take to encourage entry capacity on our network, they are one part of wider changes including other parties in the industry. Therefore, specific milestones and targets are not something we can commit to.
	Demonstrable benefit to customers which they support	Green	Customers will benefit from greater certainty with respect to capacity. Reinforcement investment will also result in a more strategic approach to compression, which may be more economical.

Regulatory treatment	Criteria	Rating	Further explanation of assessment
Licence obligation	Absolute minimum, with significant customer harm if we do not deliver it		This output does not relate to a minimum standard. However, we must strike the balance between meeting consumers' needs and putting an acceptable level of risk on the network/
	Applicable to all GDNs		This output is bespoke to our network and reflects the engagement we have had with our customers.

Doesn't meet criteria	Weakly meets criteria	Partially meets criteria	Meets criteria	Strongly meets criteria
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This commitment does not satisfy any of the requirements for the output types we could include in the plan. Therefore, we are not proposing a specific output for this commitment. There are however actions we can define to support the development and delivery of the new regime, and we have included these in our EAP. Ofgem have indicated that there will be an annual environmental report which will include the monitoring and performance reporting of the EAP.

We have also included a bespoke uncertainty mechanism to allow us to respond to the outcome of the commercial regime review process. This is described in Our Uncertainty Mechanism case 10.10 Entry charging and access review.

As mentioned above, the work we are doing to develop funding and commercial arrangements for entry for our December plan is a key aspect of our EAP, and progress against this will be reported and monitored in our Annual Environmental Reports.

Connections standardisation

Our proposals for connections standardisation are more appropriate for a bespoke output:

Table 6 Regulatory treatment (connections standardisation)

Regulatory treatment	Criteria	Rating	Further explanation of assessment
Reputational ODI	Demonstrate this is important to customers and/or stakeholders		This output has strong support from customers who want to be able to maximise the amount of gas they are able to inject into the network.
	Funded elsewhere in our plan, or inappropriate for funding		There are no additional costs associated with the initial standardisation. There is a small incremental resource included in our plans to support the enduring stakeholder forum.
	Can robustly measure performance improvement		We can record whether we have completed this process, and the feedback of our stakeholder forum.

Regulatory treatment	Criteria	Rating	Further explanation of assessment
Financial ODI	Demonstrate this is important to customers and/or stakeholders and they are willing to pay	Strongly meets criteria	As described for Reputational ODI.
	Not funded elsewhere in our plan	Doesn't meet criteria	There are no additional costs associated with the initial standardisation. There is a small incremental resource included in our plans to support the enduring stakeholder forum.
	Can robustly measure performance improvement	Meets criteria	As described for Reputational ODI.
Price control deliverable	Specific deliverable with clear timeline and targets	Doesn't meet criteria	Implementation of this commitment could be considered a specific deliverable, although the timeline for our stakeholder forum would not be time-limited (i.e. we would expect it to continue for the foreseeable future). However, since there are no significant additional costs associated with this commitment, it is not appropriate for a PCD.
	Demonstrable benefit to customers which they support	Strongly meets criteria	Customers will benefit from a more efficient connection process and greater transparency and influence over the connection process going forward.
Licence obligation	Absolute minimum, with significant customer harm if we do not deliver it	Doesn't meet criteria	This output does not relate to a minimum standard.
	Applicable to all GDNs	Partially meets criteria	This output is bespoke to our network and reflects the engagement we have had with our customers. It could however be extended to voluntarily to establish a GDN connection standard.

Doesn't meet criteria	Weakly meets criteria	Partially meets criteria	Meets criteria	Strongly meets criteria
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On the basis of this assessment, we propose a reputational ODI based on the delivery of this commitment.

5.3. What are the costs and benefits of this commitment?

We are not including any significant additional costs in our plan to deliver these commitments.

Nevertheless, the commitments support the increased level of entry gas on our network, which is something customers value, based on the willingness to pay (WTP) research conducted for us by NERA.

While the amount of green gas entering our network is uncertain (hence the bespoke UM we have included in our plan), the ‘most likely’ case from our Uncertainty mechanism equates to a build up to around 1.2% of the gas in our network being from entry by the end of RIIO-2 (from a baseline of around 0.3%).

NERA’s research provided a range of WTP valuations for entry gas:

Table 7 NERA’s triangulated annual WTP for green gas entry

Percentage of green gas in our network	Domestic customers (£)			Non-domestic customers (£)		
	Low	Central	High	Low	Central	High
In the range of 0.5% to 1%	6.01	6.01	8.51	0	14.5	14.5
In the range of 1% to 1.5%	4.95	4.95	8.51	0	14.5	14.5
In the range of 1.5% to 2%	1.49	1.49	8.51	0	14.5	14.5

Based on the WTP central scenario above (which we believe is the appropriate scenario to use, given the high level of support for green gas entry described in section 1.3), the increase over time for entry gas equates to a total (undiscounted) benefit of £146m.

The most likely cost we expect from our uncertainty mechanism is £84m, this means that entry of green gas could deliver a net present value of £52m for the whole of RIIO-2.¹¹

While the commitments we make in this output case will not on their own deliver this benefit, they are key enablers.

5.4. How are we incentivised to perform?

The reputational ODI for connections standardisation included in our plan provides an incentive for us to deliver these commitments, and we will be held to account by our customers and stakeholders via the Entry Gas Stakeholder Forum, with progress also reported in the annual environmental report.

¹¹ Note these are net present values rather than gross present values, so they will differ from the figures quoted in BPDTs

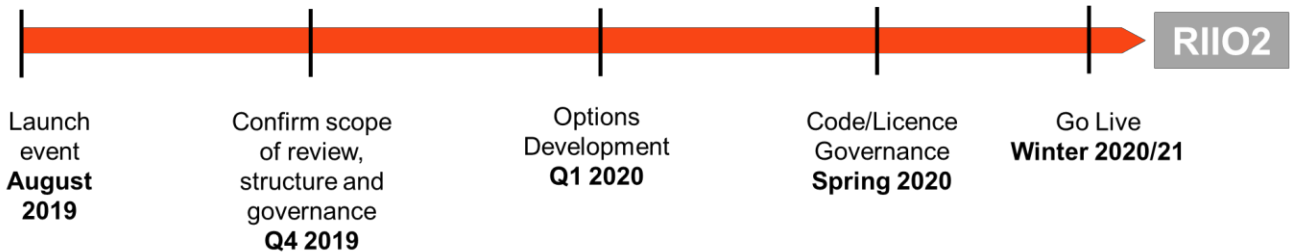
6. Delivering our commitments



6.1. How will we deliver our commitment?

We will deliver our commitments relating to the commercial framework for entry through the established industry governance framework. An illustrative high-level programme for the commercial review was discussed with stakeholders at the launch event in August. It was recognised that this was a challenging timetable and pursuing early less complex changes to start to address the key issues could enable faster implementation. Follow on changes may still be required to ensure the regime is robust and scalable in the long term. An updated version of the timetable shared in August is shown below:

Figure 7 timetable for commercial review



Once a new regime is in place, we will work closely with the supply chain to ensure we can deliver entry capacity in a timely fashion. This will be built on the experience from the Optinet innovation project which includes the installation of in-grid compression to boost the output from existing biomethane plant.

We already hold regular meetings with entry stakeholders, and working with our colleagues in the other gas networks, we will aim to formalise this to form our entry stakeholder forum, and establish an initial connections standard, ahead of the start of RIIO-2. We will aim to ensure coverage from:

- Biomethane developers
- Biomethane operators
- Trade bodies
- Shippers

Although this will be subject to their availability and willingness to attend.

6.2. What protections are there for customers against non-delivery?

Our performance in developing a new regime will be highly visible to customers and stakeholders, including via the Entry Gas Stakeholder Forum.

Initiatives being taken forward under the industry Governance would be subject to the well-established mechanisms.

Once a new regime is in place, failure to deliver capacity will be highly visible, and depending on the design of the new framework, potentially a delivery failure covered by the bilateral agreement supported by industry code.

The Uncertainty Mechanism described in 10.10 Entry charging and access review will also ensure that consumers are protected from costs associated with failure to deliver.