

# RIIO-GD2 Decarbonisation Stakeholder Group

## Introduction



**Pete Wightman, Head of Gas Distribution**

Meeting 1: 29/08/18

**1. Introductions (10:30 – 11:15)** *(Pete Wightman, Head of Gas Distribution)*

Overview of RIIO2 and purpose of the group.

**2. Cadent (11:15 – 12:45)** *(Stuart Easterbrook, Future Gas Strategy Manager)*

How should the GD2 price control support the energy system transition?

What are the 'no regrets' options on green gas, and what is the price control's role?

**3. Lunch (12:45 – 13:15)**

**4. SGN (13:15 – 14:05)** *(Danny Symes, RIIO-GD2 Project Manager (Regulation))*

Should we be extending the gas grid given uncertainty over the future of heat?

**5. Northern Gas Network (14:05 – 14:55)** *(Nick Phillips)*

In the absence of government policy direction, what should GD2 do for the future of heat?

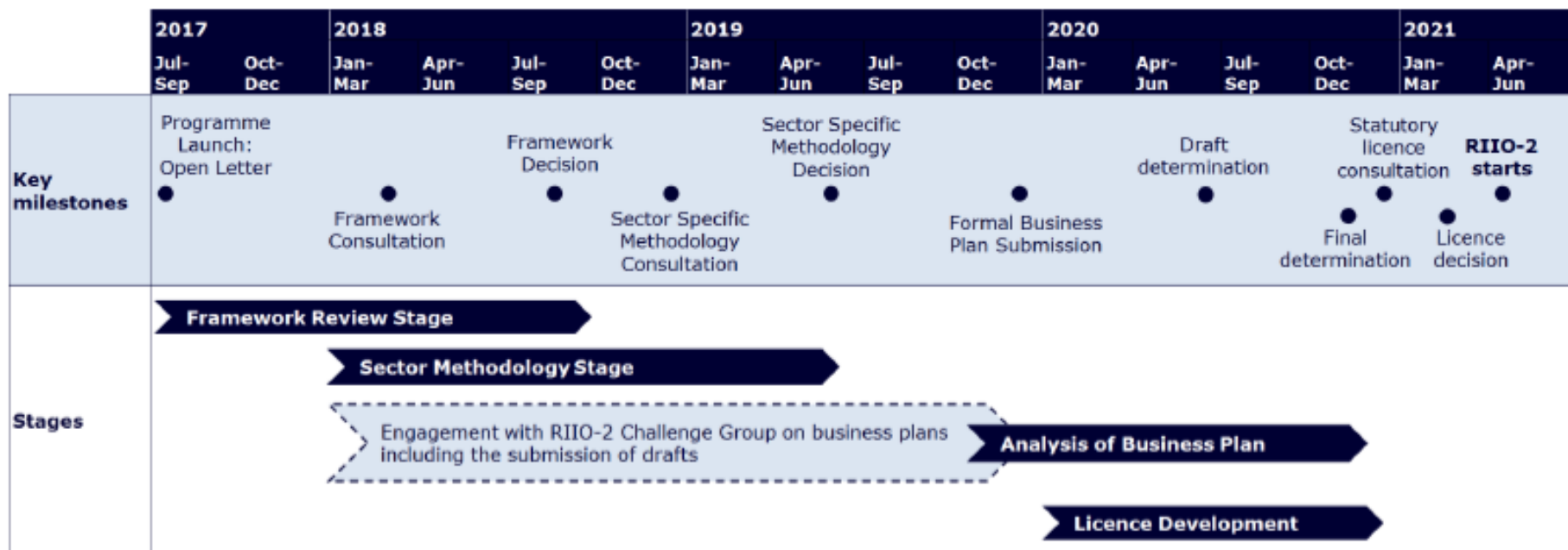
**6. Break (14:55-15:10)**

**7. Wales and West Utilities (15:10 – 16:00)** *(Chris Clarke, Director of Asset Management, Safety and Environment)*

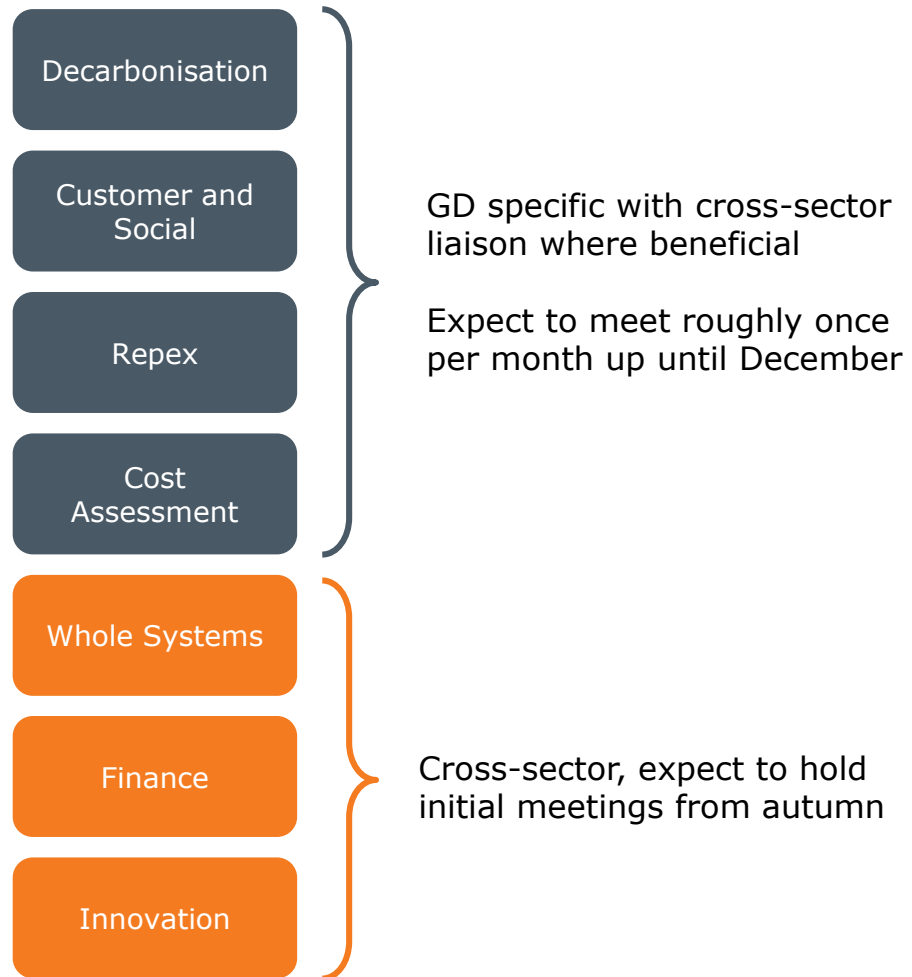
What more should be done to ensure the companies decarbonize their operations, including on shrinkage?

**8. Any other business (16:00 – 16:15)**

**Indicative High-Level RIIO-2 Plan for ET, GT, GD and ESO Sectors**



- Focus of groups at this stage is to inform Ofgem's policy and cost assessment thinking up to and beyond our December methodology consultations
- Aim to bring together expert and informed stakeholders to discuss and debate options.
- The groups will evolve as we move through the GD2 process. Eg:
  - As we get further into the detail we may discuss the specific methodology for an incentive or target setting.
  - The need for some groups may fall away / merge.
- Plan to publish materials (eg slides) on Ofgem website, as well as a non-attributable summary of discussions.



### **Decarb & Customer and Social**

- August 29 & 30 (London): Discussion on key policy questions for RIIO-GD2
- September 19 & 20 (Glasgow): Repeat above for any new key questions identified & follow-up on more detail from Aug 29 & 30
- October 24 & 25 (London): tbc

### **Repex**

- September 6 (Glasgow): Review of RIIO-GD1 and initial view towards GD2
- October 2 (Glasgow): Structuring of outputs / incentives for GD2

### **Cost assessment**

- September 5 (Glasgow): Cost drivers and cost categories
- September 26 (London): Cost assessment approach and modelling structure
- October 17 (Glasgow): Efficiency and benchmarking (tbc)
- November 15 (London): BPDTs and annual monitoring (tbc)

## Ofgem - decision-maker

Sector-specific &  
cross-sector  
stakeholder groups

Core role: support Ofgem's  
development of outputs and  
incentives, and approach to  
cost assessment

Input to Ofgem policy  
development

Independent RII02  
Challenge Group

Core role: challenge company  
business plans. The group will  
also challenge Ofgem's specific  
policy areas for RII0-2 sector  
Methodologies.

Output: independent report  
for Ofgem

## Network Operators

Independent User  
Groups/ Company  
Groups

Core role: challenge company  
business plans

Output: independent report  
for Ofgem

Network Operator  
stakeholder  
engagement

# **Outputs and incentives**

### Initial thinking only – further development/consultation to follow

- We are looking to make the output categories for RII02 as intuitive and simple as possible, reducing overlap and potential confusion.
- We are proposing to consolidate existing output categories into three new categories as described below.
- We welcome early views from stakeholders; there will be further opportunities to provide formal feedback at a later stage.

#### Improve the Customer Experience

- *All consumers, including those who are vulnerable, should receive a safe, high quality, and reliable service*

#### Support the energy system transition

- *Network companies have to enable the transition to a low carbon, consumer-focused energy system*

#### Improve the network and its operation

- *A network in better condition will be safer, greener, more reliable, and more responsive to change*



**Initial thinking only – further development/consultation to follow**

- For illustrative purposes, we have mapped some existing and potential future output measures to the three new proposed output categories.
- Some measures may fall into more than one output category.

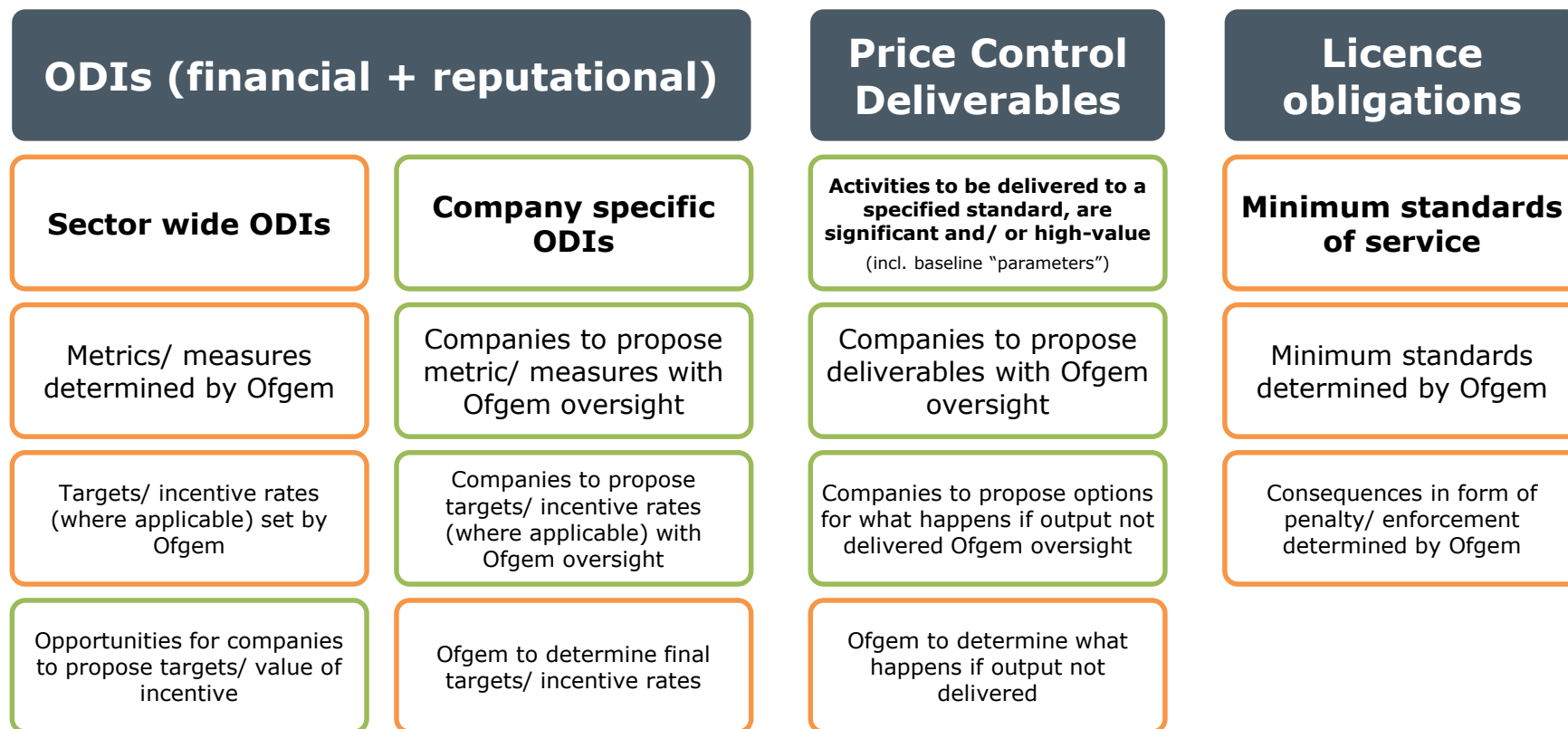
	<b>GD</b>	<b>GT</b>	<b>ET</b>	<b>ED</b>
<b>Improve the customer experience</b>  <i>All consumers, including those who are vulnerable, should receive a high quality, safe and reliable service</i>	Interruptions Guaranteed standards Customer surveys Complaints Stkhldr engagement Carbon monoxide safety Emergency response Vulnerable customers FPNES Connections	Stakeholder surveys Reliability Stkhldr engagement Connections	Stakeholder surveys Stkhldr engagement Connections	Customer surveys Stkhldr engagement Interruptions Complaints Guaranteed standards Worst-served customers Vulnerable customers Connections
<b>Support the energy system transition</b>  <i>Network companies have to enable the transition to a low carbon, consumer-focused energy system</i>	Low carbon - Green gas - Green company ops Whole system outcomes Asset stranding Network extensions	Whole system outcomes Low carbon (compressor emissions) Asset stranding Network extensions	Whole system outcomes Low carbon - SF6 - EDR - Losses Visual impact Asset stranding Network extensions	Whole system outcomes Low carbon - SF6 -Oil leakage - Energy efficiency -Losses Visual impact Asset stranding Network extensions
<b>Improve the network</b>  <i>A network in better condition will be safer, greener, more reliable, and more responsive to change</i>	NOMs Repex MOBs Shrinkage Workforce resilience	NOMs Physical/cyber security Workforce resilience	NOMs Physical/cyber security Workforce resilience Reliability	NOMs Load index Workforce resilience

## **Our July framework decision set out three types of outputs for RIIO-2**

- ✓ Licence obligation (LO):
  - ✓ Minimum standards with associated licence obligations
  - ✓ Failure to meet could lead to enforcement action and penalties
  - ✓ Not directly linked with specific funding
  
- ✓ Price Control Deliverable (PCD):
  - ✓ Specific deliverables with funding attached (eg high value capital project)
  - ✓ Clear methodology of what happens when activity is not delivered, delivered late, or delivered to a lower specification or standard
  
- ✓ Output Delivery Incentive (ODI):
  - ✓ Will apply where service quality improvements beyond the minimum standard is in the interest of consumers
  - ✓ Will reward or penalise performance; overall cost to not exceed value of performance
  - ✓ Could be relative or absolute
  - ✓ May also include reputational incentives in some areas

**Initial thinking only – further development/consultation to follow**

- This slide describes the role we expect Ofgem and companies to play in terms of proposing/ setting outputs.
- **Ultimately Ofgem will retain final decision-making on all aspects of the price control settlement.**



- All activities led by Ofgem (orange) will involve significant stakeholder engagement and consultation.
- We expect companies to engage proactively and make extensive use of their user/ customer groups in developing and putting forward proposals (green). The onus is on the companies to put forward evidence-based proposals.

**Initial thinking only – further development/consultation to follow**

- We will be keen to get views on what outputs should be common across GDNs/sectors, and what areas GDNs should be able to propose their own outputs.

**Strawman on some sector wide & company specific areas**

<b>Sector wide</b>	<b>Company specific</b>
Interruptions	Vulnerability
Guaranteed standards	CO safety
Customer surveys	Additional customer improvements
Complaints	Green gas
Stakeholder engagement	Network extensions
Emergency response	Workforce resilience
FPNES	Additional environmental measures
Connections	
Green gas	
Whole system	
NOMs	
Repex	
MOBs	
Shrinkage	
Vulnerability	

- Note: it is possible we could vary common and bespoke for LOs/PCDs/ODIs. Some areas (eg green gas, others) could have both common and bespoke elements

1. What does RIIO-GD1 tell us about this issue?
  - a) How do we capture & embed the achievements of GD1?
  - b) What are the areas where improvements are still needed in GD2?
2. What parts of GD1 in this area are driving value, and what parts are potentially redundant?
3. What new drivers are there in this area for RIIO-GD2, and what should we be expecting GDNs to achieve?
4. What options should be considered for outputs and incentives and what are the specific barriers or enablers required for change?

# Session 2



# **Decarbonisation Stakeholder Workshops**

## **GD2, the energy transition, and distributed gas**

**Stuart Easterbrook**  
**Future Gas Strategy Manager**  
29 August 2018

**Cadent**  
Your Gas Network

# Decarbonisation in RIIO-GD2

## An overview

- Decarbonisation is driven by government policy to reduce emissions.
- Gas Networks' current role is to support policy development by:
  - Identifying and filling evidence gaps, with studies, research, pilots and demonstrations at appropriate scale;
  - Engaging with stakeholders by presenting compelling visions to deliver their ambitions.
- Implementation of UK heat policy will be limited ahead of RIIO-GD2
- Ofgem ability to consider decarbonisation initiatives in business plans would be assisted with further guidance from Government e.g. Strategic Priorities.

**Decarbonisation in GD2 requires tri-partite coordination between Ofgem, government and the networks.**

***....with clarity on each of our roles***

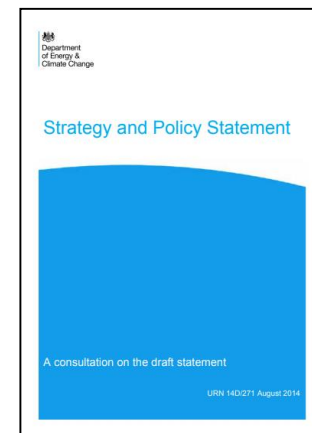


# Strategy and Policy Statement

## Extract from August 2014 DECC consultation

“Our review confirmed that Ofgem’s work is already supporting our aims but recommended that the regulatory framework should be strengthened by introducing a new Strategy and Policy Statement and associated duties to increase regulatory certainty. **This will provide Ofgem regulation with a clear direction of the Government’s strategic energy priorities and the policy outcomes we want to achieve to inform its regulatory decisions.**

The Energy Act 2013 provided powers for the Secretary of State to designate such a Strategy and Policy Statement and we are now consulting on the draft statement. Once designated, **the statement should be taken into account in Ofgem’s regulatory decision making, forward work plans** and annual reports **and help it play its full part in** improving competition, helping consumers take control of their energy bills and costs, securing investment in energy infrastructure, and **tackling climate change.**”



## Supporting the energy transition in RIIO-GD2

### Starting point reality check

- Gas networks must offer terms to connect any party seeking connection to the network: Putting gas on and using gas.
- Connections, entry and exit are evergreen with the gas networks obligated to maintain the supply. *Note: no economic test applied when maintaining supply.*
- Gas networks must continue to develop and operate a system under all credible demand condition including peak winter e.g. Winter 2017/2018

**GD2 Assumption?** *New and existing gas network users will continue to enjoy evergreen rights and access throughout RIIO-GD2. Gas network connection, network security obligations will continue unchanged. ENTRY and EXIT*

# Supporting the energy transition in RIIO-GD2


## No regrets - existing and emerging policy ahead of RIIO-GD2

The impact of transition during RIIO2 will be driven primarily by existing and emerging national and regional government policy and how the market responds in the short to medium term.



### Drivers pre-RIIO GD2

**CCC 100GW+**

- Electricity network:
  - EVs impact on the grid will drive gas solutions e.g. CHPs
  - Gas power generation for energy balancing i.e. unabated peaking plant.
- Transport emissions:
  - CNG/LNG in larger vehicles + smaller vehicles if there is a market pull.
- Decarbonising Off Gas Grid Heat:
  - Off gas grid policy: gas network extensions + economic test
  - Community solutions would require high level of engagement.
  - Addressing Fuel Poverty

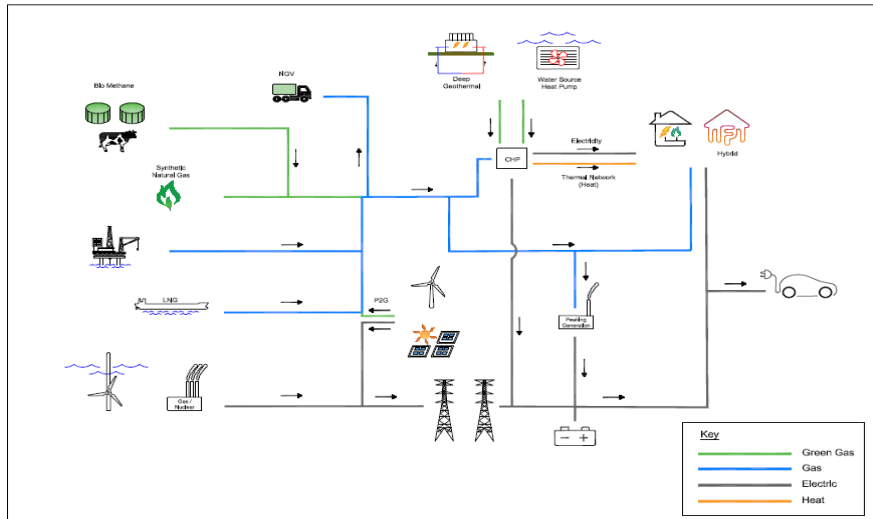
**GD2 needs to ensure no real or perceived barriers in place for timely, efficient, and coordinated network investment.**

**Strawman: Revised economic test and supporting funding for engagement, design and network extensions**

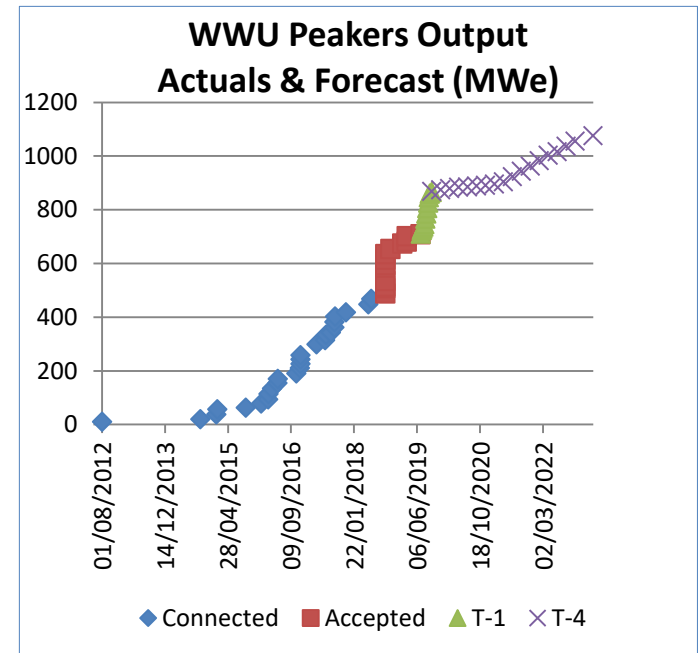
**“If it was there  
outside my house,  
I’d have it”**

# Supporting the energy transition in RIIO-GD2

## Integrated whole energy system



- Integrated networks consider, power; heat and transport
- Enabling intermittent renewable generation to be connected
- Gas grid provides the storage and flexibility



Will whole system cost need to be considered when assessing decarbonisation options?

# Supporting the energy transition in RIIO-GD2

## No regrets - existing and emerging policy ahead of RIIO-GD2

### Distributed Gas *Note: GDNs can facilitate green gas but we should not discriminate*

Highly likely to see continued/accelerated growth in distributed gas, including green gas, hydrogen blending, bioSNG and shale in the period up to 2026 and beyond. Network expenditure will be needed to unlock the full potential.

- Increasingly flexible gas grids: tools, controls, systems, data, skills and people
- Flexible GSMR / Flow weighted average CV
- Entry reinforcement / who pays? / RHI+RTFO interaction
- Stakeholder engagement and demand/production forecasting
- Shrinkage gas
- Stakeholder incentives

### Read across to shale and hydrogen blending

- Future Billing Methodology Project
- Hydeploy with blending would require new commercial and operational tools

Does GD2 need to enable expenditure for gas entry in its own right – or just continue to fit it in around the edges?

...and: who pays?

**Strawman: Entry gas revenue driver?**

# Supporting the energy transition in RIIO-GD2

## New policy leading up to and into RIIO-GD2

Filling evidence gaps to support Government policy development

- Studies and research
- Pilots and demonstrations
- H21/Project Freedom/H100/Hynet/Hydeploy/FBM/BioSNG

Keeping options open - efficiently

- Repex phasing/extension coordination with hydrogen works.
- Isolation valve installation.

Support Government to design Deployment Pathway(s)

- Market and regulatory transition.
- Supporting Regional ambitions
- Industry as well as domestic
- Regional v national deployment
- Roles and responsibilities
- Socialisation of costs

\*Developing the markets and regulatory framework is lagging well behind the physical engineering

Should GD2 enable gas networks to deliver strategic projects\* required by Government, within a regulated delivery framework?

Should these projects have flexible funding e.g. from taxpayer and/or consumer?

## Supporting the energy transition in RII0-GD2

### New policy leading up to and into RII0-GD2

Protecting gas consumers short/long term:

- Clarity on consumer protection - gas consumer or consumers?
- Protecting gas consumers now and in the future involves:
  - Maximising the life of the network
  - Maximising the use of the network

**As energy policy presents risks and opportunities to networks, should Ofgem and the networks be doing more to protect their consumers from bill increases driven by a reduction in the number of bill payers?**

# Supporting the energy transition in RIIO-GD2

## Questions for feedback?

Are the roles, accountabilities and priorities for decarbonisation sufficiently clear for GD2?	✓	✗
Assumption: New and existing gas network users will continue to enjoy evergreen rights and access throughout RIIO-GD2. Gas network connection, network security obligations will continue unchanged.	✓	✗
GD2 needs to ensure no real or perceived barriers in place for timely, efficient, and coordinated network investment to support the electricity system evolution, low emission transport, and decarbonising off the gas grid. Strawman: revised economic test and supporting funding for engagement, design and network extensions?	✓	✗
Will whole system cost need to be considered when assessing decarbonisation options?	✓	✗
Does GD2 needs to enable expenditure for gas e.g. Entry revenue driver?	✓	✗
Do we need a plan to review entry pricing (noting this may need to evolve into wholesale review of all network pricing)?	✓	✗
Should GD2 enable gas networks to deliver strategic projects required by Government, within a regulated delivery framework?	✓	✗
Should these projects accommodate flexible funding e.g. from taxpayer and/or consumer?	✓	✗
As energy policy presents risks and opportunities to networks, should Ofgem and the networks be doing more to protect their consumers from bill increases driven by a reduction in the number of bill payers?	✓	✗



## Supporting decarbonisation

Impact across the whole RII O2 framework – not just innovation

Outputs	Innovation	Industry Framework
Incentives	Uncertainty Mechanisms	Investment risk
Business Plans	Vulnerable customers	Who pays?

### Next Steps?

- GDNs develop proposal and engage customers and stakeholders through RII O2 – refined with implementation plans.
- Strategy and Policy Statement 2018: guiding the role of Ofgem and the networks in supporting decarbonisation in RII O2.  
e.g. confirming the long term need for the gas network and directing activities to identify the best route to decarbonise the gas grid?

# Lunch

# Session 4

# Should we be extending the gas grid given uncertainty over the future of heat?

Decarbonisation Working Group

29 August 2018



**SGN**

Your gas. Our network.

# Demand Background

- Peak demand(s)– the reference point for sizing the network - remains broadly constant over time.
- Annual demand showing reduction due to energy efficiency improvements of existing and new house stock, and industrial change.
- Number of new connections (total #) remains broadly constant over time.
- Peak and Annual demand changes are highly localised and subject to local economic growth and housing developments (which may not be aligned with capacity).
- New sources of demand (electricity peaking plant) are driving changes in the characteristics and level of demand, again on a regionalised basis.

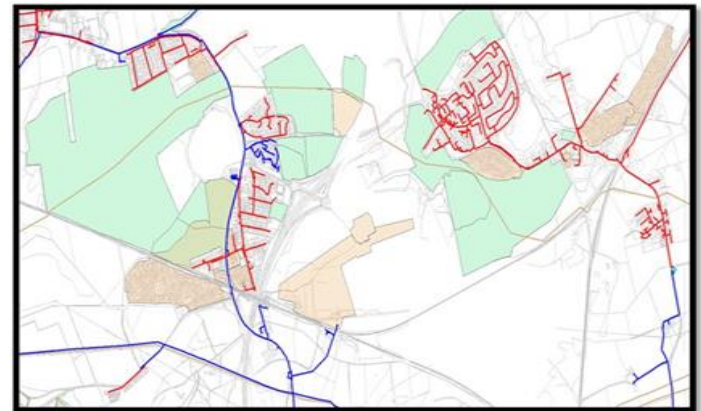
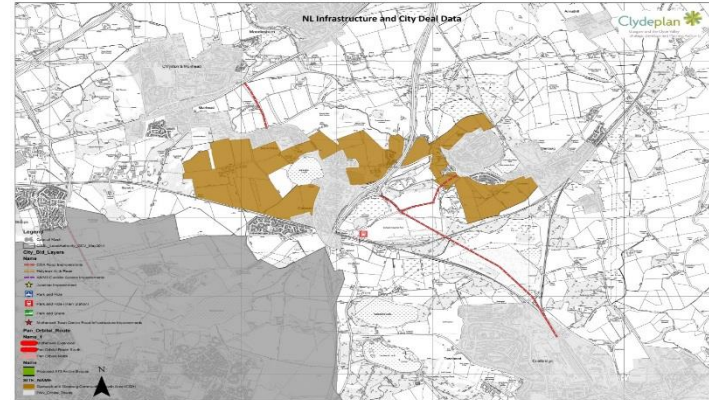
# Policy Background

- Broad recognition of the challenges of decarbonising heat through electrification and challenges of delivering winter peak (UKERC report – Beast from East, Aug '18)
- Definition and implementation of UK and Scottish heat policy will be limited prior to GD2, key to keeping flexible and least cost pathways open – a no regrets policy.
- UK and Scottish heat policy during GD2 expected to focus on energy efficiency and reducing emissions from homes off the gas grid.
- New demands on our network including gas peaking generators and CNG for transport being driven by government policy.
- Focusing GD2 on filling the evidence gaps to support policy development around future energy solutions through innovation and demonstration projects.
- Connecting fuel poor customers as the most effective solution and policy tool to combat fuel poverty and reduce emissions.

# Local Plans

- Core concern of local authorities is provision of infrastructure able to meet growth forecasts.
- Desire by local authorities to see how we are ensuring adequate provision.
- Supporting a joined up provision of utilities (water, gas, electricity and telecoms).
- A disproportionate impact from peaking plant that may constrain growth for other consumers and reduce confidence in growth forecasts.

## Clydeplan Strategic Development



# Framework

## Core Legal (Gas Act) Requirements

To connect properties within 23 meters of a gas network at a standard cost.

Non-discrimination in the application of the economic test.

## Current Extension Requirements

Competition in new connection provision.

Networks are provider of last resort and must provide a quotation.

Economic test to determine costs that will be socialised. Customers can pay additional costs if required.

Fuel poor network extensions.

## Opportunities

Strategic Development to new regions.

Strategic development to promote decarbonisation.

Strategic development to extend the range of gas transported.



# Core Legal (Gas Act) Requirements

## Connecting Properties & Maintaining Properties

- Question: - whether sub-requirement increases consumer costs in an inappropriate way or creates optimal solution. e.g. -
  - Risers - existing gas consumers retained and the buy-outs.
  - Broader Policy Objectives - i.e. Heat networks provision
  - Islanding of historic sites in IGTs development area (broadly good relationships with IGT to resolve but requires Ofgem approval)
- Sustains very important principles of consumer protection

## Non-Discrimination

- Question: - whether a more discriminatory approach is appropriate given uncertainty of future energy pathways.
  - Level of reinforcement risk that should be borne by the consumer / networks / customers for uncertain projects.
  - Implementation and operation of heat networks.

# Current Extensions (1)

## Competition in New Connections

- Any new connection below 7bar is open to competition in construction and operation, and networks will adopt (there is a challenge of securing appropriate documentation).
- Above 7bar open for competition in construction and operation, and some networks will adopt with appropriate documentation.
- Challenge of adopting private networks with incomplete records that have now become stranded (NHS, MODs, Local Authorities etc).

## Provider of last resort

- Approximately 50% acceptance rates of quotes issues
- Question: whether the quotation costs should be recovered from enquirer or socialised?

## Fuel Poor Network Extensions

- Current output measure to connect set volume of households deemed to be in fuel poverty.
- Important social driver to support vulnerable customers. Currently covered under the Customer and Social Working Group.

# Current Extension (2)

## Economic Test

- Currently socialise the costs of network connection up to the current day cost of future distribution charges over 25 years (sites > 58 TWh / yr) and 40 years (sites < 58 TWh/yr).
- Reinforcement costs above the socialised cost recovered directly from the end consumer.

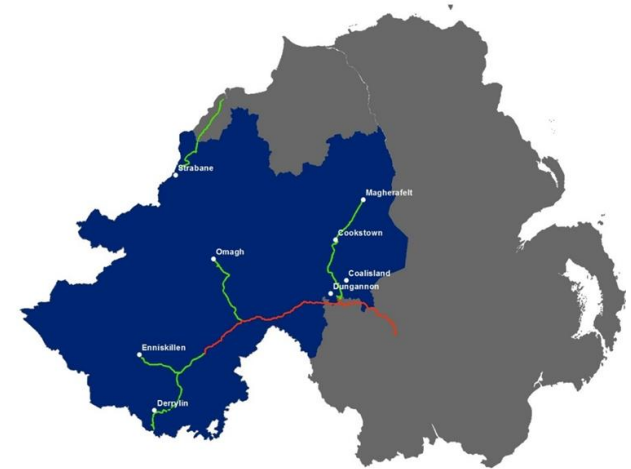
## Economic Test – Considerations

- Exposure to Energy Policy – as new plant, where the investment case is driven by government energy policy increases, is the balance of consumer protection to investor risk exposure appropriate?
- Whether health, safety and environmental benefits are appropriately captured?
- Alignment between Transmission and Distribution cost exposure – are these correctly aligned?
  - We incur charges for additional NTS offtake capacity commitments regardless of whether reinforcement is required, these charges remain in place for 4 years even if additional capacity is taken up.
- Aligning economic test to expected duration of the site (as provided by the customer and if it differs from above).
- It is targeted at individual connections and associated reinforcement. It may be less appropriate to recover the connection cost to an infill site (i.e. a local off gas grid residential area).

# Opportunities – New Regions

## Example: Gas to the West (Northern Ireland)

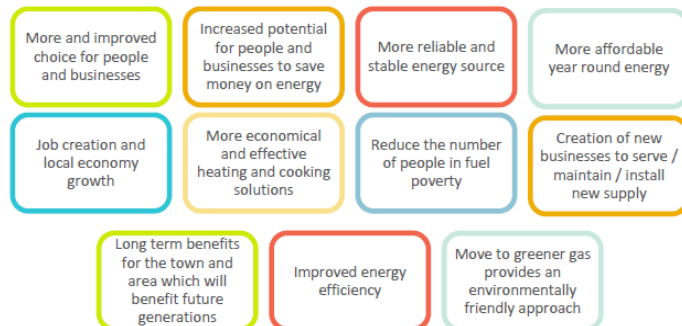
- 220km HP/IP project under construction with associated LP distribution network to be completed 2019
- CBA supported by key industrial anchor loads, domestic load, environmental and social benefits
- Broad Political and public support



## Example: Potential Project - Fort William (Scotland)

- Independent Market study undertaken.
  - Public - 68% support, 20% unsupportive, 12% not sure
  - Very early day - Options and cost benefits to be considered

### Frequent Benefits expressed by respondents



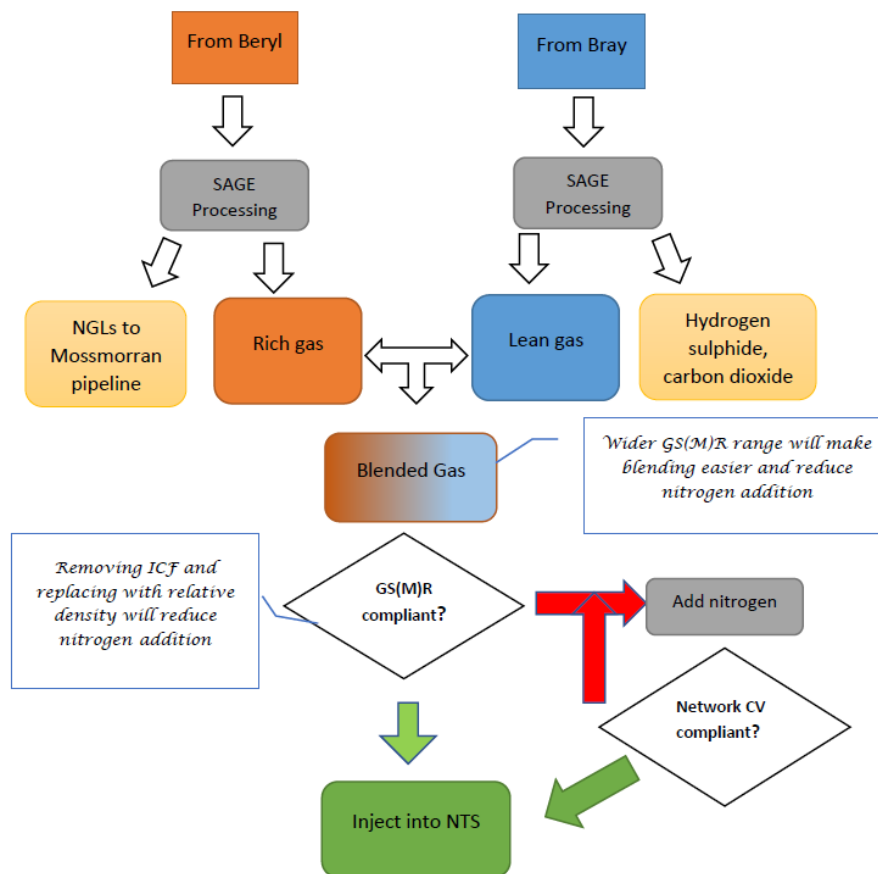
### Frequent concerns expressed by respondents



# Opportunities – Extending Range

## Extending the range of gas transported

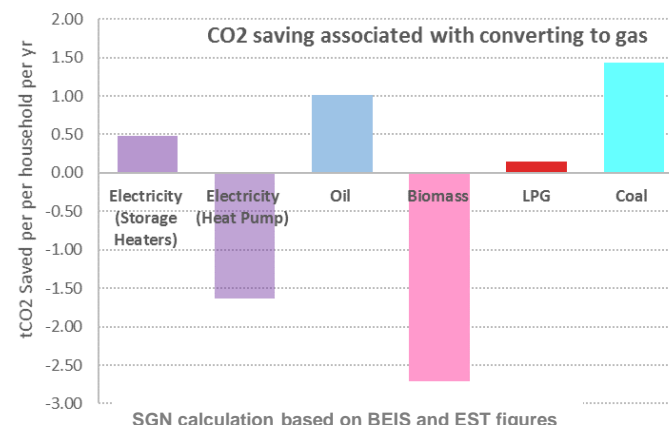
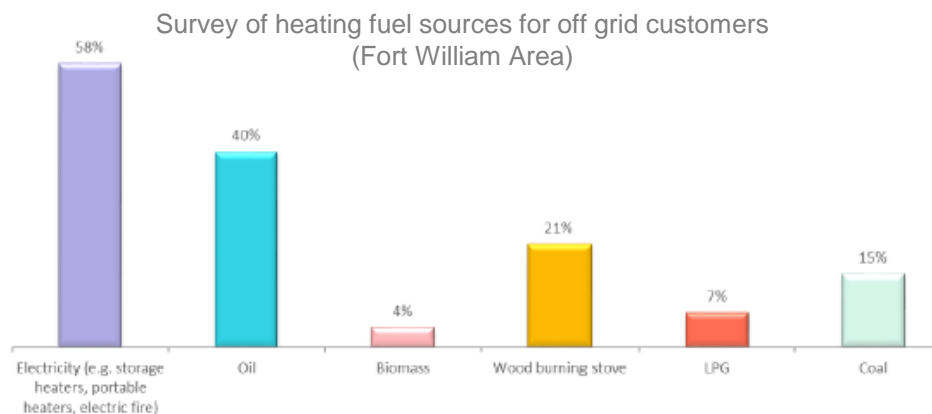
- Significant expenditure spent on ballasting of gas to maintain GS(M)R standards.
- Builds on the work in Oban and the NIC project Opening up the Gas Market.
- Reduced ballasting costs for SIUs.
- Reduced nitrogen injection and associated costs at sites like Ancala and the CATs terminal.
- Continue to progress through IGEM cross industry working groups.
- Broader benefits in reducing the cost of biomethane injection.
- Linked through to future billing methodology.



# Opportunities – Decarbonisation

## Off grid customers

- Natural gas is the most easily deployable way to reduce carbon emissions particularly where grid, site or cost constraints limit electrification.
- Lifetime savings will depend on:
  - Rate of zero carbon deployment in electricity sector compared to growth in demand from electric vehicles
  - Cost to decarbonise natural gas safely through biomethane and bioSNG.
  - Success of Hydrogen / CCS projects such as Acorn



# Conclusions

- Gas remains a 'first choice' fuel for local authorities, developers and consumers. This will remain through GD2.
- At its heart the economic test is a relatively simple, standardised NPV model.
- Complexity requires a simple model that can be applied to a broad range of potential connections across all aspects of the network.
- Extending the network can facilitate decarbonisation through network extensions and rural connections. This can be facilitated through the economic test.
- The economic test does not effectively cover different risk profiles, use cases or benefits associated with the more significant opportunities.
- Immediate opportunities to facilitate the longer term benefits through GSNR and Billing changes.





# Session 5



# Ofgem decarbonisation stakeholder session

In the absence of government policy direction, what should GD2 do for the future of heat?

# Agenda

***In the absence of government policy direction, what should GD2 do for the future of heat?***

- What has been learnt from GD1?
- New drivers for decarbonising heat in GD2
- How do we keep making progress in GD2?

# GD1 Achievements

- Connecting fuel poor customers and other off grid customers
  - Carbon benefit where alternative is oil
  - Social and health benefits
- Connecting new bio-methane capacity in GD1
  - Carbon benefit
- Improvements in shrinkage performance
- Small scale use of CNG vehicles in GDN fleet
- NIA projects with carbon benefits

***In the absence of a policy decision, this progress is reducing the carbon impact of heat and transport in GD1***

# GD1 Achievements

- Innovation in GD1 has helped define the role gas can play in decarbonising energy
  - Hydrogen conversion and blending – viable business cases
- The role gas can play is becoming well recognised
  - Policy of ‘active experimentation’
  - Climate Change Committee, BEIS, Clean Growth Strategy
  - National Infrastructure Commission
- Collaborative working groups inform policy and provide experience
  - Carbon Connect, Gas Futures Group

***Learning in GD1 has moved policy to ‘active experimentation’ and is providing evidence to support a decision in the 2020s***

# What can we improve from GD1?

- NIC funding – how to balance gas and electricity allowances?
- Outputs – whether to target network extension / connecting off grid customers?
- Shrinkage mechanism – how to recognise the contribution of hydrogen blending?
- Renewable incentive – how to have greater equality between gas and electricity?

***Discussion – pick one***



# New drivers for decarbonising heat in GD2

- Recognition there will be different solutions for different regions

Expectation that GDNs:

- Continue developing hydrogen conversion business and safety cases
- Keep options open for heat ahead of policy decision (likely mid 2020's)
- Avoid delays to network modifications after a decision – 2050 is getting closer
- Manage the recognised risk of keeping all options open – stranded assets

***What evidence do you need / already have to help reduce uncertainty in GD2?***

# Enablers for change in GD2

- How can trials / pilots at scale on live networks be funded?
  - NIA, NIC or other
- How can the delivery of network modifications that anticipate a policy decision be funded?
  - BAU or separately
- How can the impact of any under-utilised / stranded assets on customer bills be limited?

## ***Discussion***



# Break

# Session 7

What more should be done to ensure the companies decarbonise their operations, including on shrinkage?

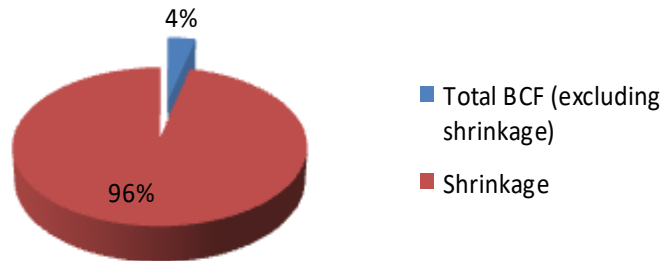
Ofgem Working Group - Decarbonisation



# Typical network business carbon footprint

## 1 x network Business Carbon Footprint (BCF)

### BCF



- 96% of BCF is shrinkage
- Methane is 21 times more harmful than CO<sub>2</sub>

Scope	Emission	Category	Units	
Scope 1	Energy consumption (excluding electricity)	Energy consumption	tCO2e	239
		Spare	tCO2e	0
		Total	tCO2e	239
	Transport	Direct commercial vehicles	tCO2e	8,120
		Business mileage	tCO2e	1,252
		Spare	tCO2e	0
		Total	tCO2e	9,372
	Total Scope 1			tCO2e
Scope 2	Electricity consumption	Electricity consumption	tCO2e	1,799
		Spare	tCO2e	0
		Total	tCO2e	1,799
	Total Scope 2			tCO2e
Scope 3	Indirect emissions	PE pipe	tCO2e	4,525
		Contractor vehicles	tCO2e	555
		Rail	tCO2e	13
		Air	tCO2e	50
		Ferry	tCO2e	0
		Spare	tCO2e	0
		Total	tCO2e	5,143
	Total Scope 3			tCO2e
Total	Total BCF (excluding shrinkage)		tCO2e	16,553
	Shrinkage		tCO2e	442,765
	Total BCF (including shrinkage)		tCO2e	459,318

# GD1 Losses through transportation

Typical network losses are reducing – 0.64 to 0.52

Year	2013/14	2014/15	2015/16	2016/17	2017/18
Throughput (GWH)	62,420	59,865	57,846	66,050	67,798
Shrinkage (GWH)	417	395	381	379	372
Leakage (GWH)	398	376	363	358	350
Shrinkage % of throughput	0.67%	0.66%	0.66%	0.57%	0.55%
Leakage % of throughput	0.64%	0.63%	0.63%	0.54%	0.52%

Achieved through:

- Iron Mains replacement
- Pressure Control equipment
- Active network management

Incentives have provided:

- Investment in smart replacement programme
- Increased maintenance spend
- Pressure control management

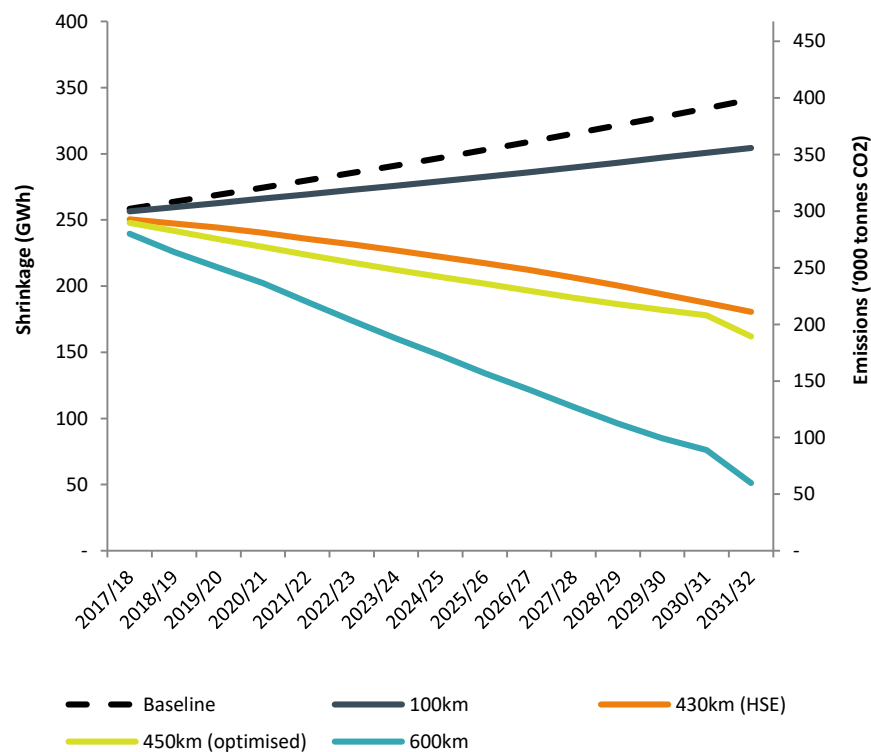
## What new drivers are there in this area for RIIO-GD2?

- Shrinkage
  - Repex
  - Pressure Control
  - Pre-heating
- Operational carbon footprint
  - Transport – GVs & filling stations
  - Offices & depots – efficiency and green energy
  - Replacement programme – PE pipe and fuel
- Greening the gas – facilitating Biogases
- Adaptation to climate change

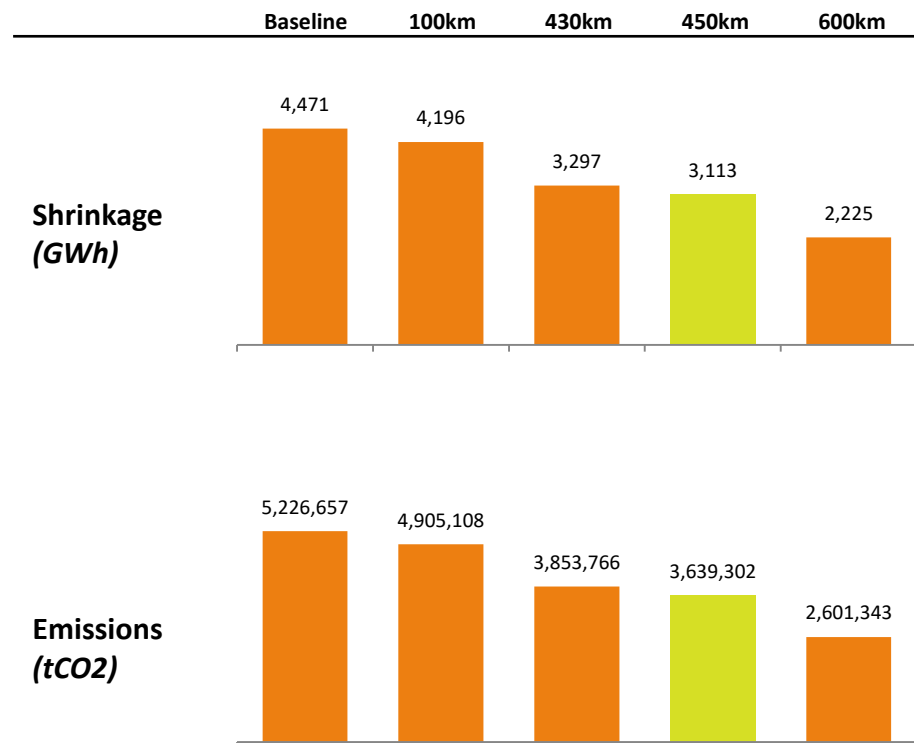
# Outcomes: Environmental

The charts below illustrate the impact of the repex programme on Shrinkage

## Shrinkage and Emissions



## Total over 15 years (2017 – 2032)



## What have our stakeholders said – iron mains?

- Iron mains replacement has moved to be fully capitalised, so shareholder fund it up front.
- Annual savings from repairs, shrinkage and emissions equate broadly to the depreciation and regulatory return.
- Stakeholders strongly support the programme when this explained.
- They also prefer road disruption once in a planned way, rather than constant unplanned repairs.



# Shrinkage - other

- Pressure Control
  - Tension now between gas entry and shrinkage
  - Should networks invest to accommodate more network entry?
  - Should consumers pay to facilitate network entry?
- Pre-heating
  - Mostly modular boilers and water bath heaters
  - Upgrading to high efficiency condensing boilers reduce CO2 emissions and NOx.
  - Low carbon preheat schemes such as GSHP, CHP may not payback in financial terms – should they be supported?
  - Should GDNs purchase green gas to cover carbon output?
  - Leakage model doesn't recognise reductions in 'own use' gas – should investment target these emissions?

# Operational Carbon Footprint

- Transport
  - Should GDNs invest in electric and gas vehicles?
  - NOx and particulates can be reduced at point of use.
  - Could a cross utility/LA transport plan be supported by GDNs, including the provision of gas filling stations?
- Offices and depots
  - Building emissions are smallest part of emissions (0.4%)
  - Should this be targeted?
- PE Pipe and fuel for replacement programme
  - Carbon payback = less than one year

## What options should be considered for outputs and incentives?

- What are the specific barriers or enablers required for change?
  - Carbon abatement payback periods are very long.
  - Cost per tonne of carbon abated is lower in gas industry than elsewhere in society.
- Options for outputs and incentives
  - Broader measure of environmental performance for GD2 – overall emission reductions including those facilitated for others?
  - What need is there for financial incentive?
  - Potentially flag bespoke outputs – which may come out through GDN business planning process
- What are the regulatory mechanisms that could facilitate carbon reduction?

# Session 8 - AOB

**Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.**

**We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers' experiences and the operation of energy systems and markets.**