# GAS QUALITY STANDARDS

UNC Transmission Workgroup
Meeting 7th December

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Institution of Gas Engineers & Managers
www.igem.org.uk

# GAS QUALITY AND STANDARDS

- **Overview**
  - Drivers for a new gas quality standard
  - Why an IGEM standard?
  - Scope and work of the Gas Quality Working Group
    - Scope and objectives of the group
    - Who is involved
    - Progress on activities
    - Next steps
  - Summary

# Drivers for a New Standard

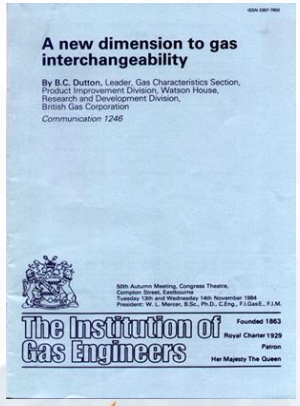
- **Gas Quality is changing…**

  1970s, 1980s

  – Dominated by southern North Sea supplies
  – Relatively stable gas quality


  1980s, 1990s

  – Northern North Sea supplies, Morecambe bay supplies
  – Slightly wider ranges




  Dutton

  – Drivers for interchangeability method

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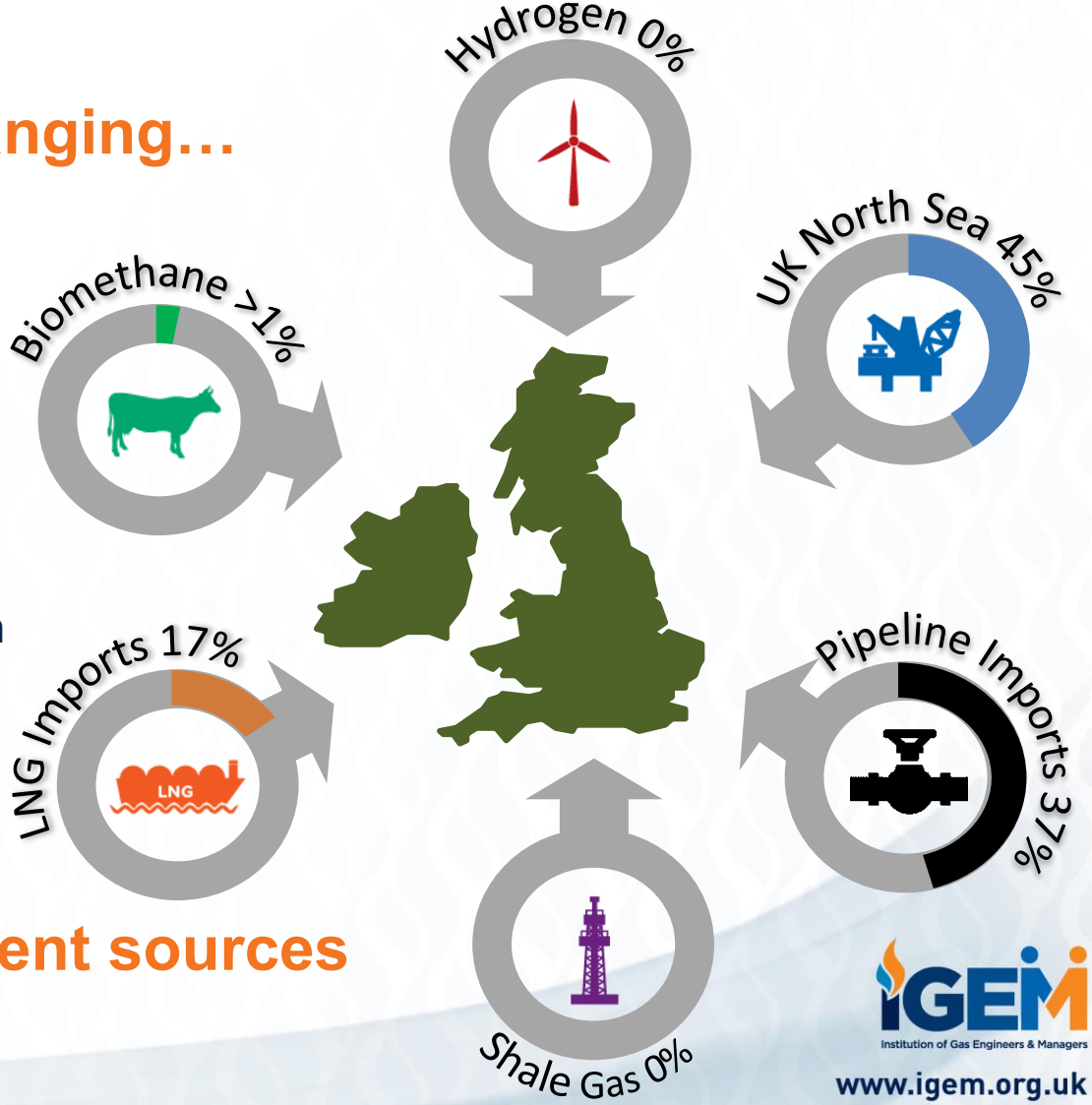
# Drivers for a New Standand

- **Gas Quality is changing…**
  - Current and future
  - Significant imports
    - Pipeline
    - LNG
  - Biomethanes
    - AD-derived
    - Biomass gasification
  - Shale
  - Hydrogen




- **…a range of different sources**

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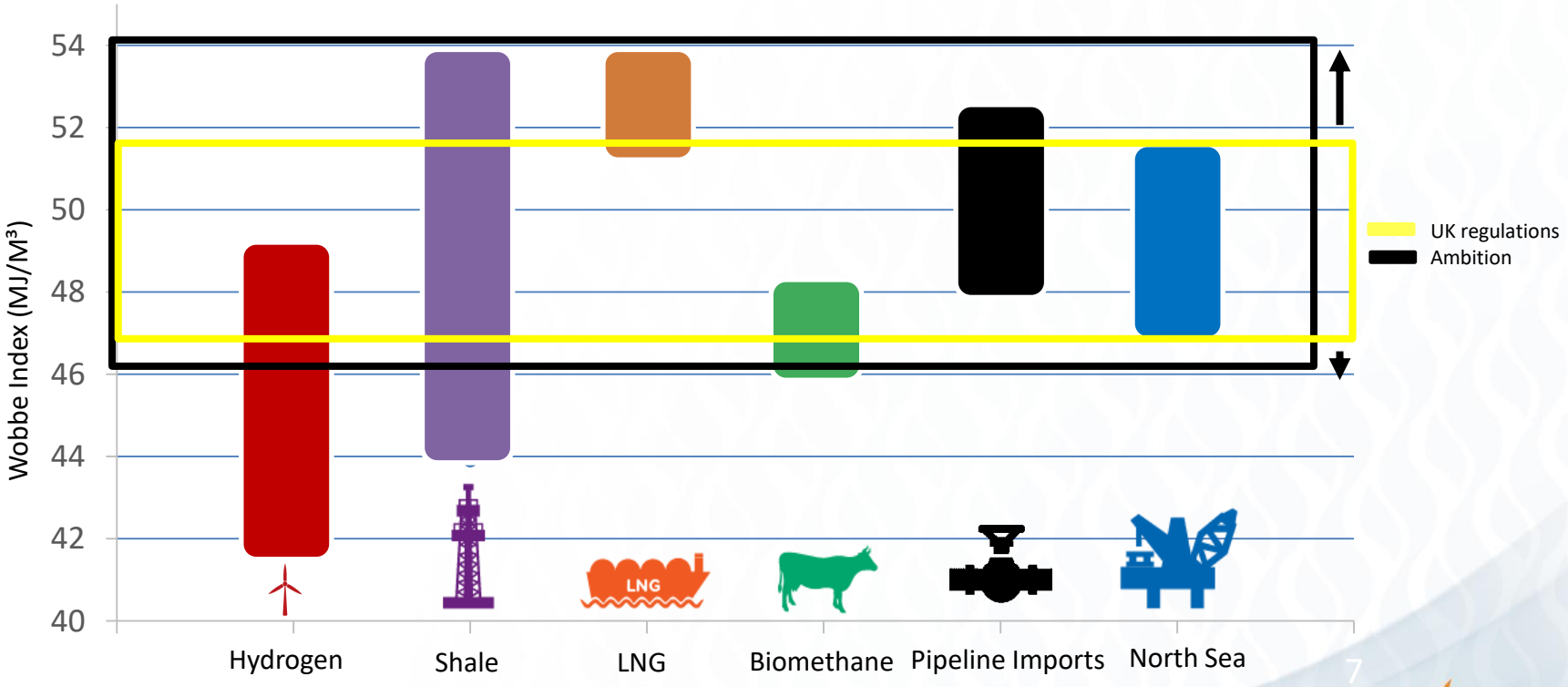
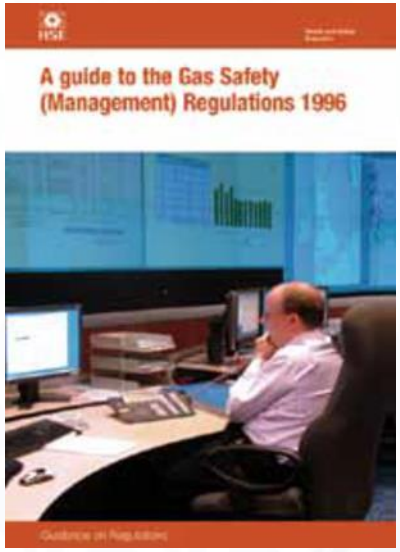
# Drivers for a New Standard

- **Current limits are becoming restrictive**



# Current Prescriptive Regulation

- **Gas quality is currently specified through the GSMR**
  - hydrogen sulphide content ≤5mg/m3;
  - total sulphur content (including H2S) ≤50mg/m3;
  - hydrogen content ≤0.1% (molar);
  - oxygen content ≤0.2% (molar);
  - impurities shall not contain solid or liquid material
  - hydrocarbon dewpoint ;
  - WN (i) ≤51.41 MJ/m3, and (ii) ≥47.20 MJ/m3;
  - ICF ≤0.48
  - SI ≤0.60




*(Schedule 3 – Part 1 Requirements under normal conditions)*

# Drivers for a gas quality standard

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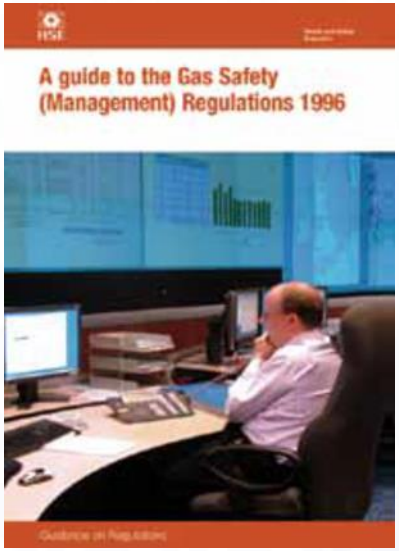


*(Exemptions currently in operation)*

*(Schedule 3 – Part 1 Requirements under normal conditions)*

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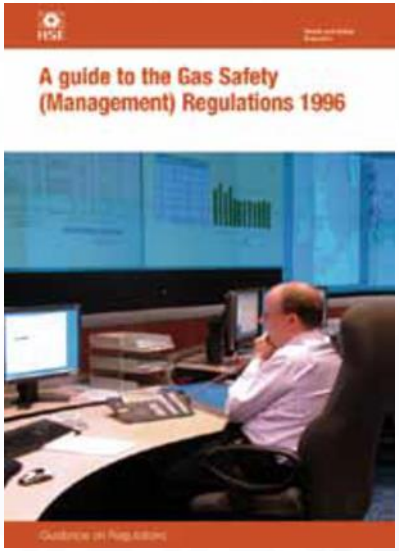


*(Exemption application pending)*
*(Exemptions currently in operation)*
*(Schedule 3 – Part 1 Requirements under normal conditions)*

# Drivers for a gas quality standard

- **Climate Change Act**
  - Sets out a transition to a low carbon economy
  - UK GHG emissions  reduced by at least 80% of 1990 levels by 2050
  - Alternative supplies from renewables and hydrogen are likely to be essential
- **Industry-led innovation projects**
  - Currently exploring innovative projects designed to support and meet our future energy needs
  - Mix of natural gas, renewable and low carbon sources
- **Schedule 3 of GSMR is a barrier to their introduction**
  - Parallel activity for development of enabling regulation

# IGEM Gas Quality Standard

- **Enabling regulation**
  - Reference to a gas quality standard
- **Why an IGEM standard?**
  - IGEM has a long history in production of standards
  - Enjoys the confidence of Industry and Government agencies at home and abroad
  - Responsive to future changes…
  - …whilst retaining strict governance through an industry peer-review process
  - Benefits to the gas consumer
  - Allows innovation and future proofing
  - Supports safety without prescriptive regulation
- **IGEM gas quality standard working group**
  - Established early 2016 following discussions with BEIS, OFGEM & HSE

# Gas Quality Standards Working Group

- **Scope**
  - Primary objective covers gas quality in the UK
  - Will initially examine the upper limit in Wobbe index
  - Examine prospects for further widening at the lower end of the Wobbe index range
  - Examine the case for change of other parameters
- **Process**
  - Examine previous and current studies
  - Commission further work where gaps exist
- **Funding**
  - Network innovation allowance project

# Gas Quality Standards Working Group

- **Current membership**

nationalgrid

SGN Your gas. Our network.

Energy UK

Northern Gas Networks

WALES&WEST UTILITIES

HHIC

kiwa Partner for progress

Cadent Your Gas Network

ICOM Energy Association

davelanderconsulting

HSE Health & Safety Executive

DNV·GL

CHEMICAL INDUSTRIES ASSOCIATION

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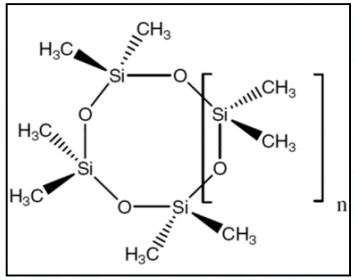
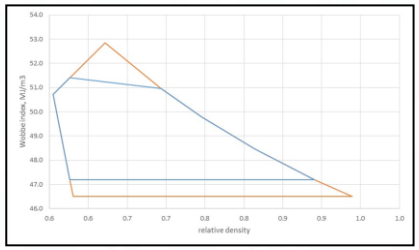
# Gas Quality Standards Working Group

- **Progress on activities**
  - First Meeting in June 2016 - 10 x meetings
  - 14 x Presentation Technical Papers
    - Review of Domestic Case Oban OGM
    - Dutton Revisited
    - Test Gases for Hydeploy
    - Pipeline Fracture Propagation
    - Siloxanes



  - Research Papers from Europe/America – 37 x Papers
  - GSMR Consultation – 28 x Responses on Gas Quality
  - Stakeholder Engagement
  - 1st Working Draft
  - Commissioned Industrial and Commercial research

# Gas Quality Standards Working Group

- **OBAN PROJECT OVERVIEW**

1,100 gas properties

Statistically representative of Great Britain

LNG storage LNG storage

Self-contained network

2,500 gas appliances

SGN

Supplied with LNG by road truck

"One small Scottish town is about to change the gas industry for the better"

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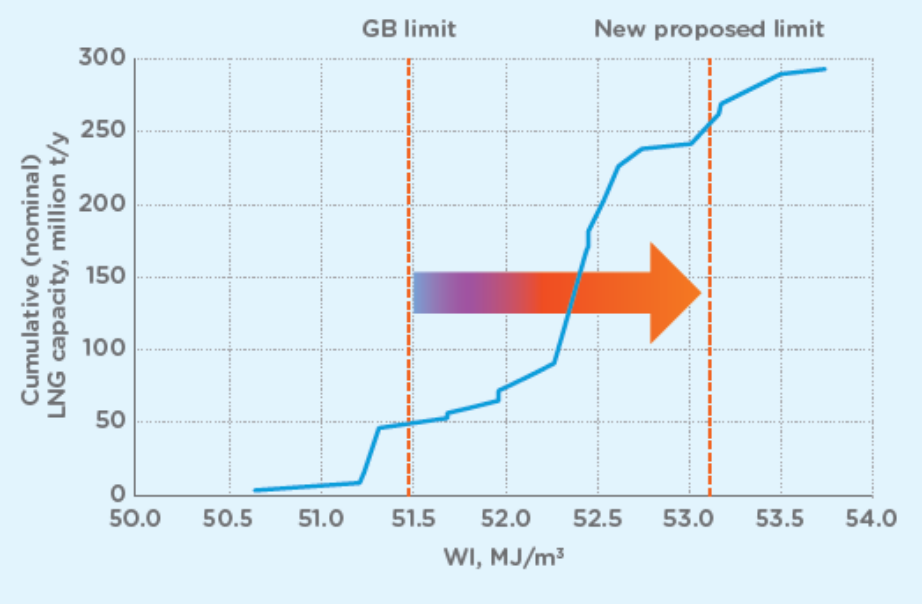
# Gas Quality Standards Working Group

- **Oban project recommendations**
  - Increase in the upper WI limit from 51.40 MJ/m3 to 53.25 MJ/m3.
  - Proposed limit allows sufficient headroom for any deleterious unknowns in the field condition of appliances

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# Gas Quality Standards Working Group

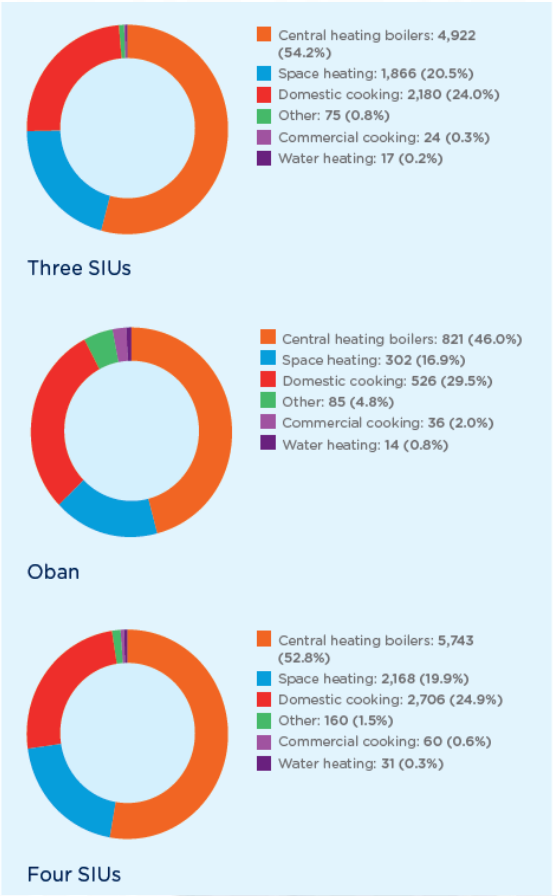
- **Review of Oban and SIU projects**

**Facts and figures for the 4 SIU's;**

7777 properties
10,860 appliance inspections
13,740 burner inspections
9,578 combustion tests
206 appliances replaced
>97% were found to be correctly installed, serviced and operated.

**Extensive data collected on the appliance health**
Condition
No of ID/AR appliances etc.
CO monitor alarms (present/operational)

**Example opposite shows appliance populations in the 3 SIU's proportionately similar to those found in Oban**



# Gas Quality Standards Working Group

- **Commissioned Industrial and Commercial research project**
  - Will explore the effects of a wider gas Wobbe Index including blended hydrogen mixtures (up to 20% H2)
  - Equipment examined will be greater than 1MW in size.
  - Range of Wobbe Index:

    45.67 MJ/m3 up to 53.25 MJ/m3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# Gas Quality Standards Working Group

- **Industrial and Commercial research project**
  - Phase 1
    - Collate types of Industrial and Commercial equipment and customers impacted
    - Review of prior work into gas quality impacts on these equipment
  - Phase 2
    - Exploration of mitigation
    - Engagement with customers/manufacturers to develop mitigation measures/costs

# Gas Quality Standards Working Group

- **Next steps**
  - Peer Review of the New Approach Proposals
  - Impact Assessment
  - GSMR amendment process
  - Parallel review of other GSMR clauses
    - HSE view the process will be led by the changes to gas quality
  - Produce industry draft for comment of IGEM standard
  - Amend GSMR to place general safety duties on gas conveyors
  - Transfer the gas quality specification to an appropriately developed IGEM standard
    - Essential to reach agreed inter-related safety parameter
    - Essential for HSE control

# GAS QUALITY STANDARD

- **Summary**
  - Future energy needs likely to be met mix of sources
    - GSMR Schedule 3 can be a barrier to change
    - Overwhelming evidence domestic safety is not an issue
  - Transferring schedule 3 to an IGEM Standard
    - Robust flexible and future proofed
    - Supports the change required to low carbon economy
  - Significant cost savings to the UK customers
  - Increased security of supply

**www.igem.org.uk/technical-standards/working-groups/gas-quality.aspx**

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***IGEM/GL/10***
***Communication XXXX***

***IGEM Standard for Gas Quality***

# Thank you

*Founded 1863*
*Royal Charter 1929*
*Patron: Her Majesty the Queen*

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