



# The Wobbe Index in the H-gas standard and renewable gases in gas quality standardisation

Presentation by CEN

Sector Forum Gas WG Pre-normative studies on H-gas quality parameter (SFGas GQS)

Kris de Wit, Chair ([kris.dewit@gasbe.de](mailto:kris.dewit@gasbe.de))

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## EU harmonization of gas quality – Remind the context

### EC Mandate M/400 (2007) to CEN for standardization in the field of gas qualities

- directly related to **Directive 2003/55/EC on the creation of a competitive single European gas market**, especially Art. 6: Interoperability of systems respecting objectivity and non-discrimination;
- supporting the **Gas Appliances Regulation (EU) 2016/426** (referred to as GAR and replacing former Directives 2009/142/EC and 90/396/EEC);
- resulting in publication of **EN 16726:2015 Gas Infrastructure – Quality of gas – Group H *without Wobbe index requirements***;
- continued by pre-normative studies on Wobbe index (WI) and other parameters ⇒ **CEN Sector Forum Gas WG Gas Quality Study (CEN SFGas GQS)**;
- aiming at completing EN 16726 for all relevant gas quality aspects.



# CEN SFGas GQS – Summary of Wobbe index (WI) study

Final report reflecting consensus and dissent related to the proposed Wobbe index (WI) requirements.

- Structure of the report:

a. Core report with

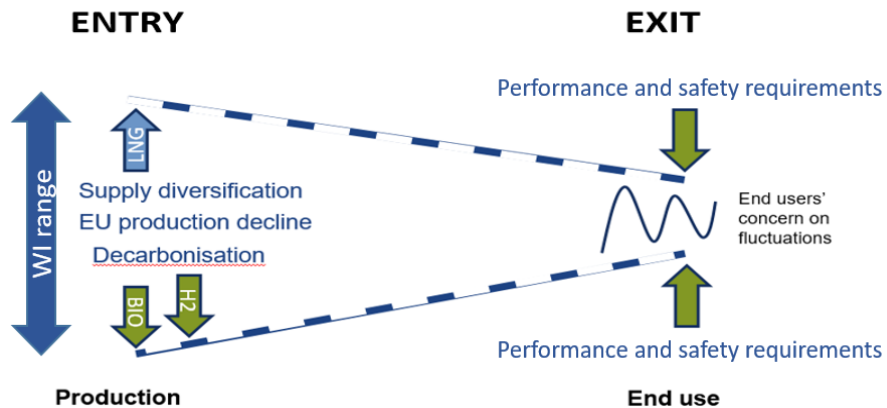
- introduction, context, summary of preparatory work/process,
- **Wobbe index entry and exit proposal**
- evaluation of the **impact of renewables**
- **recommendations on the framework** as precondition and
- **open issues/aspects** that need consideration in CEN or elsewhere

b. Annexes on:

- **rate of change,**
- **onsite adjustment,**
- answers to the consultation on the proposals and list of participating sector organizations and mirror committees.

- Comments treatment after SFGas GQS **consultation in process**

- Plan to finalize the final **report by end 2020** for delivery to CEN/TC 234





# CEN SFGas GQS - Current proposal of Wobbe index (WI) requirements

## • WI ENTRY:

➤ entry = point where gas enters the gas system

➤ 46,44 – 54,00 MJ/m<sup>3</sup>

## • WI EXIT:

➤ exit = point where gas leaves the gas system for end-use

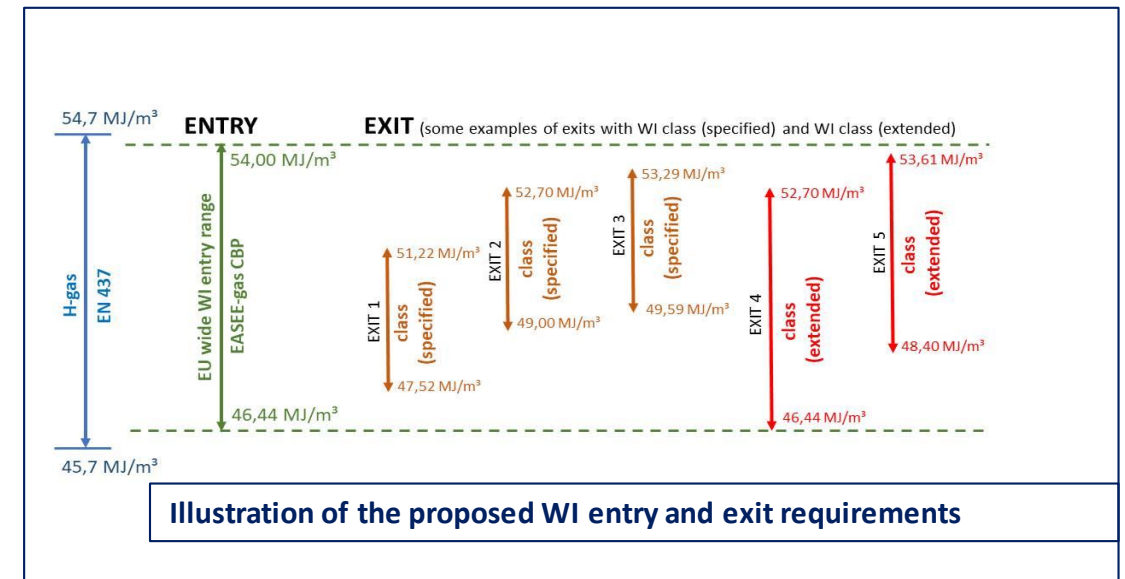
➤ WI range of gases distributed to concerned exit point determined for a certain validity period → revised afterwards

### ➤ specified class:

- WI range with a bandwidth of 3,7 MJ/m<sup>3</sup> within entry range
- 1-99 percentiles → entry range limits apply in case of non-respecting class limits
- no specific further requirements

### ➤ extended class:

- WI range with a bandwidth > 3,7 MJ/m<sup>3</sup> within entry range
- 1-99 percentiles → entry range limits apply in case of non-respecting class limits
- presence of sensitive applications to be examined and appropriate mitigating measures to be implemented



The 'gas system' covers the transmission and the distribution system.

Reference conditions for all WI figures: 15 °C for combustion, 15 °C and 101.325 kPa for gas volume



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## Key items to be solved during comments treatment:

### ➤ **WI entry range**

- Inclusion of LNG imports with high WI (cf. security of supply and competitiveness).
- Prepare the WI requirements increased use of renewables with lower WI (cf. decarbonisation).
- Difficulty to separate the WI entry range completely from the WI exit range due to the potential exceptional case that end-user can receive gases with the full WI entry range (7,56 MJ/m<sup>3</sup> vs. 3,7 MJ/m<sup>3</sup>).
- Risk of malfunctioning (safety, emissions, efficiency) of applications with upper WI limit > ~ 53 MJ/m<sup>3</sup> (if not specifically adjusted to this limit).

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# CEN SFGas GQS – Impact of renewables on Wobbe index (WI) proposal

- Blending of hydrogen or lower WI biomethane into a natural gas stream results generally in a decrease of the WI.
- The proposed lower WI entry range reflects this.
- The classification can also be applied for these blends.
- Remark: injection of these gases, especially hydrogen, affects other gas quality parameters (e.g. methane number, relative density).

Gases	Possible max concentration in natural gas within the defined WI entry range (depending on the base gas)	
	WI entry range of 46,44 MJ/m <sup>3</sup> to 54 MJ/m <sup>3</sup> (without exceeding lower WI limit)	<u>Example</u> of Class Specified: 49,0 MJ/m <sup>3</sup> to 52,7 MJ/m <sup>3</sup> (before re-classification is needed)
Synthetic methane	100 vol-%	up to 100 vol-%
Biomethane (EN 16723-2)	100 vol-% (46,65 MJ/m <sup>3</sup> to 50,37 MJ/m <sup>3</sup> )	up to 100 vol-% (if the biomethane WI ≥ 49,0 MJ/m <sup>3</sup> )
Hydrogen	8 vol-% to 45 vol-% (45,88 MJ/m <sup>3</sup> )	2 vol-% - 27 vol-%

*Note 1: This study disregards the impact of these gases on other gas quality parameters.*  
*Note 2: A re-classification of a class is not required, when its lower WI limit is not exceeded for more than 1 % of the time (cf. percentiles).*





# Framework for implementation of SFGas GQS Wobbe index (WI) proposal

Although the competency of CEN is clearly technical in this matter, **SFGas GQS collected the framework/process-related issues raised during the discussions** in order to document and forward them to EC together with the result of the on-going SFGas GQS process :

- a. **Transparent methodology rules and procedures** for a reliable implementation of the proposed **classification system** (assignment of classes, validity duration ...).
- b. **A legal framework for enforcing the implementation of the classification proposal** and more specifically **roles and responsibilities** is to be elaborated by the European and national authorities (ministries & regulators) in close collaboration with all stakeholders.
- c. **European alignment of safety and environmental requirements for comparable end-use applications**, as existing national/regional requirements lead to different acceptable WI bandwidths in different Member States or even different regions in one Member State.
- d. **Regulation (EU) 2016/426** on (residential and commercial) gas appliances (**GAR**) requires to satisfy the essential requirements for the gases distributed on the territory in the country of destination. it is recommended to study the possibility of **replacing the current national WI specifications published in the OJEU by harmonized WI specifications based on the classification system**, in order to prepare a future common stock of installed gas appliances.
- e. **In case of presence of sensitive applications**, a range of **mitigating measures** shall be considered locally and on a case by case basis in agreement between the stakeholders.
- f. **Evaluation of the existing regulatory implementation tools**, e.g. regulation (EU) 2015/703 (NC INT): The regulatory framework probably needs to foresee a step-by-step implementation to allow for solving different national issues (due to current legislation, stock of existing installed applications not coping with wider WI bandwidths, etc.).
- g. ...



## Open issues in CEN and/or elsewhere

SFGas GQS has identified the need for **further considerations in CEN and/or in other organisations** raised during the discussions , e.g.:

- a. **Implementation of the Wobbe Index proposal as part of the CEN standard EN 16726:** the WI proposal for entry points is wider than the legal WI limits in some Member States and could lead to A-deviations on a revised EN 16726 standard.
- b. **Rate of change of WI is identified as a significant issue:** further work on **tracking of the rate of change and related end-use requirements** are needed.
- c. Further confirmation and information of the **abilities of different appliance categories (acc. to GAR)** would be useful to evaluate whether the current local/national stock of installed appliances can accept wider WI exit ranges or not.
- d. Further work is needed for **auto-adaptive controls of gas application settings**, e.g. ability of existing controls, possibility of retrofitting, improvements of controls.
- e. On-site adjustment is widely spread practice to optimise performance: **improvement of the way of adjusting the installed applications** to the local WI exit range is needed.







# Joint efforts for finalisation of SFGas report on Wobbe index

## CEN and CENELEC Members:

- AFNOR (F),
- ASI (A),
- BSI (UK),
- DIN (GE),
- DS (DK),
- NBN (B),
- NEN (NL),
- NSAI (IRL),
- NQIS ELOT (GR),
- MSZT (HU),
- PKN (PL),
- SIS (S),
- SIST (SLO),
- UNI (I),
- UNE (E)

## European associations

- afecor
- CECOF
- C.E.F.A.C.D.
- CEFIC
- COGEN Europe
- EASEE-gas
- EBA
- EHI
- ELVHIS
- ENTSOG
- EUGINE
- EURO-AIR
- EUROGAS
- Euromot
- ETN European Turbine Network
- EUTurbines
- FARECOGAZ
- GIE
- IFIEC
- IOGP
- Marcogaz
- NGVA Europe

## European Commission

- Joined Research Centre, JRC





## Contact

**Kris De Wit**  
**Chair CEN SFGas GQS WG**

+32 478 97 93 84  
[kris.dewit@gas.be](mailto:kris.dewit@gas.be)

**Hiltrud Schülken,**  
**Secretary CEN SFGas GQS WG**

+49 228 9188 905  
[schuelken@dvgw.de](mailto:schuelken@dvgw.de)

