marcogaz

TECHNICAL ASSOCIATION
OF THE EUROPEAN NATURAL GAS INDUSTRY








Towards a harmonised EU specification on Gas Quality : Marcogaz contribution

The authors:

marcogaz

François CAGNON — Gaz de France

Kris De Wit — Technigas

Daniel HEC, Alessandro CIGNI — marcogaz

Dave LANDER — nationalgrid

Howard LEVINSKY — gasunie Engineering & Technology

Michael MOLLNER — OVGW Österreichische Vereinigung für das Gas- und Wasserfach

Jose SAHUN — gasNatural

Francisco SICHAR — sedigas Asociación Española del Gas

Bruno VIGLIETTI — Eni Snam Rete Gas

Context

marcogaz

- Gas Quality specification differs within EU countries
  - **Considered as hurdle to free movement of gas**
- EASEE-gas prepared a Common Business Practice on gas quality
  - **Consumers represented only by industrial users**
  - **No representation from residential market (manufacturers/users)**
- MARCOGAZ WG "Gas Quality" gets involved
  - **Marcogaz associated member of EASEE-gas**
  - **WG Gas Quality created in May 2002**
  - **Scope of WG: "Impact of gas quality on applications"**

Marcogaz involvement

- Harmonised gas specification at cross border points:
  - **Gas will usually be distributed as such**
  - **Gas shall be usable by domestic market**

- MARCOGAZ WG "Gas Quality" gave advice
  - **Parameters and specifications proposal covering safety issues for (some) domestic users**

The situation in 2005

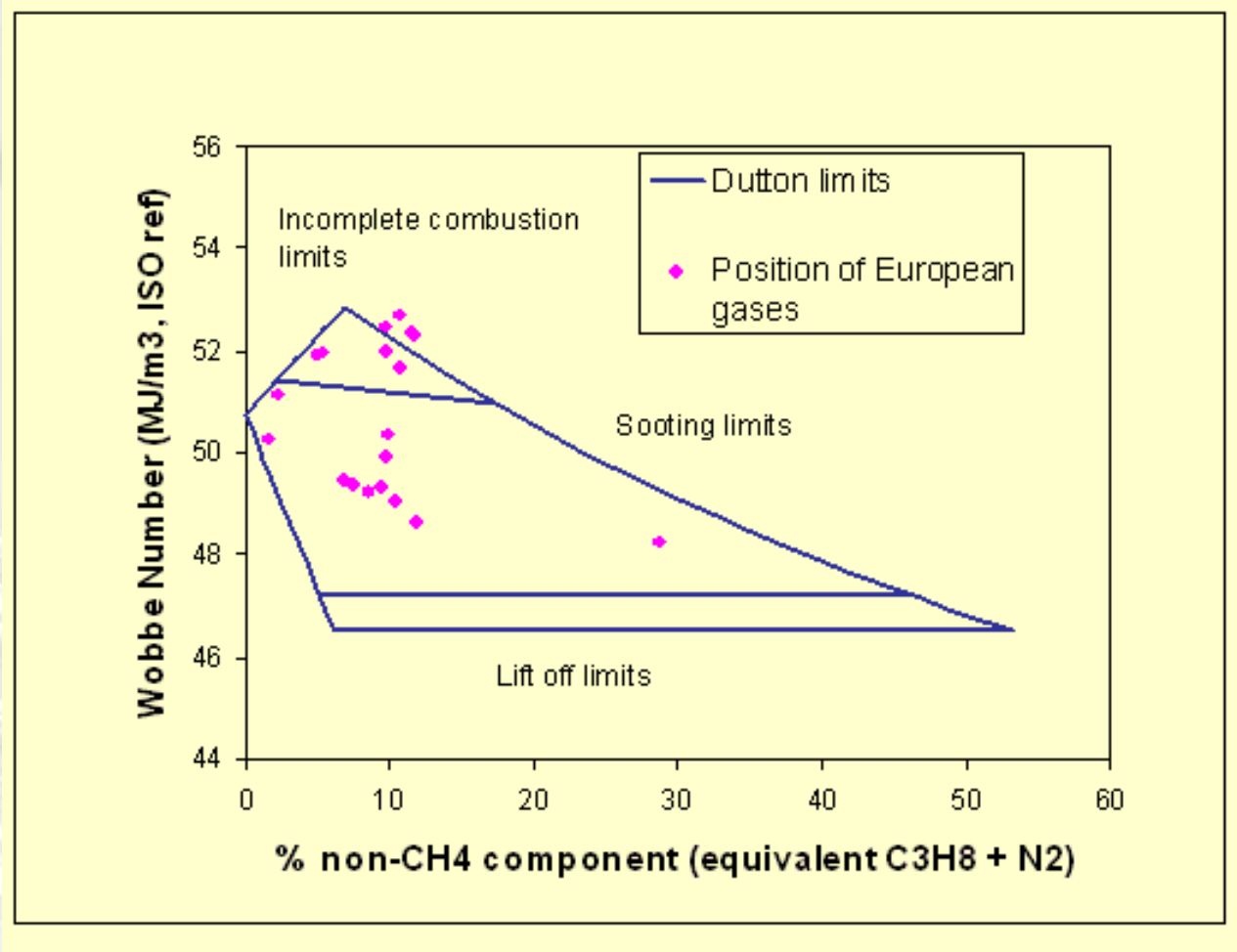
marcogaz

- All EU countries use WOBBE index for interchangeability
  - **Different limits from one country to the next**
- Some countries are using additional parameters
  - **UK : SI, ICF**
  - **Be : Combustion potential**
  - **…**

Dutton method (UK, published in 1984)

marcogaz

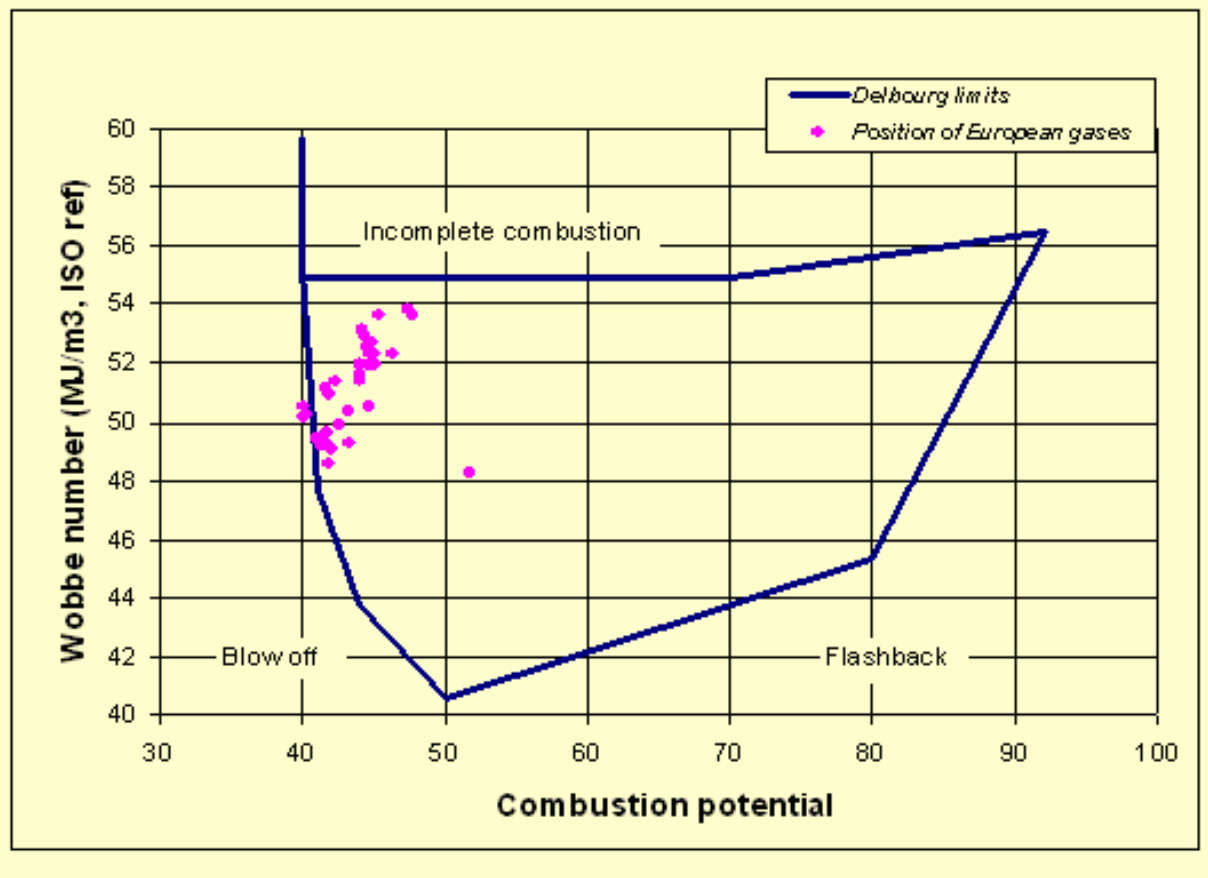
- Adresses only natural gases without hydrogen



DELBOURG method (France, published in 1971)

marcogaz

- Encompasses manufactured gases :
  - **Takes Hydrogen & unsaturated HC into account**
  - **Combustion potential related to flame speed**



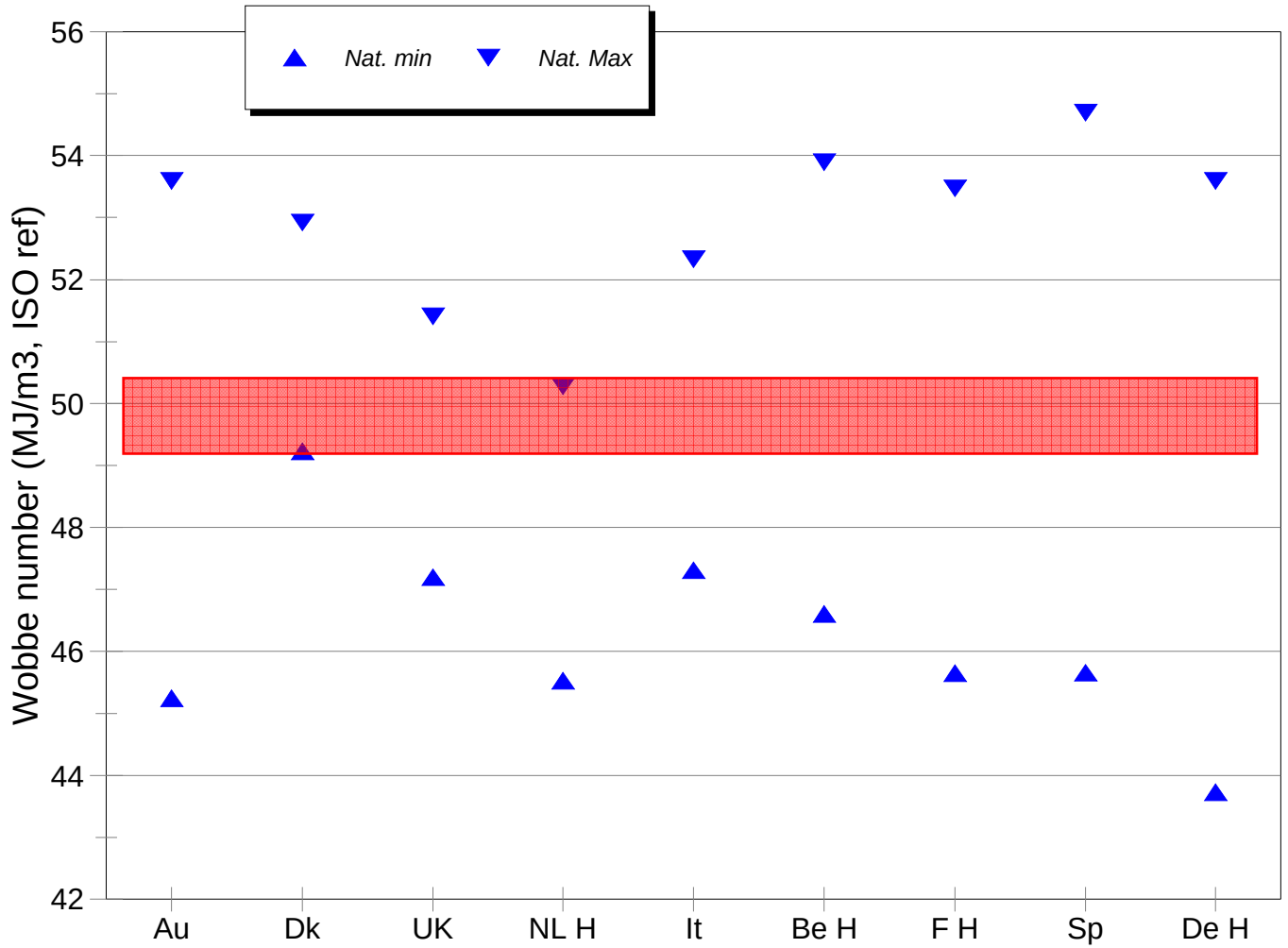
The situation in 2005

marcogaz

- Differences legacy of:
  - **Different interchangeability approaches**
  - **Different historical gas supplies**
  - **National market of gas appliances.**

Thus the current situation: Limited interoperability

marcogaz



Directive 90/396/CEE (GAD): A new approach

marcogaz

- Applicable for all appliances (except Industrial)
- When normally used the appliance shall
  - **Achieve good flame stability**
  - **No noxious compounds in harmful concentration in the combustion products**
- Normally means
  - **Installed, used and maintained accordingly with manufacturer recommendations**
  - **Gas specifications within normal limits**

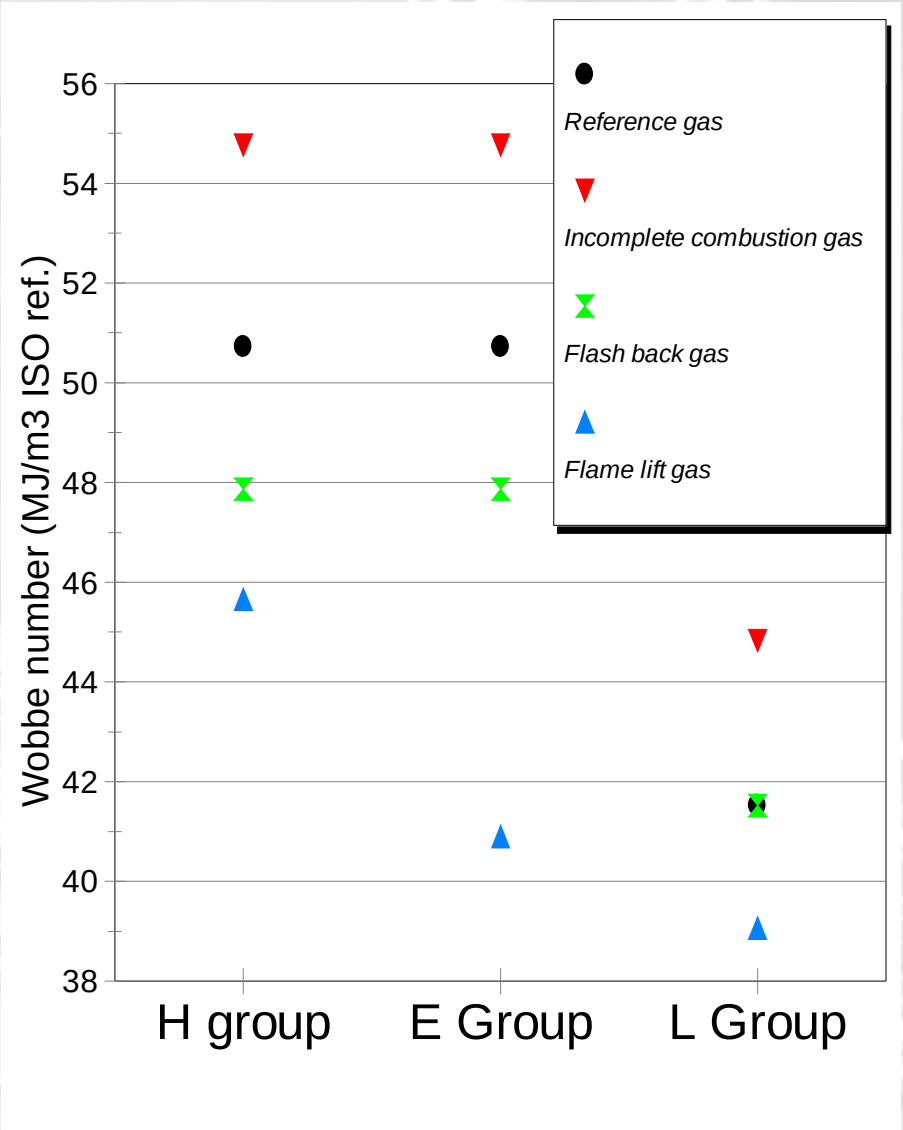
MARCOGAZ assumptions:

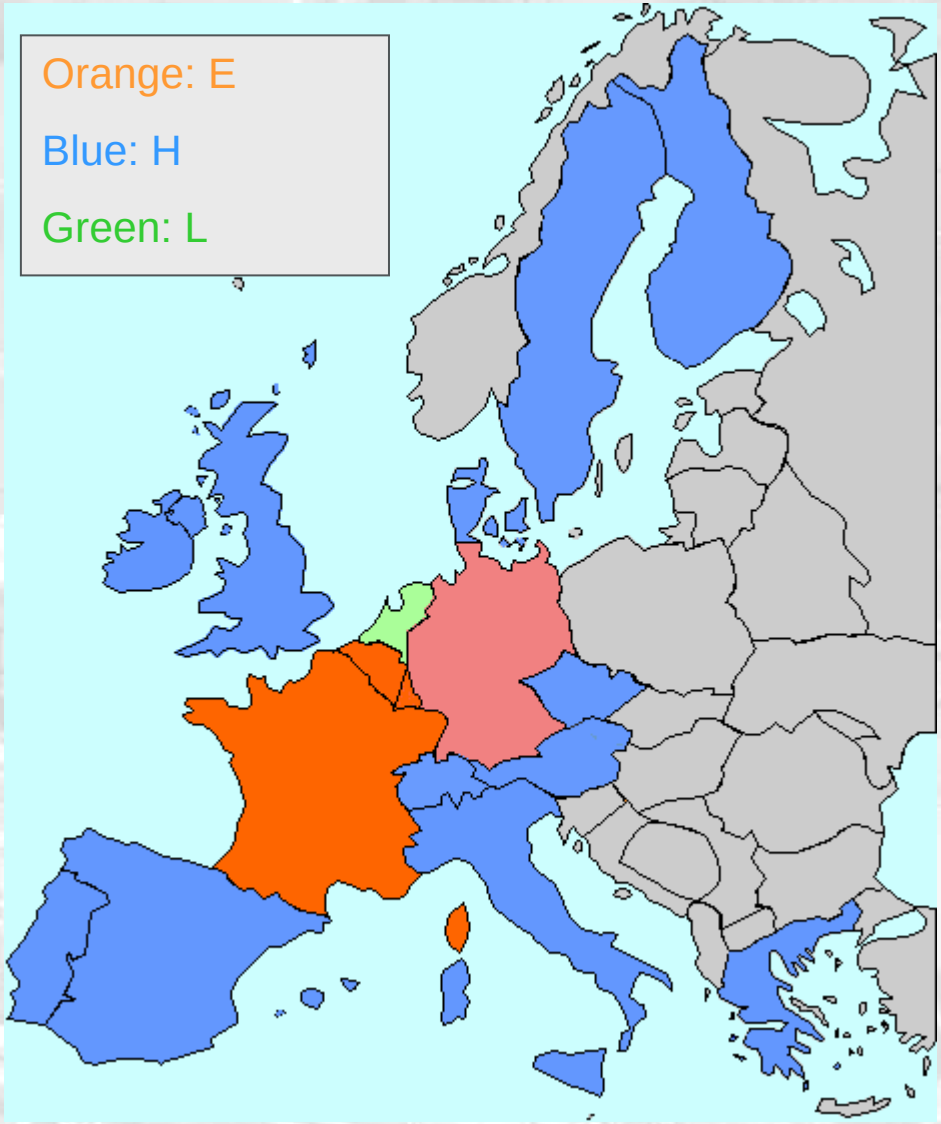
"The performance of GAD compliant appliances should be the basis for harmonisation"

- All appliances sold in EU for use with H gas since 1993
  - **Tested in the range of at least**
    45.7 – 54.7 MJ/m3 (ISO ref.)
    13.38 – 16.02 kWh/m3 (EASEE-gas ref.)

Main European markings

marcogaz





MARCOGAZ assumptions:

marcogaz

"The performance of GAD compliant appliances should be the basis for harmonisation"

- All appliances sold in EU for use with H gas since 1993
  - **Tested in the range of at least**
    45.7 – 54.7 MJ/m3 (ISO ref.)
    13.38 – 16.02 kWh/m3 (EASEE-gas ref.)

- Assumed that all such appliances perform similarly with H gases.

- Older appliances may not accept same gases
  - **Application of Marcogaz proposal to those may raise safety issues**
  - **Assumed it affects time scale for transition to harmonised specification**

Other parameters required

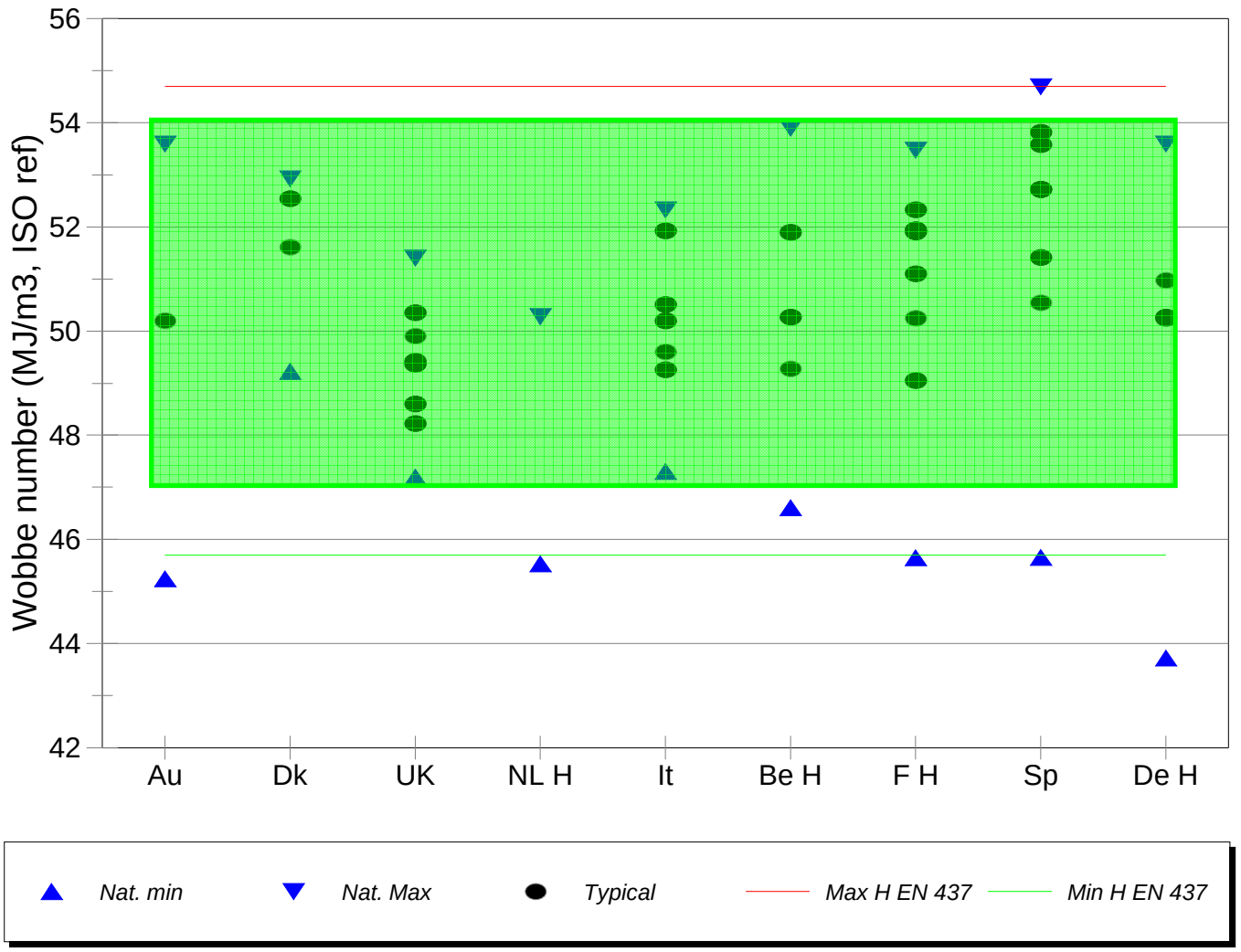
- Wobbe index range covers
  - **Incomplete combustion (partially)**
  - **Flame lift**
- Sooting / incomplete combustion
  - **Due to high concentration of heavy hydrocarbons**
  - **Marcogaz proposal: covered by relative density limit (rd <0.7)**
- Flash-back
  - **Due to the presence of high flame speed compounds**
  - **Main issue related to hydrogen injection**
  - **Marcogaz proposal valid only in the absence of hydrogen.**

Necessity of safety margins?

marcogaz

- EN 437 test conditions
  - **Operating Wobbe range for new appliances (starting point)**
- Safety margin is appropriate
  - **Aging, installation, …**
- Basis for safety margins was:
  - **Different H gases distributed around EU**
  - **Appliances able to use safely these gases**
  - **All the range of distributed gases safe to be used**
- Thus the Wobbe range proposal

Result (1/2): Marcogaz proposal



Result (2/2): Marcogaz proposal

- Wobbe index in the range 47 – 54 MJ/m^3 (ISO ref.)

  13.76 – 15.81 kWh/m^3 (EASEE-gas ref.)
- No hydrogen in the gas
- Relative density between 0.55 and 0.7

Challenges & uncertainties 1

marcogaz

"Wobbe range too large"

- Proposal based on certification results
  - **Assumes that all appliances have same working range**
- "Adjustment" of appliances possible
  - **By manufacturers (to fit local gases)**
  - **By installers or during maintenance (to fit distributed gas)**
- Consequence of adjustment
  - **Working range modified**
  - **No longer "unique" market of appliances ?**
  - **National markets and/or individual appliances ?**
- Matter under investigation.

Challenges & uncertainties 2

marcogaz

"Wobbe range too tight"

- Spain asks for increasing the higher limit
  - **Some LNG may have WOBBE index > 54 MJ/m³**
- Some producers ask for decreasing the lower limit
  - **Some H gas fields have Wobbe index < 47 MJ/m³**

Conclusion

- Marcogaz proposal:
  - **An interchangeability range consistent with EU modern appliance market**
  - **Older appliances have to be accounted for before implementation**
- But

- May be too wide in some countries
  - **"Adjustment" of appliances may occur**
- May be too tight for some players

- More investigation under consideration

Any questions ?

marcogaz