Common Business Practice on units used in Hydrogen market processes

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EASEE-gas
European Association for the Streamlining of Energy Exchange – gas

Founded in 2002

85 companies in EU gas market

Three working groups

- Technology Standards
- Message & Workflow Design
- Gas Quality Harmonisation

Solutions

- Edig@s
- Gas Role Model
- Security Certificates
- Common Business Practices (CBP's)

CBP on Hydrogen Units
Introduction

Natural gas

- Traditionally used as an energy source
- Market transactions, i.e. nominating, allocating, balancing, based on energy flow
- Energy content takes the contributions of all combustible components into account
- Units used: kWh/h (energy flow), kWh (energy)

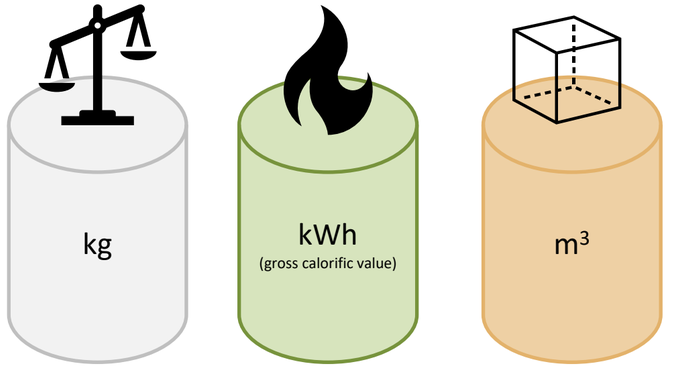
Hydrogen

- Traditionally used as a feedstock and as an energy source
- Transactions in industry based on mass with a certain quality specification (grade)
- End users are only interested in the amount of hydrogen (feedstock, carbon free)
- **Question what units need to be used?**

Units for hydrogen
Options

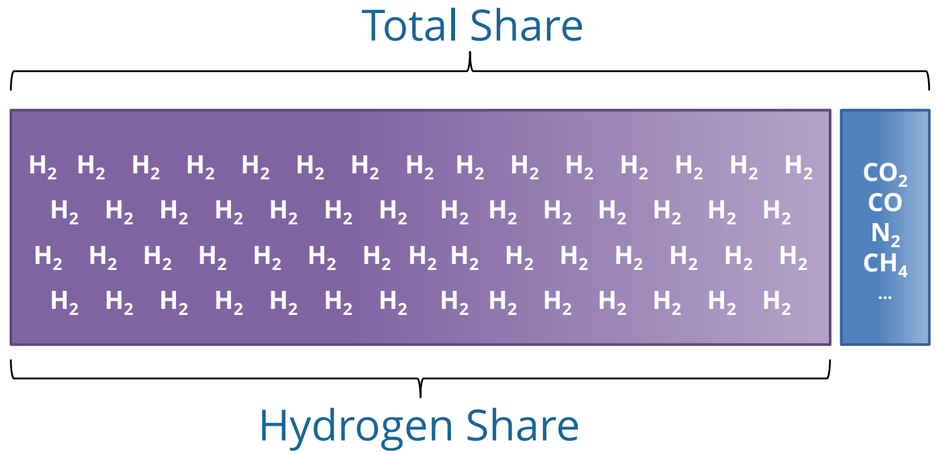
Base unit used for hydrogen market processes

- Mass (kg)
- Energy (kWh)
- Volume (m^3)



Energy determination of hydrogen stream

- All combustible components (total share)
- Only the hydrogen molecules (hydrogen share)



Base unit for hydrogen

Ranking the various options

Basis	End user acceptance	Future proof
Mass (kg)	The market for chemicals mostly uses mass but gas and electricity are traded on energy basis	Not desirable for the integration of electricity and gas market.
Energy (kWh)	Hydrogen energy (only consider the hydrogen content) could confuse end users and result in questions and / or measurement complaints. (Risk can be mitigated by information provision)	The hydrogen market is expected to be closely integrated with the electricity market.
		The current gas market messages can be used without modifications
Volume (m^3)	Volume units are not relevant for hydrogen customers.	Volumes depend on chosen pressure and temperature conditions
		Not desirable for the integration of electricity and gas market

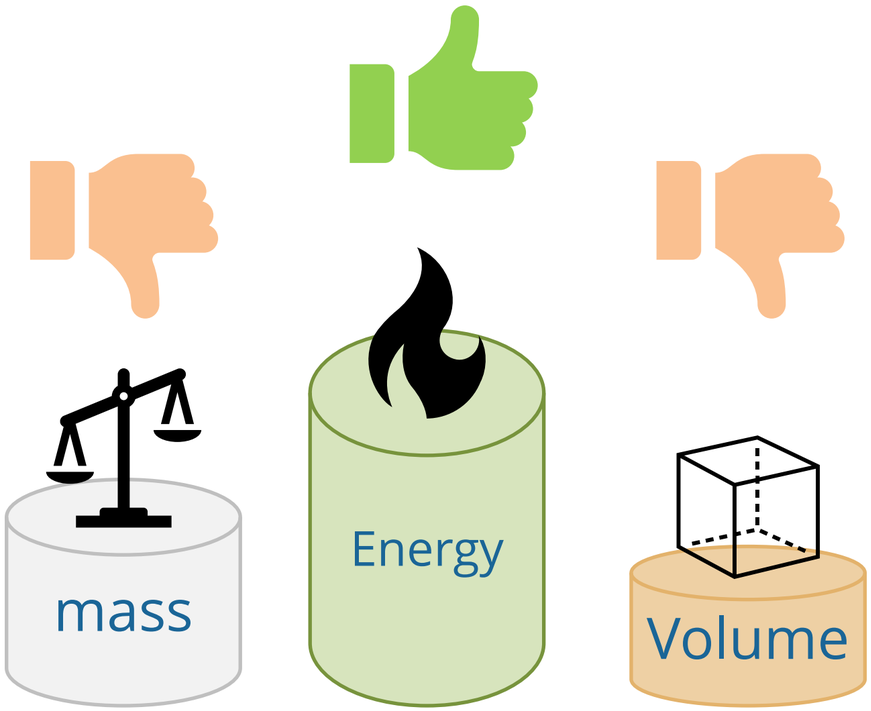
++ / no risk | 0 | - / high risk

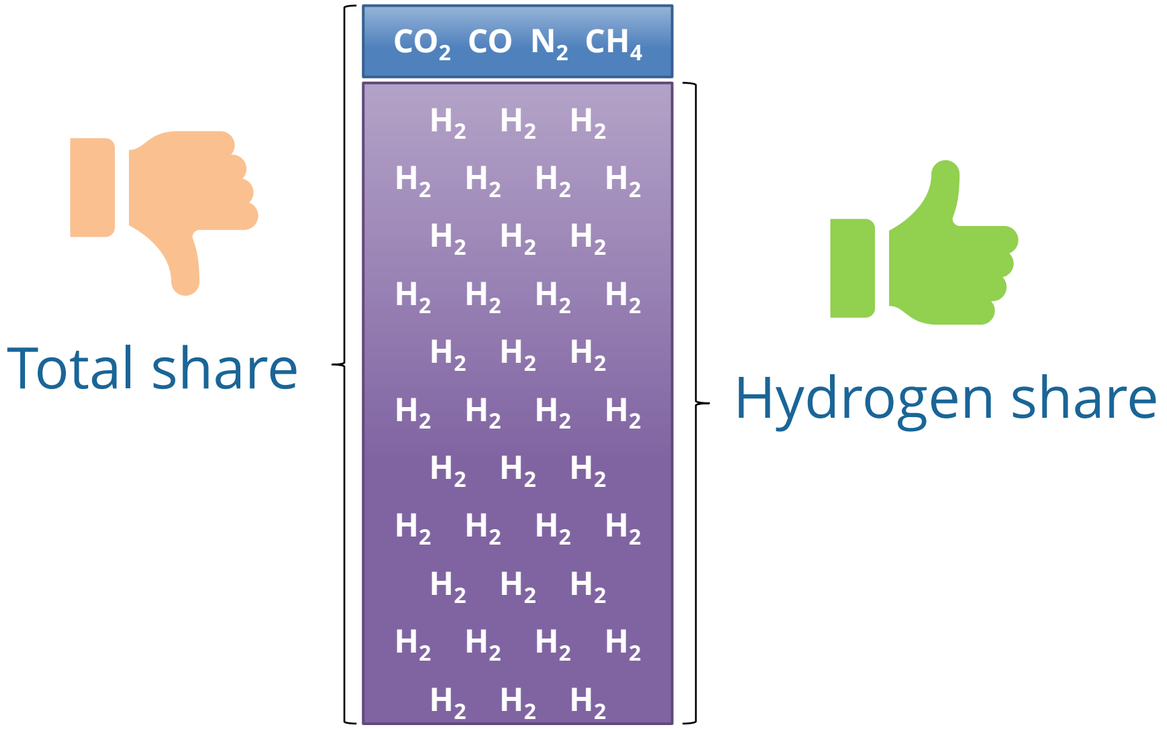
Energy determination
Ranking total share and hydrogen share options

Property	Total share	Hydrogen share
end user acceptance	Match between end user and TSO measurements (all components)	Mismatch between end user and TSO measurement (only hydrogen)
Future-proof	No incentive for producing hydrogen with higher purity and even a risk for adding additional combustible components	An incentive for producing hydrogen with higher purity and no risk on adding additional combustible components
Transmission fees	All combustible products are settled (allocation)	Only hydrogen quantities are settled (allocation).
	Transmission fees based on all combustible products (like for natural gas).	Transmission fee only based on hydrogen (Allocating of transmission costs based on the total amount of hydrogen transmitted).
Facilitating certification	The amount of all combustible components are taken into account	Only the amount of hydrogen present in the gas is taken into account

++ / no risk 0 - / high risk

Units for hydrogen
Conclusions





CBP on Hydrogen Units
Outlook

Units to be used in market processes

- Based on energy content of hydrogen is only based on the hydrogen molecules present which means the energy content of all other components is not taken into account.
- Based on gross calorific value of hydrogen calculated at a reference combustion condition of 15 °C, a volume reference temperature of 15 °C and a volume reference pressure of 1,01325 bar

Note

- In some countries a formal approval is required from the legal metrology authorities before implementation of the in the CBP proposed method is allowed.

CBP is expected to become available before the end of this year