

State of play in the EU

Country experience: the case of Europe

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The European Commission services

DG
**Internal Market,
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Climate**

AFID – Hydrogen standard requirements



AFID requirement 2.1: **outdoor hydrogen refuelling points**

EN 17127:2018 Outdoor hydrogen dispensing gaseous H₂ and its protocols

3 points
being



AFID requirement 2.3: **fuelling algorithms**

Alignment to the ISO standards started

given as example, protocols acceptable



AFID requirement 2.2: **hydrogen quality**

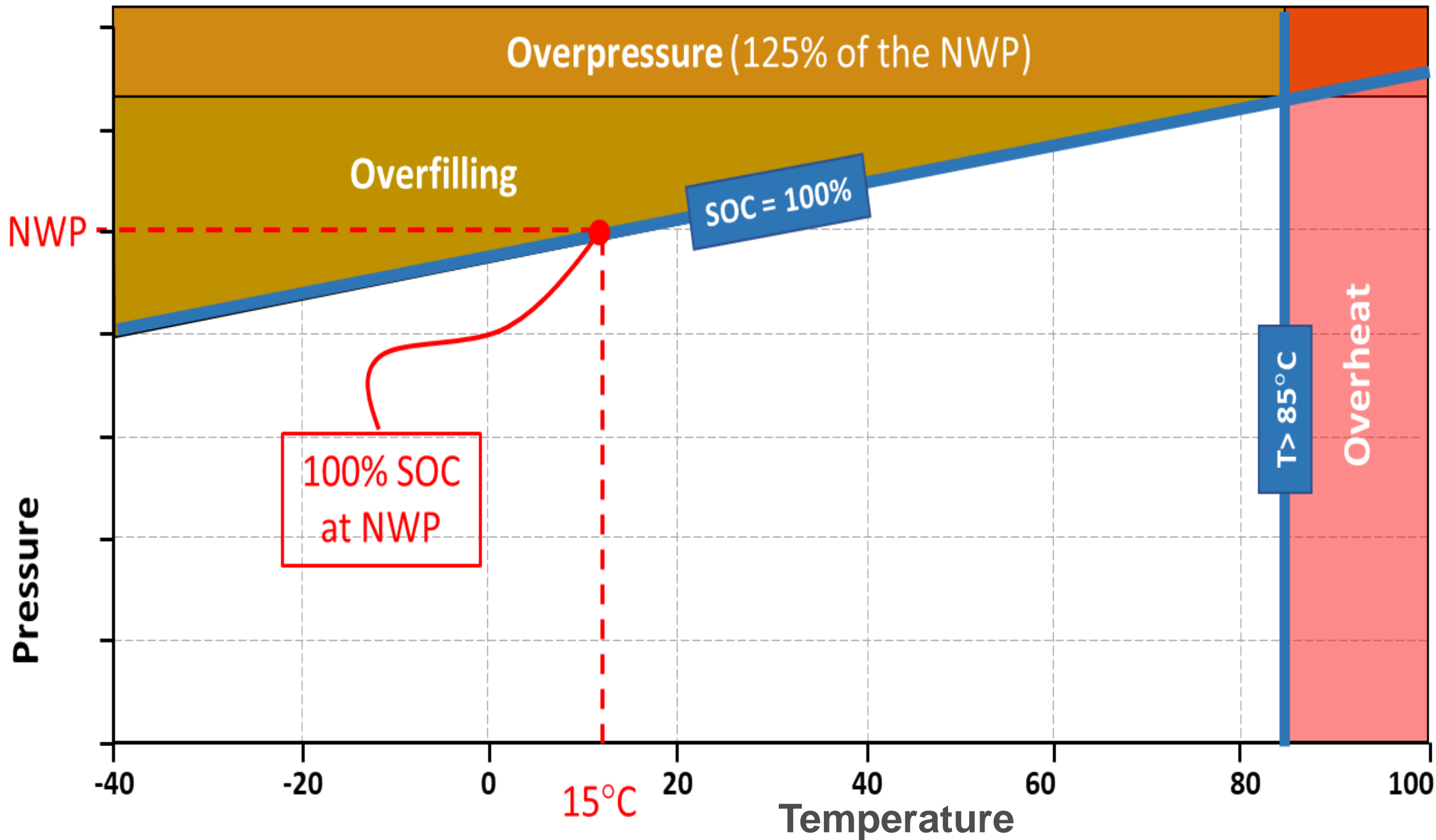
EN 17124 hydrogen quality assurance

Fuel - Product specification & FC applications for road vehicles



AFID requirement 2.4: **Connectors**

EN ISO 17268:2020 Gaseous hydrogen land vehicle refuelling connection devices



EN 17127 Refueling conditions

Ambient temperature between -40°C and $+50^{\circ}\text{C}$;

Pressure less than the maximum operating pressure (MOP);

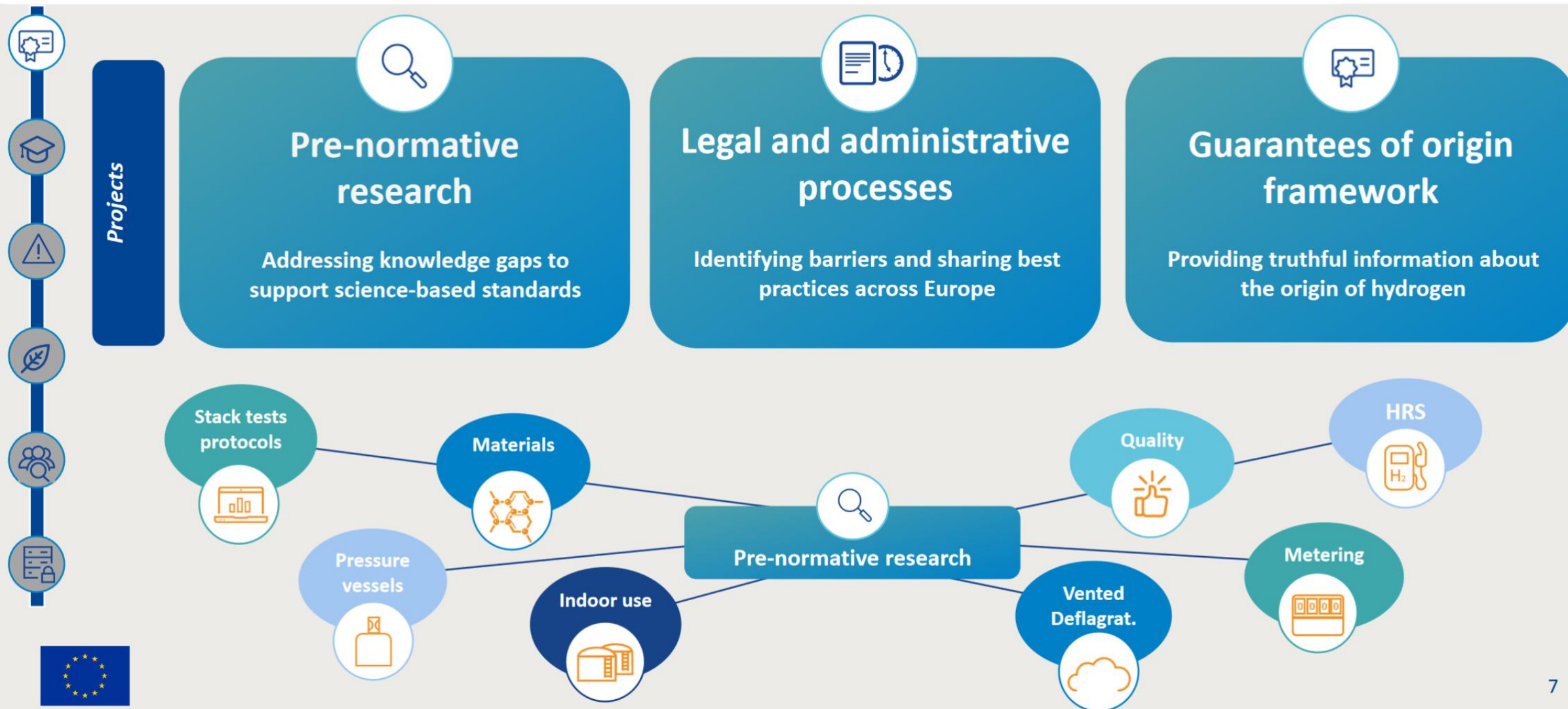
Gas temperature greater than -40°C ;

Fuel flow rate less than 60 g/s (light duty vehicles) or 120 g/s (trucks and buses);

Maximum CHSS material temperature $< 85^{\circ}\text{C}$ throughout the refuelling.

Developing suitable environments for FCH technologies in Europe

Supporting and facilitating adequate frameworks for market uptake





FCH JU projects



Pre-Normative Research for Thermodynamic Optimization of Fast Hydrogen Transfer [2013-16]



Protocol for heavy duty hydrogen refuelling [2020-21]



Hydrogen Contaminant Risk Assessment [2014-17]

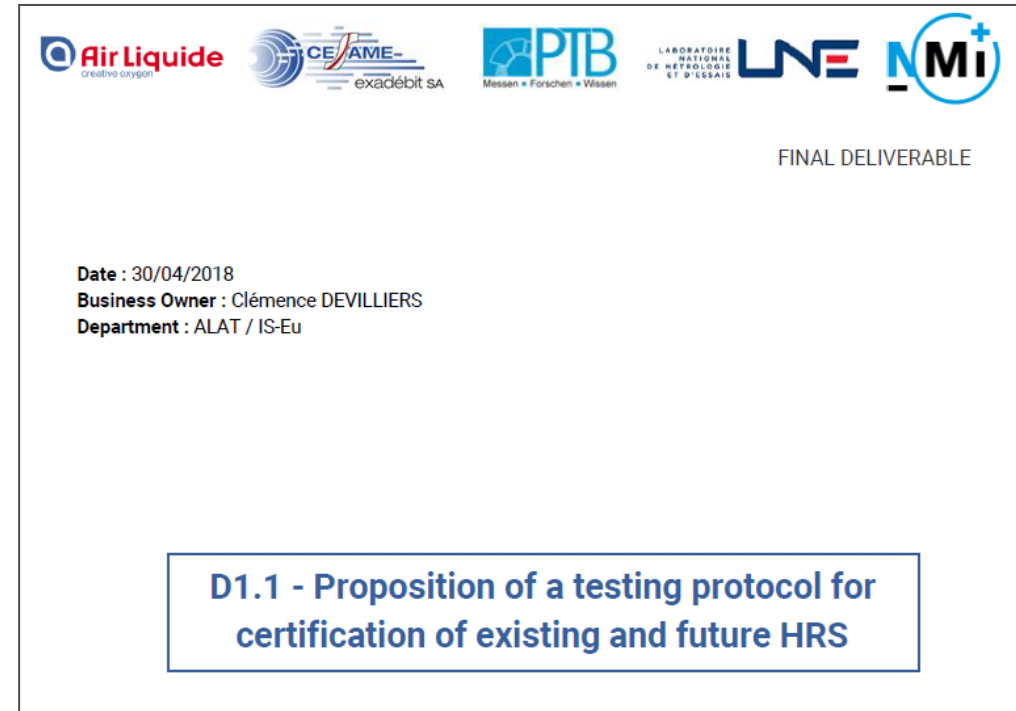


Hydrogen delivery risk assessment and impurity tolerance evaluation [2018-20]

Certification of dispensers

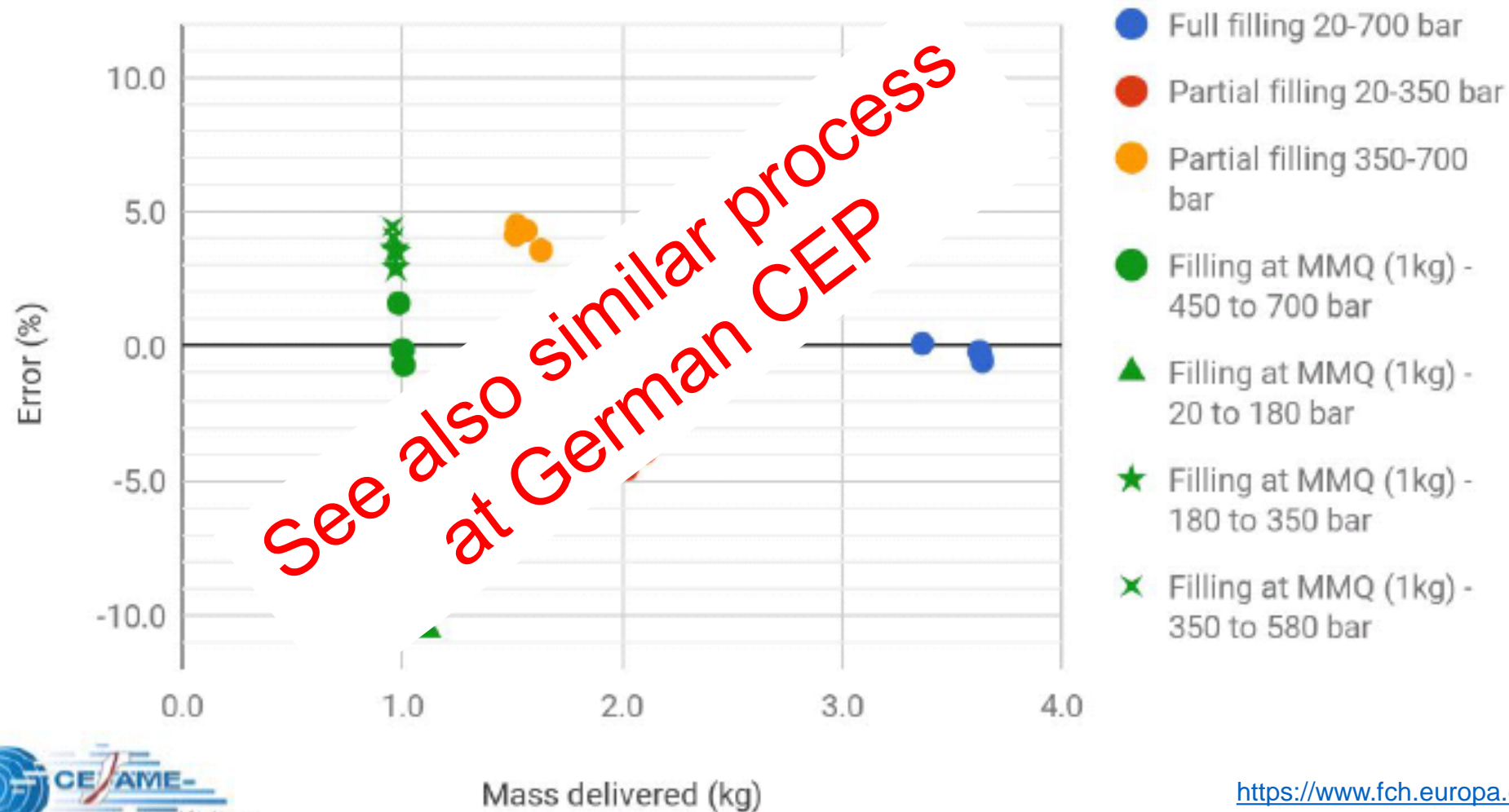
Why H2 dispensers are not certified (yet)?

- Flow meters not approved according to OIML R139 due to the absence of testing facilities
- OIML R139 updated only in 2018 to the H2 case
- Lack of certified reference testing device to determine the global accuracy of meters and dispensers



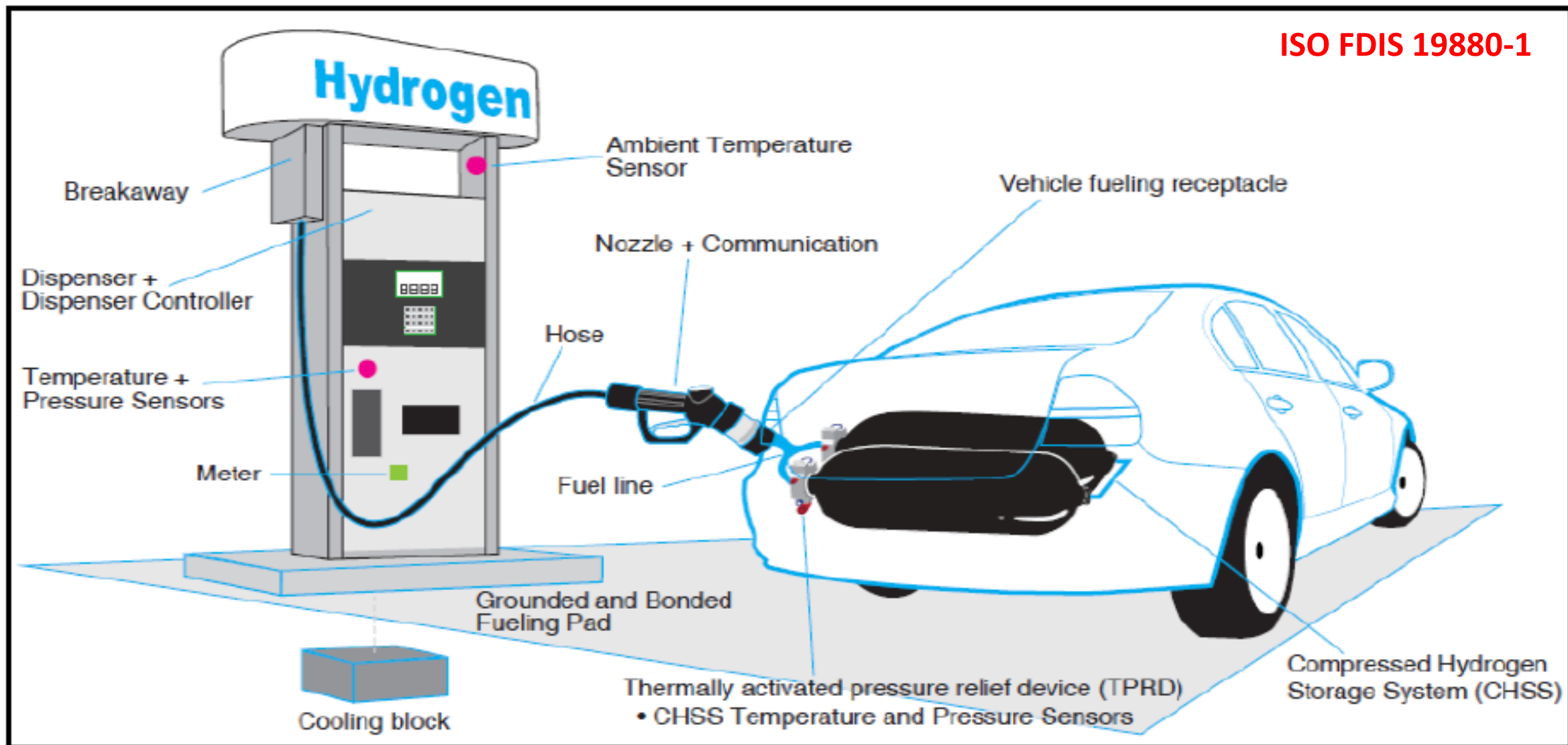
Certification of dispensers

Measured accuracies - HRS 1

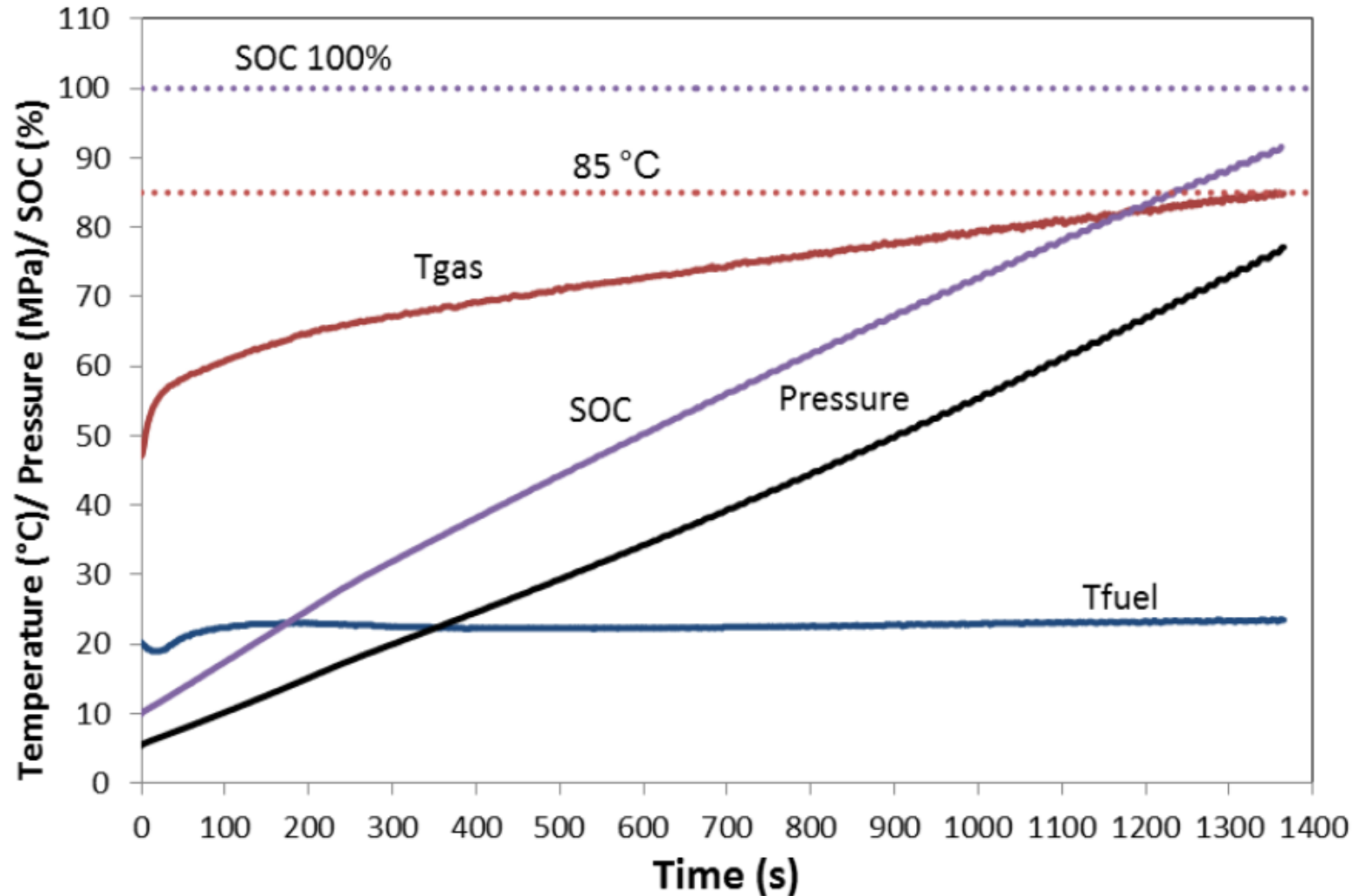


What if the refuelling goes wrong?

ISO FDIS 19880-1



Out of spec fuelling experiments



Single out-of-spec event
Type 3

Technical failure:
No cooling with a T40
table @ $T_{\text{amb}} = 50\text{ °C}$

Still to be done (gaps)

- Protocol algorithms for high mass flows, 70 MPa (*ongoing now*)
- ...from road freight transport to other modes (bunkering)
- Risk assessment and control of the refueling process
- Certification of high mass flow dispensers

Keep in touch



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Thank you for your attention

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