

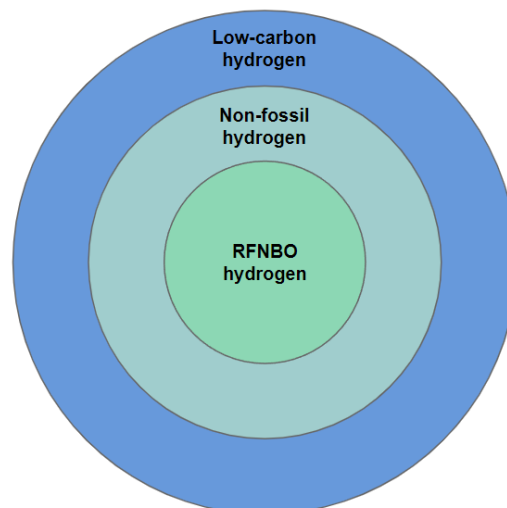
REALISTIC REGULATORY FRAMEWORK NEEDED TO ENABLE HYDROGEN ECONOMY DEVELOPMENT

DEFINITIONS FOR DIFFERENT TYPES OF HYDROGEN

Hydrogen Cluster Finland would like to contribute to discussions on supporting the development of hydrogen economy, and therefore proposes the following definitions to be considered in the context of interinstitutional discussions on hydrogen regulatory framework.

Clean hydrogen holds a large potential in reaching the climate targets. So far hydrogen discussion in the EU regulatory framework has focused on setting the criteria (only) for RFNBO hydrogen. There is a need for expanding the regulatory outlook also for other types of clean hydrogen, such as non-fossil electrolytic hydrogen (H₂ produced with electrolyser but which is not RFNBO-eligible) and hydrogen from pyrolysis and steam methane reforming using renewable/non-fossil energy.

In this document, we propose new definitions for these types of hydrogen to give them an official status and thus, possibility to be incentivised to speed up the investments needed to achieve the EU's ambitious hydrogen targets. Each type of hydrogen would be eligible to fulfil the targets but with a differentiated role. Such scheme would enable most technology-neutral achievement of hydrogen economy.



- **RFNBO** is defined in the Renewable Energy Directive (RED II), Art. 2(36): *'renewable liquid and gaseous transport fuels of non-biological origin' means liquid or gaseous fuels which are used in the transport sector other than biofuels or biogas, the energy content of which is derived from renewable sources other than biomass;*

The European Commission should adopt Delegated Acts defining the details of RFNBOs. On the basis of drafts, it seems likely that the rules for renewable electricity sourcing will be very strict, leading to intermittent hydrogen production or only part of the hydrogen produced in the electrolyser being RFNBO eligible.

Especially in the process-industry, hydrogen is needed continuously, and therefore, hydrogen production cannot be stopped when additional renewable electricity is not available. This means that also (the rest of) electrolytic hydrogen produced with non-fossil electricity needs to have a status and definition to be also suitable for incentives. Hydrogen can also be produced from renewable or non-fossil energy sources using other technologies (e.g. pyrolysis or steam methane reforming) and these should also be recognised. Incentive-wise this non-fossil hydrogen would not be as valuable as RFNBO, but better than low-carbon hydrogen.

- **Non-fossil hydrogen** to be defined in the Gas Directive, a new proposal: **'Non-fossil hydrogen' is carbon-neutral, non-fossil based hydrogen from both electrolyser and other technologies such as pyrolysis and steam methane reforming using renewable and/or non-fossil sources, including also industrial side-stream hydrogen from renewable and/or non-fossil sources.**

Low-carbon hydrogen definition should cover low-emission hydrogen from both renewable and fossil sources which achieve the less than 3 kgCO_{2e}/kgH₂ threshold (defined in the EU Taxonomy).

- **Low carbon hydrogen defined in Gas Directive Art XX to be amended: 'Low-carbon hydrogen' means those types of hydrogen that are not eligible for the categories of 'RFNBO hydrogen' nor 'non-fossil hydrogen' but achieve the [EU Taxonomy* and/or WBCSD** based] greenhouse gas emission threshold of less than 3 kgCO_{2e}/kgH₂, including also industrial side-stream hydrogen.**

*) EU Taxonomy: The activity complies with the life cycle GHG emissions savings requirement of 73,4 % for hydrogen [resulting in life-cycle GHG emissions lower than 3tCO_{2e}/tH₂] and 70 % for hydrogen-based synthetic fuels relative to a fossil fuel comparator of 94 g CO_{2e}/MJ in analogy to the approach set out in Article 25(2) of and Annex V to Directive (EU) 2018/2001. Life-cycle GHG emissions savings are calculated using the methodology referred to in Article 28(5) of Directive (EU) 2018/2001 or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018.

***) 3 kgCO_{2e}/kgH₂ corresponds to the low-carbon threshold as defined by WBCSD.

In addition, there could be a definition for **'carbon-negative hydrogen'** for hydrogen of which GHG emissions from hydrogen production are negative, i.e., below 0 kgCO_{2e}/kgH₂ on a life cycle basis.

Hydrogen Cluster Finland proposes that each type of hydrogen would be eligible to fulfil the targets but with a differentiated share which could be defined in percentage or with multipliers.

Hydrogen Cluster Finland

Contacts:

Marko Janhunen, UPM, Member of Steering Group of Hydrogen Cluster Finland
marko.janhunen@upm.com

Outi Ervasti, Neste, Chair of the Steering Group of Hydrogen Cluster Finland,
outi.ervasti@neste.com

Pia Salokoski, CLIC Innovation, coordinator of the Hydrogen Cluster Finland,
pia.salokoski@h2cluster.fi