Commissariat à l'énergie atomique et aux énergies alternatives
Atomic Energy and Alternative Energies Commission

Answer to the European consultation on the Delegated act establishing a methodology for assessing GHG emission reductions from renewable hydrogen

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Summary

The rules defined in the delegated acts of the renewable energy directive will be structuring for the European hydrogen industry. It is therefore essential that they are coherent and follow a long-term approach.

In this respect, CEA proposes that the time step allowing for hydrogen to be produced from Power Purchase Agreements (PPA) should be equal to one hour **from today onwards, rather than** from 2027. Indeed, if we open the door to monthly time steps, we may find it harder to move to shorter ones. Monthly time steps would send the wrong economic signals to the sector, while being tantamount to greenwashing.

The rules to define hydrogen's carbon intensity should cover its transport, distribution, storage and compression. Calculation methods of the carbon intensity of the electricity production dedicated to hydrogen production should also be harmonized (which is not currently the case) and preferably include upstream indirect emissions.

Moreover, calculation methods of the carbon intensity of national electricity mixes should build on real-time data provided by the transmission and distribution network operators, rather than on annual averages that are not very representative of their real-time carbon intensity.

Concerning the origin of carbon captured for use (CCU), the Commission should introduce a grandfathering clause from 2036 onwards, in order to safeguard e-fuel production projects with non-avoidable CO_2 captured from industrial installations (e.g. cement, steel) that have demonstrated that there were no proven decarbonisation alternative on an industrial scale at the time.

The Renewable Energy Directive sets out a greenhouse gas emission reduction target of at least 70% for liquid and gaseous fuels of non-biological origin (RFNBOs) compared to those of fossil fuels. The precise rules for assessing emission reductions from renewable hydrogen are defined in a dedicated delegated act, currently under consultation.

CEA would like to make several comments on this draft delegated act.

An hourly time step is needed for hydrogen production from 2022

CEA urges the Commission to establish an hourly time step <u>from 2022 onwards</u> (rather than in 2027 as foreseen in the draft delegated act) for the production of hydrogen via PPAs. A monthly time step would indeed allow hydrogen to be produced from non-renewable energy sources while being labelled

as renewable, which contradicts the very objectives behind the development of renewable hydrogen: namely reducing the EU's greenhouse gas emissions while reducing its dependence on fossil fuels.

More fundamentally, the definition of the time step puts at stake the overall efficiency of the hydrogen deployment strategy. If we consider that the intermittency of renewable energies makes the economic equation of hydrogen production insoluble because of the low load factors it imposes on electrolysers (which is the reason behind the Commission's proposal for a monthly time step), then the situation will be the same in 2027. We must therefore choose between the following assumptions:

- either renewable intermittency is not an economic problem for hydrogen production, in which case an hourly time step should be imposed as of today;
- or renewable intermittency is an economic problem for hydrogen production, in which case:
    - either the Commission extends the hydrogen deployment targets to all low-carbon energies (to allow higher load factors and a simplification of the economic equation);
    - or it chooses to keep this monthly time step in the long run in order to continue producing hydrogen from any energy sources, while labelling it "renewable", which amounts to greenwashing...

Defining a monthly time step in a transitional manner (until 2027) also carries the risk of not being able to reduce it to one hour in 2027. Indeed, in 2027 the hydrogen players will have developed their activity by producing hydrogen with a high load factor due to the possibility of using any energy while labelling it "renewable" thanks to the loophole provided for in the delegated act. At that point, it is doubtful that they will accept to see their economic model disrupted by a rule that suddenly forces them to reduce their load factor.

Finally, for the same reason, CEA calls on the Commission to amend the Renewable Energy Directive to reduce gradually the lifetime of guarantees of origin for electricity to a time step of one hour[1].

Hydrogen transport and storage

The transport, distribution and storage of hydrogen should be included in the calculation methods of its greenhouse gas emissions.

The Commission should define a reference pressure (e.g. 3 MPa as proposed by CertifHY) above which greenhouse gas emissions related to the compression of hydrogen should be included in its carbon footprint. Indeed, the compression of gas requires energy, especially when high-pressure rates are targeted. This leads to greenhouse gas emissions, which have to be added to those already emitted by the generation of the electricity used to produce the hydrogen.

The compression and distribution of hydrogen for direct use in vehicles is excluded from the calculation of the carbon footprint in the draft delegated act. However, it is not clear whether the transport of hydrogen from the production site to the distribution site is included or not.

The Commission should clarify this point and preferably include emissions related to the whole processing and transport of hydrogen, until the point of distribution. This would make it possible to distinguish between hydrogen produced or not on the distribution site, to distinguish the mode of

[1] See details of CEA's proposals in the response to the consultation on the revision of the Renewable Energy Directive.
https://www.cea.fr/english/Documents/european-positions/2021-11-revision-renewable-energy-directive.pdf

transport used (truck, pipeline...) and to consider the geographical distance between the production and distribution sites. It would make it possible to take into account all the associated emissions, from the production to the use of the hydrogen.

Carbon intensity of electricity used to produce hydrogen

To determine the carbon intensity of national electricity mixes, the Commission should rely on real-time values provided by the transmission and distribution system operators. The method currently prevailing is not representative of the real carbon intensity of the electricity mix of each country, which can moreover vary significantly over time.

The Commission should standardise its methods of calculating the carbon intensity of electricity so that they cover the same perimeter, whatever energy source is considered. It does not seem logical that the calculation of the carbon intensity of renewable energies should not include upstream emissions, whereas the calculation of the carbon intensity of other energies (in particular nuclear energy) should include them. In order to better assess the environmental impact, we recommend to generalise the inclusion of upstream emissions for all energy sources.

Allocation of carbon intensities of (co)products

For co-products, a method is proposed in point 15 to allocate the relative shares of emissions. If all co-products are fuel, electricity or heat (15(e)), the allocation should be in terms of energy content. If one of the co-products is not used as fuel (15 f)), an allocation in economic terms should be taken into account.

The Commission should align its approach with the Joint Research Centre's Carbon Footprint Guide (Ares(2012)873782) which sets out the prioritisation of allocation methods. A substitution allocation method should prevail and economic allocation should be reserved as a last resort.

Production of synthetic fuels with CCU technologies

The methodology defined in the delegated act applies to renewable hydrogen, but also to all other types of RFNBOs such as renewable methanol, e-fuels and e-methane, all derived from renewable hydrogen combined with captured CO_2 (CCU). These e-fuels will be used primarily to decarbonise industry, air and sea transport.

For these synthetic fuels, the scope includes and deducts the CO_2 equivalent of the carbon captured and incorporated in the chemical composition of the fuel that was or would otherwise have been emitted as CO_2 into the atmosphere.

However, the Annex specifies that carbon from non-sustainable sources, captured from industrial emissions using CCU technologies, could only be used to produce e-fuels before 2036. This means that from 2036 onwards it will not be possible to use emissions from industrial installations to produce RFNBOs. Only atmospheric carbon captured by direct air capture (DAC) technologies and biogenic carbon captured from the combustion of bioenergy could be used to produce e-fuels.

This date is not compatible with the duration of the projects and the amounts to be invested in the air and maritime sectors.

Moreover, some industries, such as cement plants, inevitably emit CO_2 as a co-product of chemical reactions. These large quantities of CO_2 should therefore be valorised, especially so because they are less energy-intensive to capture than atmospheric CO_2.

The Commission should introduce a grandfathering clause to safeguard e-fuel production projects using non-avoidable CO_2 captured from industrial installations (e.g. cement plants, steel mills) that have demonstrated that there were no proven decarbonisation alternative on an industrial scale at the time.