EDF key points on the Delegated act on methodology for assessing GHG emissions savings from renewable liquid and gaseous transport fuels of non-biological origin and recycled carbon fuels

EDF commends the publication of this draft Delegated regulation which will provide clarity to project developers and national policy makers. EDF also notes that the Delegated Act goes beyond the definition of a methodology to calculate the emissions of RFNBOs and that it includes a set of data and methodologies to calculate the emissions of hydrogen produced with grid electricity. This Delegated regulation therefore provides important indications to investors in electrolytic low carbon hydrogen ahead of the finalization of the Directive on hydrogen and decarbonized gas. **It is therefore critical to ensure that the default data, proposed formula, and alternative methodologies are adequate and allow for a robust and sound assessment of emissions for hydrogen produced with electricity from the grid so that this potential can contribute to the EU hydrogen ambition.**

1. Default values for carbon intensity of national electricity mix must be updated

The reference table for national electricity mix emissions in part C of the annex includes 2018 data which is not fully representative and largely outdated considering the current decarbonization levels in the power sector. In addition, there is no source mentioned. (See Annex 1)

It is critical to update Table A with the latest figures and ensure that the calculation is made every year based on the latest available data on national electricity mix emissions.

2. Life Cycle Emissions default value for nuclear must be updated

The delegated act opens the possibility to calculate the carbon intensity of the mix using the data in table 3 (Fuel upstream emission factors). We were not able to find an explicit reference to the 1.4 gCO2/MJ figure for nuclear Life Cycle Emissions (table 3) in the quoted source. The 2021 JRC expert report [1]dedicated to nuclear is a very recent source which assessed in detail the life cycle emissions of nuclear. We therefore recommend using this source as the main reference.

The nuclear upstream emission factor in the table should be 0,88 gCO2/MJ expressed in final electricity – or 0.29 gCO2/MJ for primary heat produced. (Annex 2)

3. The most accurate approach is to use the hourly emissions of the average electricity mix

Calculating the emissions of hydrogen produced with grid electricity based on the emissions of the marginal power plant in the electricity system when the electrolyser produces is not relevant especially in largely decarbonized electricity mixes. Indeed, there is no strong correlation between marginal thermal units' emissions and electricity average carbon content.

The most accurate approach, especially in largely decarbonized power mixes, is to use the hourly emissions of the average electricity mix provided by the TSO. This would incentivize electrolysers to be turned off during hours of highest carbon intensity.

4. The unavoidable nature of some industrial CO2 emissions in the current state of technology should be considered when regulating E-Fuels production

EDF recommends differentiating between fossil CO_2 deriving from unavoidable sources (e.g. cement production process) and avoidable sources (e.g. fossil energy fuel) and introduce an exception for unavoidable CO2. Indeed CCU is an important decarbonisation lever for the cement industry.
EDF recommends removing the reference to an end date in the Part A, 11(a) or introducing a 'grandfathering' clause safeguard projects of e-fuels / RFNBO production using CO_2 captured at industrial plants that will be commissioned before 2036 with a minimum economic lifetime of 20 years.

[1] European Commission, Joint Research Centre, Konings, R., Van Winckel, S., Rondinella, V., et al., *Technical assessment of nuclear energy with respect to the 'do no significant harm' criteria of Regulation (EU) 2020/852 ('Taxonomy Regulation')*, Publications Office, 2021, https://data.europa.eu/doi/10.2760/665806

ANNEX 1 – emissions of the French electricity mix

For France, the proposed value of 20gCO2e/MJ (equivalent to 72gCO2e/kWh) is very high and does not reflect the actual carbon intensity of the French electricity mix. For 2018 RTE (TSO) data gives 53 gCO2/kWh ADEME gives 57.1gCO2/kWh in full life cycle analysis. The latest data from ADEME[2] gives 59.9gCO2/kWh in full Life Cycle Assessment (broader scope that what is proposed in the delegated act) for the 2020 average mix which corresponds to 16.7gCO2eq/MJ. EDF would like to highlight that reference data provided for the purpose of calculating electrolytic hydrogen emissions should refer to metropolitan France and exclude overseas territories.

ANNEX 2 - Life cycle assessment of nuclear

We propose to use the following report which is the most up to date:
European Commission, Joint Research Centre, Konings, R., Van Winckel, S., Rondinella, V., et al., *Technical assessment of nuclear energy with respect to the 'do no significant harm' criteria of Regulation (EU) 2020/852 ('Taxonomy Regulation')*, Publications Office, 2021, https://data.europa.eu/doi/10.2760/665806

This report establishes that lifecycle GHG emissions for nuclear plants with a closed fuel cycle (the existing French nuclear fleet falls in this category) are 5.29 gCO2-eq/kWh. According to the report the construction, operation, and decommissioning of nuclear power plants are responsible for 40 % of the lifecycle GHG emissions while uranium mining account for 32 % and enrichment for 12 %.

The proposed LCA methodology in the Delegated Act excludes emissions from the construction, decommissioning and waste management of electricity producing facilities. Therefore, it can be deduced that nuclear upstream emissions are 5.29 x 60 % = 3.17gCO2/kWh (0.88 gCO2/MJ) expressed in final electricity produced and to 1.05 gCO2/kWh (0.29 gCO2/MJ) for primary heat produced using the conversion efficiency of 33 % for nuclear power plants.

Table A.2-1. Summary of LCA results for the closed fuel cycle showing all lifecycle phases of nuclear energy

Non-radioactive impact indicators I.

Lifecycle phase	GHG emission [gCO_2eq/kWh_e]	Atmospheric pollution SO_x [mg/kWh_e]	Atmospheric pollution NO_x [mg/kWh_e]	Water pollution [mg/kWh_e]
Mining	1.704	14.242	19.73	263.07
Conversion	0.278	0.058	1.04	0.087
Enrichment	0.626	0.547	1.06	2.548
Fuel fabr.	0.035	0.013	0.05	0.021
Operation	2.140	0.938	2.84	16.366
Reprocessing	0.376	0.484	0.50	5.433
MOX fabr.	0.027	0.004	0.035	-
Disposal	0.104	0.024	0.097	-
Total	**5.29**	**16.252**	**25.35**	**287.53**

Note: the cyan background means larger than 15% contribution to the total emission, while the yellow background indicates the dominant (largest) contributor.

[2] Agency of Environment and energy