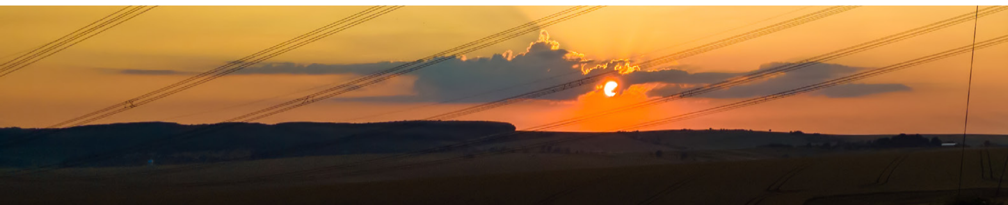
BELLONA EUROPA

CONSULTATION RESPONSE

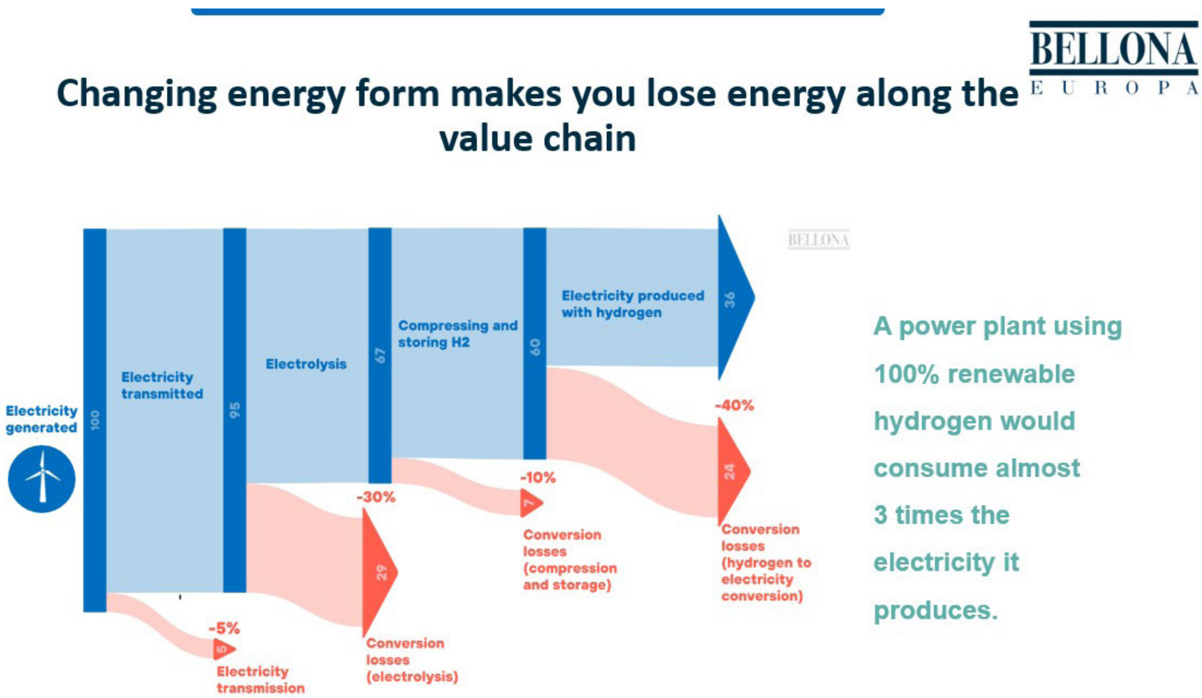
February 2023

Competitive Bidding schemes for hydrogen under the Innovation Fund



RESPONSE TO CONSULTATION ON THE COMPETITIVE BIDDING SCHEMES FOR HYDROGEN UNDER THE INNOVATION FUND

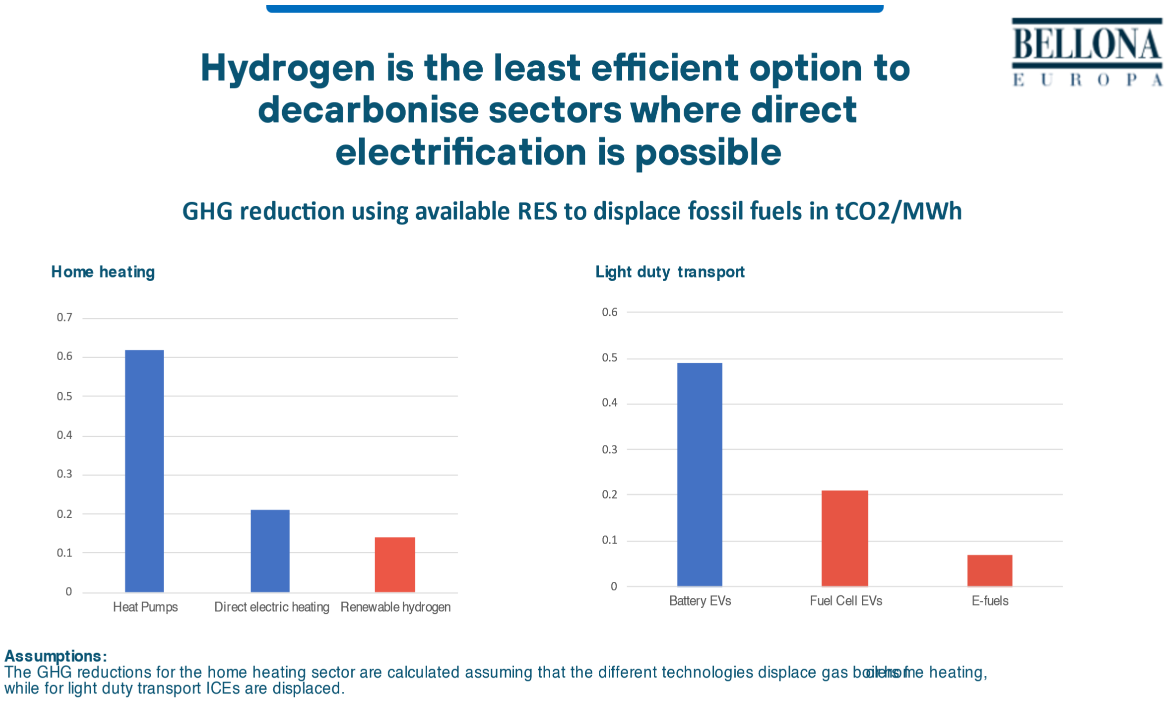
Electrolytic hydrogen production requires a large amount of energy, 1.6 times its output. This 40% loss in energy does not include the additional energy required to compress or transport hydrogen, which makes it an inherently inefficient energy carrier. Especially when electrolytic hydrogen is converted back into electricity, almost two third of the initial energy is lost. Most of the losses in the value chain occur when converting from electricity to hydrogen and back.



Source: Bellona "Fossil gas "Sustainable" label relies on promises in bad faith"

The impact of hydrogen is only fully understood when the alternatives for the electricity used in its production are weighed out.

Given this, alternative use of electricity yields far more efficient results. In-home heating **heat pumps displace more than four times the emissions renewable hydrogen would against fossil fuels**. The contrast is even starker for light-duty transport, with **battery EVs displacing seven times more GHG emissions compared to fossil-based ICE (internal combustion engines) than E-fuels would**.

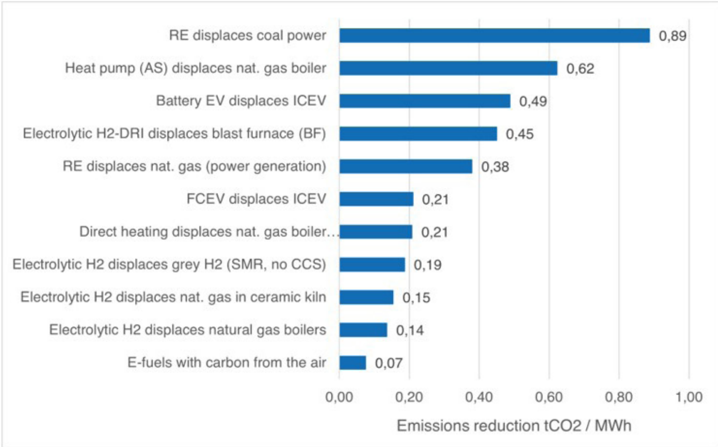


Source: Bellona "Hydrogen's place in an energy-efficient EU"

Hydrogen's role in decarbonisation works only under strict conditions. Limited by its inefficiency, delivering climate-credible solutions would mean ensuring additional renewables are deployed at the scale and pace to meet the electricity demands of hydrogen production and climate goals. This additionality provides climate benefits for the EU while ensuring energy security. Similarly, if hydrogen is to be produced from fossil gas with carbon capture and storage, it remains a climate solution only insofar upstream methane emissions are minimised and capture rates are maximised, reaching comparable emission abatement as renewable based hydrogen.

Hydrogen provides climate credible solutions by decarbonising high-emitting sectors where direct electrification is not possible. Targeted use of hydrogen, by reviewing alternatives on a case-by-case basis, results in an efficient EU energy system. There is a need to look beyond the hydrogen hype to realise more efficient forms of resource use. This means deploying direct electrification wherever possible.

Emissions savings from using 1MWh of renewable electricity for various applications



FCEV: Fuel Cell Electric Vehicle, EV: Electric Vehicle, ICEV: internal Combustion Engine Vehicle RE: Renewable Electricity, DRI: Direct Reduced Iron

Source: Bellona analysis. The use of renewables will usually focus on electricity but in some cases may include a component of renewable heat *"Effective use of Renewables to Reduce Emissions"*

Therefore, public support for hydrogen production under the Innovation fund should be granted only under the following conditions:

1. **Hydrogen is produced in a way that does not increase emissions in any other part of the energy system**

Only hydrogen meeting the taxonomy threshold of 3 gCO2/gH2 should be supported. For this to be accounted for properly, the methodology should look at full lifecycle assessments including the effect of hydrogen production on the rest of the energy systems. For what renewable hydrogen is concerned, special attention should be given to whether the production of hydrogen increases the emissions in another part of the power sector or if the additionality principle is respected. For "blue" hydrogen this should include the upstream methane emissions and the capture rates of CO2.

Given that definitions under RED delegated acts and gas market package are still not in place, a methodology including these points should be developed for financing purposes.

2. **Hydrogen is used in a sector that does not have other decarbonisation pathways**

Wherever different (and more efficient) decarbonisation pathways exist for hydrogen they should be prioritised. For this reason, public support should be given to hydrogen only if it's used to decarbonise targeted industrial sectors, such as the chemical sector (in application such as ammonia production), the metal industry, and applications needing high temperature heat such as glass or ceramic.

CONTACT
Marta Lovisolo
Policy Advisor
Renewable Energy Systems

Phone
Mobile: +32 (0) 489 638 862

Online
Email: marta@bellona.org
Website: www.bellona.org