

**Response to the:**

**Public consultation on accounting methods and conditions for the 10% renewable energy in transport target – and on the need for additional types of biofuels being listed in Annex III of the Renewable Energy Directive**

**By**

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**Section B: Hydrogen from renewable sources in transport**

***1. Which are in your view the most likely ways to produce hydrogen from renewable sources (partly or fully) by 2020?***

Biomass based synthesis gas is expected to be the most practical route to produce commercial quantities of renewable hydrogen in the foreseeable future. The production of renewable hydrogen by gasification offers low production cost and implies a relatively simple process, based on proven technologies.

As of today ~ 18% of global hydrogen demand is covered via gasification of fossil coal. Principally the same process, adapted to biomass gasification could be established relatively fast to produce significant amounts of green hydrogen by 2020.

Based on an industrial sized biomass gasification plants, it is possible to produce hydrogen with a full production cost of < 0.1 €/kWh (< 1 € per 1 diesel equivalent). The cost of producing hydrogen from renewable electricity and bio-methane is expected to be considerably higher.

***2. For each option you selected under (2), if it would be used for transport, how would you suggest to calculate its contribution to the 10% target for renewable energy in transport?***

There are two relevant routes to utilize hydrogen originating from bio-syngas in the transport sector:

1. direct supply via a specific infrastructure to be used in fuel cell equipped vehicles
2. co-processing of green hydrogen in the refinery sector to substitute today's fossil energy based hydrogen that is used for hydro-cracking of mineral oil

The first option has very high long term potential; however, the demand of pure renewable hydrogen for transport purposes (e.g. fuel cell vehicles) until 2020 is unclear.

The 2<sup>nd</sup> option offers an advantageous way to introduce a 2<sup>nd</sup> generation biofuel component (based on non-food feedstock) into the existing fuel infrastructure on short term.

On an energy value basis, (fossil) hydrogen covers 5-10% of feedstock currently processed in a standard refinery. Using renewable hydrogen in the refinery sector instead of hydrogen produced from fossil naphtha or natural gas offers the following main advantages:

- relatively low cost compared to other advanced biofuels, to fulfil the 10% renewable energy target in the transport sector,
- an excellent CO<sub>2</sub> balance as the conversion of bio-syngas to hydrogen is very energy efficient and raw material supply implies low energy input,
- a very wide sustainable feedstock base (e.g. recycling wood, forest residues, straw, perennial energy crops).

Discussions with several representatives of the refinery sector have validated the general attractiveness of bio-syngas based hydrogen utilization for hydro-cracking purposes.

The following calculation method of renewable hydrogen to the 10% target of renewable energy in transport is proposed:

- The energy content of renewable hydrogen (120 MJ/kg) that is utilized in refineries shall be fully counted towards the 10% target of renewable energy in the transport sector (under recognition of Article 21-2. of the RED).
- If renewable hydrogen is fed to a pipeline system which is directly or indirectly linked to a refinery, it should be eligible to take the same energy equivalent from the pipeline system on basis of an annual balance and count it as 100% renewable. The balancing system of green electricity or bio-methane in Germany could be taken as reference for specific regulation.
- The CO<sub>2</sub> balance default value of renewable hydrogen based on synthesis gas should be derived using the same methodology to that used for the RED default values for wood based methanol or FT fuel, as hydrogen usually offers a comparable or even better climate gas balance.

Whilst not all hydrogen energy ends up in transportation fuels, for the purpose of facilitating the use of low-GHG renewable hydrogen in the production of fuels it is recommended that all the energy content of the renewable hydrogen be deemed to end up in the transportation fuel.

A methodology which counts renewable hydrogen towards the 10% target in a simple and practical way, and which respects preconditions of the refinery sector, will enable: the implementation of first commercial renewable hydrogen projects, as well as the development of a bio-syngas industry not only producing biofuels but also able to substitute mineral oil based products (bio-refinery approach) in the future.

## Section D: Energy content of biofuels

*1. Do you think additional types of biofuels need to be listed in Annex III of the Directive? If yes, which ones and could you provide values?*

Renewable hydrogen should be added to the list in Annex III of the RED.

The related energy values (120 MJ/kg, 10.8 MJ/Nm<sup>3</sup>) can be verified e.g. on the following website: <http://www.h2data.de/>