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**OPINION**

# Why hydrogen is no magic solution for EU Green Deal

By **JØRGEN HENNINGSEN**

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Hydrogen as an important energy carrier in future European energy/climate policy has experienced yet another renaissance recently, this time with much stronger tailwind than previously seen.

Last summer the [International Energy Agency \(IEA\) published a report](#), richer than anything before in the technical aspects of the subject.

It was followed by a [letter to the Financial Times by Fatih Birol](#), executive director of the IEA, recommending that hydrogen should be considered an important element in moving from present energy production and consumption towards CO<sub>2</sub>-neutral societies by 2050.

The suggestion has been picked up by the new EU Commission in its recent communication [A hydrogen strategy for a climate-neutral Europe](#) on 8 July and endorsed by the FT in an editorial.

Nobody should question the versatility of hydrogen as an energy carrier.

It can be stored after conversion from electricity during periods of excess production of green electricity, particularly wind.

It can be used - as hydrogen or as a building block for more sophisticated fuels - for a number of purposes, such as air transport, where the use of electricity is more challenging than in, for instance, passenger cars or heat pumps for heating buildings.

## **Versatile, but...**

But hydrogen is also an energy carrier fuelling controversy.

The [green NGOs seem to be mainly preoccupied](#) with the risk that future hydrogen production might to a significant extent be based on natural gas (albeit with [Carbon Capture and Storage](#)) rather than on green electricity, a possibility that has activated the anti-fossil-fuel instinct in many NGOs.

Others have, correctly, pointed out that any use of hydrogen where it will replace fossil fuels is going to imply much higher energy costs for the user, probably by a factor of three to five, depending on the specific cases and future prices on oil and gas.

The commission's communication is short in addressing the obstacles linked to a wider use of hydrogen in the energy sector.

And it is completely silent on what might be, from a climate point of view, the most important question to be answered: setting aside the 'natural gas concern', is the use of green electricity to produce hydrogen a wise policy, at this point in time and towards 2030, from a CO<sub>2</sub>-emissions reduction point of view?

Or could we, by acting differently, achieve more emission reductions? The answer to the first question is 'no', to the second 'yes'.

## **Simple arithmetic**

The explanation is quite simple: conversion of electricity, green or not, into hydrogen implies a loss of +/- 30 percent of the energy content of electricity; and whatever subsequent step taken in making the hydrogen into practical use will imply another 30 percent loss (of the 70 percent energy remaining in the hydrogen), altogether leaving us with +/- half the energy in the original electricity being available for useful purposes.

It is often argued that hydrogen will "solve the problem" of surplus green electricity, particularly in periods with strong wind production.

This should not be accepted as a valid argument.

It may be true for the southeastern corner of the North Sea, but here the problem is rather insufficient infrastructure to transmit green electricity to the hinterland, particularly western and southern Germany.

Big parts of Europe will be at pains to ensure a CO2-free electricity sector in 2030, and at even greater pains to provide green electricity for the structural changes in fossil-fuel dependent sectors such as road transport and heating of buildings.

So, why is the commission promoting a lose-lose (pay more, get less) strategy rather than the straightforward use of green electricity where it will deliver bigger CO2 reductions and for less money?

In this context, can it really be true, that no one in the DGs Energy, Climate or Growth has checked the strategy for "climate effectiveness"?

Maybe the strategy could be the [result of lobbying](#) by the many companies behind the [European Hydrogen Alliance](#).

It is clear that there will be big money involved in the implementation of the strategy and, unfortunately, with the decision that 30 percent of the Recovery Fund, as well as of the €1 trillion-plus, seven-year budget, will have to be spent in support of climate change there will also be easy money.

The views expressed above do not mean, that there cannot be special applications where hydrogen could be an intelligent energy approach. They only want to highlight that the general enthusiasm for hydrogen as a general energy carrier should be put on hold.

Ecclesiastes (c. 300 BC) wisely reminded us that for everything there is a time . This is not the time for launching a major move into a hydrogen economy.