

The tough choice to create a hydrogen economy

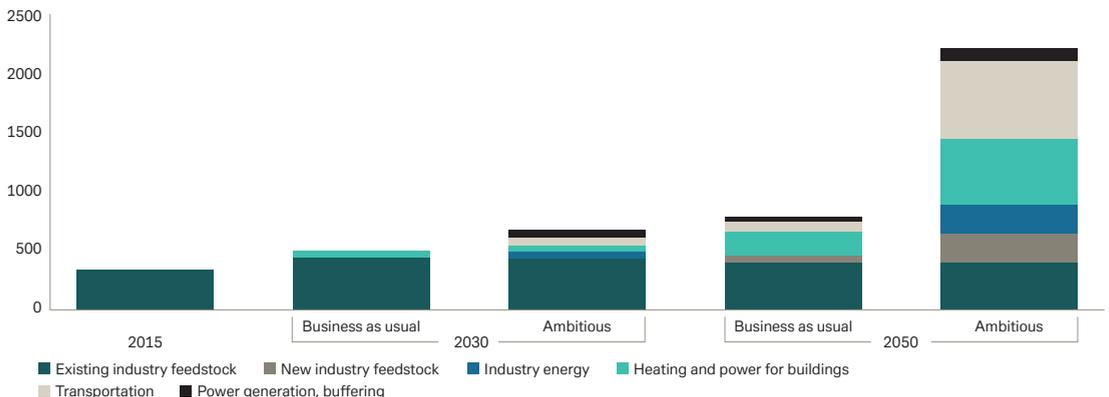
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"Clean hydrogen is the perfect alternative to fossil fuels". So said European Commission President von der Leyen in October. Many disagree, and no wonder given that green hydrogen is significantly more expensive than other renewable energy sources. Nonetheless, European leaders see the gas as a big part of the continent's energy transition. Indeed, the EU's Hydrogen Roadmap says that hydrogen may satisfy a quarter of total energy demand by 2050.

The buzz around hydrogen is two-fold. First, there are a lot of potential applications. Already, the technology is powering trains, a small number of cars and a myriad of other small projects. There are also many potential uses in heating, shipping, heavy industry, energy storage, and more. Second, as the source fuel is water, it is virtually unlimited, while green hydrogen production creates no harmful emissions.

Hydrogen could provide 24 per cent of total energy demand in the EU by 2050 (TWh)

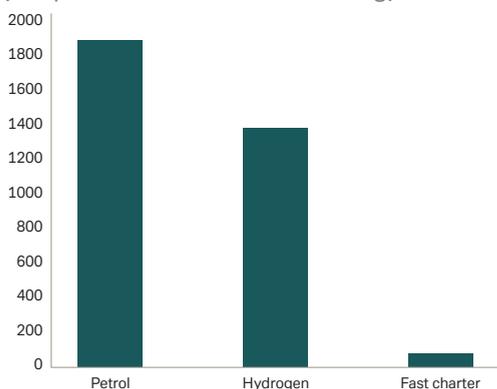


Source: Hydrogen roadmap Europe

So if hydrogen is so important, should governments simply shovel subsidies at it? That would be the wrong solution. If hydrogen is going to be part of the world's energy transition, there are a few things we need to accept, and a lot we must do beyond simple subsidies.

The key thing we need to accept with hydrogen is that because the technology is a long way behind other clean energy sources, we cannot aim for perfection. Instead, we have to look for what is good now, in order to hit the bigger goal later. Green hydrogen is currently expensive and inefficient. Today, there are only a handful of hydrogen projects that are commercially viable, and many in the industry believe green hydrogen will not become widely viable until at least 2030. Hence, the legitimate debate about whether subsidies should be better allocated to other climate change projects that are more developed and closer to being commercially viable.

Refuelling speed (km per 15 minutes of refuelling)



Source: Hydrogen roadmap Europe

behind that of electric vehicles. No government wants to fund a potential 'white elephant'.

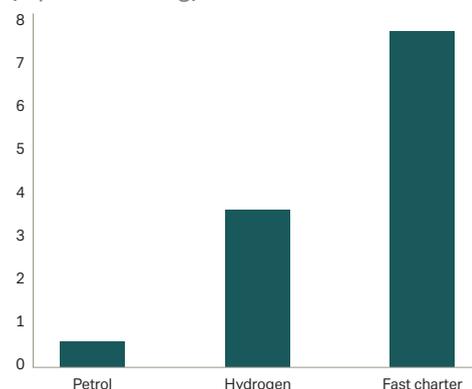
Demand, though, can be created in other ways. First, governments could require that the natural gas that flows through pipelines be blended with five per cent green hydrogen. Cue immediate demand. Furthermore, ports could mandate that the trucks that pass through it be zero-emission vehicles. They could start small and work their way up. For example, they could mandate that five per cent of trucks be zero emission by 2025 and half of trucks by 2030. Of course, those proportions can change depending on the progress of clean vehicle technology.

Now the action points. For the hydrogen economy to develop we need a better market for it. Currently, about two-thirds of hydrogen is 'captive'. It is produced in-house and is used for producing other products. And nine-tenths of hydrogen demand comes from heavy industry, such as chemicals, refineries, and metal processing plants.

To move outside a 'captive' environment and create a deep market, we need two things: customer demand, and support of financial institutions.

First, demand. The obvious problem with creating demand is the 'chicken and egg' issue. No one will buy a hydrogen fuel cell car if there are no refuelling stations. Yet, the latter will not appear until there is enough of the former. Of course, governments could simply build the refuelling stations, but that is extremely risky given that hydrogen fuel cell vehicle technology is way

Investment costs per refuelling (€ per refuelling)



Source: Hydrogen roadmap Europe

Such a system would not only help establish a market but also encourage market-based solutions. If it turns out that electric trucks are better than the hydrogen fuel cell alternative, then so be it – money will not be wasted on subsidising a failed application.

The second call to action is that the industry needs support from financial institutions. On this topic, there is good news and bad news. The good news is that since the outbreak of covid, investors, lenders, and other financial stakeholders have invigorated the climate change agenda. Companies have taken notice and change is occurring faster now than it

has in previous years. The bad news is that large investors are relatively uneducated about hydrogen compared with other forms of renewable energy. Therefore, in order to push the hydrogen agenda, financial institutions must educate themselves.

For European investors with an ESG agenda, this means encouraging companies to make changes to climate policies that include a perspective on markets that could include hydrogen. Following the example above, it means encouraging ports and logistics companies to enter the market for hydrogen alternatives. This could include nudging them to issue sustainability-linked bonds that include higher interest payments if certain climate targets are not met. This would push them to require more zero-emission trucks, and thus promote the hydrogen economy.

Aside from creating a better market to assess the potential for hydrogen, there is no escaping the fact that government subsidies will be needed for hydrogen to cross the threshold of commercial viability. How this is done is important. If it is going to take a decade or two for green hydrogen to stand on its own two legs, then we need something to smooth the transition process and ensure sufficient applications are ready to go when green hydrogen is ready.

Thus, governments should consider allowing 'blue' hydrogen. This is hydrogen that creates carbon emissions during its production, but those emissions are captured and stored or reused. The benefit of this approach is that pricing in the blue hydrogen industry is already close to the level at which various projects can be commercially viable. Therefore, significant government subsidies are not necessary for operators to start using in a range of applications. When those applications are developed using blue hydrogen, the fuel can transition to green hydrogen when it is commercially viable. All the while, government support can be poured into green hydrogen research with a view to enabling a ten-year transition process.

There are some hurdles to this idea. Among them is that various countries have different policies on blue hydrogen. In Germany, the mood is very much against the underground storage of blue hydrogen emissions. Despite that, Germany is still keen on the applications and has

earmarked €9bn for green hydrogen projects. The Netherlands may be more supportive and has plans for a 'hydrogen valley' in the country's north. Another hurdle is EU agreement on how subsidies will work. Already, there has been disagreement between Brussels and the Netherlands over the latter's subsidy plans.

Subsidies in the right areas, though, are badly needed to encourage research into green hydrogen in order to reduce its cost. So too are harmonised regulations, whether they be in Europe, or between other regions and countries in the world. That will help with the efficient distribution of the €145bn of public support that is needed to scale up the EU's hydrogen sector by 2030, according to Hydrogen Europe, a trade body whose members include many of the continent's biggest energy companies.

In the end, there is a difficult but necessary choice for policymakers to make. If hydrogen really is to become a key part of the clean energy transition, they must accept that we should encourage the market-based use of blue hydrogen today despite the fact that it produces polluting by-products. If they do, then when green hydrogen becomes commercially viable over the next decade or two, it will immediately have many applications, which will only encourage exponential growth. Given hydrogen's unlimited abundance and ability to produce clean energy no matter what the weather, that is a tantalising prospect that should not be mismanaged.