



Interview Reiner Block, TÜV SÜD

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Bert Beyers: Why is it necessary to certify hydrogen, even green hydrogen, at all?

Reiner Block: Essentially for two reasons. Firstly, because hydrogen is a gas that has been used in industry for many decades and you can't tell from this molecule how it was produced. Is it conventionally produced from natural gas with a rather large CO₂ backpack? Or is it the so-called blue hydrogen, which is produced conventionally but with the CO₂ part captured? Or are we talking about the so-called green hydrogen, which is produced from renewable energies, by means of electrolysis. The second reason is that precisely this green hydrogen will be in great demand and will almost certainly be more expensive on the market. The customer wants to know exactly what he is buying.

And the customer receives a corresponding certificate from you, from TÜV Süd?

Ten years ago, we already developed a standard for green hydrogen, which is always measured against the amount of CO₂ produced in the production of conventional grey hydrogen; as a benchmark, so to speak. And in contrast, green hydrogen must have, for example, a reduction of the CO₂ inventory of 70 per cent. This is the CertifHy process.

With grey hydrogen, the CO₂ baggage is considerable: 10 tonnes of CO₂ emissions per tonne of hydrogen produced. Is that right?

That's how it is. This benchmark also changes a bit, of course, depending on how conventional technology advances. But in essence, one can state: The grey hydrogen has a huge CO₂ baggage.

You mentioned the prevailing colour theory of hydrogen, i.e., grey, green, blue, etc. Do you think this classification makes sense?

Yes, because you can name the source of production relatively quickly. And it will also be demanded by marketing at some point - in order to be able to quickly say: grey - green - blue. Ultimately, the decisive factor is the CO₂ backpack that a tonne of hydrogen carries with it during production. The so-called well-to-gate consideration applies here, for instance, from the creation of the hydrogen until it is fed into a pipeline at a certain point. To be precise, one must consider that the hydrogen's CO₂ inventory changes again during transport.

How exactly do you certify?

A plant that is built anywhere in the world is certified with regard to the production volume of hydrogen. And certificates are issued for this. These are then issued to the customer who wants to use this green hydrogen. When he uses the hydrogen, he has to set these certificates aside. It's just like the CO₂ compensation projects. There, too, projects are promoted around the world that bind CO₂. This way, CO₂ certificates are generated, which the person who financed this project can use for himself.

With your certification - will it also be about other criteria than "just" CO₂?

This certification is exclusively about CO₂. For a very simple reason: if I wanted to do a complete life cycle assessment, I would have to take into account the possible methane slip during methane production and transport. The same applies to the origin of the water used to produce the green hydrogen. If we look at this from the point of view of decarbonisation, then we should stick with CO₂. This does not exclude the possibility of taking other criteria into account when

promoting projects. The German government wants to promote hydrogen imports from other countries (H2global). And there, for example, the question is: Where will the water come from? That is important for areas such as North Africa or the Middle East, because there is a certain water shortage there.

The EU Commission is also dealing with the issue of hydrogen certification. It requires, for example, that green electricity be used by an electrolyser to produce hydrogen in the same hour in which it was generated. What do you say to this?

To put it pointedly. It would have been simpler if the Commission had said: importing green hydrogen from other countries is forbidden in Europe. The simultaneity you mentioned actually undermines the advantage of hydrogen. Because I produce it precisely because I want to compensate for these temporal fluctuations in production from renewable energy sources. I want to use hydrogen as a storage and transport medium for renewable energies.

You think this set of rules, which also defines distances between electricity and hydrogen production, is wrong?

Yes, of course. The situation we have in Europe is that we want to use the sunny plains in Spain to produce hydrogen, which is then used in Central Europe, in Germany, France, but also in the Czech Republic and Poland. And the same applies to offshore wind from the north of Europe. If I were to apply these rules, that would not be possible.

Simply put, the Commission makes it too complicated?

I think it is important that we, who believe that hydrogen must play a decisive role in decarbonisation, have influence at all levels and say: With these criteria, we will not be able to produce hydrogen on a large scale in Europe in one country, which we want to use in another country. One can speculate that hydrogen opponents were at work there. But fortunately, the last word has not yet been spoken.

So, it's not only about technology, but also about politics.

Yes, most certainly.

What are the difficulties in the political discussion?

The whole discussion about hydrogen as the "champagne of the energy transition" comes from the fact that people say that renewable energies in Germany are so limited that I cannot afford to produce hydrogen from them with the corresponding conversion losses. What is misunderstood in this discussion is that it is not at all about hydrogen produced in Germany, but about the fact that Germany already imports 80 per cent of its energy and even with the strongest expansion of renewable energy sources in Germany, the situation will not change fundamentally. A good part of our energy will also have to come from outside in the future, then in the form of green hydrogen. It looks as if the supporters of this champagne theory have established themselves in key positions in the ministries. What is very encouraging is what Economics Minister Robert Habeck keeps saying. He is very open to the import of green hydrogen. And I even heard the other day that he doesn't want to ban thinking about blue hydrogen either.

Why do you think this is important?

Blue hydrogen is necessary because of the enormous demand for complete decarbonisation in Germany and worldwide. Otherwise, the world would still produce it, just no longer bring it to Europe, but to Asia and America.

What could a meaningful certification of hydrogen look like?

You can very well compare hydrogen in all its colours with electricity and its origin. We can't tell from the electron whether it was produced in a photovoltaic plant, a nuclear power plant or a coal-fired power plant. In the case of green electricity, there are reliable procedures in which the production and the amount of production are independently certified. It has to be the same with hydrogen. And someone who sells this green electricity or hydrogen cannot sell more of it than he has demonstrably produced. That is the simplest system. We have already talked about certificates. It's not just about green hydrogen, but also about green ammonia and methanol, for which I then receive this certificate - and have to decommission

when I use it. A tried and tested procedure. And for that I need an independent registration. It would make a lot of sense to create something like that at the European level, for example, to ensure that there is no double use of these certificates.

This sounds like it's still a long way until we reach a sensible certification system.

Yes, but it won't be a short way until we have the necessary quantities of hydrogen. We have to imagine that currently around 100 million tonnes of hydrogen are produced in the world per year for industrial processes, for refineries, for ammonia and fertiliser production. And of these 100 million tonnes of hydrogen, not even 1 million tonnes are green. If we produce these 100 tonnes green at some point, we still don't have the additional hydrogen we need for our mobility or perhaps even for heating. And that is why we will need years for the certification system - until the EU has reached an agreement, until it is synchronised bilaterally with countries like Australia or Oman or Morocco. All this will take time.