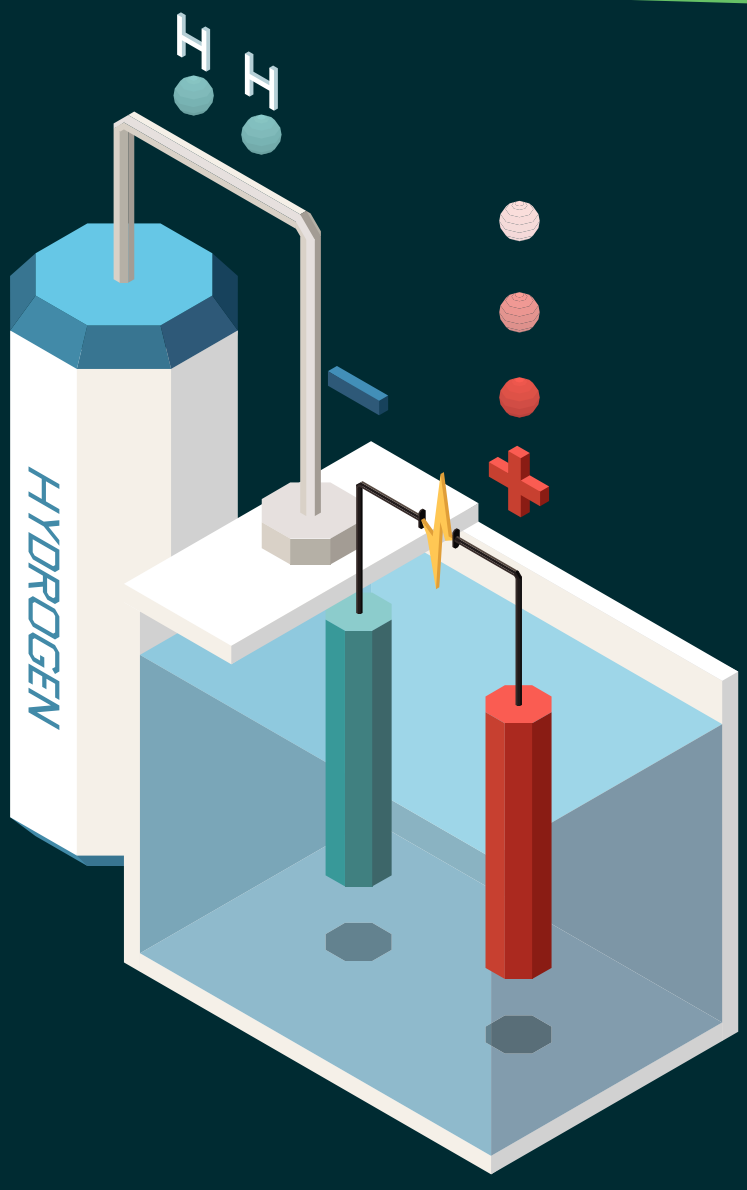
End of last year, BlueTech Research published an Insight Report on the Hydrogen Economy.

Paul O'Callaghan's team was kind enough to share it with me.

I expected it to be straightforward! The World needs to decarbonate, hydrogen is a tool for that, and it's a convenient way to stock excess renewable energy production.



So electrolysis plants will start popping up everywhere, representing a tremendous business opportunity for the Water Industry.

Simple!
Well, simple but...

wrong

That story is much more complex and intricate.

BlueTech RESEARCH

(DON'T!) WASTE WATER

Equipped with BlueTech's report as a precious translation tool, I went down the Rabbit Hole. In this upcoming trilogy, you will learn:

1. What to think about all the colors of Hydrogen
2. How the "Hydrogen Economy" may or may not impact the Water Industry (and where)
3. How Hydrogen may well have a strong link with wastewater treatment (and why)

So buckle up and embark with me: this journey starts in Vienna in 2018!

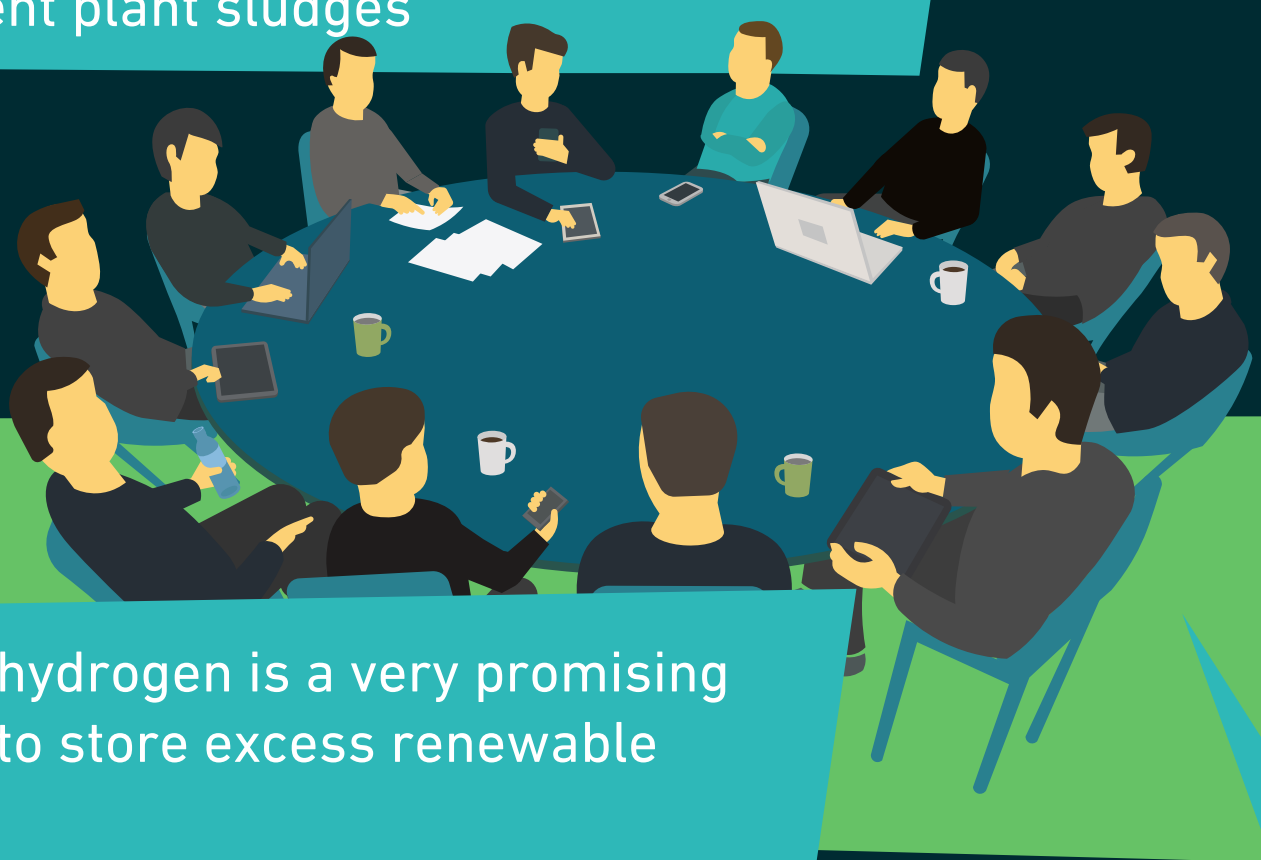
The first time I came across the topic of Hydrogen was indeed during the European Utility Week, and it started from the opening Keynote.

No less than five speakers mentioned it as the future of energy management in a decarbonized world.

Getting ready for the future, you're looking at hydrogen and biomethane...

... there will be "Power to Gas" approaches, like hydrogen for longer-term storage

... we're thinking of clean energy like the production of hydrogen from wastewater treatment plant sludges



... power to hydrogen is a very promising technology to store excess renewable energy

... there will be energy but not in the form of electricity, rather as hydrogen or biogas

The recurring example was, how Germany could solve its negative electricity price issue, thanks to green hydrogen.

The rapid growth of wind farms had triggered a weird effect: during the windy nights, the production of electricity was so much above the demand that power companies had to pay users to take energy out of the network and keep it balanced.

So, storing that energy (Power-to-X) was rapidly becoming the name of the game. And green hydrogen sounded like a good prospect. (it consists of electrolyzing water, to transform it into hydrogen - and oxygen).

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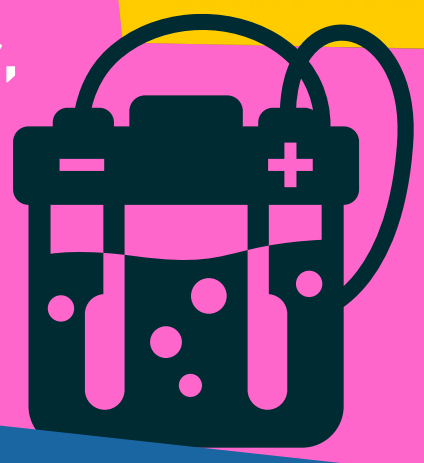

The colors of hydrogen

Green
produced through electrolysis, powered by renewable energy

Blue
produced by steam methane reforming from fossil fuel, but with carbon capture

Turquoise
produced through pyrolysis, from Methane

Purple/Pink
produced through electrolysis and powered by nuclear energy

Brown
gasified from coal

Gray
steam methane reforming from fossil fuel, this time without carbon capture

This is not gray, it's black, ultra-black, black hole black, 30% blacker than the fossil fuel that it's made from!

Meet Paul Martin, you'll get to know him better in a jiffy 😉

Now, we may see a colorful panel of Hydrogens and a promising prospect with the Green one.

Yet if we're honest:

98.7% of Hydrogen produced today is created from steam methane reforming from fossil fuel (gray).

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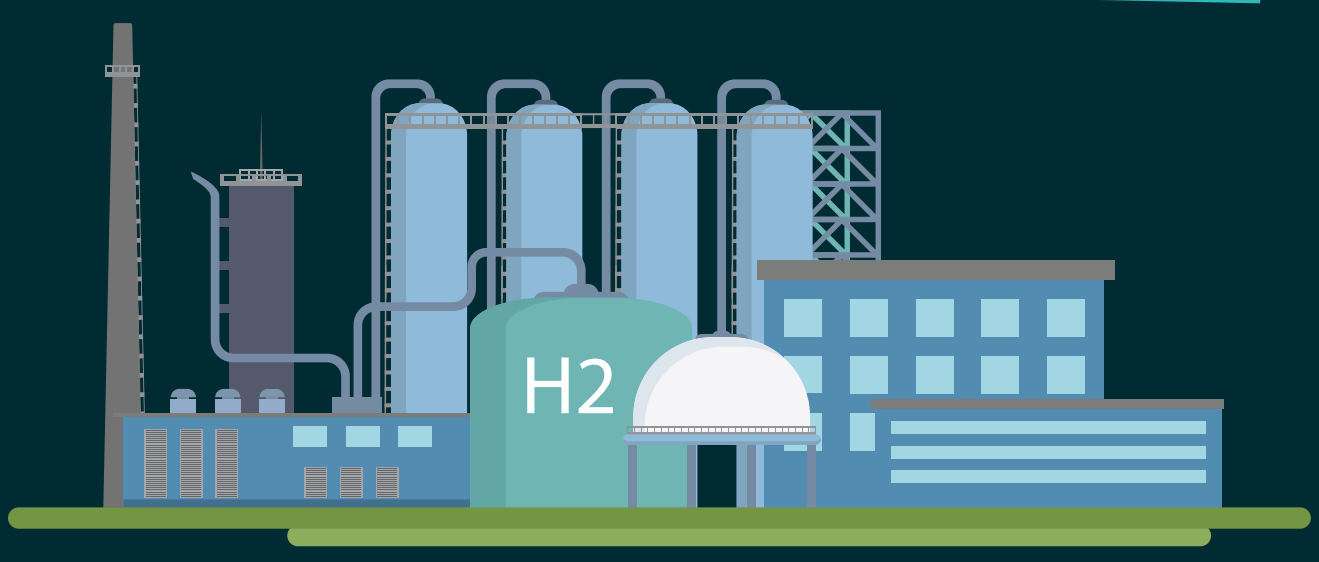
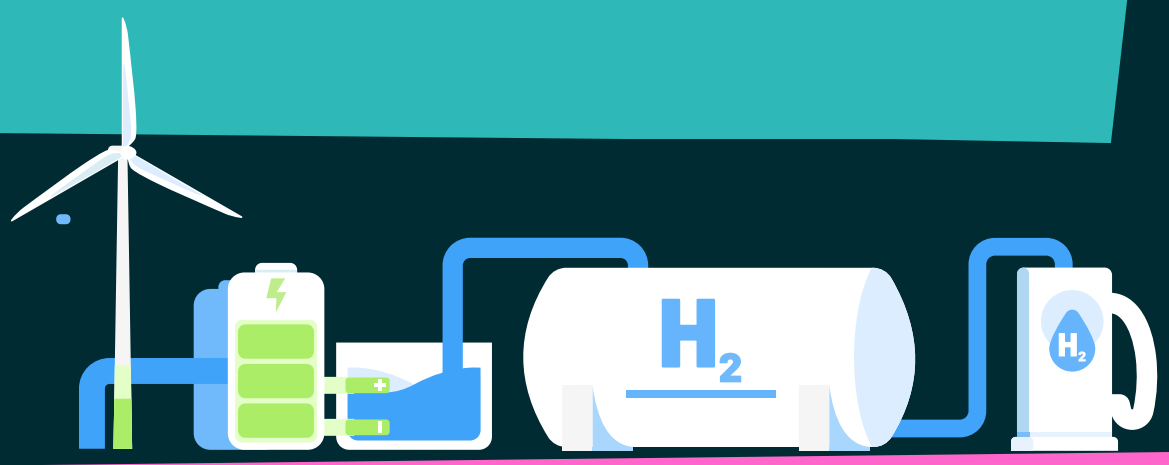


In other words:

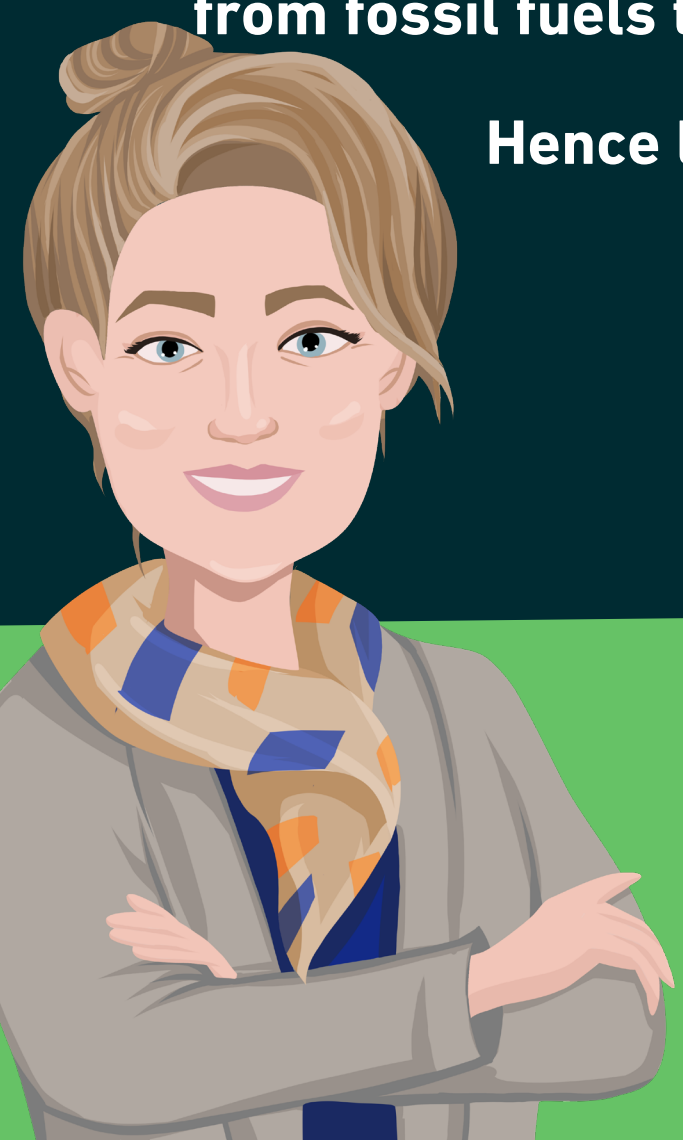
There are only two kinds of Hydrogen in the World. The one you can buy (gray) and 1.3% hydrogen that's made as a by-product of electrolysis to make Chlor-Alkali chemicals.



So regardless of the side you'll be picking, there's a common base everybody agrees on.
Long before upscaling (or not) the Power-to-X approaches, there's a lot to build in the wannabe-Hydrogen Economy.

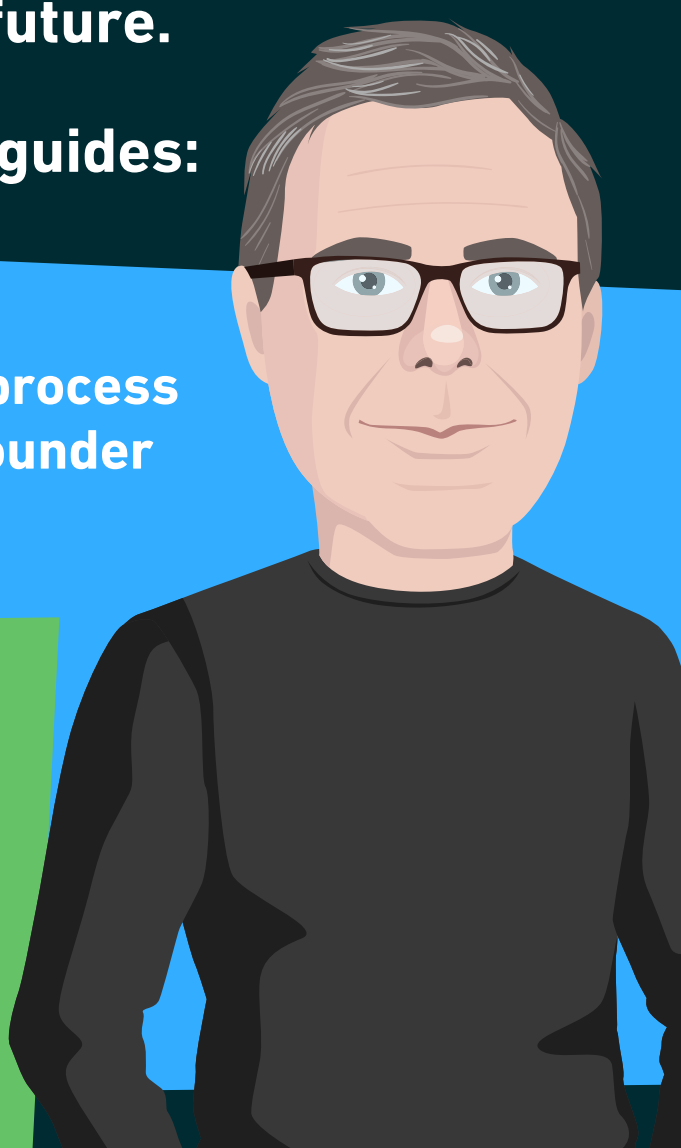
And one thing's for sure: we must find a way to move away from fossil fuels to thrive in a decarbonized future.

Hence let me introduce you to our guides:



Paul Martin is a Chemical process development expert and founder of Spitfire Research.

Alena Fargere is Principal at SWEN Capital Partners and co-founder of the first European investment fund dedicated to renewable gases.



As we've seen, Hydrogen is always addressed as a way to decarbonize our World. Yet:

Hydrogen is more a decarbonization problem we haven't begun to solve and one that we must solve.

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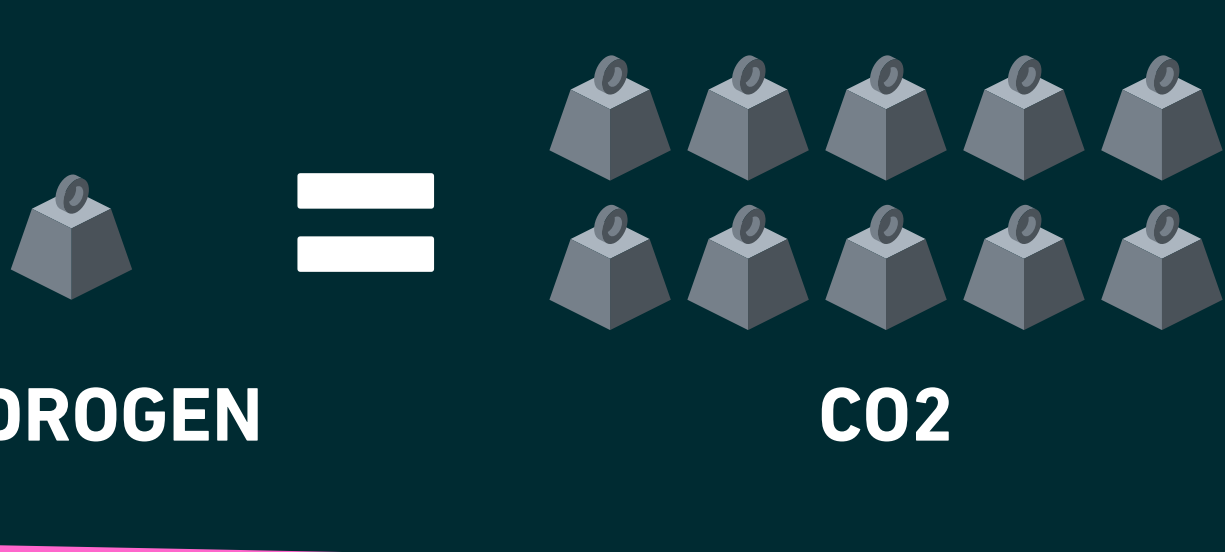
Why?

Today, the World is using 120 million tons of Hydrogen a year, and as 98.7% of it is being produced from fossil fuels, it is, in turn, a carbon-intensive good.

In a decarbonized future, the Hydrogen needs will fall to 90 million tons, as we no longer will have to desulphurize fossil fuels. Yet:

For one ton of gray Hydrogen, you're producing 10 tons of CO2



So, even in a decarbonized future, the hydrogen economy will be producing 900 million tons of CO2 a year if it doesn't move away from gray Hydrogen.

(And BlueTech's report shows how this is even twice worse when you're using coal as a feedstock, aka brown Hydrogen!)

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To be continued...