To achieve this, both our guides agree:

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We need decarbonization policies, carbon taxes, and emission bans that signal to people you shouldn't use fossil fuels unless you don't really have an alternative.

States need to implement support mechanisms to accompany the roll-out of the hydrogen economy

The role of Hydrogen in that story may start with the most pressing issue of replacing the "blackish" gray one.

... and future will tell if the

EU 470Bn€ investment

expected in BlueTech's report by 2050, or SWEN Capital's

475 M€ green gas funds

can unleash a Hydrogen opportunity beyond this "lowest hanging fruit."

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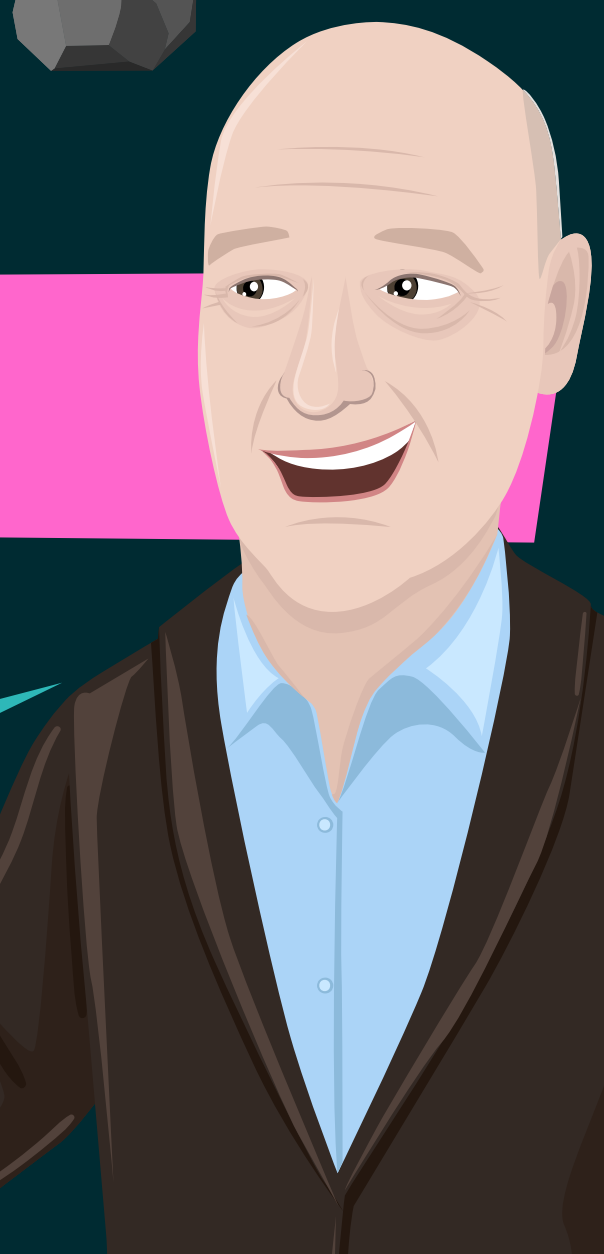
Towards Carbon-Negative Hydrogen?

Let's make a quick color recap: we want to move away from blackish gray and brown; blue might be as much a problem as a solution; Paul qualified purple as a "waste of nuclear electricity," and green divided our guides.

Yet, there's a color that can be greener than green: Turquoise.

Imagine you would be producing biomethane, which is, by definition, carbon neutral.

If you then use this biogas in a pyrolysis process to form Hydrogen and capture the carbon as graphite, your entire process now becomes carbon negative!



Is this science-fiction? Not at all!

We're building our first demonstration project at Woodman Point, in Perth, Australia. It will be a 100 ton/annum Hydrogen production facility and co-produce about 375 tons of graphite.

That plant will feature the

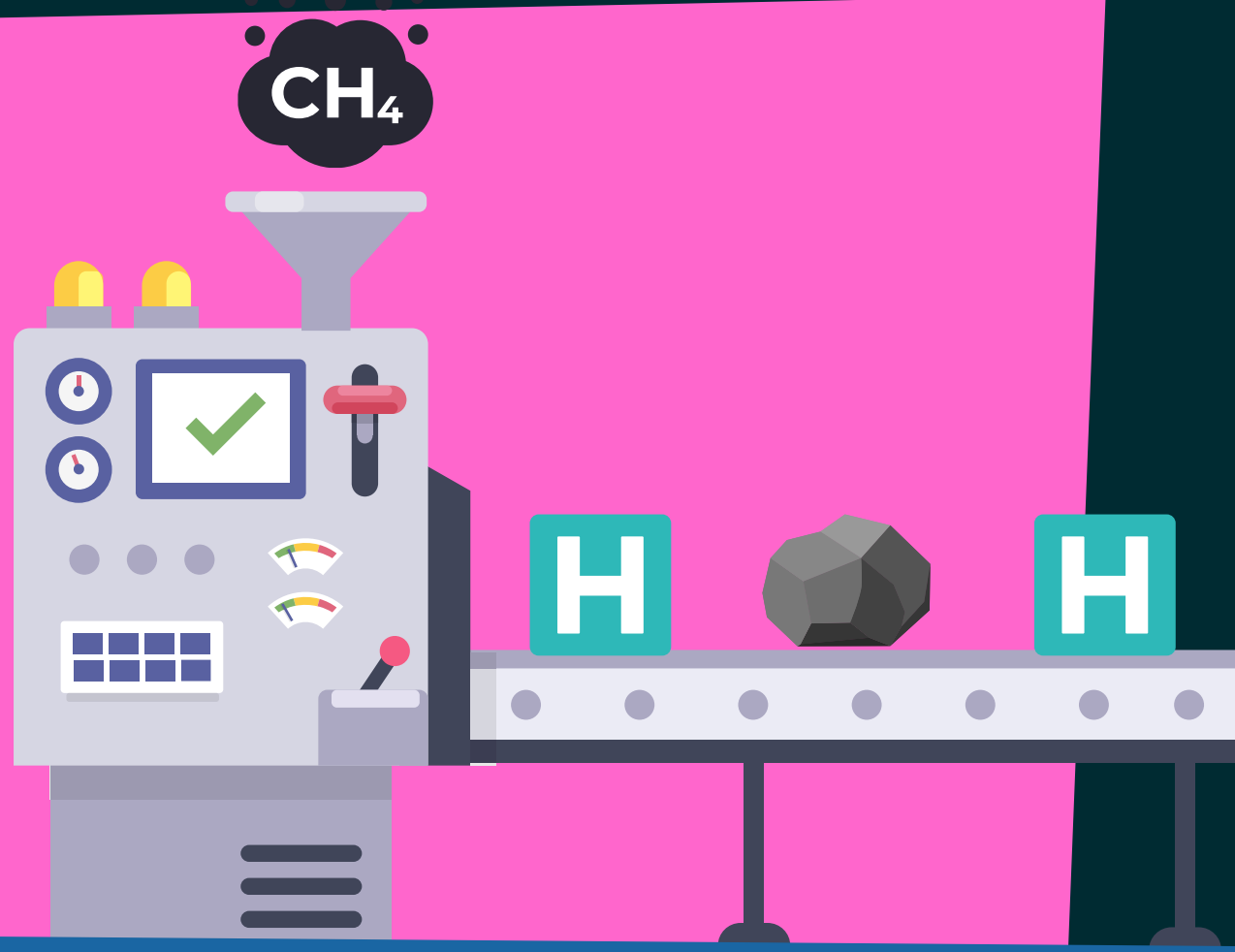
HAZER process

- an acronym for Hydrogen And Zero Emissions Research.

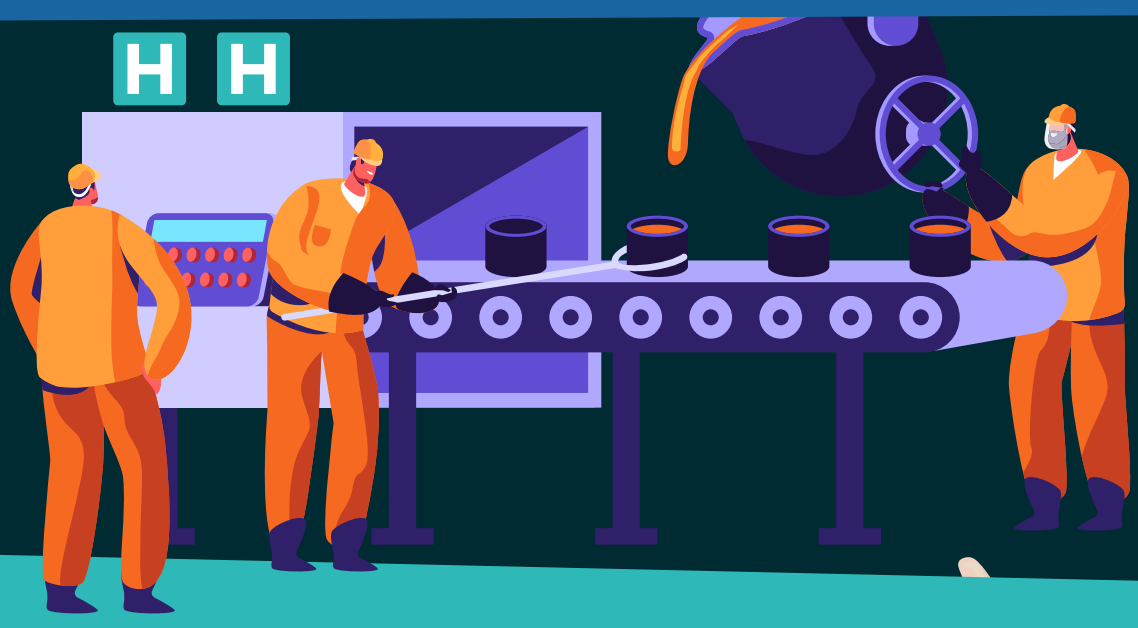
And Woodman Point isn't actually any industrial location: it is... a wastewater treatment plant!

We thought it would be a very good opportunity for both the wastewater and the clean energy industries to collaborate! It showcases the lowest emission, most sustainable and most circular economy application of the technology.

Indeed, biomethane produced out of wastewater sludge digestion will be taken through HAZER's reactor and split to create two high-value products: (Turquoise) Hydrogen and Graphite.



Hydrogen could be used in heavy vehicle transport, or actually even closer to the point where it's produced:



The city of Perth has metal processing and other industries; a number of them use Hydrogen. With our process, we could supply Hydrogen into these heavy industrial applications.

A key feature of this approach is that it turns carbon into a valuable feedstock, 90% pure at the outlet of the reactor.

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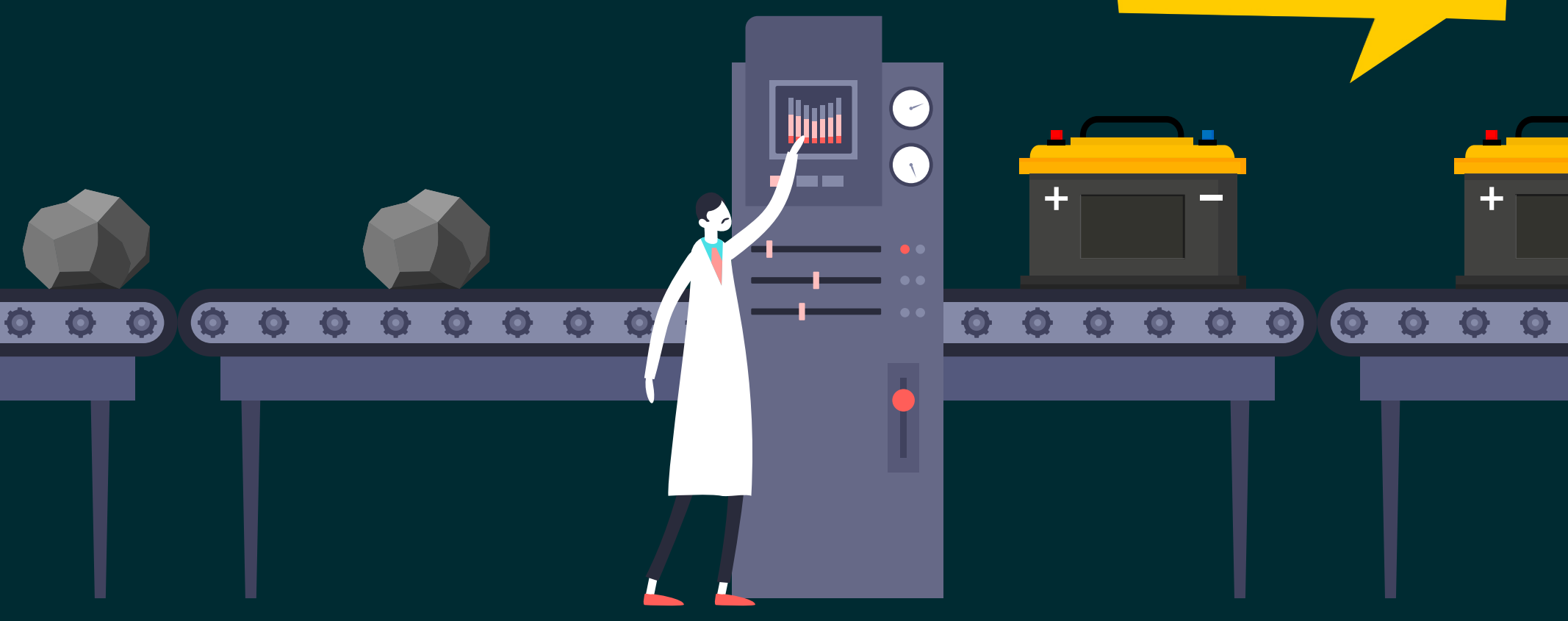
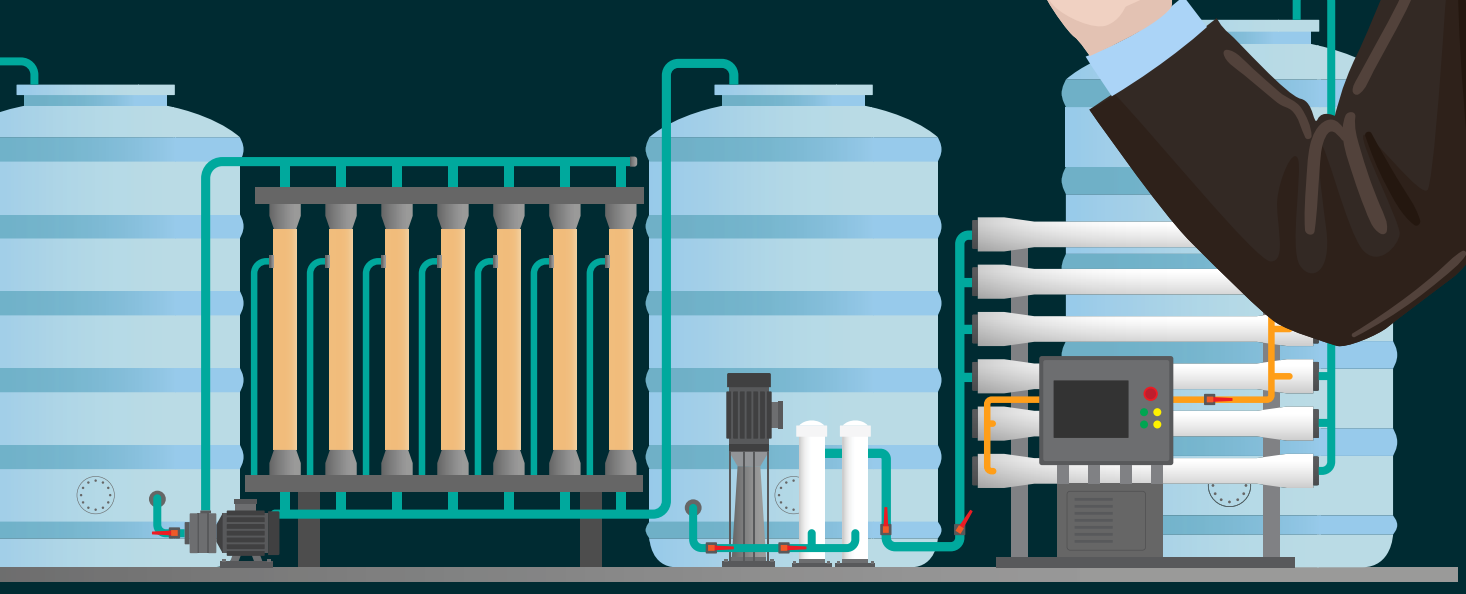
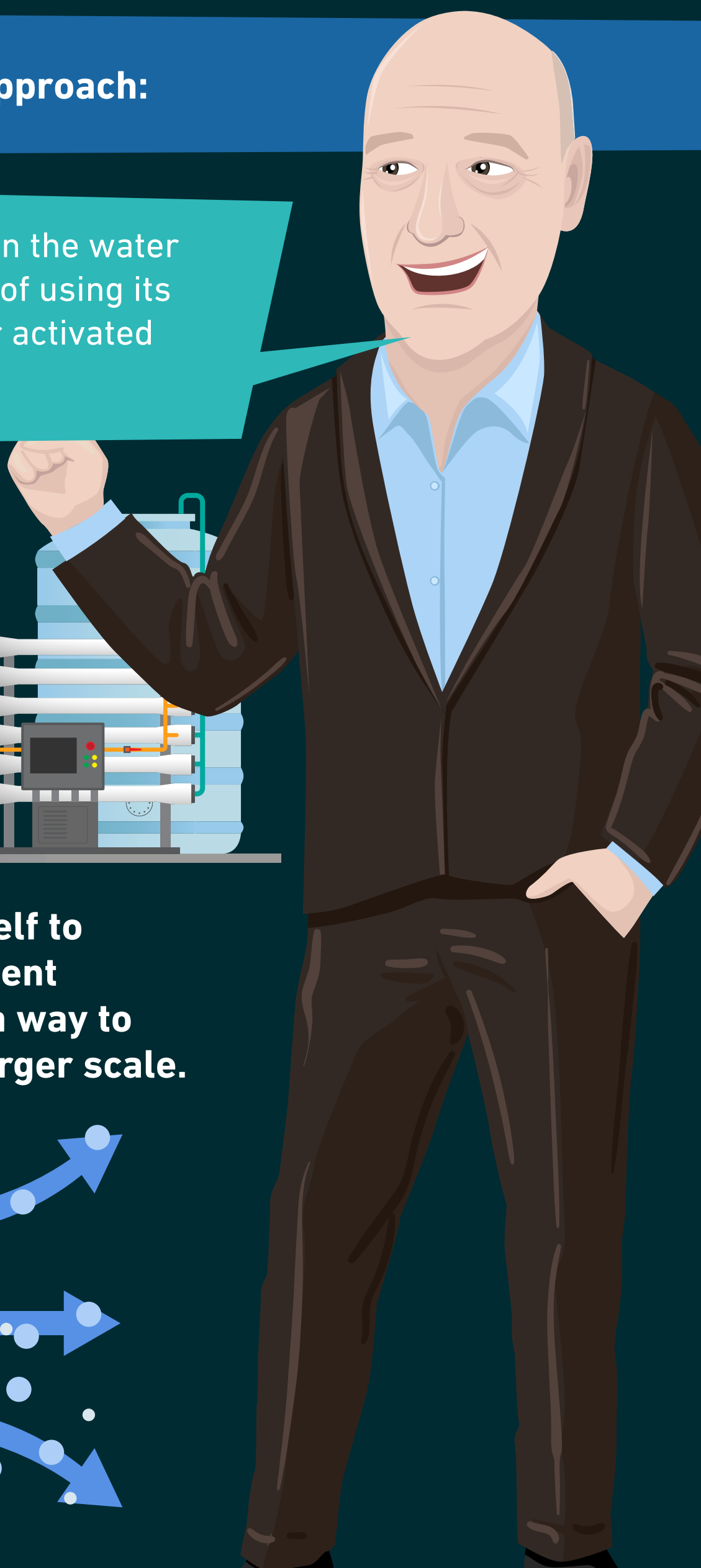


It could have several applications, ranging from low-value options (e.g., road-making, building materials) to high-end ones (e.g., battery anode materials).

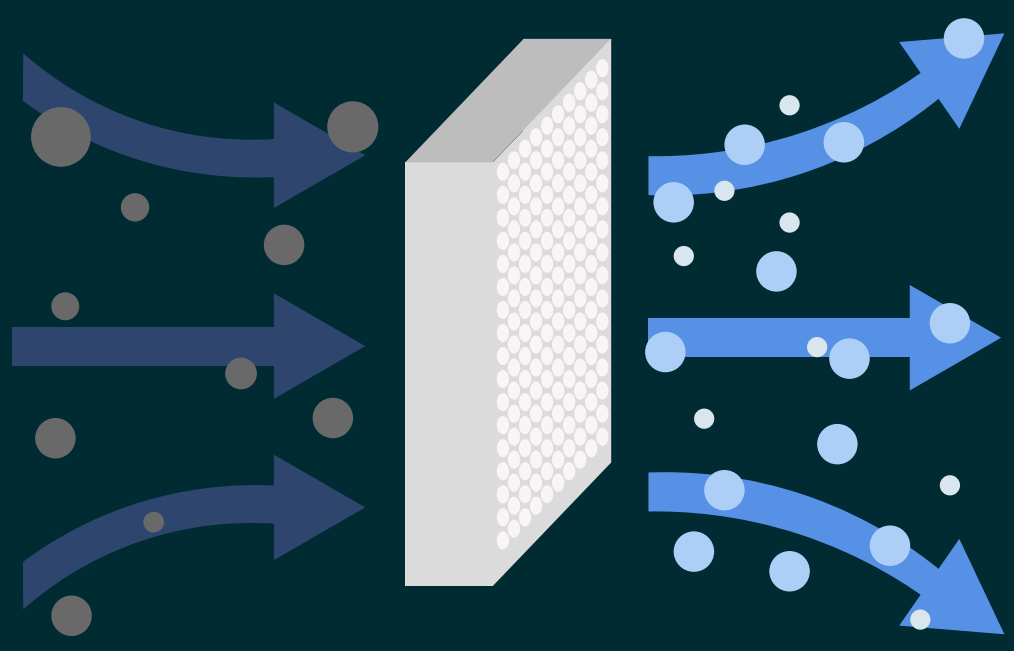
And in an even more circular approach:

We're evaluating ways to reuse it in the water treatment industry itself, as ways of using its unique properties to substitute for activated carbons





Hazer doesn't intend to limit itself to the scale of Wastewater Treatment Plants, and sees in its process a way to decarbonate natural gas on a larger scale.



Yet from a Water Industry perspective, isn't that an exciting prospect to contribute to the energy transition, leverage synergy effects (e.g., heat exchangers), and decarbonize the sector itself?

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I bet many will be closely monitoring whatever happens in Perth in the next years!

So, what did we learn on that journey?

Maybe that, as water professionals, we shall keep an eye on the development of Green and Turquoise hydrogens - yet without stopping everything to focus just on that, as BlueTech's report wisely advises.

Maybe also, that there are many sides to a single story!

But above all, this entire investigation proves how central carbon topics will be in the next years - in case anyone still doubted it.

It was a blast to conduce this (huge😅) piece of work; I'd like to thank BlueTech's team, Paul Martin, Alena Fargere, Geoff Ward, and all the ones that pointed me in the right direction along the way.

If you like this kind of deep-dive, consider subscribing to the "(don't) Waste Water" podcast, and please: Share it around you!