Best Practice Examples of Hydrogen Applications in Germany
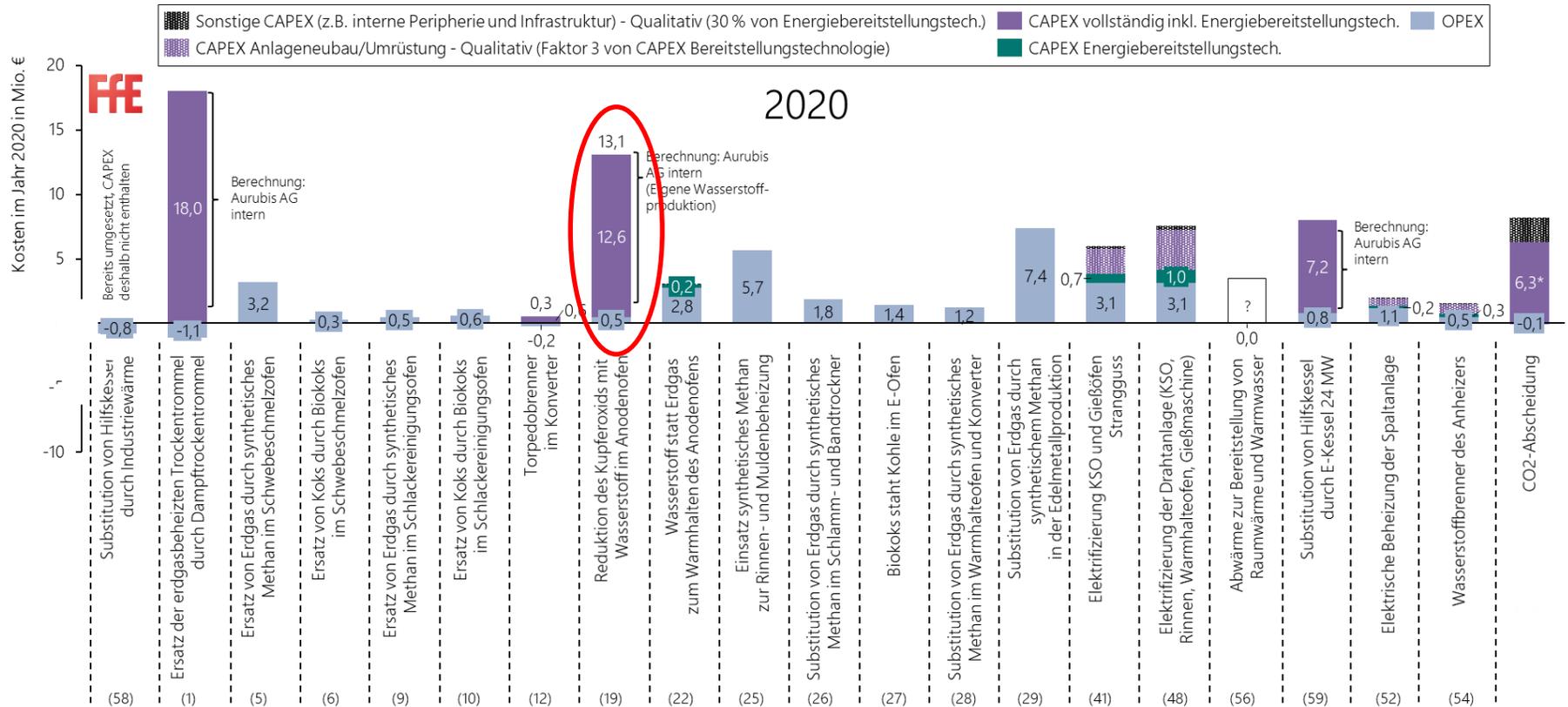
Vision of green hydrogen in the copper production

Ulf Gehrckens
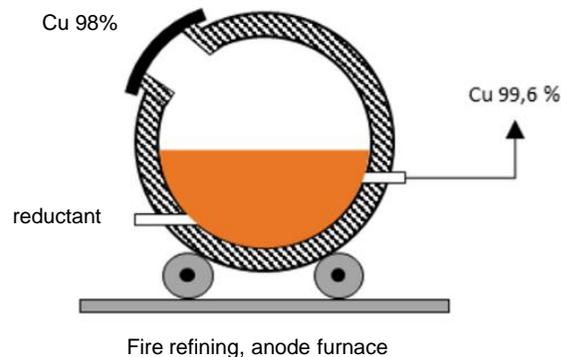*Senior Vice President Corporate Energy & Climate Affairs*

18.08.2020

The use of hydrogen could make a contribution to the decarbonization of the copper industry.
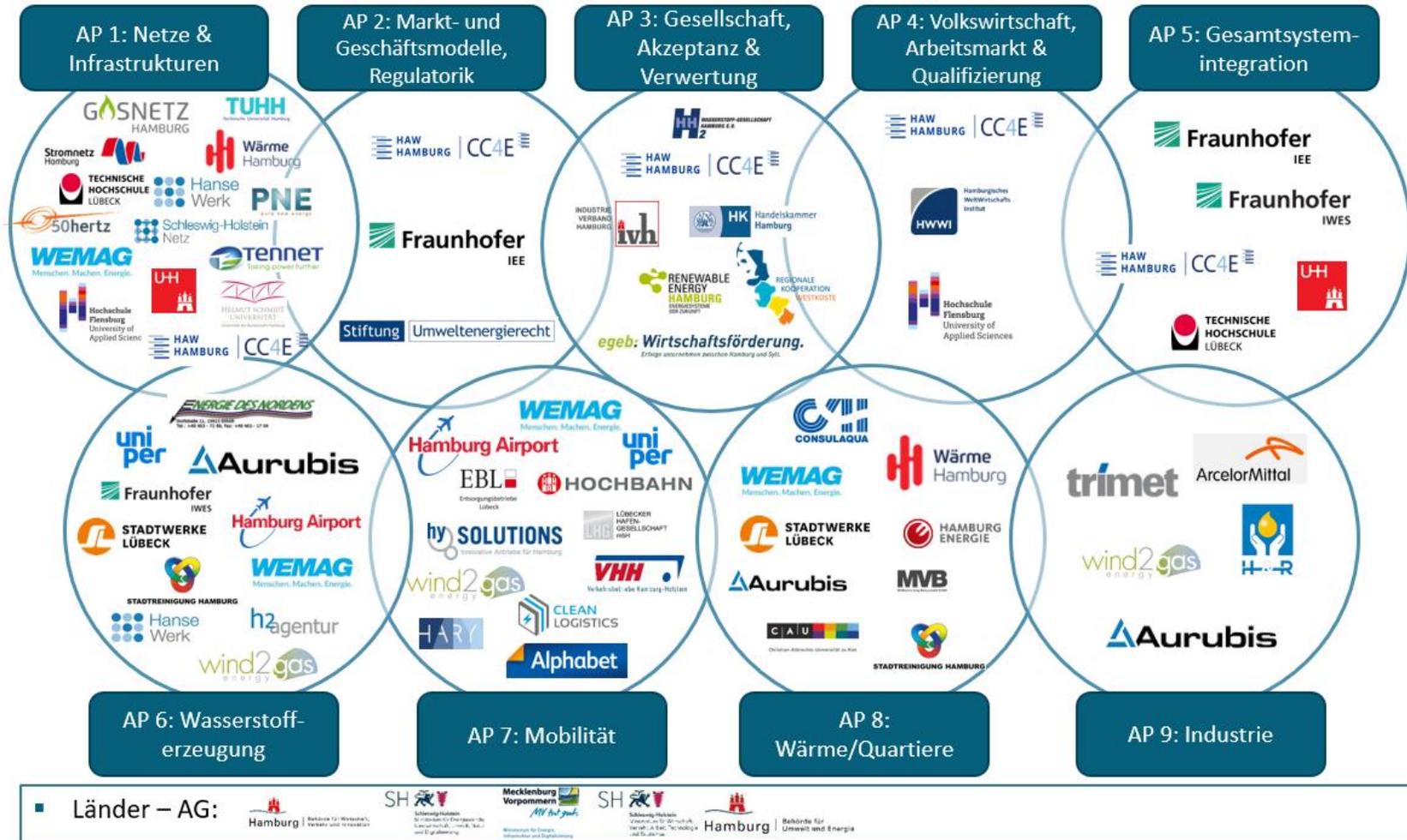

The entire calculation also refers to a material use in the anode furnace, in which the hydrogen displaces natural gas and can be used much better. It needs 1,3 Nm³ hydrogen to replace 1 Nm³ natural gas (see Ecofys). When using hydrogen as fuel in other furnaces, the usability is only about one third, which greatly reduces the economic efficiency.

» In the fire refining step natural gas removes most of the oxygen in the blister copper before casting anodes

» Initial study results show that hydrogen could be used as an efficient substitute.

» A reduction of **6.200 t CO_2 p.a.** direct emissions in Hamburg possible. Provided that electricity from renewable energies is used. This means that this process is indirectly electrified.
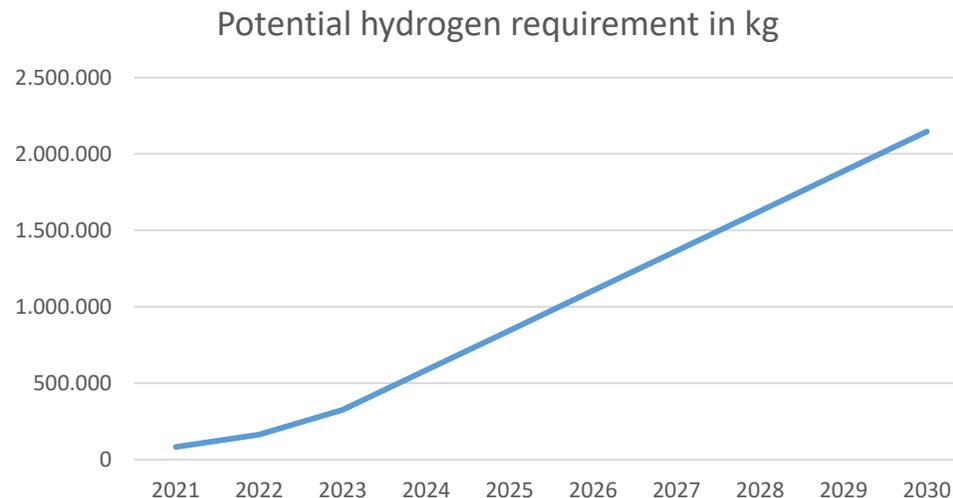
Cu 98%

Cu 99,6 %

reductant

Fire refining, anode furnace

» The resulting amounts of oxygen could possibly be used as a by-product.

» The transmission potential is given within the European copper industry.

» The efficiency will be higher, first estimates resulted over 77% efficiency

» Further technical-metallurgical investigations and tests in pilot plants are required.

Aurubis

Aurubis intends to participate in the work packages "Hydrogen Generation" and "Heat" of the research and demonstration project named "Norddeutsches Reallabor", which is an supra-regional field test.

» The technologies have to develop further, the <u>costs have to be reduced</u> and, above all, an adequate infrastructure has to be built

» Promotion of research and development

» Promotion of investment and operation

» Through competitive electricity prices for your own production of hydrogen

» Clear announcement: in which direction should it go (green, blue, etc.)?

Potential hydrogen requirement in kg

The potential is enormous, now politicians have to create the right framework conditions

Thank you for your attention!