

Catalytic Pyrolysis Technologies P.C. (CPTech)

CPTech has developed the process of “blue” hydrogen production through methane (natural gas or biogas) catalytic cracking MCC.

Waste materials of metallurgical processes function as optimal - zero value catalysts

Graphitic carbon produced offsets hydrogen production costs.

The need for hydrogen

The need for high volume - zero emission - low cost hydrogen by 2030 is officially enforced.

Energy consuming industries: Metallurgical - steel / nickel, cement, petroleum refining, data centers and AI require very large quantities of “clean” H₂ by 2030 to reduce CO₂ emissions.

Such quantities of H₂ can not be obtained from RES via electrolysis. MCC process hits low-cost zero-emission targets.



“Blue Hydrogen”

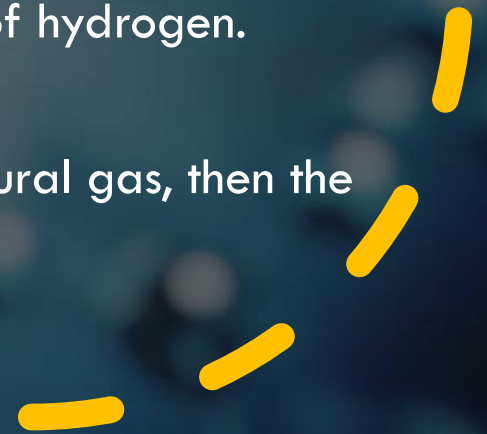
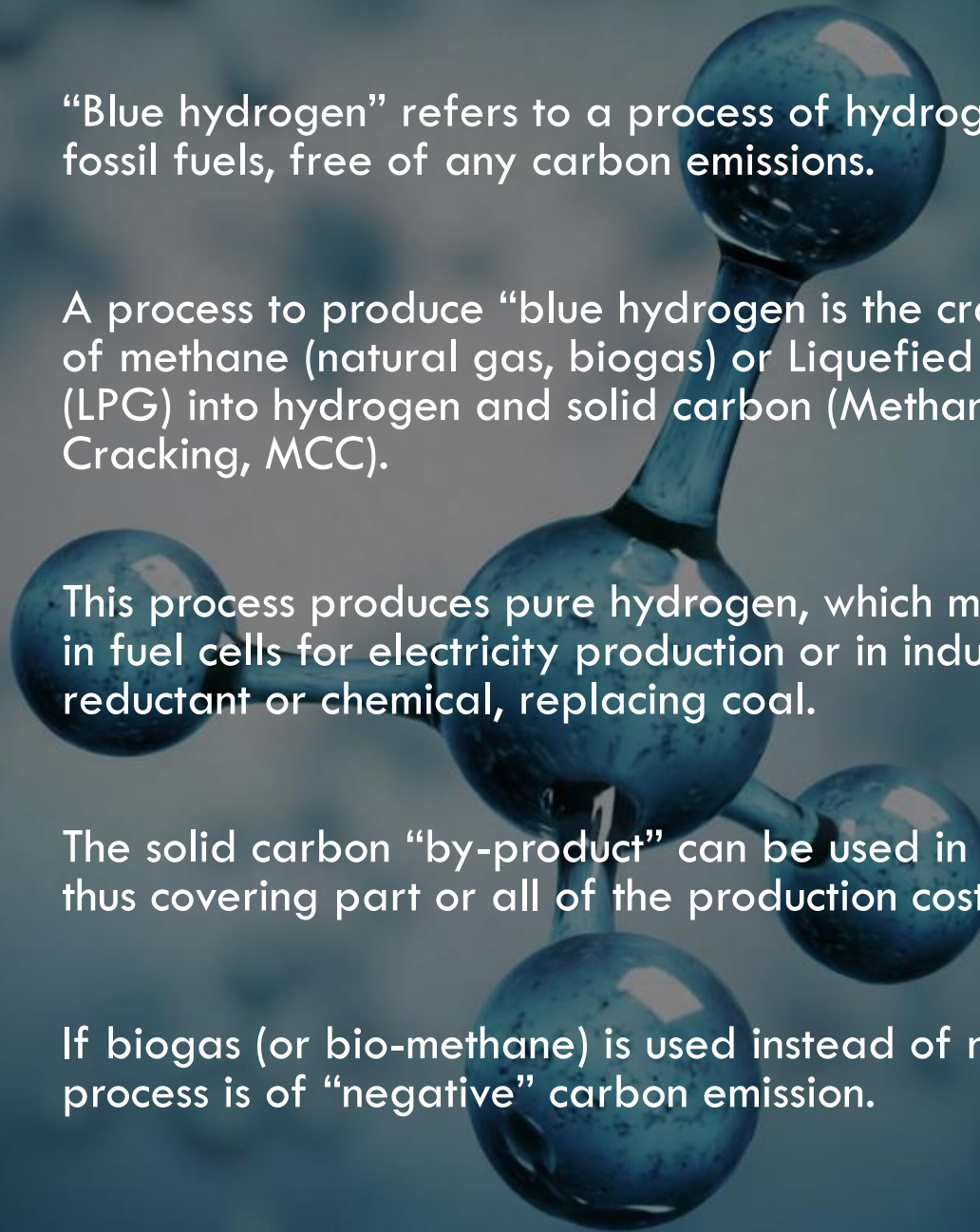
“Blue hydrogen” refers to a process of hydrogen production from fossil fuels, free of any carbon emissions.

A process to produce “blue hydrogen is the cracking or pyrolysis of methane (natural gas, biogas) or Liquefied Petroleum Gas (LPG) into hydrogen and solid carbon (Methane Catalytic Cracking, MCC).

This process produces pure hydrogen, which may be used directly in fuel cells for electricity production or in industrial processes as reductant or chemical, replacing coal.

The solid carbon “by-product” can be used in industrial processes, thus covering part or all of the production costs of hydrogen.

If biogas (or bio-methane) is used instead of natural gas, then the process is of “negative” carbon emission.






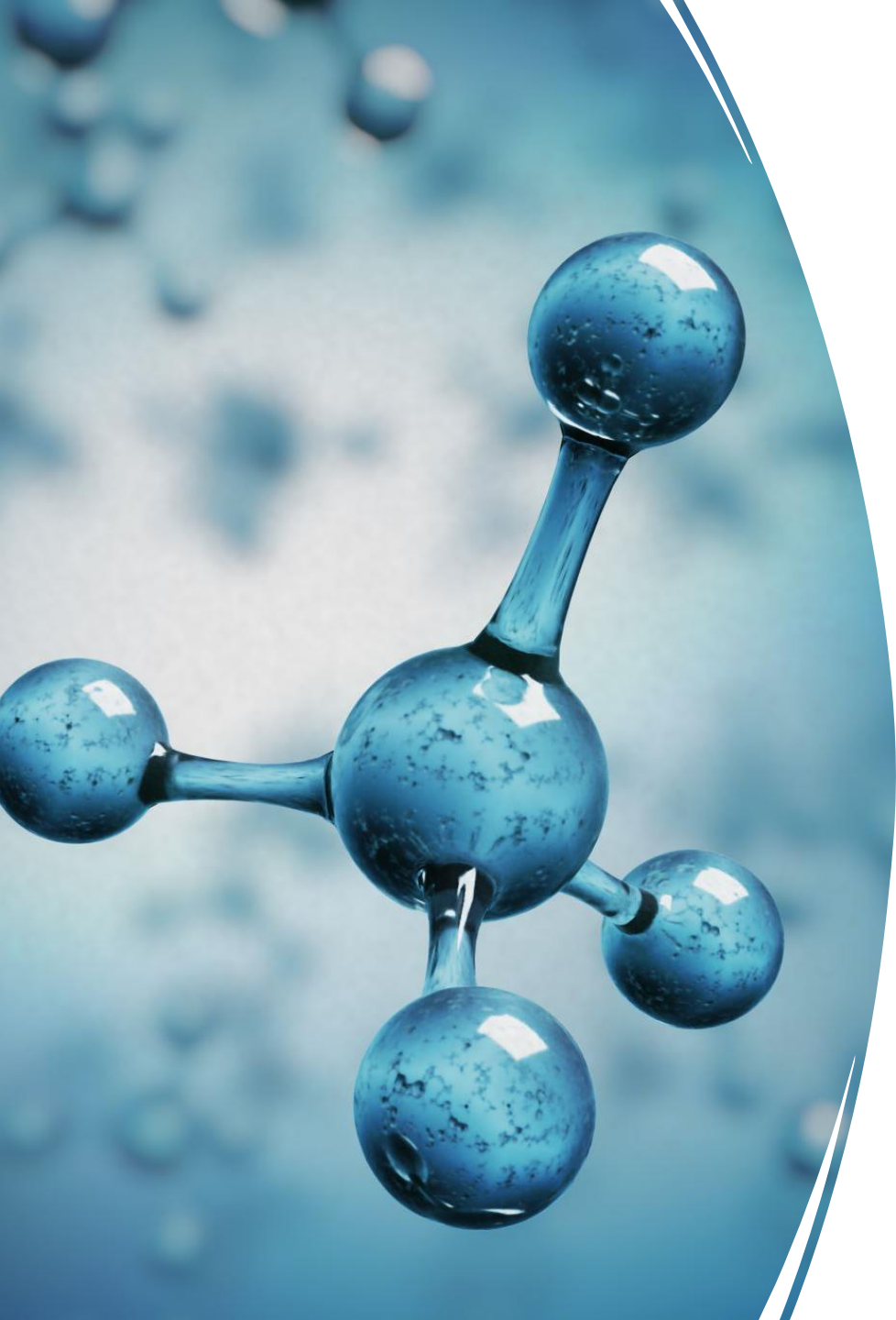
CPTech's vision

provide solutions to major industrial sectors to significantly reduce carbon footprint and emission of pollutants through the development of innovative technological solutions in hydrogen production to hit 2030 zero emission targets.

CPTech's mission


develop and deploy innovative, environmentally clean, energy efficient hydrogen production technologies, based on natural gas pyrolysis, which will serve major industrial and global energy needs under the guidelines of the energy transition of FitFor55.





Technological Breakthrough: Official Patents

- CPtech has patented the demonstration that metallurgical waste materials of zero value (i.e. mill scale, slag, red mud) can effectively catalyze the pyrolysis or cracking of methane (natural gas) and other hydrocarbons (such as LPG) into pure hydrogen and graphitic carbon.
- 2 granted U.S.A. patents & PCT global patent in approval phase: Europe, China, India and Japan.

A photograph of an industrial facility, likely a refinery or chemical plant, at dusk. The image shows several tall distillation columns and complex piping systems, illuminated by artificial lights. The sky is a deep blue, and the foreground is dark, suggesting a body of water or a grassy field. The image is partially obscured by a white curved shape on the right side.

Advantages of Methane Catalytic Cracking (MCC) process:

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- Low cost - zero carbon footprint hydrogen production.
 - Waste materials utilisation as catalyst - economic and environmental benefits.
 - H₂ production through biogas- negative carbon footprint.
 - Circular economy – dual market revenue through byproduct graphitic carbon
 - Large quantities of H₂ production
 - No infrastructural modification H₂ production is easily integrated in energy - demanding industries such as metallurgical, cement, oil refining & electricity supply.

MMC in metallurgical industries

- A process to produce “blue hydrogen,” is the cracking or pyrolysis of natural gas into gaseous hydrogen and solid carbon (Methane Catalytic Cracking, MCC).
- The process of hydrogen production is ultra low cost as the catalyst for cracking comes from waste materials of the iron industry (Fe-Mill scales)
- Carbon, of the graphitic form, is captured by the catalytic materials and is commercially exploited in the market (tires production, electrodes for fuel cells and batteries, electrodes for arc furnaces, composite materials with carbon fibers, plastics)
- The production cost for H₂ reaches negative value.
- Selling the produced carbon at a price of 1€/kg gives zero production cost of H₂
- Selling the produced carbon at a price of 10€/kg, the production cost of H₂ (for annual production of 1 million tons of Steel) is - \$931 million



Hydrogen production cost comparison

Process	H2 production cost (€ / kg H2)	Source	Comments
NG reforming with carbon capture	13.8 – 14.5	PPNL Report *	Cost depends strongly on the process of carbon capture
Electrolysis @ 200 €/MW-h	10	Various reports	Contains only cost of electricity
NG Pyrolysis	8.3	Own estimation	Without carbon sale
NG Pyrolysis	- 17.4 – 5.7	Own estimation	With sale of carbon. Cost depends strongly on type of carbon produced