

Exercise - H₂ Mobility

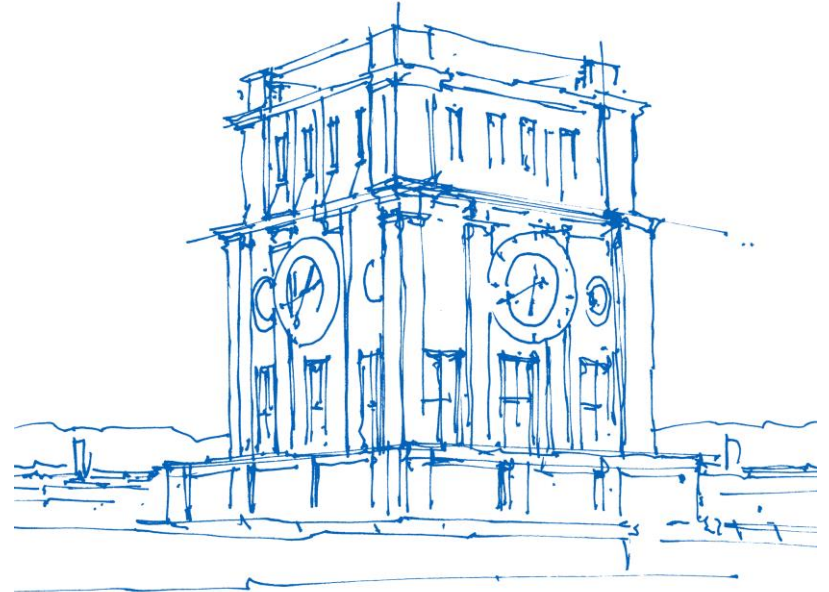
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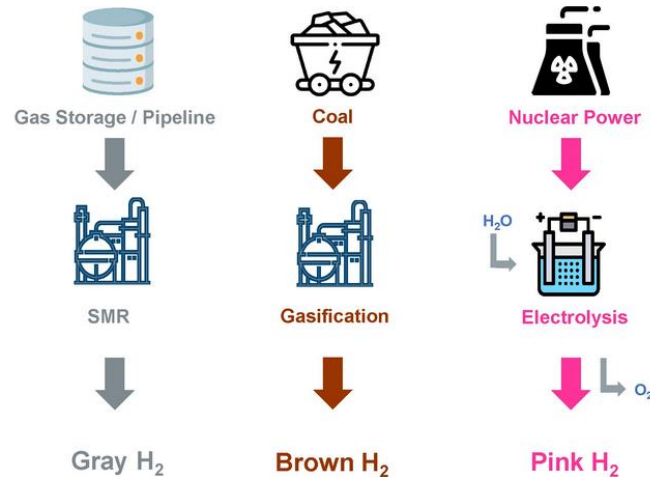
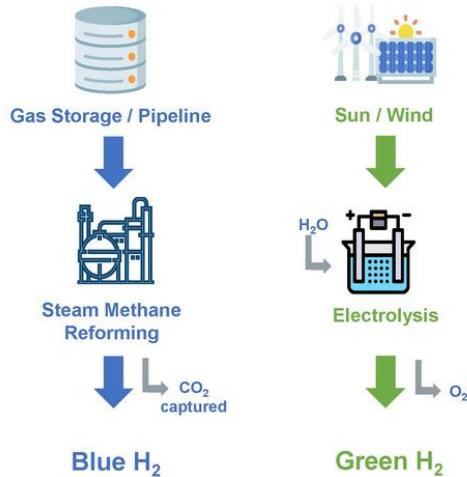
Chair of Renewable and Sustainable Energy Systems

Montevideo, 22 August 2024



Uhrenturm der TUM

Hydrogen production



Other colors:

Turquoise:
Methane
pyrolysis

White:
Natural
geological
hydrogen

Icons made by Freepik from www.flaticon.com

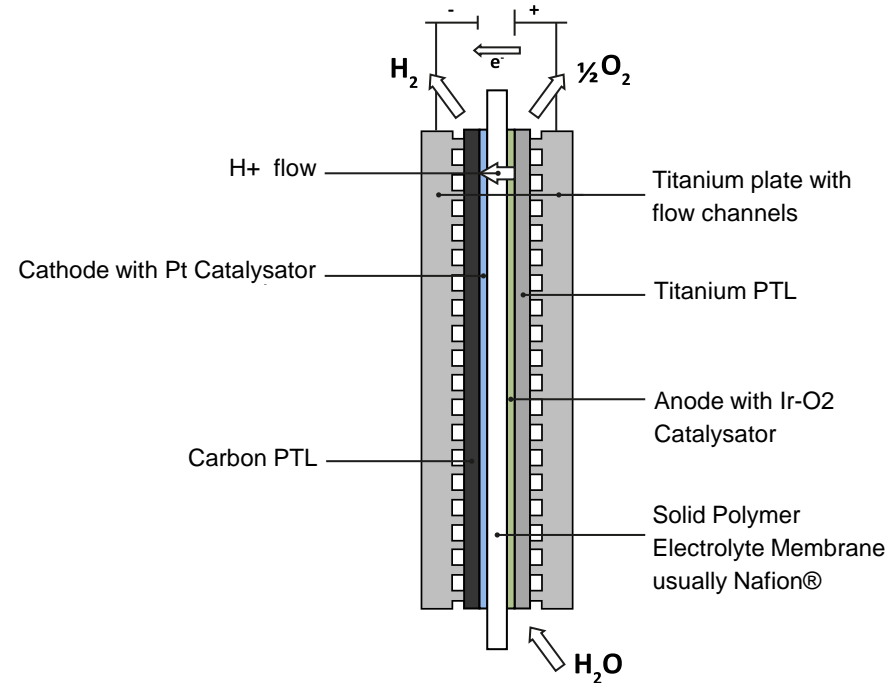
Source: <https://www.williams.com/2021/04/23/what-are-the-colors-of-hydrogen/>
<https://www.accelerazero.com/news/hydrogen-rainbow-what-is-it-and-why-it-useful>

Green Hydrogen

- Splitting of water (electrolysis) by electricity from RES.
- most developed electrolyzers:
 - Alkaline electrolyzer
 - PEM electrolyzer
 - High temperature electrolyzer
 - High temperature co-electrolysis

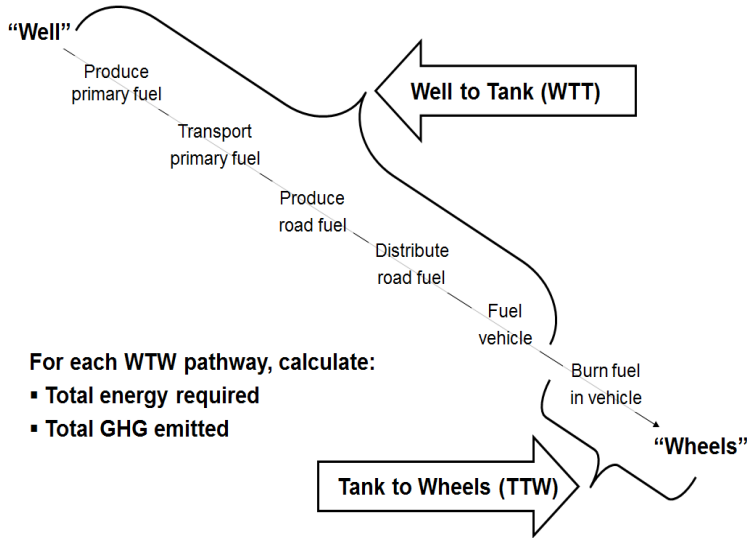
~9kg water per kg H₂

50.5 kWh electricity/kg H₂ (66% LHV)

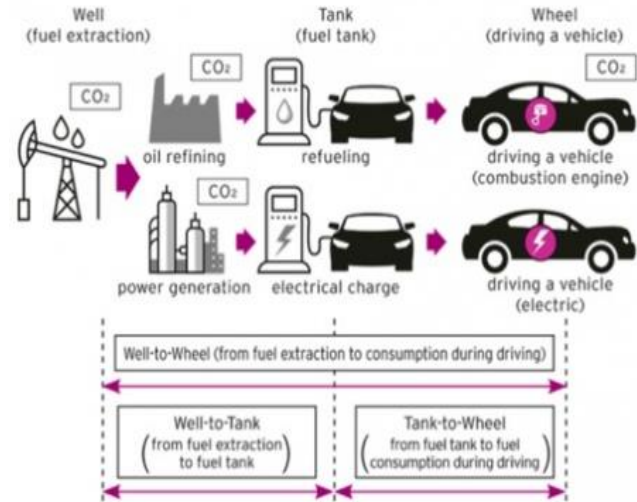


PTL : Porous Transport Layer, Pt: Platinum, Ir: Iridium

Well, Tank and Wheel Concepts



[1]



[2]

Source: [1] European Union Joint Research Centre. *Biofuels & Bioenergy: Well-to-Wheels analysis JEC.*
 [2] "FUTURE #SMARTMobility Needs Sustainable #CLEANenergy - Hans-Peter Kleebinder."

System

