

# Materials aspects considering H<sub>2</sub> use and generation on a practical scale

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## Abstract

Hydrogen seems on a way to become a vector of the future energy landscape, for mobility, (heavy) industry and heating, poised to increase about 10-fold in use from currently around 8 EJ or <2% of the world energy conversion. In order for (green) hydrogen to be available on a large scale, huge electrolysis capacity is required, on the order of several 100GWe in Europe alone. Like for batteries, this inevitably raises questions : both on the feasibility of this scale, and on the use and availability of the required materials on this scale.

This contribution will draw parallels to other large scale electrolyses (e.g. salt, aluminium) and take a quantitative look at the materials aspects of catalysts (among which the platinum group metals), membranes and steels, as a function of the different H<sub>2</sub> generation electrolysis technologies (water vs steam, alkaline vs acidic), with an emphasis on Solid Oxide Electrolysis (SOE).