# The future of today by advanced materials innovations and knowledge transfer

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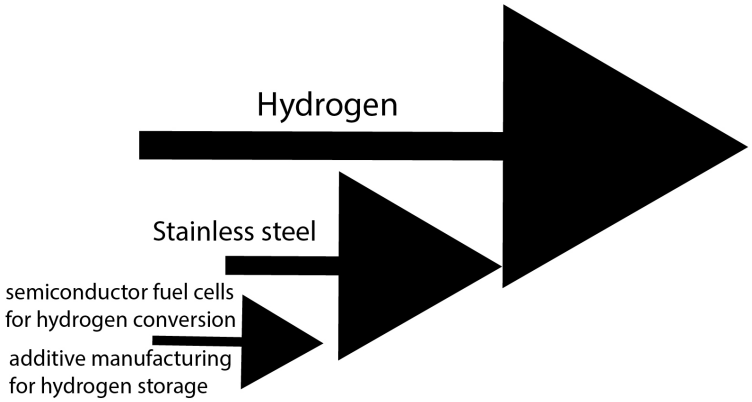
## Graphical Abstract




## Abstract

Energy technologies from advanced materials can have various routes. Common ground is the motivation of energy saving and cost. Typically manufacturing cost comes up, even if the technology concept is at early research stage. Presently there is a shift in that the sustainability aspect also has a value. In this session we present a case related to semiconductor and additive manufacturing approaches in the hydrogen future. In that the concept of semiconductor fuel cells for hydrogen and direct fuel conversion and additive manufacturing for hydrogen storage are presented. Today the hydrogen production is facilitated by new development of reducing iron ore material for steel manufacturing using hydrogen produced by renewable energy. The huge investment into this will push down the hydrogen production cost. The new approaches for hydrogen storage using additive manufacturing and semiconductor fuel cell conversion benefit from this push. Emerging technologies will have additional motivation when these dependencies are raised and understood. In Europe the Green Deal is growing strongly, and aspects such as regional development by smart specialisation are additional motivations for novel advanced materials technologies. These aspects are related to the knowledge transfer activity, which is not only in technology, but also regional and other broader contexts. The awareness of these today will be influencing the future prospects of advanced materials research and innovation for creating more utilisation and impact in the society.

**Keywords:** silicon carbide; energy materials; semiconductors; hydrogen; additive manufacturing

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