Teaser for Wind farm coupling with PtH

Please find both the report and the presentation made at the "Early Business Cases for PtH in Europe" event here: http://www.fch.europa.eu/publications/study-early-business-cases-h2-energy-storage-and-more-broadly-power-h2-applications

The key variables for the profitability of Power-to-Hydrogen (PtH) are the size of the electrolyser (scale effect), the time of deployment (maturity of the technology is still increasing and so are sizes which, together with higher deployment rates will bring further down its CAPEX), the value of the hydrogen produced (and the grid services the electrolyser can deliver) and the electricity cost for running the electrolyser.
As per slide 23 of the presentation and figure 2 at page 9 of the report (see figure below), the profitability boundary conditions for those variables are laid down.
Guiding you in these rather complex figure, in 2017 (left hand chart) you would get a viable business case for a PtH light industry or mobility project with a 1MW electrolyser with a target hydrogen (H2) sales price (electrolyser output) of 5 €/kg if the total electricity price of 35 €/MWh was not surpassed (total electricity price includes grid fees, taxes and levies). Should the primary market demand increase to allow the installation of a 6MW electrolyser, H2 sales price could drop to about 4 €/kg (moving along the horizontal axis); or, alternatively, the acceptable electricity price could increase to just above 50€/MWh to achieve the 5 €/kg sales price target (moving along the diagonal 5€/kg curve).
If you look at the 2025 scenario (right hand chart in the figure below), due to the higher volume production of electrolysers and technology developments in the pipeline (that enable higher capacity electrolysers suitable for the large industry) further reducing its CAPEX, a profitable business case is found at lower target H2 sales price should the electricity cost remain the same.

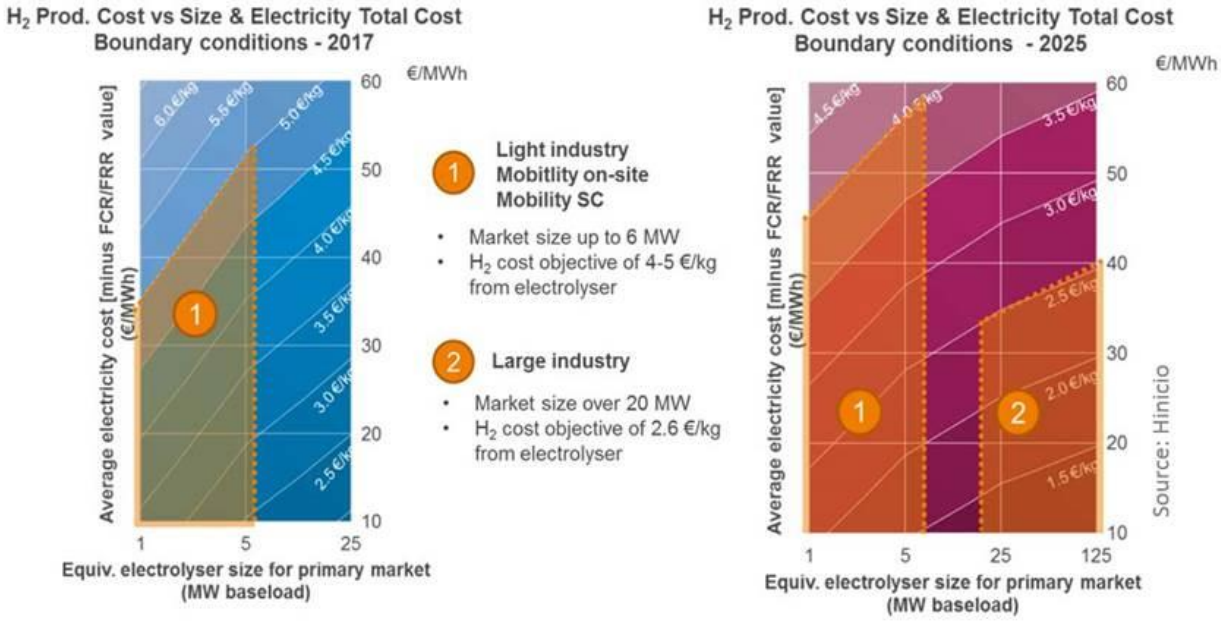

Figure 2: H_2 production cost vs electrolyser size vs total electricity cost boundary conditions in 2017 and 2025

As mentioned before, I believe this study opens new pathways for PtH and enables new business models that can be highly complementary and symbiotic with renewable electricity projects (RE). It opens the door to engaging into a long-term PPA with a renewable electricity provider that will ensure a low cost source of green-electricity for the electrolyser (producing the green H2) at the same time it offers a price floor to the RE. This turns the former profitable while it enables the latter to get into a project finance structure based on stable minimum long-term cash flows to service its debt instead of the traditional FiT (Feed-in-Tariff) that is being phased-out all over Europe.