Utilising hydrogen by-product to create carbon free transportation

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ABSTRACT

Chlorine-Alkaline production is well-established for either caustic soda or chlorine production, to which stoichiometrically, hydrogen is a common byproduct. In Europe, up to 50% of the hydrogen by-product is either used for heating, steam generation or vented. Even with hydrogen supply set to increase rapidly by 2030, most analysts still don't believe supply will match government targets. Furthermore, one of the primary challenges of increasing hydrogen supply lies in the costs of production.

In this paper Chart will outline how hydrogen liquefaction has the potential to turn the hydrogen byproduct from chlorine-alkaline production into a revenue stream for the plant owner. The amount of vented hydrogen matches the current capacity of hydrogen liquefaction plants and with the cryogenic products required for transporting and storing liquid hydrogen also already proven, the liquid hydrogen value chain is extremely low risk.

Aside from other applications, the mobility market is an interesting outlet for liquid hydrogen. It is the ideal CO_2 free alternative to diesel for heavy haulage vehicles and development projects are already at advanced stages for ships, trains and aeroplanes. Even without taxes imposed, hydrogen at the refuelling station can compete with globally traded gasoline and once carbon taxes are added, liquid hydrogen becomes an even more attractive alternative fuel.

Keywords:

Hydrogen, transportation, sustainability



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