Target for electricity generation in the SWIS assist in achieving the decarbonisation objectives of the State Government?

Recommendation 1:

Renewable hydrogen in the SIWS will not decarbonise the grid

hydrogen target for electricity generation in the SWIS.

It will be more effective in terms of decarbonisation to stipulate a instead of sectors where

If the objective of using hydrogen is to mitigate climate change, it is more effective to have a renewable hydrogen target in hard-to-

- for example, heavy buses, trucks, ships, trains, planes, steelmaking, and chemicals. A regulatory measure such as a target or a quota will force carbon-intensive users to meet a minimum (share) consumption of renewable hydrogen instead of fossil fuels.

you were removing a tonne of CO2, it would make more sense to put the hydrogen in the steel or ammonia sectors than worrying about the last 10% of the electricity demand (Evans & Gabbatiss, 2020)

For those sectors in which electrification is not an option still, renewable hydrogen can bring them renewable electricity generation. For instance,

and it can serve as a

feedstock for chemical reactions to produce a range of synthetic fuels and feedstocks instead of using fossil fuel.

If the objective is to develop the renewable hydrogen market, the target needs to be focused on the right market to then assist with the further decarbonisation of other industries. The renewable hydrogen target should be focused on opportunities outside of the SWIS, to develop the market to achieve the full decarbonisation of the whole industry from an economic perspective.

There is also an opportunity cost of using renewable hydrogen in a sector that could be easily electrified. Quotas to replace fossil fuels with renewable

. Given that the supply of renewable hydrogen is scarce, there is a high opportunity cost of putting renewable hydrogen quotas in electricity generation in the SWIS instead of using it in hard-to-abate sectors.

The proposed scheme it is not designed to and will not assist in achieving the decarbonisation objectives of the State Government from an economic perceptive. The scheme should cover hard-to-abate sectors in which the use of green hydrogens is required to decarbonise.

These uses can increase the future demand for hydrogen and take advantage of possible market expansion, which will help to create larger economies of scale, decreasing the costs in the green hydrogen value chain, and making it more attractive (more competitive) for

across different steps in the value chain. After converting electricity to hydrogen, shipping it and storing it, then converting it back to electricity in a fuel cell, the delivered energy can be below 30% of what was in the initial electricity inpu (Bulgarian Institute, 2022)

Green hydrogen incurs significant energy losses at each stage of the value chain. About 30significant single cost component for on-site production of green hydrogen is the cost of the renewable electricity needed to power the electrolyser unit . (Reglobal, 2021) This creates an opportunity to produce hydrogen at locations like WA that have optimal renewable resources to achieve competitiveness in external markets.

Conclusion

Implementing a renewable hydrogen target to decarbonise the grid should

, such as wind, tidal and solar energy, and batteries. Once the above has been implemented, this fuel in the grid should only be used to provide stability to the grid. There is still the potential for hydrogen to play a hugely significant role in reducing emissions in hardto-abate sectors. For instance, a target of renewableeo 13 527.4 Tm 0 g0 G[r) 23(e) - 4(n) - 9(e) - 4(w) - 4(a0 g0

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