Review of: "Low-Carbon Hydrogen Economy Perspective and Net Zero-Energy Transition through Proton Exchange Membrane Electrolysis Cells (PEMECs), Anion Exchange Membranes (AEMs) and Wind for Green Hydrogen Generation"

Juan M. Paz-Garcia[1]

1 Universidad de Málaga

Potential competing interests: No potential competing interests to declare.

This article discusses the economic aspects related to green hydrogen through water electrolysis. The article is interesting and addresses a very up-to-date topic of interest for companies and research institutions all around the world, as green H2 is considered one of the key vectors for a decarbonized energy system.

The manuscript is, in general, well organized. However, I have detected some aspects that could be improved. First, some of the references are old, taking into account that the topic is addressing a present and future perspective of the technology. For example, it is mentioned, “Currently, 23% of hydrogen is generated from coal, and 76% is generated from natural gas (Peschka 1992).” – A reference from 1992 is not providing suitable information about what is happening in 2024. Even though the data is correct, the consulted reference should be from, at least, 2020 or newer. Similarly, other references are also from nearly 20 years ago; they should maybe be updated with more current information.

In terms of scientific accuracy, there are some sentences that seem to be incorrect to me. For example:

1. Green hydrogen, which will be sold between US$1.5 and US$3.4 per kilogram in 2023, is used in the manufacturing of methanol, electricity generation, fuels, and ammonia. However, because it is made from fossil fuels, CO_2 emissions increase. (**Green energy is not supposed to be made from fossil fuels.**))
2. The cost of producing one kilogram of green hydrogen, which is derived by hydrolysing water, ranges from $3 to $7. (** Not hydrolysing, but electrolysing**)
3. An electrolyser is essential for producing hydrogen from any electrical source because it combines electricity and water to produce hydrogen and oxygen (*the electrolyzer definition and fundamental operation should be rewritten for clarity. For example, it is not correct to say “A stack of electrolytic cells *absorbs* clean water and electricity”**)
4. Please, rewrite: e^–1 => e^– (**not –1 but only –**)