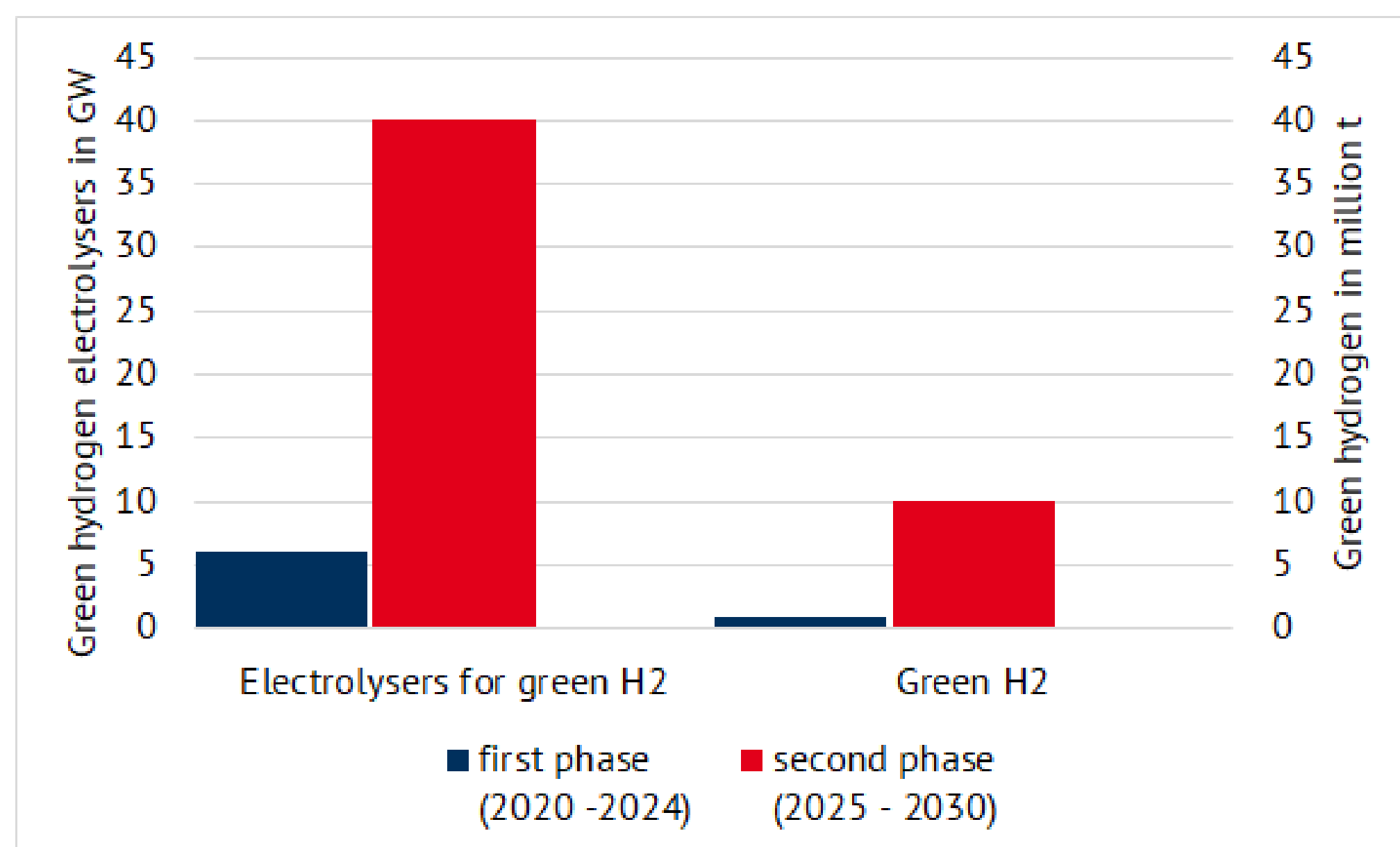
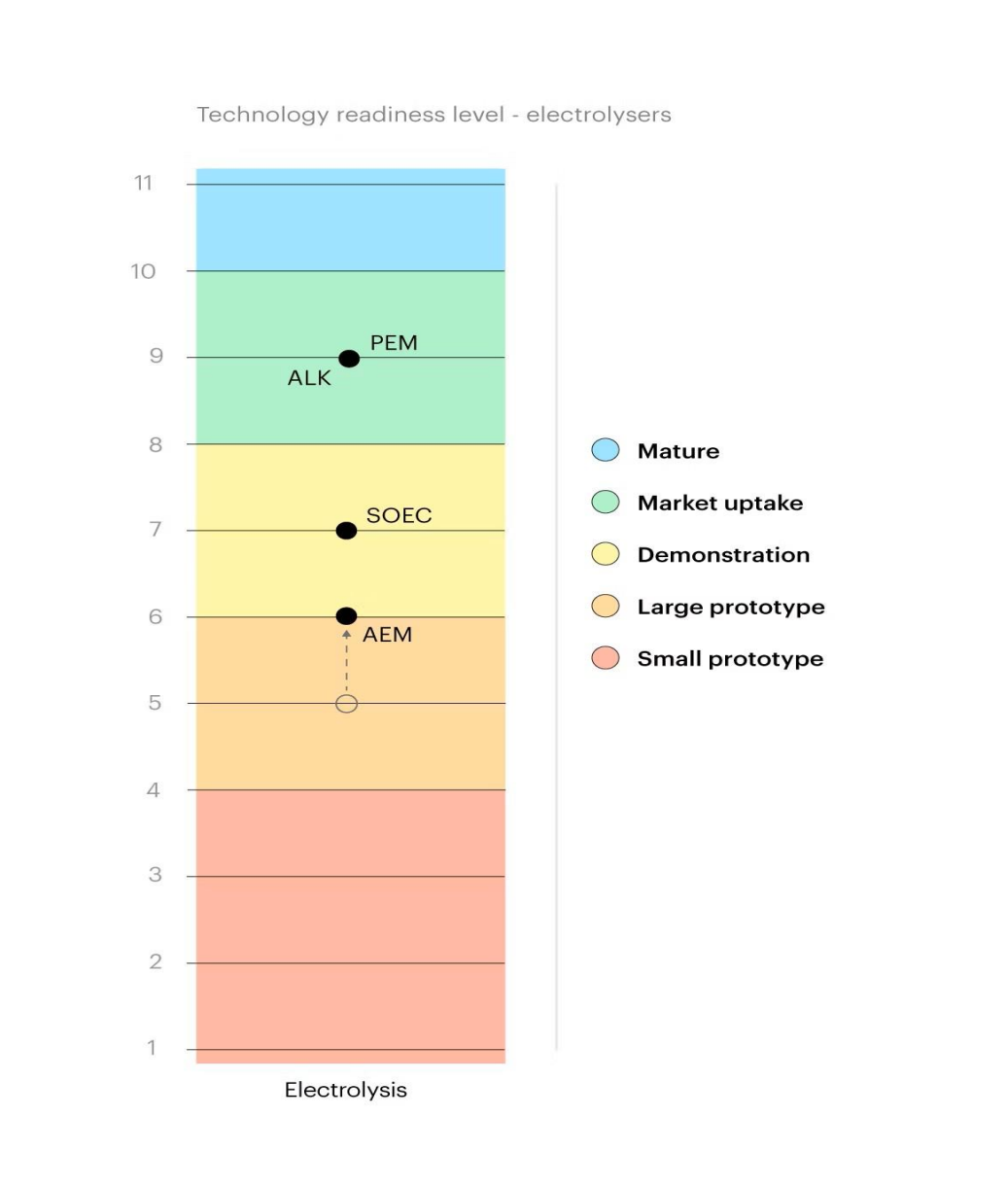


# Evaluation and Performance Analysis of AEM Electrolysis and improvement possibilities in terms of Sustainability and Efficiency

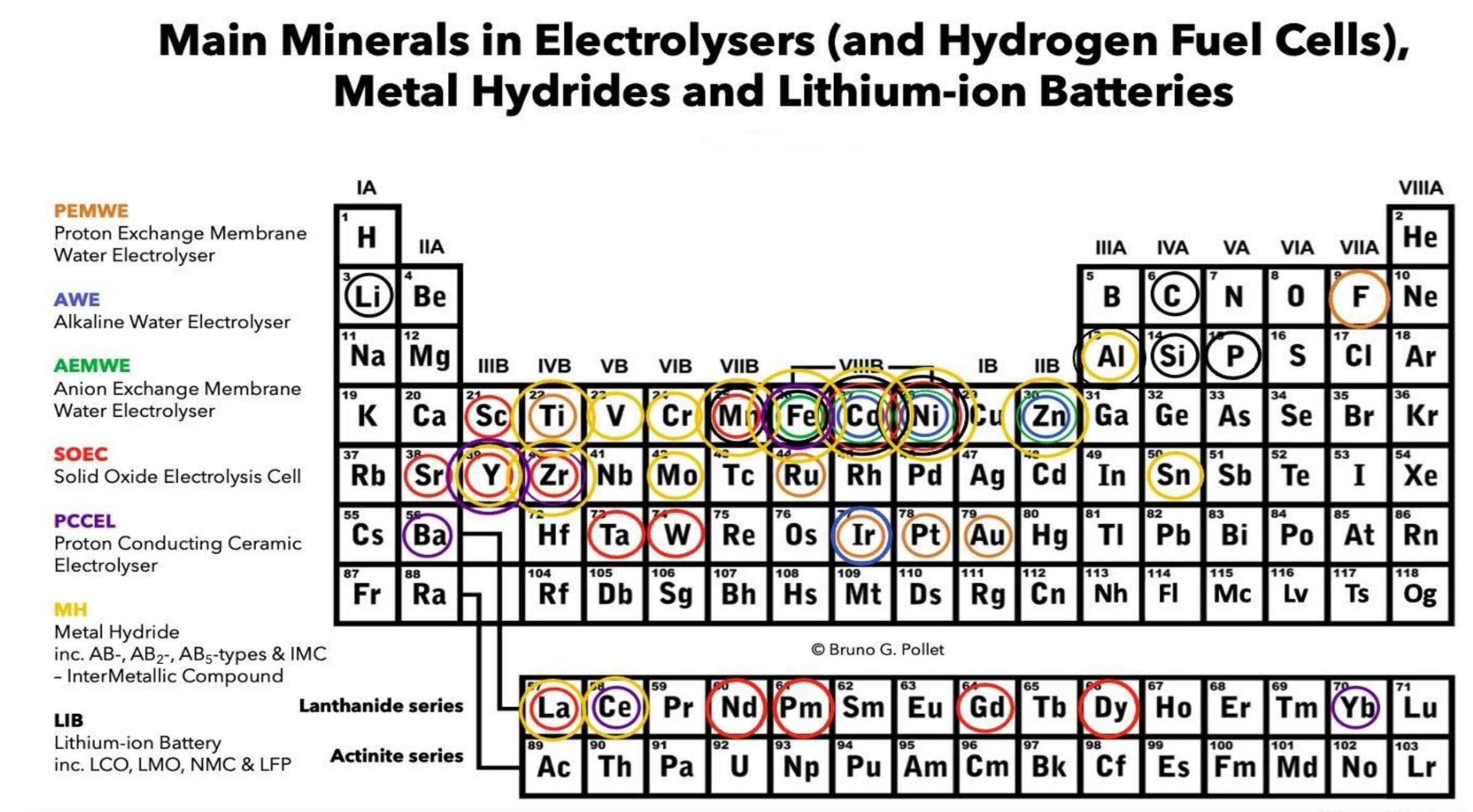
Increasing demand for Green Hydrogen is stressing the CRM supply chain and here is what we can do !!



EU Hydrogen requirement and Electrolyzers capacity by 2030



Electrolyzers Maturity

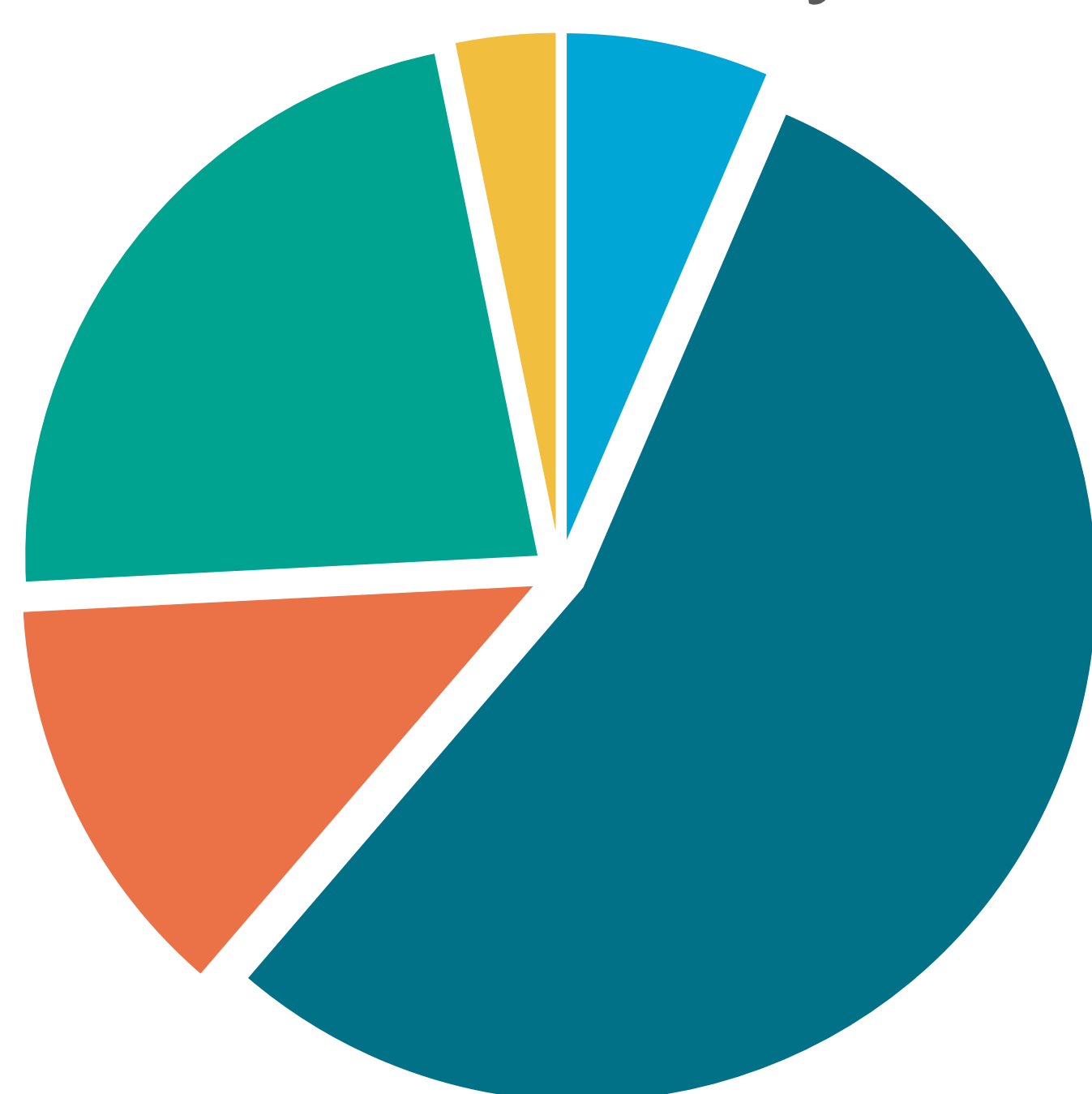


Elements used in types of Electrolyzers

## Why the Life Cycle Assessment of Electrolyzers is important?

High demand implies huge implications on environment, To reduce the effects on environment while it is under development is the best way as once whole supply chain is ready; It becomes hard to change or substitute the components in supply chain. As a results, we can bend the way we want when it is under development.

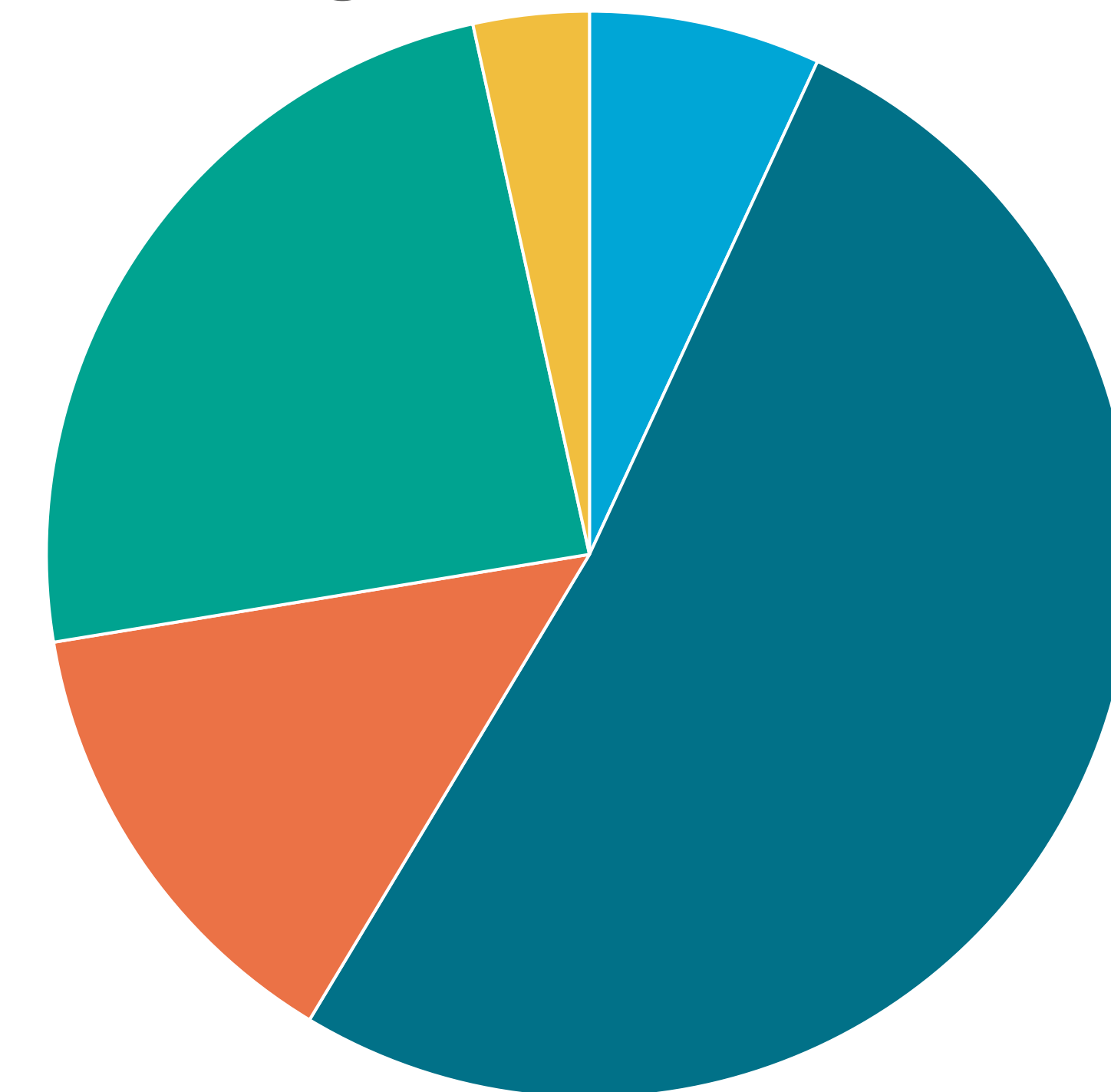
### Base Electrolyzer



■ Membrane ■ Electrode ■ Gas Diffusion Layer ■ Bipolar Plate ■ Stack Assembly

Major Contributor to  $CO_2$  emissions is Electrode which is approximately 8258 Kg over the lifetime of 6000 hrs Whereas in the replacement with non-CRM's, it reduces to 6971.5 Kg  $CO_2$

### Change of Electrode



■ Membrane ■ Electrode ■ Gas Diffusion Layer ■ Bipolar Plate ■ Stack Assembly

## Results:

- Replacement of Electrodes with non-Critical Raw Materials is possible.
- The change in carbon footprint will be huge looking for the long term.
- With change in electrode,  $CO_2$  footprint can be reduced by almost 15%.

## Conclusions:

- The Coating technology used in the membrane is not so common which needs specialized equipment. Which makes it harder to coat the metals on membrane, but it is possible.
- To avoid the disruptions in the supply chain of Critical Raw Materials, we should start looking for alternatives now and it will be preferred that we should diversify the supply chain.