

Cost-Effective Water Electrolysis

BullX Research, LLC

Objectives. This is a proposal to commercialize a new technology that will provide a better way of making electrolyzer cells and stacks of such cells. Another objective is to provide such improved cells that are made with less expensive materials, a reduction in the number of components, reduction in the required manufacturing procedures, and a reduction in labor costs.

Background. The IEA projects a minimum installed electrolyzer capacity of 700 GW to meet hydrogen demand for net-zero energy by 2050. Currently there is only around 8GW of electrolyzer manufacturing capacity. Therefore, a highly scalable, cost-effective solution is needed to reach the installed capacity for the net-zero goal.

The majority of commercial water electrolyzers have high costs associated with their manufacture. Current systems include combinations of expensive materials that may include rare-earth metals, precious metals, and metal alloys in the electrode materials. Additionally, current electrolysis cell designs are highly complex and labor intensive resulting in high manufacturing costs.

A simplified design allowing for reduced manufacturing costs and increased scalability is needed to meet the market demand.

Technology. A proprietary technology under development by the team at *BullX Research* offers a radically improved method of electrolyzer manufacturing. The new, patent pending, design is developed from the ground up and driven by principles of manufacturability and scaling of production. The new design overcomes the above-mentioned limitations of expensive materials, numerous components, expensive manufacturing procedures and labor costs.

Application of the new technology for cost-effective electrolyzer manufacturing can drastically reduce the capital costs for renewable energy projects relative to currently available commercial offerings. The new technology also allows for scaling to multi-gigawatt capacity with a considerably lower capital investment.