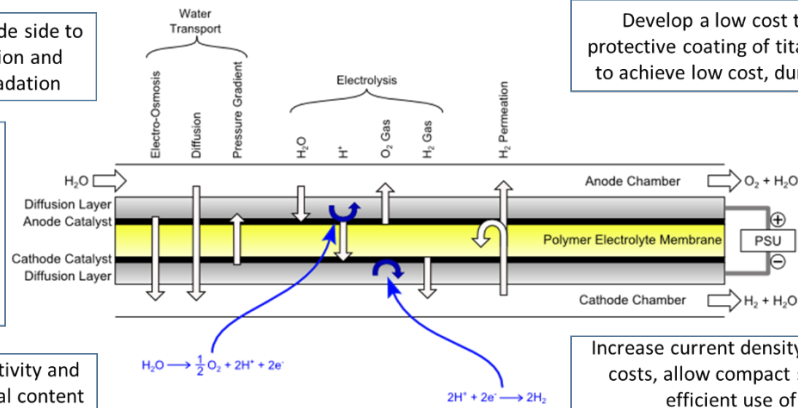


Chemical and Physical Advances on PEM cell level

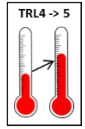
Redesign diffusion layer anode side to improve oxygen gas diffusion and overcome reversible degradation

Lower membrane thickness to reduce ohmic drop
Increase of operating temperature (up to 140 °C) and improve mechanical stability through the use of fibre reinforcement

Increase intrinsic catalyst activity and stability, lower precious metal content

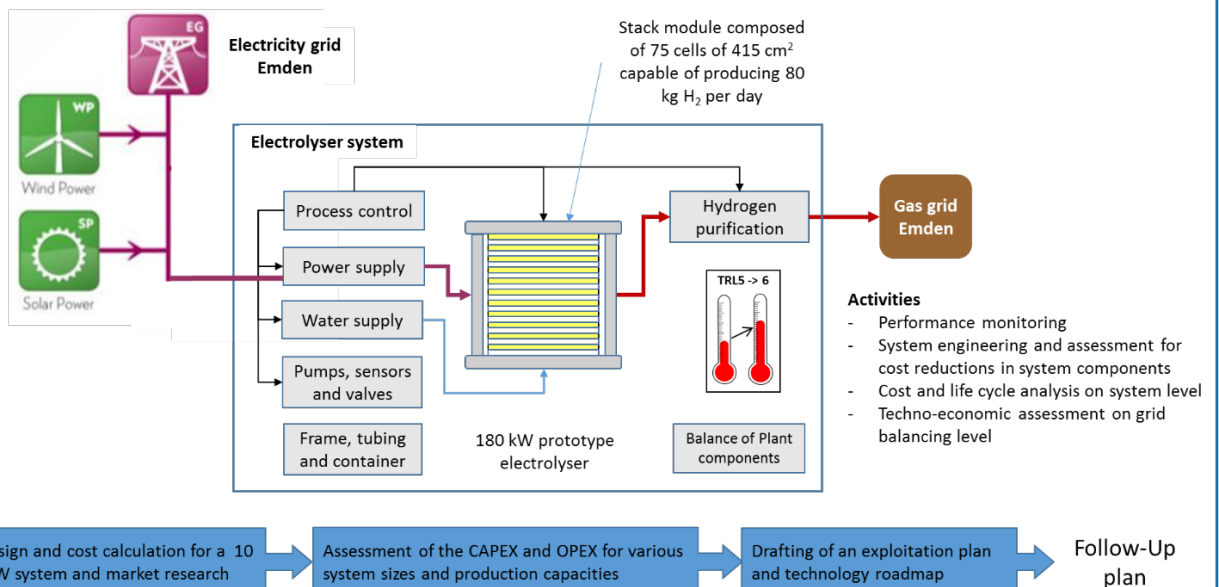


Develop a low cost technique for a protective coating of titanium components to achieve low cost, durable components



Increase current density to reduce capital costs, allow compact stack design and efficient use of materials

System design, system optimization, prototyping and validation in a field test at Emden



Design and cost calculation for a 10 MW system and market research

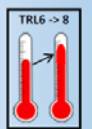
Assessment of the CAPEX and OPEX for various system sizes and production capacities

Drafting of an exploitation plan and technology roadmap

Follow-Up plan

Follow up activities:
Exploitation plan

Demonstration on 10 MW scale
2020-2022



Build up of production Capacity

Market entry/development and technology roll out