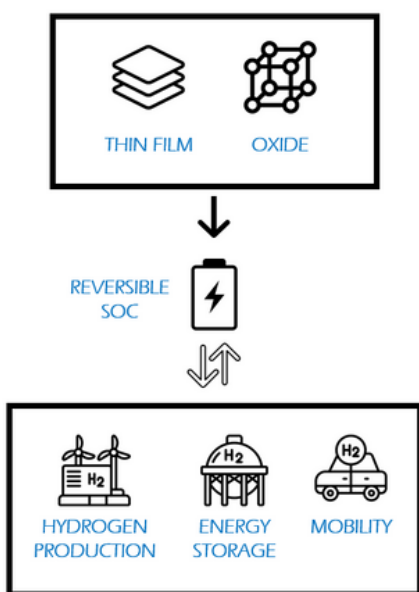


# ULTRA-COMPACT REVERSIBLE SOLID OXIDE CELLS

POCKET-SIZED KW-RANGE STACKS

## THE CONCEPT



## ADDED VALUE

- High density current per volume
- High production yield at low cost

## TRL

3



## CONTACT

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## PRODUCT DESCRIPTION

- Revolutionary **ultra-compact** thin film **reversible** solid oxide **electrolyser-fuel cell**
- **Pocket-sized** kW-range stacks
- **Negligible content** of critical raw materials (CRM)
- Able to **efficiently store renewable** energy and **generate** it through the use of **green hydrogen**
- Suitable when **small-sized constraints** or long-term applications are required
- Lower working temperature range than current technology

## APPLICATIONS

- **Hydrogen production** (chemical + metallurgical industry)
- **Energy storage** (Grid-storage, off-shore generation, decentralised off-grid scenarios, solar energy)
- **Mobility** (Land, naval, air)

## DESIRED PARTNERS

- Microelectronics foundry
- System integrators

## EXPECTED BENEFITS



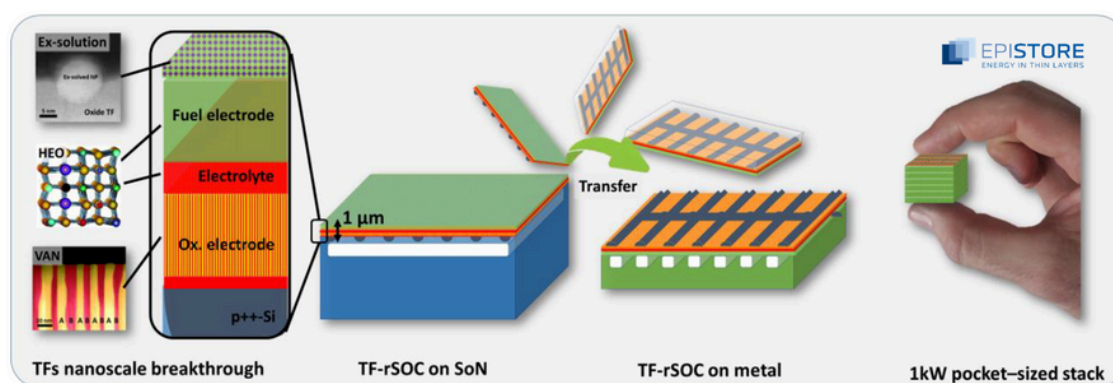
technical details

## INNOVATION SOLUTION

This technology is a thin film reversible Solid Oxide Electrolysis Cell (SOEC) which is able to operate at high current densities and at lower temperature range ( $T < 650^{\circ}\text{C}$ ). In addition, it requires negligible quantities of Critical Raw Materials. The use of thin film technology ( $< 1\mu\text{m}$ ) represents a technological innovation driven by nanoscale phenomena. Furthermore, the solution combines nanoscale advances and materials yet to be explored with pioneering to provide new ultra-compact and fast-response power-to-gas (P2G) and power-to-power (P2P) storage solutions with high performance.

## KEY ELEMENTS

- Thin Film Reversible Solid Oxide Cells:  $< 1\mu\text{m}$  thick cells
- Pocket-size stacks
- Ultralow content of CRMs: 0.048 g/kW in our ultracompact cell vs. 19-58 g/kW conventional SOFC
- Better P2G efficiency (95%) compared to other electrolyzers, also P2P efficiency is increased (65%).
- High production yield at low cost: Use conventional microelectronics manufacturing technology
- Cheaper hydrogen production enables a larger uses cases for green hydrogen. The competitive production of green hydrogen using IREC's SOEC contributes to increase the integrate higher shares of renewable energy sources.



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