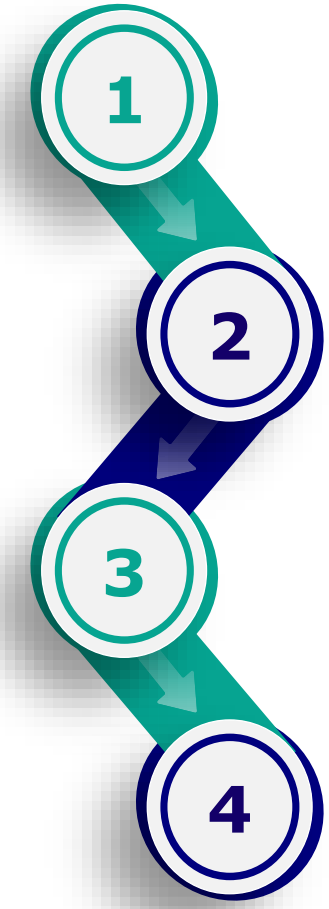
FutureScaleX

CASE STUDY

Identifying unmet needs in green hydrogen production technologies

futurescalex.com contact@futurescalex.com

Executive Summary - FutureScaleX helps Energy Supermajor formulate R&D strategy and identify white space opportunities in green hydrogen



SITUATION

A European supermajor sought to refine its R&D capital allocation strategy in green hydrogen, focusing on water electrolysis and hydrogen storage. The goal was to prioritize technologies that reduce the levelized cost of hydrogen and remain relatively unexplored by competitors.

CHALLENGE

The client needed a comprehensive framework to evaluate all current technologies under research for water electrolysis, analyze prominent OEMs and energy companies active in green hydrogen R&D, and identify technology white spaces best aligned with its strategic objectives.

SOLUTION

FutureScaleX (FSX) conducted an innovation benchmarking exercise, ranking and rating 15 competitors based on R&D investments, corporate venture capital (CVC) activity, academic collaborations, and patent filings. This analysis provided insights into emerging electrolysis technologies and identified areas with varying R&D intensity.

IMPACT

- Validated and refined the client's existing green hydrogen R&D strategy.
- Identified areas of competitive advantage, including hypercompetitive and white space opportunities.
- Highlighted key competitors in water electrolysis and recommended technology segments for the client to prioritize.

Business Context

Our client, a global integrated energy company, views low-carbon hydrogen as a critical solution for decarbonizing hard-to-abate sectors and non-road transportation. To position itself as a leader in green hydrogen, the client tasked its R&D division with two key objectives:

1. Develop technologies that enable affordable and sustainable production of green hydrogen.
2. Research innovations that could provide a long-term competitive edge in the green hydrogen market.

To address these objectives, the client engaged FSX to deliver a comprehensive solution that meets both priorities.

Business Requirement

The client initially asked FSX to concentrate on the broader water electrolysis value chain, aiming to identify solutions that lower both capital and operating costs of electrolyzers. Additionally, the client sought insights into:

- Industry players active in water electrolysis R&D.
- Technologies with the highest and lowest levels of R&D activity.
- Technology segments with significant emerging startup activity.

By evaluating these parameters, the client intended to allocate R&D capital strategically, targeting innovation white spaces that would secure a sustainable competitive advantage.

The FSX solution framework

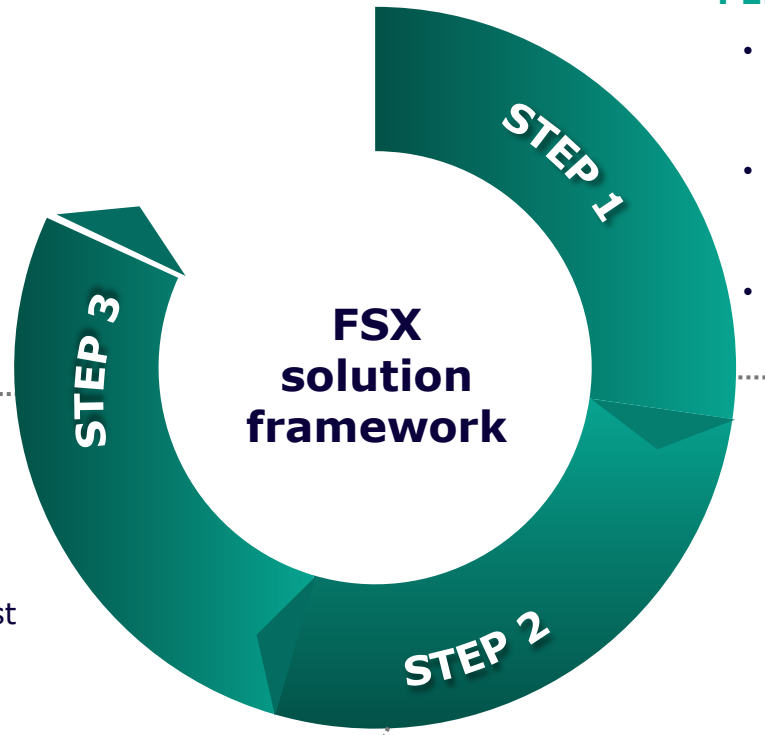
FSX utilizes a 3-step process to conduct peer benchmarking in green hydrogen production

START-UP & COLLABORATION ANALYSIS

- **Partnership ecosystem:** Assess various joint ventures, technology partnerships, led by peers in hydrogen
- **Startup engagement**: Identify peer collaborations and investments in green hydrogen startups
- **Market Approach**: Analyse peer-led research collaborations with universities and grants provided to academic institutions

IP AND ACADEMIC DATA SCREENING

- **IP data screening:** Screen an exhaustive list of patents authored by peers
- **Screening of NPL:** Screen an exhaustive list of publications authored by peers
- **Analyze each peer:** Gather datapoints regarding academic / industrial partners listed as co-affiliations



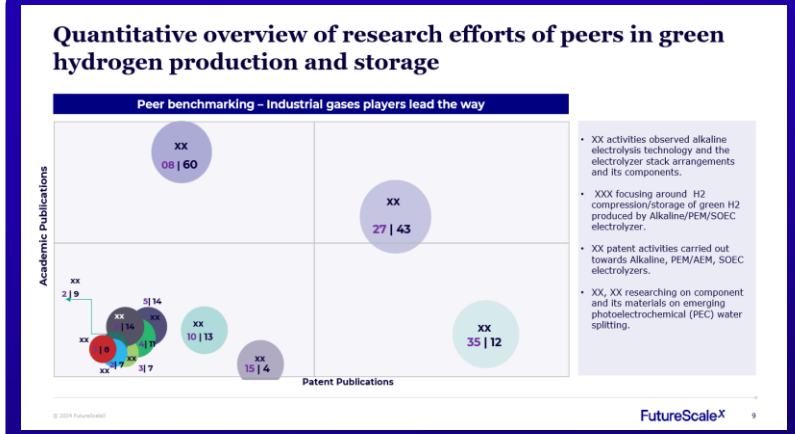
PEER IDENTIFICATION & SEARCH ENGINE

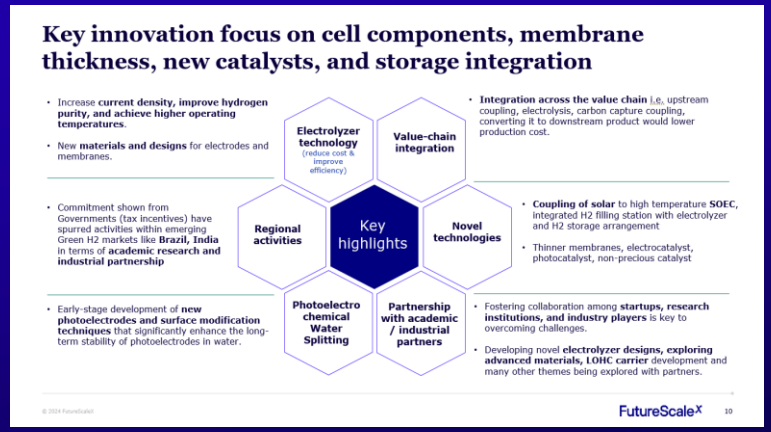
- **Competitor universe setup:** Screen energy and industry peers who are direct competitors to the client and are active in hydrogen production
- **Robust search engine:** Prepare robust search engine, keywords identification, identifying relevant IPCs-CPCs for different concepts
- **Grouping of taxonomy:** Propose structured categorization of relevant IP and academic data

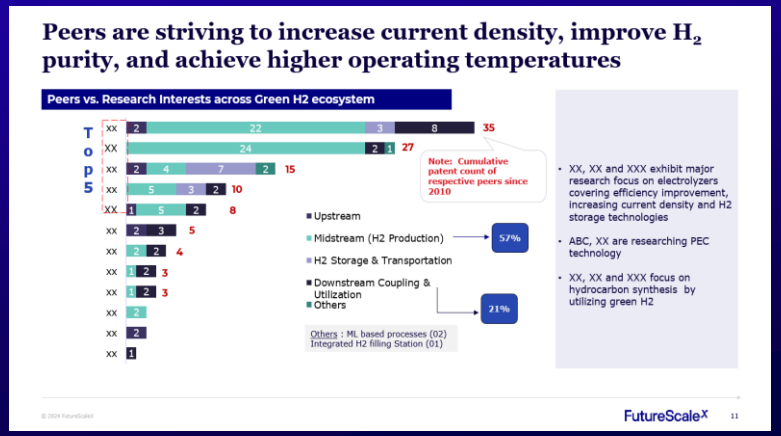
Impact

- Delivered a comprehensive analysis of the client's R&D positioning within the green hydrogen landscape, validating and refining its electrolysis strategy.
- Provided detailed insights into emerging trends and peer research priorities in green hydrogen production, highlighting cost-reducing technologies.
- Identified hypercompetitive technology segments, potential underexplored white spaces, and areas best suited for the client’s R&D investment.
- Assessed peer collaborations across the green hydrogen value chain, including partnerships with electrolyzer manufacturers, chemical suppliers, material providers, and other relevant partners.

Sample output







Methodology
The FSX Sustainable-Growth-as-a-Service™ Methodology

Policy & Regulation

Carrots vs. Sticks

Innovation & Technology

Potential vs. scale

Techno-economics

Tipping points vs. ROI

Supply Chain

Technical vs. Capital readiness

Digitalization

Time-to-market vs. Payback period

Partnership & Ecosystem

Risk vs. Reward

Connected, systems-level thinking to identify the tipping points and solutions that matter.

Are you ready to grow sustainably?

At FutureScaleX, we believe that the future of business lies in sustainable growth. Our six-lens methodology is more than just an approach—it's a movement towards a more resilient and sustainable future.

FutureScale^{x}

Connect with us.

To request more information such as a meeting, demo, trial, or referral, please visit our website: www.futurescalex.com or email contact@futurescalex.com

Mumbai

Floor 8th, Plot 368, Vivaria Tower
Bhandarkar Rd, Matunga Phul Market,
Mumbai 400019 India

futurescalex.com

contact@futurescalex.com

Singapore

1 North Bridge Road, #18-06 High Street Centre, Singapore, 179094

futurescalex.com

contact@futurescalex.com

Amsterdam

Transistorstraat 31, 1322 CK
Almere, The Netherlands

futurescalex.com

contact@futurescalex.com

Boston

44 School Street, Ste. 505
Boston, MA 02108 USA

futurescalex.com

contact@futurescalex.com