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IDTechEx Discusses Key Business Models for Electrolyzer Firms in Green Hydrogen Projects

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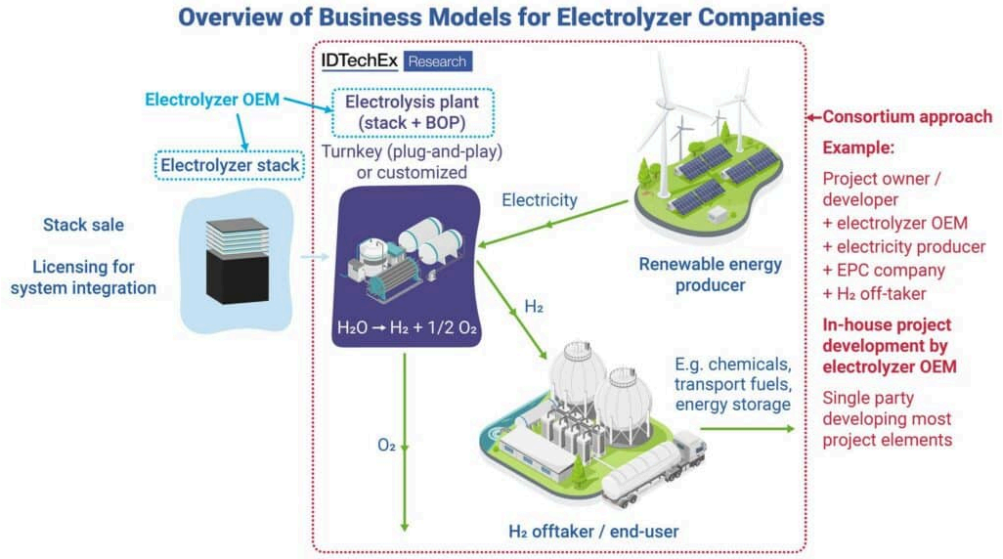
The burgeoning green hydrogen industry is powered by a key component: the electrolyzer. A recent report by IDTechEx, "Green Hydrogen Production & Electrolyzer Market 2024-2034," sheds light on the various business models employed by electrolyzer manufacturers (OEMs) to navigate this evolving market.

Green hydrogen production relies on electrolyzers, which come in four main varieties: alkaline water (AWE), proton exchange membrane (PEM), anion exchange membrane (AEM), and solid oxide (SOEC). These systems convert renewable electricity into clean-burning hydrogen gas. Each technology boasts unique characteristics and caters to specific applications. The core electrolyzer stack (often manufactured by OEMs) integrates with other components (balance of plant, BOP) to form a complete hydrogen production system.

The IDTechEx report explores the various strategies adopted by OEMs to deploy their systems in commercial projects. Here's a breakdown of some key business models:

- **Stack Licensing and System Integration Partnerships:** Start-up OEMs often focus on their core strength – designing and manufacturing the electrolyzer stack. They license this technology to other companies who handle system integration and project execution. This approach facilitates rapid market entry and revenue generation without the substantial upfront investment needed for global operations and BOP expertise. However, it comes with potential risks like intellectual property mismanagement and quality inconsistencies.

- **Turnkey Solution Providers:** Established players often provide a complete package – the electrolyzer stack and all necessary BOP components, often pre-assembled in containers or skids. This caters to clients seeking a simplified procurement and installation process with a single point of contact. This model offers higher revenue per project and strengthens customer relationships, but requires substantial investment in design, manufacturing, and maintenance capabilities.
- **Customized Systems for Projects:** For clients with specific needs, some OEMs offer customized systems where both the stack and BOP are tailored to meet project requirements, optimizing overall system performance. This caters to large-scale industrial applications or integration with existing infrastructure. However, customized systems require extensive engineering expertise and can extend project timelines due to the complexity of development.



Overview of business models for electrolyzer companies. Source: IDTechEx

Beyond these individual approaches, the report highlights the growing trend of collaboration within the industry. Electrolyzer OEMs are increasingly participating in project development consortiums. These involve collaboration among multiple entities, potentially even competitors, to share the risks and rewards of large-scale projects. This approach leverages combined expertise and financial resources, enabling projects that might be difficult for individual companies to undertake.

A select few OEMs choose to take full responsibility for every aspect of a project, from technology development and manufacturing to contracting, securing offtakers, financing, commissioning, and operations. This model grants maximum control over the value chain, potentially leading to higher margins and direct relationships with end-users. However, it requires substantial financial backing, expertise across multiple domains, and the ability to manage various project elements and associated risks.

The IDTechEx report also delves into the specific considerations for each electrolyzer technology. AEM electrolyzers, used in small-scale applications, are a less mature technology compared to PEM and AWE, but are undergoing advancements towards medium-scale capacities. PEM electrolyzers, known for

reliability, are commonly deployed in small to medium-scale applications. AWE technology is the most mature and sees wide use across various project sizes. Finally, SOEC electrolyzers operate at high temperatures, making them ideal for integration with industrial processes that can provide necessary heat or steam, facilitating highly efficient operations and innovative applications like synthetic fuel production.

The IDTechEx report provides a comprehensive analysis of the electrolyzer market landscape, offering valuable insights for both industry participants and those following the development of the green hydrogen economy.