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Digital Integration of Hydrogen Technologies in Southeast Asia

PROJECT FACTS

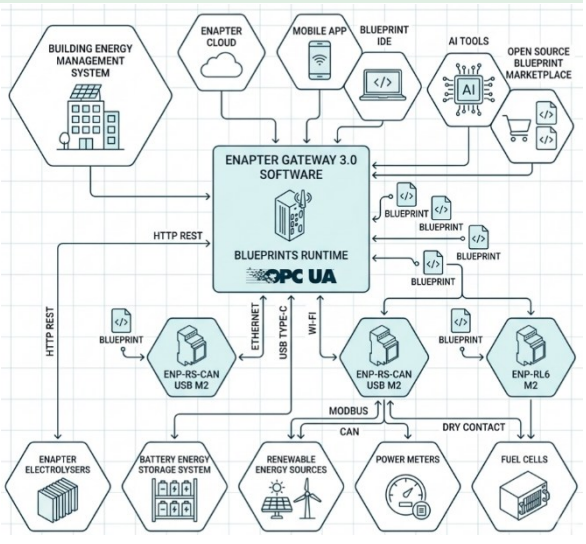
Duration: Feb 2026 – Sep 2026

Country: Southeast Asia Countries

Partners: Enapter GmbH

Outputs:

- Three flagship hydrogen projects in Southeast Asia digitally upgraded with EMS 3.0 for multi-vendor interoperability, optimisation and automation
- OPC-UA whitepaper establishing a standardised framework for hydrogen system integration
- Regional dissemination and capacity building to enable market interoperable hydrogen systems at scale



H2Uppp Enapter

PROJECT OVERVIEW

Today's hydrogen projects typically combine renewable energy sources to electrolysers, storage, fuel cells, safety equipments and control units from multiple vendors. However, these components often operate on fragmented and incompatible communication protocols. Without a unified digital architecture, projects rely on self-developed proprietary interfaces and bespoke engineering- resulting in increased integration complexity, higher costs, and limited flexibility for expansions.

This project addresses this bottleneck by advancing standardised, interoperable system integration. By leveraging OPC Unified Architecture: IEC 62541 as an open, industry-recognised communication backbone, it introduces a harmonised digital framework for multi-vendor hydrogen systems. Combined with advanced energy management capabilities, this enables seamless data exchange, coordinated control, and system-wide optimisation.

"Enabling interoperable, scalable, and optimized green hydrogen systems through standardized digital integration."

OBJECTIVES & EXPECTED RESULTS

- Successfully deploy an Open Platform Communications Unified Architecture (OPC UA)-based Energy Management System (EMS) across three showcase projects to prove diverse hardware can interoperate seamlessly
- Implement smart digital tools at the selected sites to achieve enhanced real-time monitoring, intelligent energy flow management, and production efficiency.
- Create a proven blueprint utilising universal communication protocols to accelerate cost-effective green hydrogen development across Southeast

ABOUT H2UPPP

The International Hydrogen Ramp-up Programme (H2Uppp) paves the way for companies to develop the global green hydrogen market through project identification, project development, support and trade.

Published by:
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Dag-Hammarskjöld-Weg 1-5, 65760 Eschborn, Germany on behalf of the German Federal Ministry for Economic Affairs and Energy.

GIZ is responsible for the content of this publication.

The International Hydrogen Ramp-up Programme is supporting entrepreneurial engagement in the ramp-up of hydrogen in the Global South and is a funding programme of the:

Federal Ministry for Economic Affairs and Energy

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As at: January 2026

Implemented by:

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