



Process Power simulator for Green Hydrogen

The energy transition and Green Hydrogen
New times, new challenges, new services

Green Hydrogen (H₂) is an important contender to minimize global carbon emissions. Reducing costs without sacrificing operational performance and compliance is essential to maximizing the value of H₂ operations



Achieving maximum efficiency, ensuring operability, and maintaining compliance while minimizing costs requires balancing multiple diverging objectives. The current energy transition is creating new challenges, such as addressing different designs, managing variable-load operations, and building business cases that optimize costs.

This means a fundamental change to designing process power supply, **as renewables are variable and less predictable**. And yet, despite increased system complexity and cost pressure, **the stringent requirements on system operability and reliability remain**.

The solution to these challenges involves early phase studies based on ABB's power system capabilities and knowledge, supported by ABB Process Power Simulator.

Companies in the energy transition are challenged by operational aspects of power systems, which should be taken into account from early concept development:

- Integration of renewables and energy storage
- Variable power generation and operational complexity
- Integrating new designs, concepts and equipment
- Lack of operational experience
- Increased pressures on CAPEX and OPEX reductions

ABB Process Power Simulator (PPSim)

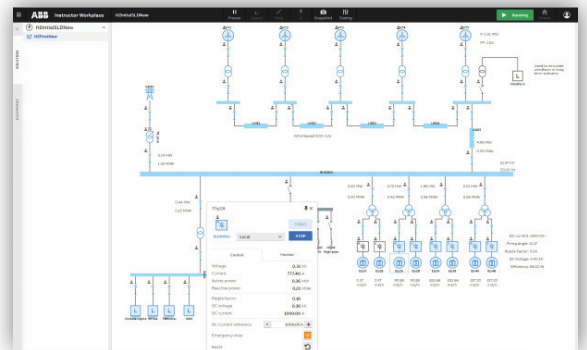
Supplements ABB's studies and tools, and supports the energy transition to H₂

The ABB Process Power Simulator enables ABB to provide unique study value to our customers by analysis of process power system, control and operation, and characterizing the combined performance of different design alternatives.

With PPSim, dynamic power system simulations are possible throughout the project lifecycle, from early design through operational support. This ensures early selection of a viable concept as well as guidance for further work.

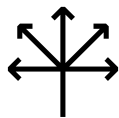
How it works

- Simulate steady state and system dynamic responses for voltages, currents, frequencies, and power flows
- Wind turbine generators, electrolyzers, transformer rectifier units, harmonic filters, PV power generation, and battery energy storage systems
- Reveal compliance-related issues, such as DC ripple factor and harmonics
- Identify performance-related issues, such as H₂ production, efficiencies and power consumption, number of unit starts/stops
- Conduct full-scale testing of power control, load balancing, synchronization and other features provided by the ABB Process Power Manager library
- Exchange data with dynamic process models for full plant dynamics process power
- Visualize equipment dynamics for typical electrical components and interfaces



PPSim enables **dynamic power system simulations throughout the plant lifecycle.**

Make virtual mistakes and achieve real success



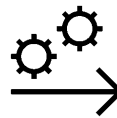
Evaluate alternatives

Operate your system design before dividing system responsibilities and committing investments



Improve visibility

Gain a holistic view of your complete system and its full operating range



Gain agility

Perform fast iterations to assess multiple concepts, including operational strategy, technology and sizing options, and control strategies



Mitigate risk

Mitigate risks by addressing key aspects up front, before project definition



Why ABB

ABB brings a unique combination of experience and vision to the H₂ industry

- **130 years** of innovation history
- **More than 50 years** in the energy sector
- **110,000 employees** in over 100 countries
- Pioneering technology that enables energy-efficient and low-carbon operations across traditional industries
- **ABB Adaptive Execution™**, agile method to industrial project execution to help energy customers adapt to challenging market conditions
- Strong capabilities in delivering renewables projects
- Solid commitment to helping all customers transition to a cleaner-energy future



For more information, please contact:
ABB Inc.
Operating in more than 100 countries.
<https://new.abb.com/oil-and-gas/products/automation/process-power-simulator>