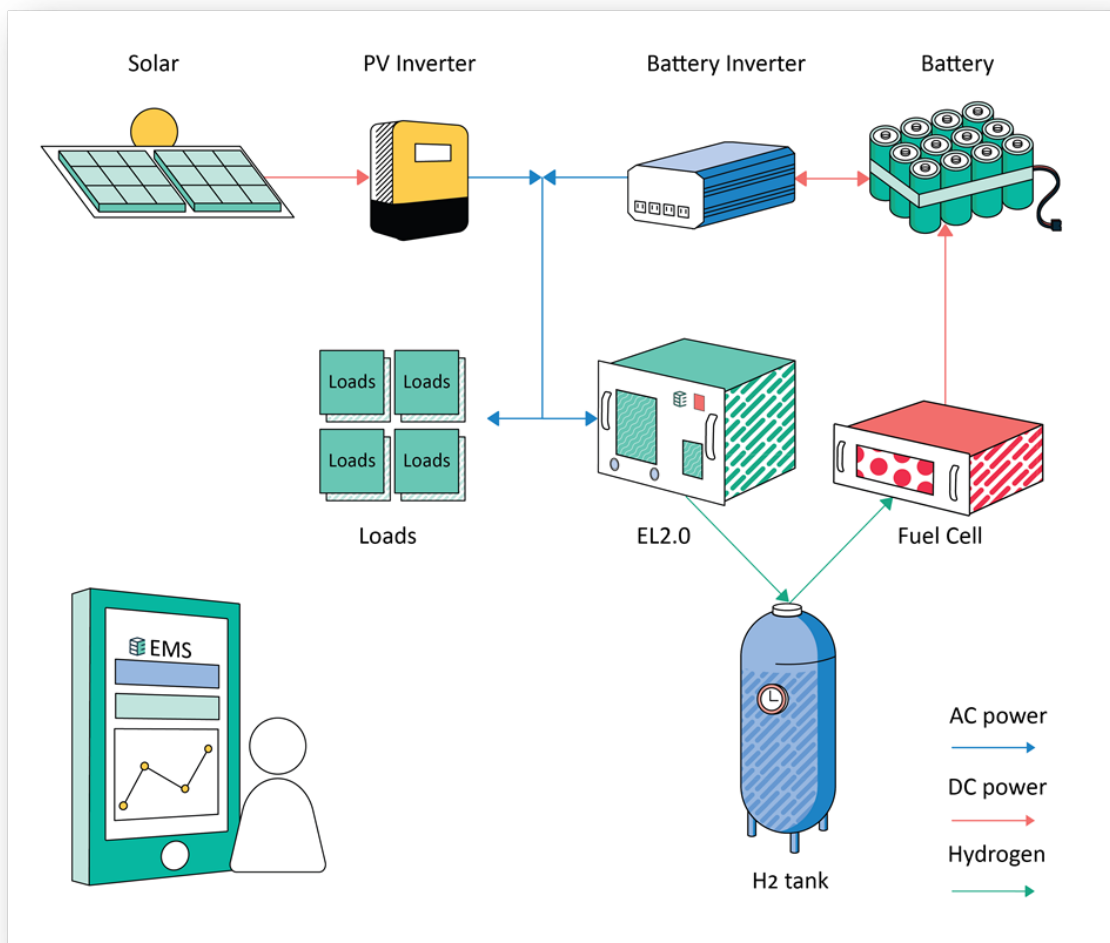


## System Setup for Hydrogen Hands-On Seminar

Nano, pico, micro, mini – doesn't matter which size, energy systems often require a fossil-fuel component to be fully energy independent. This is the past! On October 8 we demonstrated how smart building blocks of the future of energy create autonomous green hydrogen energy systems in just a few hours. No need for diesel or any fossil fuels. Quick and easy set-up. Plus, a hidden champion. This really is a Big Thing.

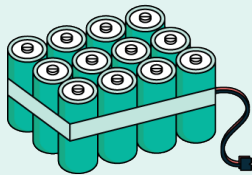
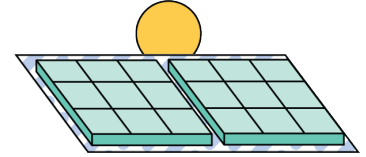
Enapter hydrogen generators were at the core of the system that was showcased in Chonburi, Thailand, on the day. Modular and easy to integrate electrolyzers turn solar and wind energy into carbon free hydrogen gas that provides energy independence without any emissions. This workshop provided participants with the expertise to understand this new technology.

### Outline of the system



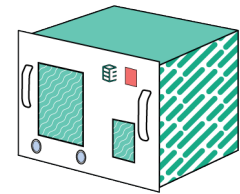
## Demo System Setup

**Renewable energy** provides clean and pollution-free onsite energy for local consumption. Our demo system used 5 kWp standard monocrystalline photovoltaic panels.



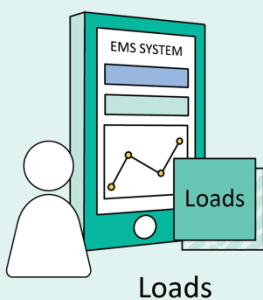
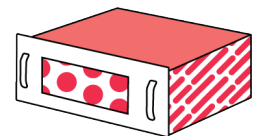
**A battery** was integrated in the system to buffer the main load and build the grid. In our case, we use a standard sealed maintenance-free lead-acid battery with 10 kWh storage capacity. The battery inverter was a Sunny Island 8.0H, max AC input power: 11.5kW, max continuous AC output power: 6kW.

The **Enapter electrolyser EL 2.0** uses electricity to split water into hydrogen and oxygen. Flexibly it can be combined to provide any flow rate needed. One block provides hydrogen with 500Nl/h @ 35 bar, power consumption: 2.4 kW.



**Hydrogen vessels** keep the gas for later use. Hydrogen can be stored without time or quantity limitations and at low or high pressure. In our setup we used a standard 55l tank pressurized at 35bar.

The **fuel cell** transforms hydrogen back into electricity when needed. In our system, we connected the fuel cell to the batteries which it supplies with power when charges get low. We used a PlugPower FC E-1100, output: 48Vdc, 1100W.



The hidden champion in this setup is **Enapter's Energy Management System (EMS)**. To make distributed networks work, secure and reliable interconnection for monitoring and control is everything. IoT communication modules are connected to Enapter electrolysers and can be added to all other elements of the energy system – making them **plug-and-playable**.

## Microgrid System-Before



## Microgrid System-After

