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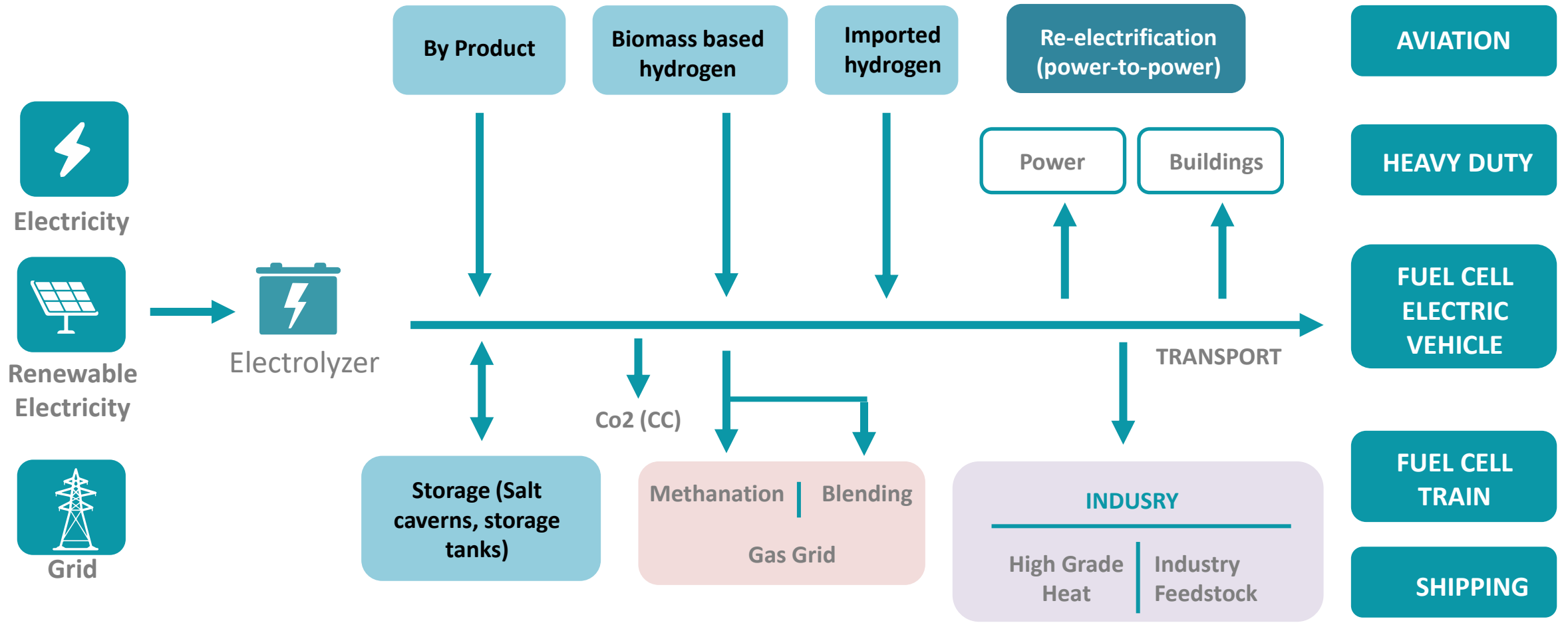
**ADB**



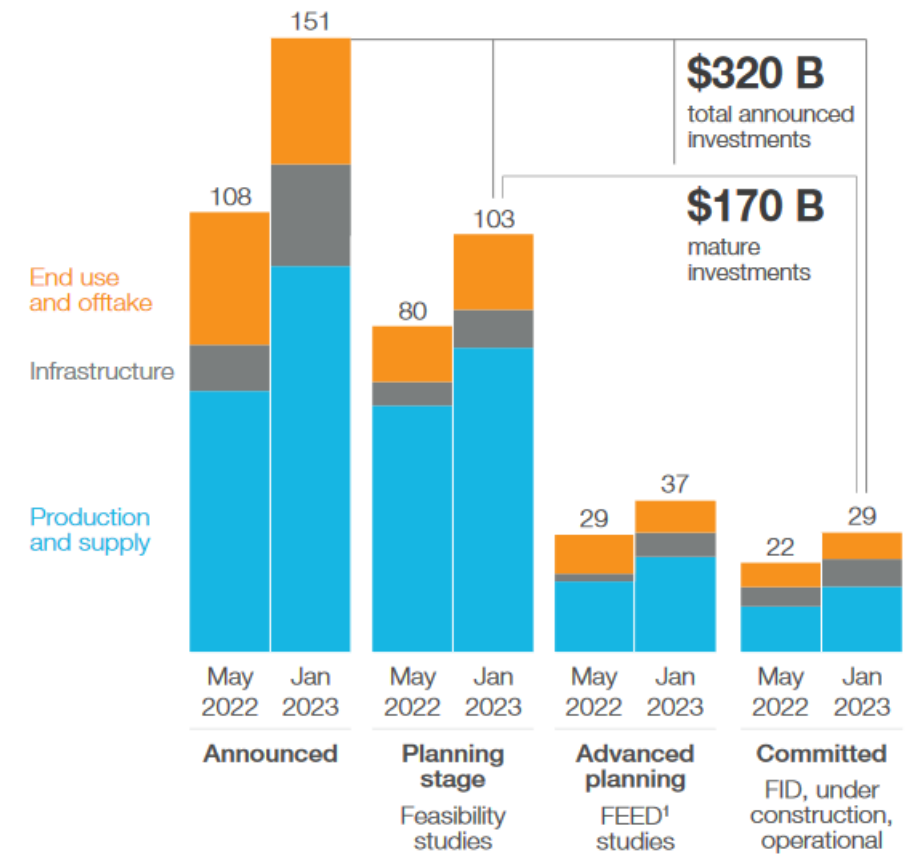
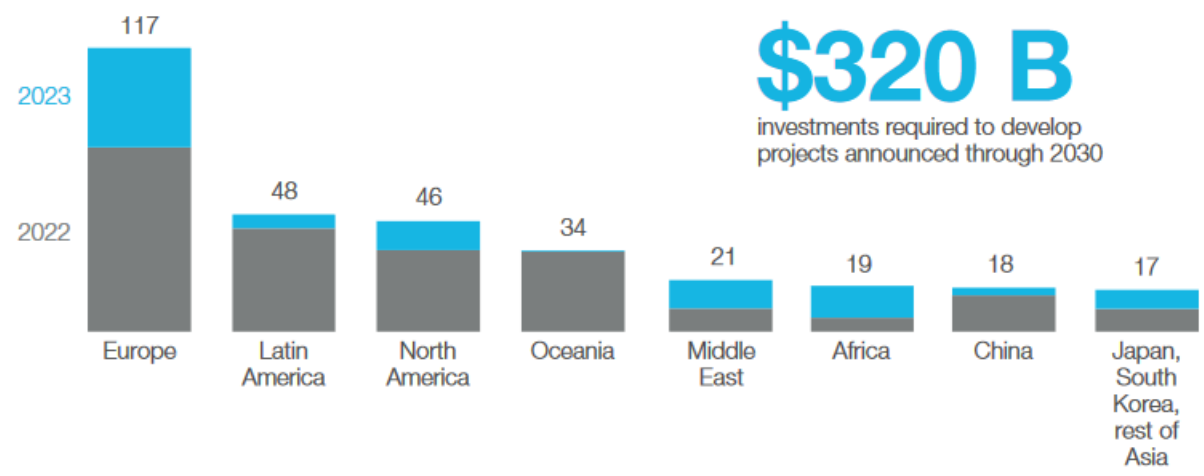
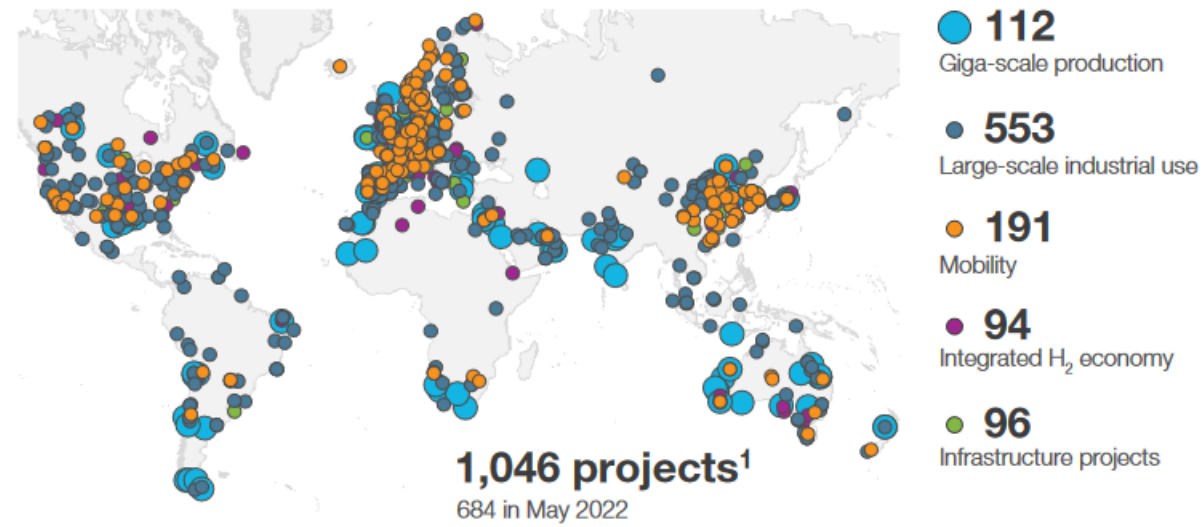
**ACEF 2023**  
**Firm & Stable power from H2**

**Manila, June 16, 2023**

# GREEN HYDROGEN APPLICATION AND CHALLENGES



# WHAT IS THE GLOBAL DYNAMIC? And specificity for ASIA?



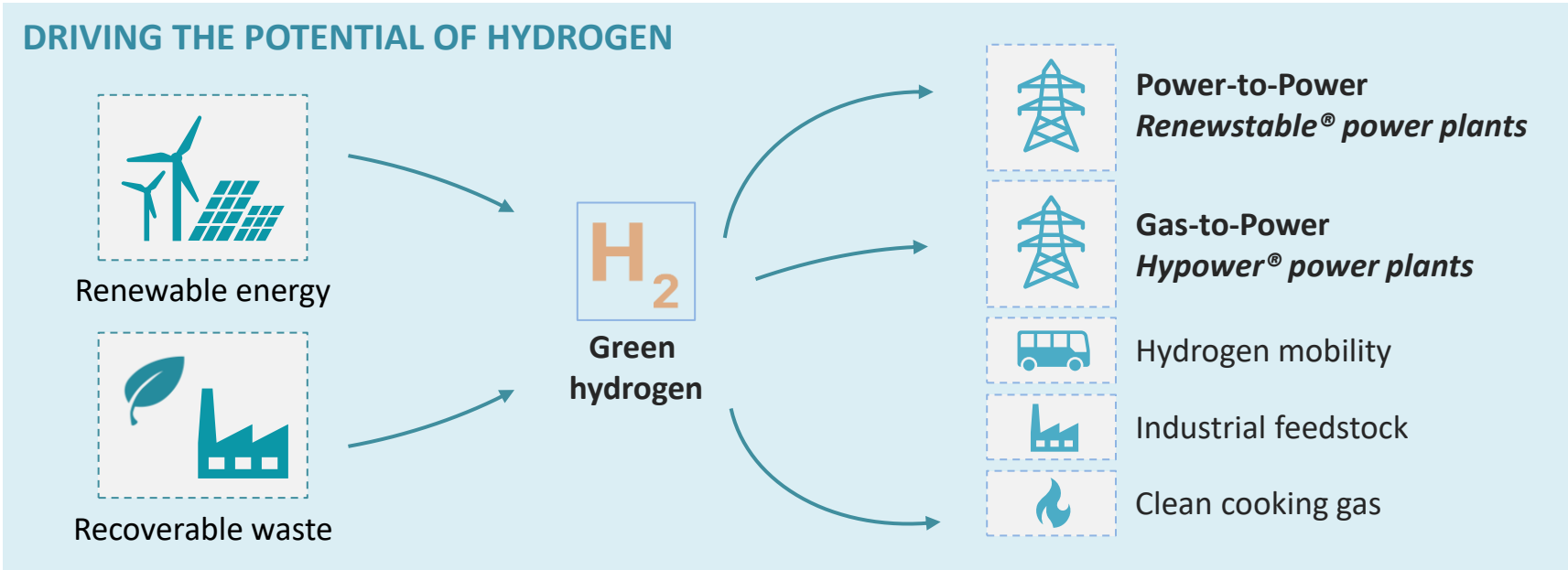
**+35%** investment growth in 8 months

**65%** of investments focus on supply

Source: Hydrogen Council, McKinsey "Hydrogen insights report 2023"

# FOCUS ON POWER APPLICATION

**MULTIPLE  
POSTIONING  
ON THE USE  
OF  
HYDROGEN**



## CORE BUSINESS: POWER-TO-POWER AND GAS-TO-POWER STATIONARY APPLICATIONS

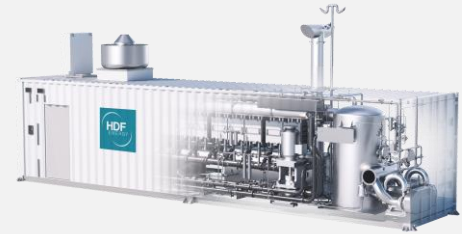
**RENEWSTABLE**

**POWER TO POWER**



**HYPOWER**

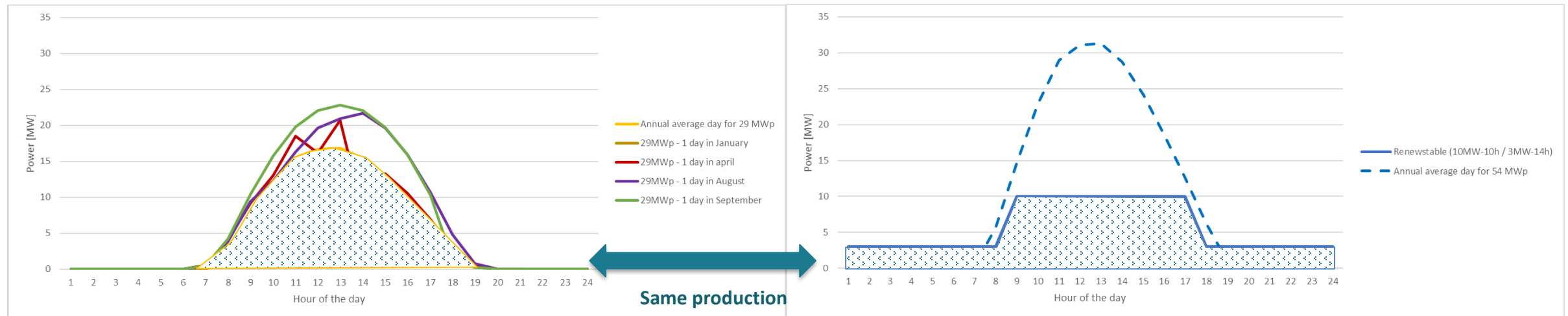
**GAS TO POWER**



# RENEWSTABLE POWER PLANTS

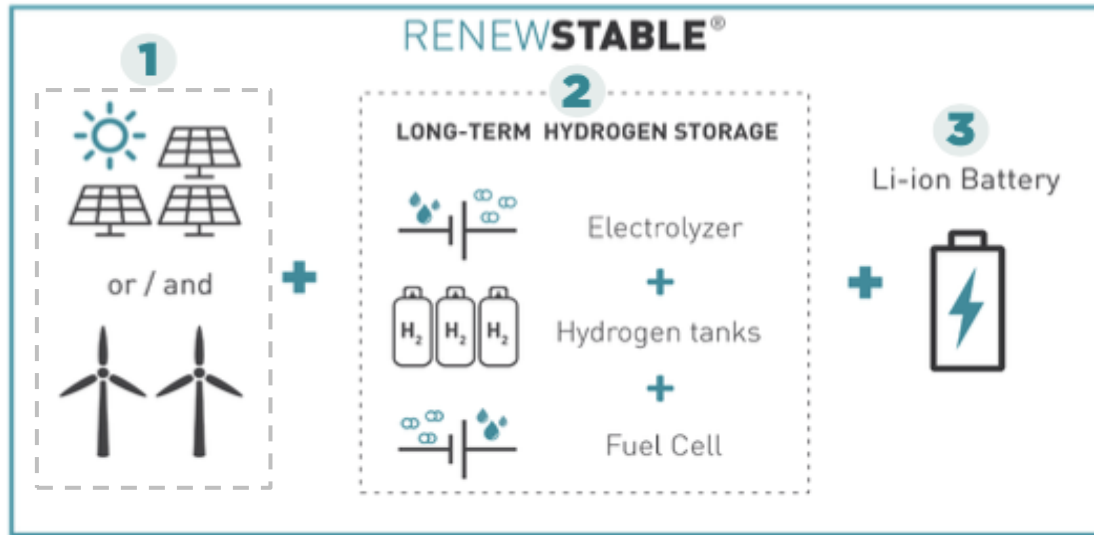
## Point of differentiation

- Power production at MW scale
- Increase Part of Renewable energy in location where grid is not able to manage



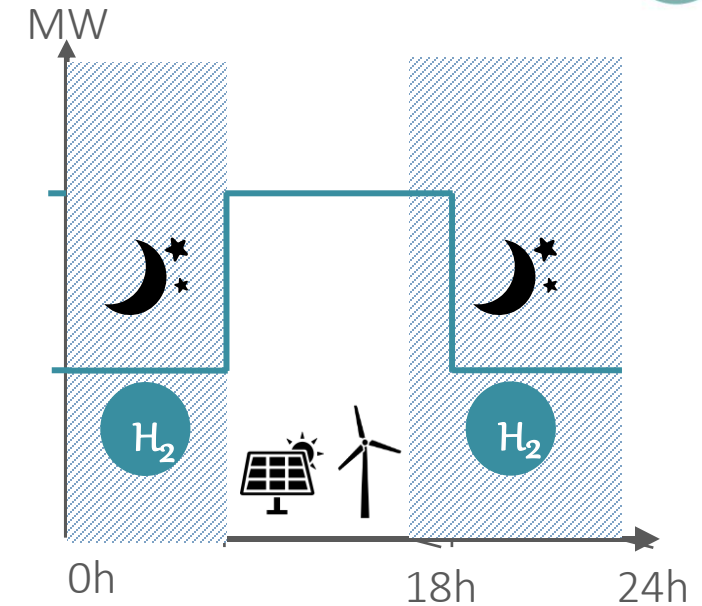
Grid constraint to manage high variability  
Grid asset based on peak power production

# RENEWSTABLE POWER PLANTS



## Smart combination of

- 1 Renewable energies power plant
- 2 Long term hydrogen storage
- 3 Highly responsive li-ion battery



## POWER PLANT BENEFITS



Deliver a **stable, firm, dispatchable** power to grid



Capacity factor > **80%**



Could provide **grid services**: frequency regulation and voltage support, island mode, blackstart mode, easily interconnected with dispatch center (depending on negotiations with offtaker/s)



Serve as **base load power**



**GHG emission free** during operation



**Competitive against diesel** power plant

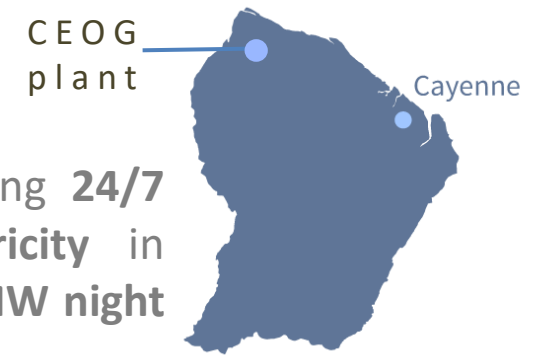
# FRANCE

# CEOG PROJECT (FRENCH GUIANA)



## Project definition:

World first MW-Scale power plant delivering 24/7 carbon-free and non intermittent electricity in Western French Guiana. 10MW daytime. 3MW night time.



STORAGE CAPACITY  
**128 MWh**

INVEST  
**150 M€**

HYDROGEN FUEL CELL  
**3 MW**

HYDROGEN PRODUCTION  
**600 Tons H<sub>2</sub> /year**

GENERATION  
**50 GWh/year**

PPA  
**25 years**

KEY FIGURES

EPC  
**SIEMENS ENERGY**



# INDONESIA

INDONESIA  
20 projects  
1,5 b\$ investment

- Supports **grid stability** in the island setting
- **Reduce dependency to fossil fuel** (dedieselisation)
- Strong potential **for replicability**

▪ **First project and Pipeline development supported by**



**Renewable Sumba**  
Commercial project





## MINDANAO, PHILIPPINES

HDF Energy signed a Memorandum of Cooperation (MoC) with the following stakeholders from Mindanao on March 17, 2022 for its proposed Renewstable® plant in Olutanga Island, Zamboanga Sibugay:

- Mindanao Development Authority (MinDA)
- Provincial Government of Zamboanga Sibugay (PLGU Zamboanga Sibugay)
- Zamboanga del Sur II Electric Cooperative, Inc. (ZAMSURECO II)
- Municipalities



Zamboanga Sibugay, French renewable energy company ink agreement on solar farm

thesunmonitor.net • Lecture de 2 min

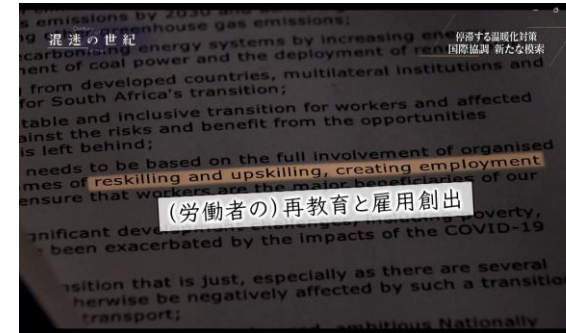
## MINDANAO



## SOUTH AFRICA

- Eskom awarded HDF with 1782 hectares of land in Mpumalanga to develop several green baseload power plants :
  - 1500 MW PV
  - 3500 MWh H2
  
- Mpumalanga being the heart of the JETP in SA, it is key to ensure the security of communities and workers that have depended on the continued existence of coal, and HDF has a bankable solution that can make a substantial and meaningful contribution to that process.
  
- New capacities should be fast-to-deploy:
  - HDF's Renewstable® architecture will provide stable and dispatchable power
  - A Renewstable® power plant uses local sources of clean energy to enhance domestic production of electricity, reducing exposure to imported fuels, associated price volatility and supply risks

### JAPAN BROADCASTING CORPORATION (NHK) [DOCUMENTARY](#)



# Contact list

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