HDF ENERGY FLAGSHIP SOLUTION

ABOUT HDF ENERGY

H2 INFRASTRUCTURE

Development, operation & ownership of large-scale hydrogen infrastructure

Electricity production

Green hydrogen production

MULTI-MW FUEL CELL TECHNOLOGY

Made in France

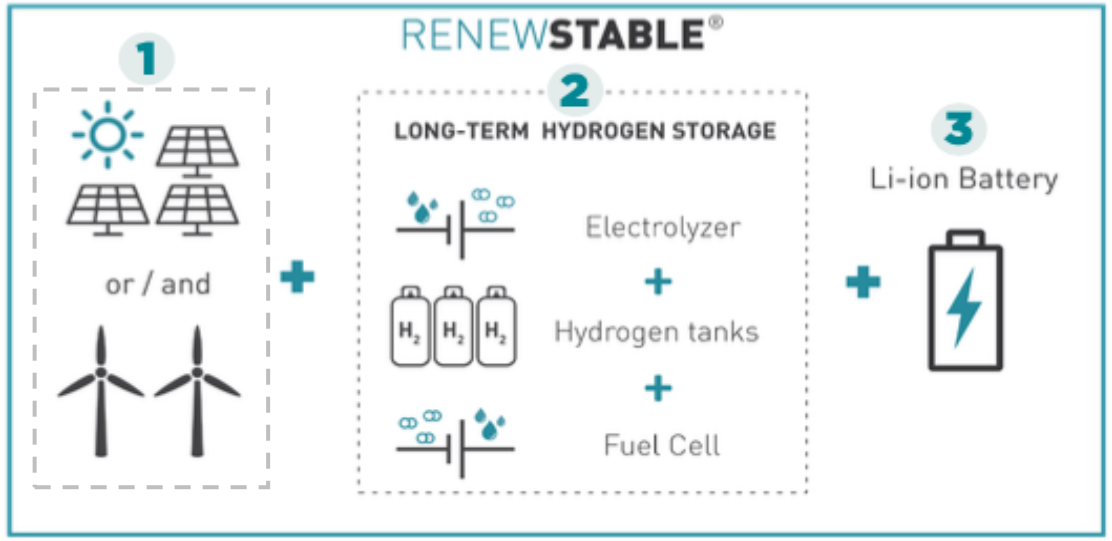
Design and production of high-power fuel cells

Power supply

Maritime

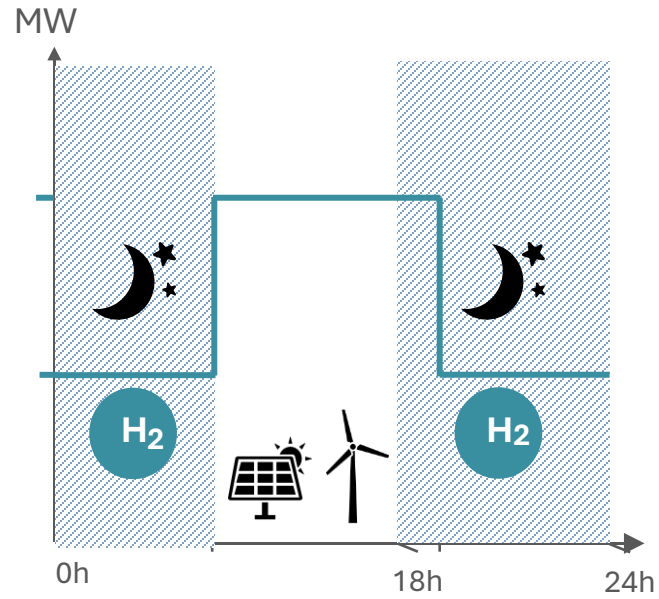
Rail

OUR FLAGSHIP SOLUTION:
RENEWSTABLE® POWER PLANTS



Smart combination of

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

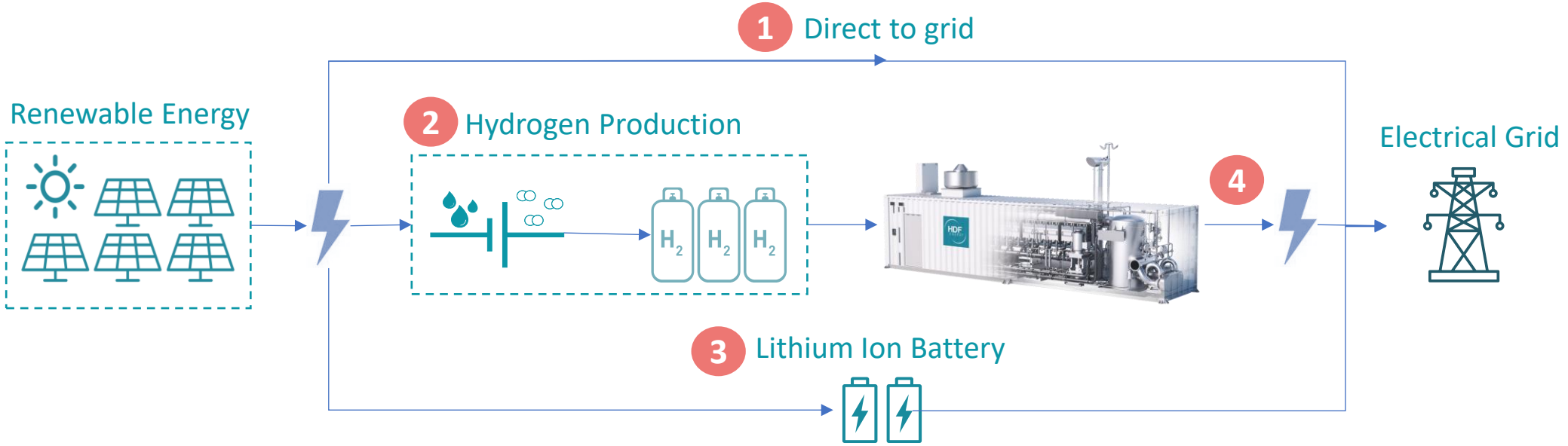


POWER PLANT BENEFITS

- Deliver a **24-hours stable, firm, dispatchable** baseload power to grid
- Could provide **grid services**: frequency regulation and voltage support, island mode, grid following and easily interconnected with dispatch center
- **Capacity target** is defined by needs of utility
- Capacity factor **> 80%**
- **Capacity contract** with high availability,, thanks to Battery and H2
- **GHG emission free** during operation
- With all the benefits, it is **competitive against diesel** power plant

RENEWSTABLE BLOCK DIAGRAM

SOLAR PV + BESS + HYDROGEN STORAGE



1. The electricity generated by Solar PV Power Plant will be **supplied directly to the system** during daytime

2. The power plant is designated to generate more electricity that needed during the day. The surplus electricity is utilized for **electrolysis to convert water into hydrogen**

3. Additionally, The surplus electricity will be used to charge batteries, which will be discharge for **nighttime peaker and smoothing.**

4. The stored **hydrogen will be converted back into electricity using fuel cells** during the nighttime

02

RENEWSTABLE PROJECTS DEVELOPMENT

RENEWSTABLE®, A STRONG TRACK RECORD IN PROJECT DEVELOPMENT

IN ADVANCED DEVELOPMENT STAGES

RSWK – Namibia

SWAKOPMUND RENEWSTABLE (PTY) LTD

Solar PV	Storage Capacity	Power Generation
85 MWp	230 MWh	142 GWh/year baseload

LOS CABOS – Mexico

ELC ENERGÍA LOS CABOS

Solar PV	Storage Capacity	Power Generation
152 MWp	280 MWh	189 GWh/year Baseload

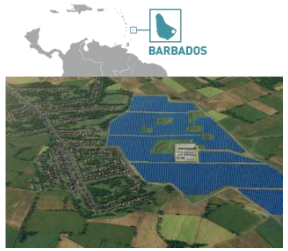
SUMBA - Indonesia

First project
to be duplicated in +20 locations across the country

Solar PV	Storage Capacity	Power Generation
30 MWp	67 MWh	47 GWh/year Baseload

RSB – Barbados

RSB RENEWSTABLE® BARBADOS



Solar PV	Storage Capacity	Power Generation
50 MWp	120 MWh	60 GWh/year baseload

UNDER CONSTRUCTION

CEOG, the world's first MULTI-MW hydrogen power plant

KEY FIGURES

Solar PV	Storage Capacity	Power Generation
55 MWp	128 MWh	50 GWh/year Baseload

Hydrogen Production	Power Supply	Power Purchase Agreement
600 tons / year	for 50 000 inhabitants	25 years

TOTAL INVESTMENT : 170M€

OFFTAKER
EDF

EQUITY INVESTORS
Meridiam for people and the planet · SARA · HDF ENERGY

LENDERS
BNP PARIBAS · SMBC · CIC · AFD

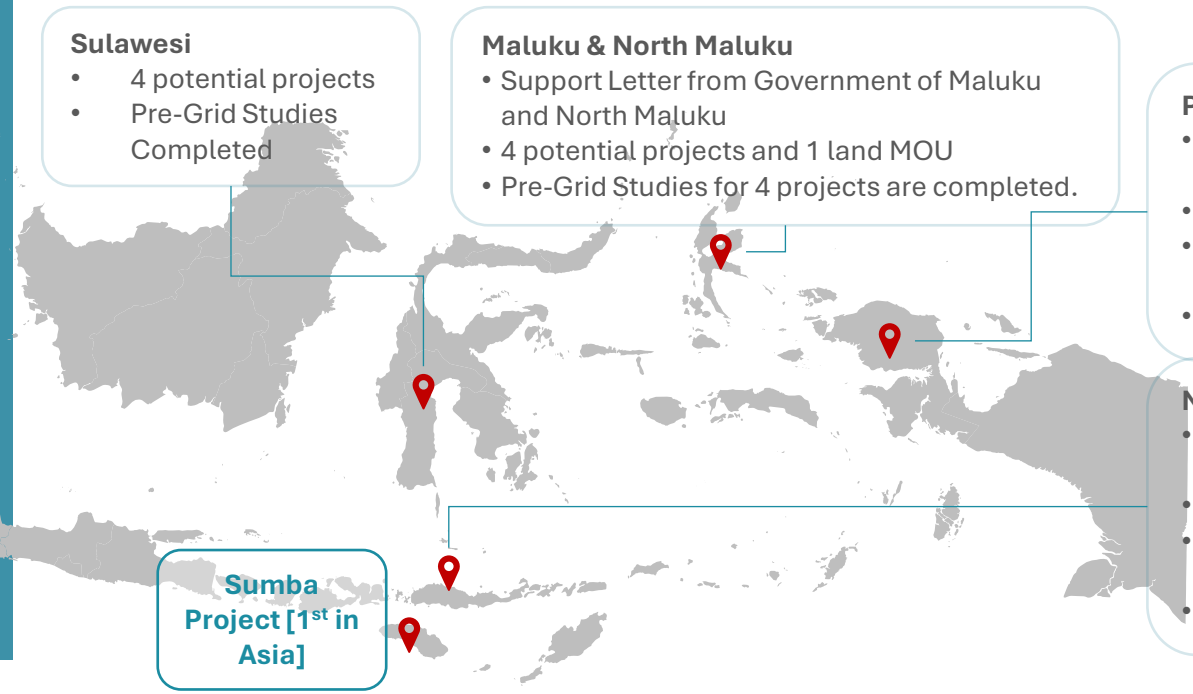
EPC
SIEMENS energy

HDF IN INDONESIA: POWER SECTOR

INDONESIA's POTENTIAL on **RENEWSTABLE® APPLICATION**

Green Hydrogen and Renewstable®

- In line with national strategy, provides potential to **reduce GHG emissions** and **decarbonize** power sector in Indonesia.
- Supports **grid stability**
- **Reduce dependency to fossil fuel**
- No chemical or toxins involved in the project, only **water and pure oxygen as by products,** Support achievement of **SDGs 7** and **SDGs 13**
- **Technical assistance** from development banks and agencies.
- Replication potential of **22 projects** with investment **> 2 billion USD**.



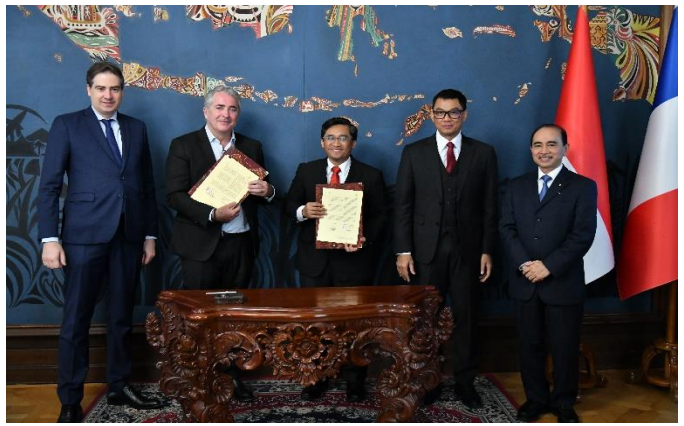
Sulawesi
- 4 potential projects
- Pre-Grid Studies Completed

Maluku & North Maluku
- Support Letter from Government of Maluku and North Maluku
- 4 potential projects and 1 land MOU
- Pre-Grid Studies for 4 projects are completed.

Papua & West Papua
- Support letters from Province and District governments
- 6 potential projects and 5 Land MOUs
- Pre-Grid Studies are completed, pre-FS is on-going
- Site identification and land booking

Nusa Tenggara
- Support letter from the Governor and district governments
- 8 potential projects and 3 Land MOUs
- Pre-Grid Studies for are completed, pre-FS are on-going
- Site identification and Land booking

Sumba Project [1st in Asia]



HDF IN INDONESIA: COOPERATION

Renewstable® Projects

- **MOU** with **PT PLN (Persero)** on Hydrogen Business Development
- **JDSA** with **PT PLN (Persero)** to conduct joint studies, evaluating the technical and financial feasibility of deploying HDF 's game-changing Renewstable® hydrogen power plants in the Eastern Indonesia
- **MOU** with **PT PLN Nusantara Power (PLN NP)** on Joint Studies for Renewables and Hydrogen for Eastern Indonesia
- **MOU** with **BBSP EBTKE KESDM** on studies for hydrogen to power applications in Indonesia
- **MOU** with **PLN and EBTKE** on development for hydrogen ecosystem to support National Hydrogen Roadmap

Other Hydrogen Applications

- **MOU** with **Bukit Asam** – Hydrogen in Train Application.
- **MOU** with **Tripatra** on HyPower Development – HyPower® Application.
- **MOU** signed with **Daewoo Engineering** for technical cooperation.
- **MOU** in preparation with **PLN** and **ASDP** – Hydrogen in Ferry Application.

OPPORTUNITIES IN THE PHILIPPINES

15 PROJECTS

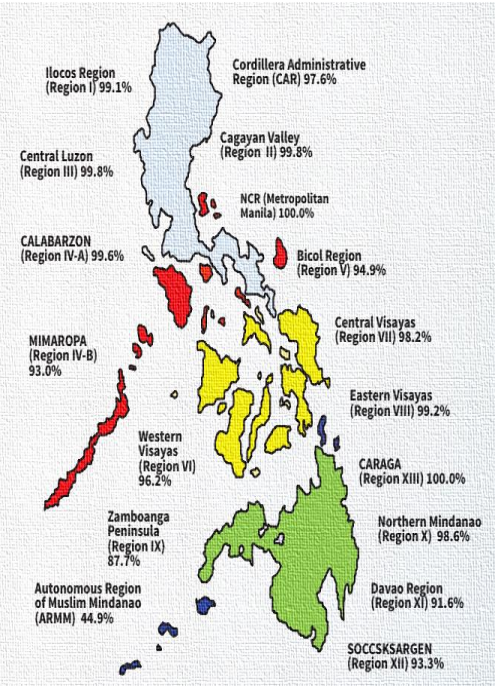
TOTAL INVESTMENT
>1.5 BILLION USD

Power Sector Overview

- The Philippines generated most of its electricity from coal (59.6%) and natural gas (16.0%) in 2022. RE portion accounted for a meager share of 22.0% of electricity generated.
- In terms of Capacity, power sector is sourced in a decreasing order from coal (43.1%), oil-based (14.5%), natural gas (12.8%), and RE (29.5%). Solar power plants have an installed capacity of 1,419 MW (5.4%), while those of wind is 443 MW (1.6%). RE is still dominated by hydroelectric (13.6%) and geothermal (7.0%) sources.
- The Philippines set multilayered policies to achieve 35%-50% RE Energy Mix in 2040.

Missionary Electrification

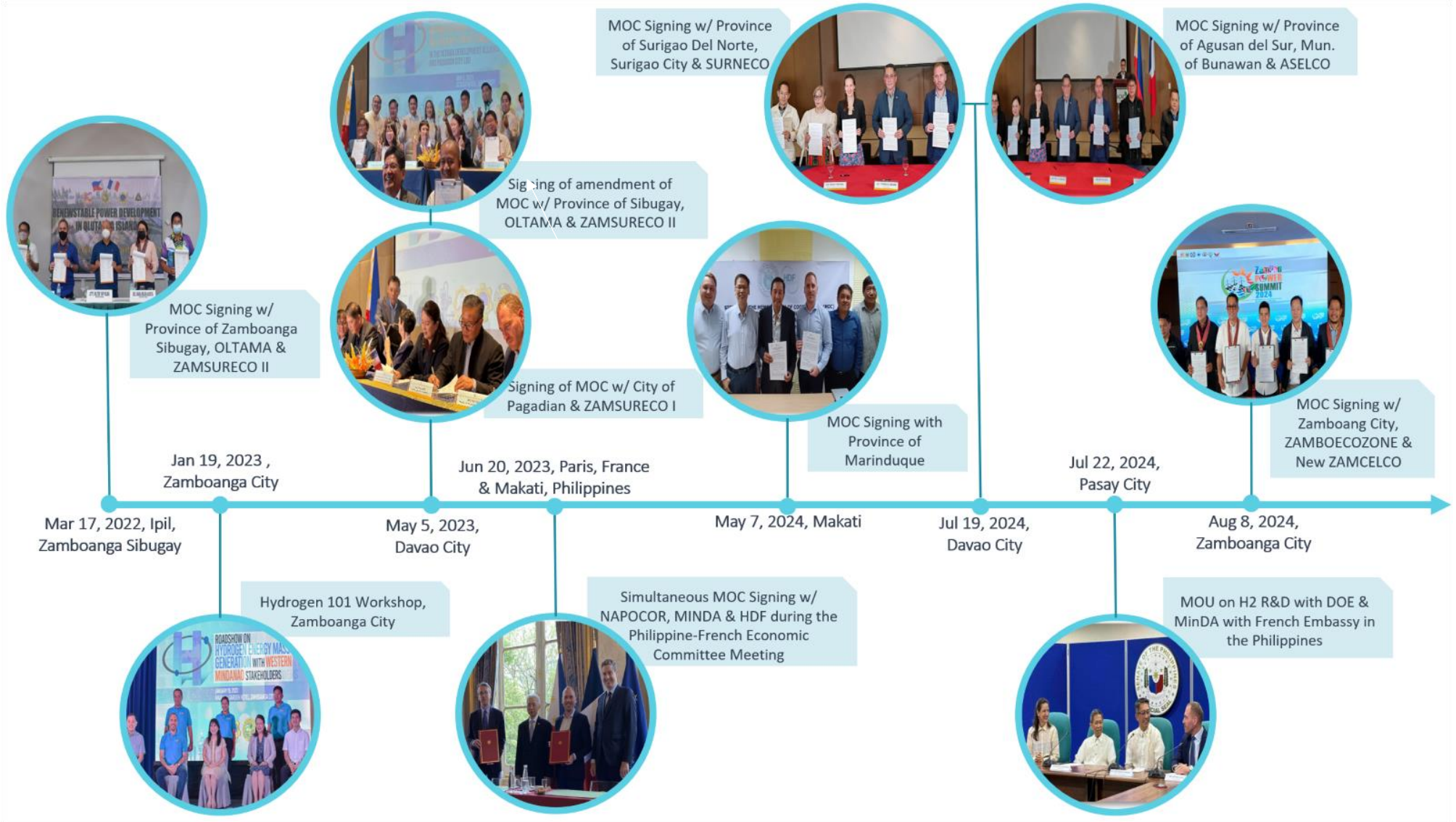
- Access to electricity remains a challenge especially in the peripheries of the archipelago, thus hampering the socio-economic development in these communities.
- The Missionary Electricity Development Plan 2021-2025 set the following objectives:
  - Achieve Total Electrification
  - Ensure reliable, adequate, and quality services to off-grid electricity
  - Reduce dependence from imported fossil fuels
  - Promote grid modernization
- Average true cost of generation in these area amounts to 300USD/MWh (2021, SPUG NPC)



Regional Household Electrification Level (Dec 2022)

RENEWSTABLE® presents the sustainable solution to power small and remote areas

KEY MILESTONES IN THE PHILIPPINES



03

HYDROGEN NEXUS FOR POWER AND MARITIME

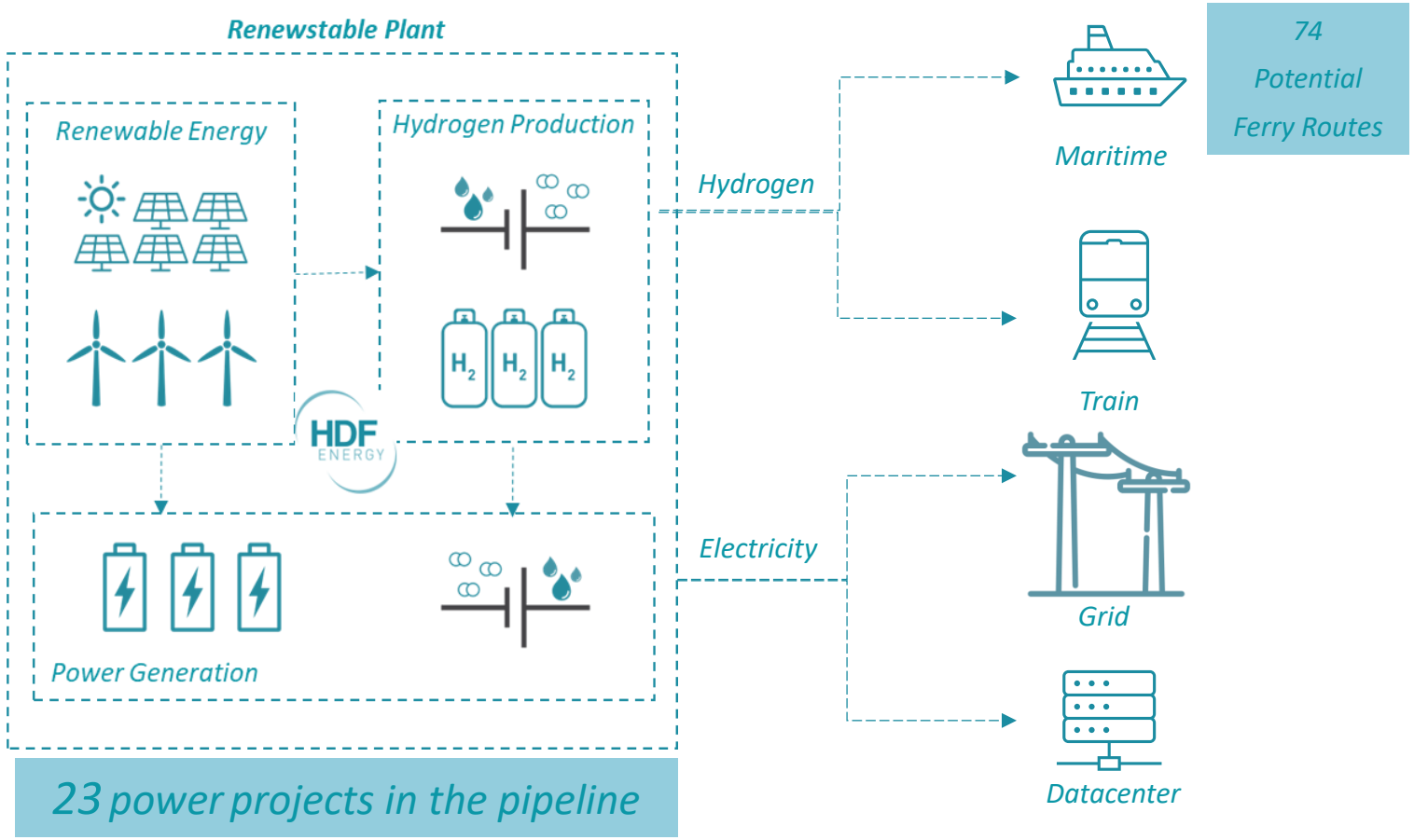
POTENTIAL COUPLING OF
MARITIME-RENEWSTABLE LOCATIONS

8 Renewstable Locations, are in 4 – 20 km distance from nearby ports.

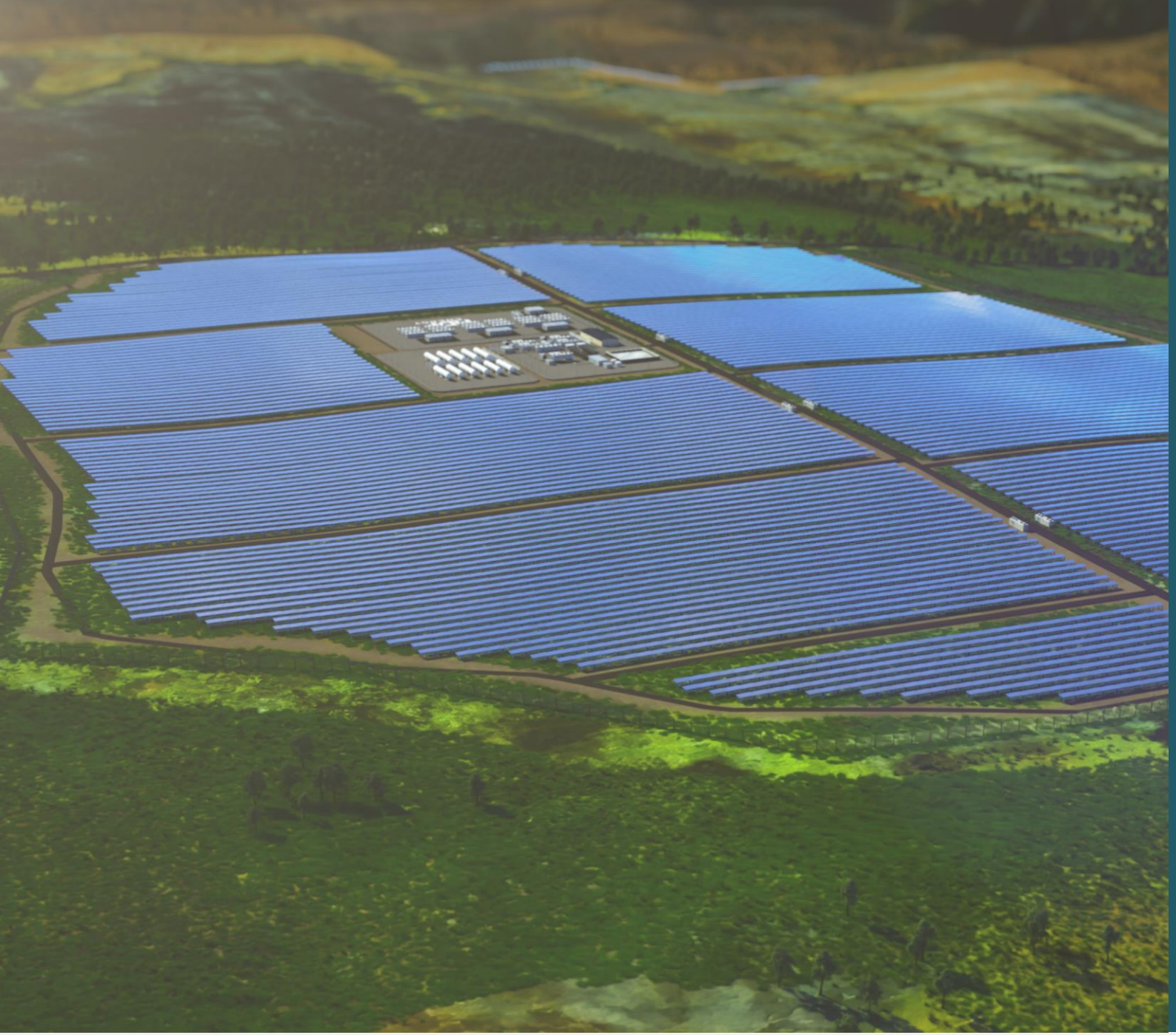
5 Renewstable Locations, are within the port proximity connecting ferry routes across islands.

3 Ferry routes connect the port nearby the Renewstable Locations.

HYDROGEN ECOSYSTEM



- While generating baseload and stable electricity to the grid, Renewstable® could produce extra Hydrogen to decarbonize other sectors including train and maritime.
- 74 routes identified for potential hydrogen use to decarbonize ferry (maritime)
- HDF assisted by K**emenhub (MOT)** has been confirmed a Technical Assistance grant from **International Maritime Organization (IMO)** to study the feasibility of ferry retrofitting for Kupang – Ferry route and evaluate the potential of replicability in the country. **GIZ Technical Assistance** is also being finalized to assist the study.
- Renewstable® is a potential green alternative to powering the datacenter, given the sector's strong ambition to be net zero by 2030



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