



MARENGO I
GREEN AMMONIA MADE IN MEXICO
FEBRUARY 2024, H2LAC / H2UPPP, MEXICO

MEXCO AT A GLANCE

OUR PAST: RENEWABLE ENERGY SECTOR / OUR FUTURE: POWER-TO-X



- Founded in 2005 by **Ralph Wegner** (CEO) Mexion Corporation S. de R.L. de C.V ("MexCo") is a **Mexican corporation** headquartered in **Mexico City**.
- MexCo** controls group of companies that **supply services and products to the renewable energy sector in Mexico** and the region, like <https://climatik.net/> and <https://mexion.mx/>.



- MexCo** engages in the **origination, development and commercialization of utility-scale renewable energy projects**. The Company's business model is to develop and sell these projects before the Final Investment Decision (**FID**).
- The **primary development tasks** of the Company are as follows: **securing interconnection rights, obtaining applicable permits, conceptual engineering, negotiating offtake terms, preparing financial models, leasing appropriate real estate, or purchasing real estate, forecasting energy production, negotiating contracts** for the sales of the project SPVs.

Outstanding track record: + 1.0 GW experience

Name	Location	Technology	MW	Year
Marengo	Campeche	Power to Green Ammonia	[600]	[2024]
Mocochoa	Yucatan	Wind	88	2018
Cerro Iguana	Oaxaca	Wind	250	2014
Dzilam Bravo	Yucatan	Wind	70	2012
Santo Domingo Ingenio	Oaxaca	Wind	50	2010
Oaxaca II	Oaxaca	Wind	200	2010
Oaxaca III				
Total			1,158	

Pioneering Vision

With **Marengo** as the flagship, **MexCo** spearheads Mexico's transformation into the **Power-to-X** domain



Leading company in developing, financing, building, and operating plants for RFNBO⁽¹⁾ production

Premier Global Collaborators for P. Marengo



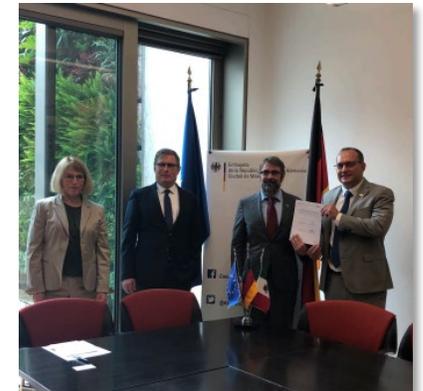
German development agency that provides services in the field of international development cooperation



Federal Ministry for Economic Affairs and Climate Action of Germany



Ralph Wegner during the collaboration agreement signatures for P. Marengo with Layda Sansores (Campeche Governor)



Ralph Wegner during the signing event at the German embassy in Mexico City with GIZ, Hy2gen, BMWK and MexCo to carry out a pre-FEED study for P. Marengo

MEXCO AT A GLANCE

OUR **U**NIQUE **V**ALUE **P**ROPOSITION



- Long and successful **experience** as a **pioneer business developer** at the **industry forefront** in Mexico with **Comprehensive understanding** of circular economy
 - Outstanding **expertise** and **partner network** covering the PtX value chain
- **Support** of state **government**, aligned with its and Federal development plans.
 - The Governing Party agrees on utility-scale renewable energy projects if they are off-grid
- **Prime Access to an Exploding Market**
 - Within the nearshoring framework, producing H2 in Mexico for export to the US and Europe is a more competitive and strategic alternative compared to other countries in the region and globally.

Project Partners



OEMs and hardware suppliers



EPC partners and service providers



Financial Partners



Governmental Partners

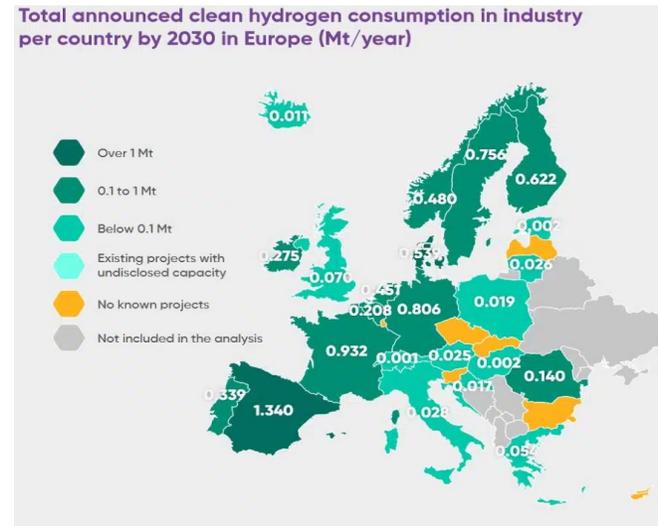
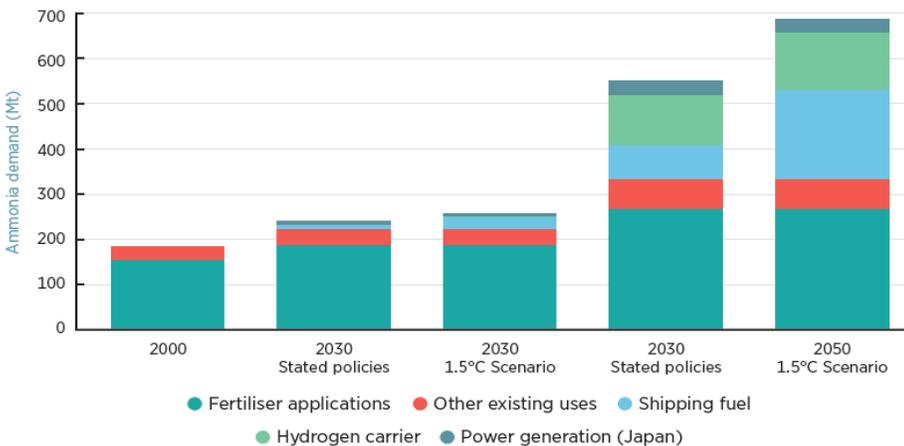
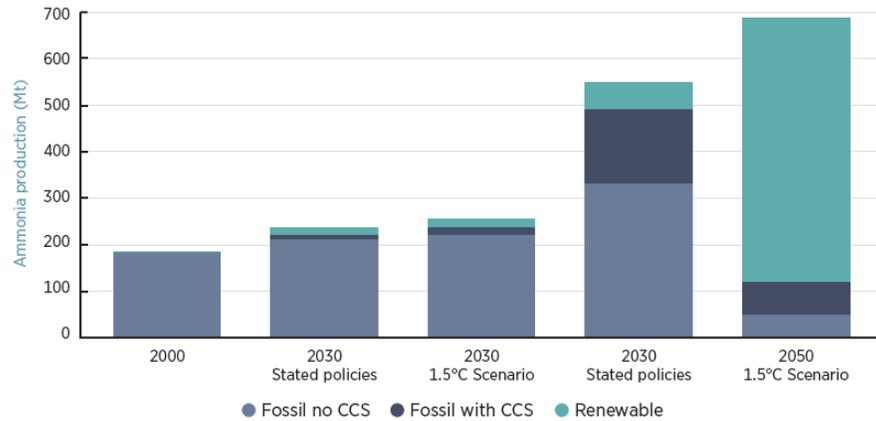


Industry Representatives

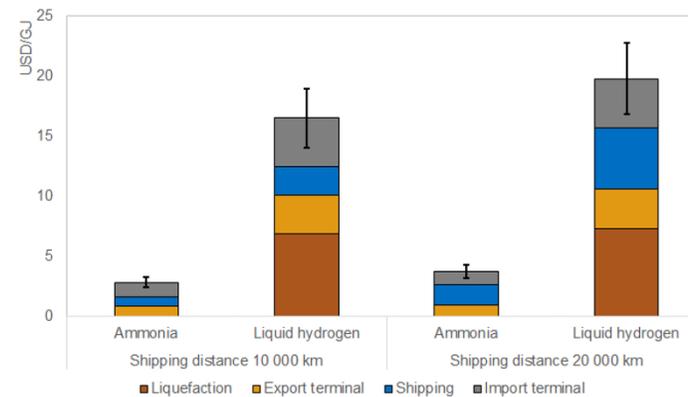


GLOBAL AMMONIA / HYDROGEN MARKET OUTLOOK

PRODUCTION, DEMAND, LCOA, TRANSPORT (IRENA & IEA)

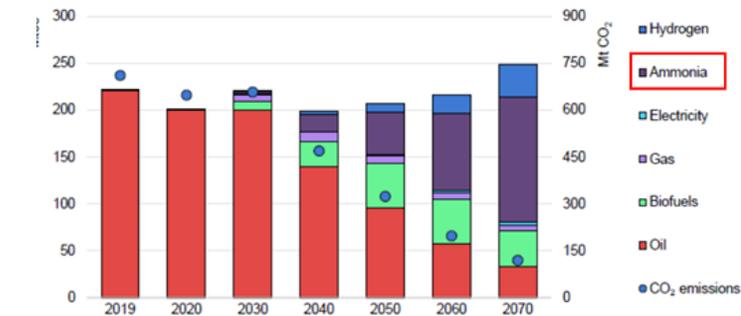
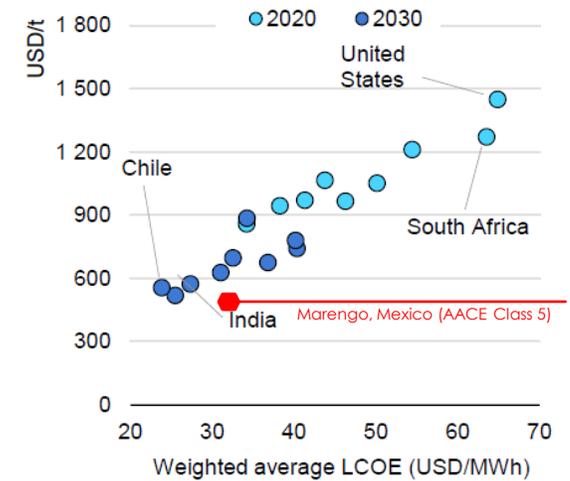


Marine transport cost estimates for ammonia and liquid hydrogen



IEA. All rights reserved.

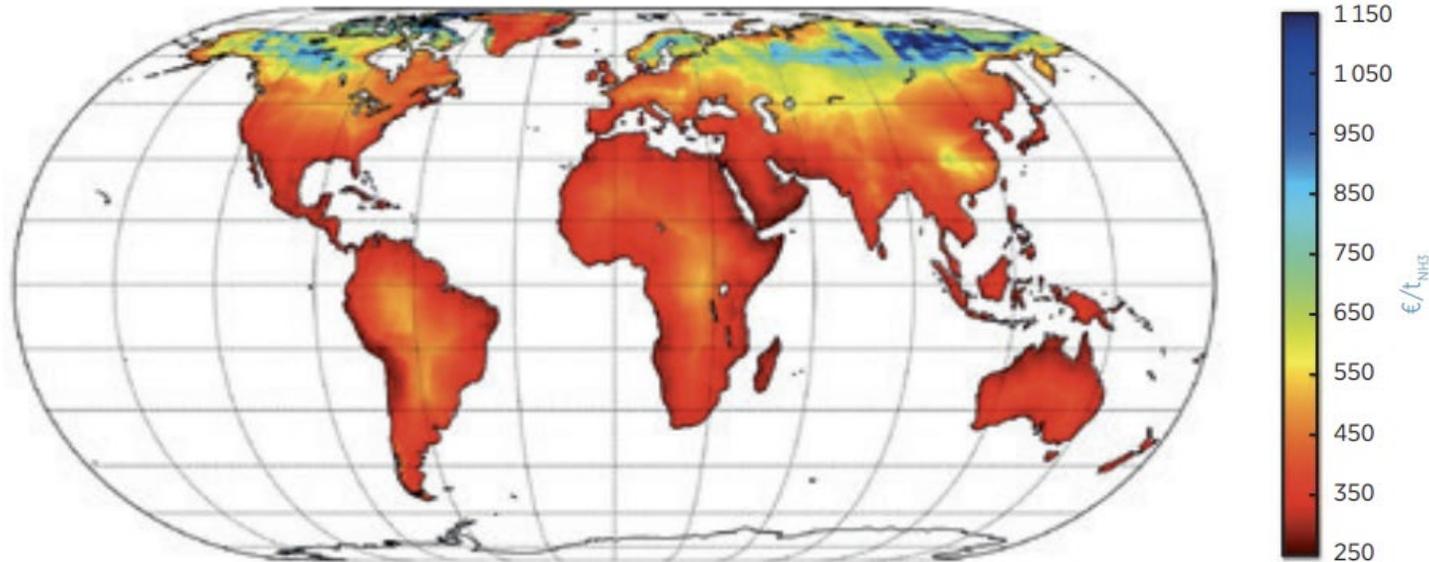
Note: WACC 5%; energy consumption of H₂ liquefaction 6 kWh/kgH₂. Storage costs included in the cost of terminals. All assumptions available in the Annex.



Mexico's global PtX competitiveness

Optimal locations for renewable ammonia combine high solar irradiation and a high wind load factor

Heat map for the production cost of renewable ammonia by 2050



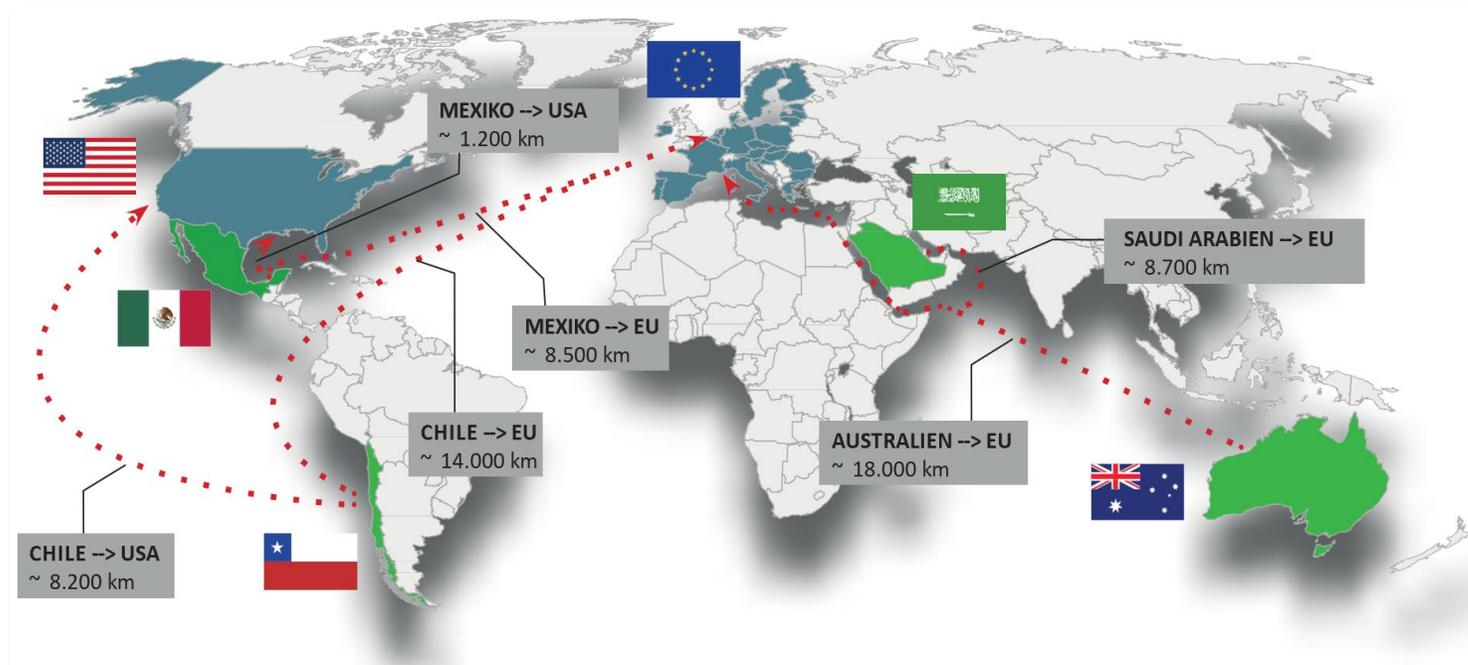
Comments

- **High-Capacity Locations with Mexico's Potential:** Mexico stands out as an ideal location for renewable ammonia production, offering both high solar irradiation and strong wind load factors.
- **Cost-Effective Regions with Mexico Included:** Alongside regions in Africa, Asia, Australia, North America, South America, and Southern Europe, Mexico has been identified as having significant potential for low-cost renewable ammonia.
- **Mexico's Geopolitical Advantages:** The country's existing trade agreements and proximity to large markets like the USA strengthen its position for international collaboration and project success.
- **Mexico and International Collaboration:** As a bridge between North and South America, Mexico is strategically positioned to foster international collaboration.
- **Mexico's Suitability for Gigawatt-Scale Projects:** Mexico's expansive, less populated regions and long coastline make it ideal for large renewable energy projects and ammonia export facilities that utilize seawater for electrolysis.

Mexico's global PtX competitiveness

Mexico's global green ammonia hub is the closest to markets & world-class production sites

Comparative distances for ammonia trade routes from producing countries to major markets



■ Producing Countries ■ Main Markets

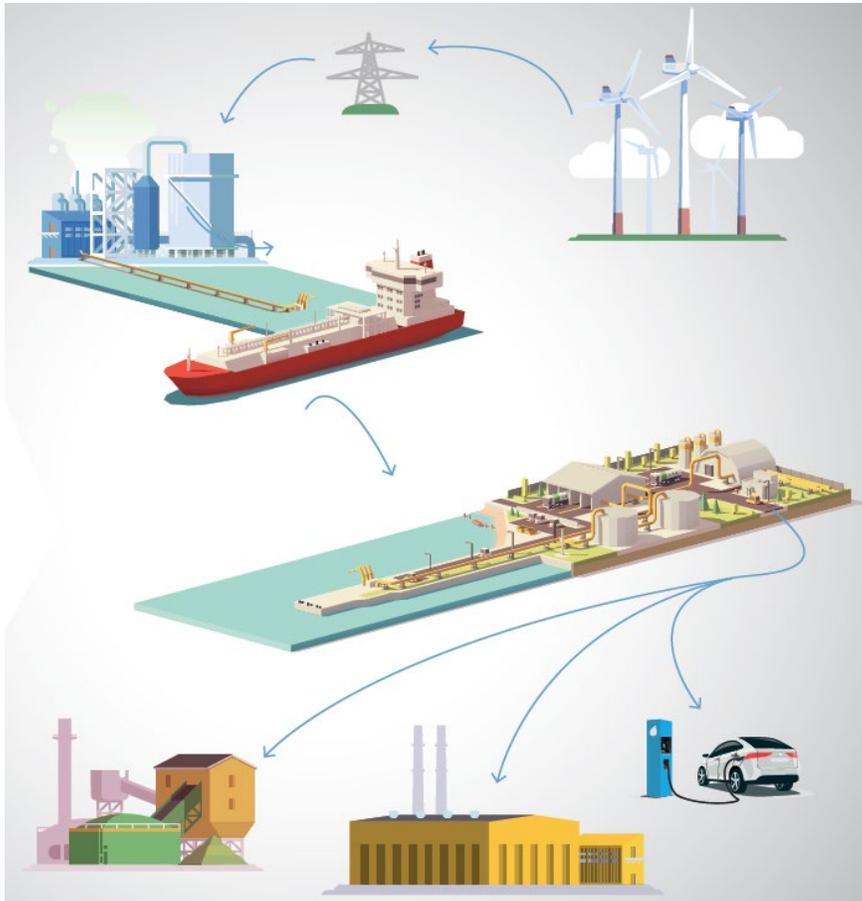
Comments

- **Mexico's Strategic Geopolitical Advantage:** Mexico's position at one of the narrowest parts of the American continent allows direct Pacific to Atlantic trade, avoiding the Panama Canal's climate-related delays. This, along with an Investment Grade rating, boosts Mexico's appeal as an investment hub over Chile.
- **Superior Proximity to the US Market:** With just about 1,200 km separating Mexico from the USA, the transportation of green ammonia can be more efficient and cost-effective than from Chile, which is approximately 8,200 km away and reliant on passage through the Panama Canal.
- **Unconstrained EU Access:** Mexico is roughly 8,500 km from the EU, presenting a competitive advantage over Chile, which not only has to cover 14,000 km
- **Reduced Shipping Times and Costs:** The shorter distance to key markets from Mexico could result in significantly reduced shipping times and lower transportation costs
- **Optimal Conditions:** Mexico enjoys one of the highest solar irradiance levels and consistent wind speeds, exceeding the average renewable energy resources found in the US

BUSINESS CASE MARENGO - MEXICO

GREEN AMMONIA PRODUCTION FACILITY WITH AN INTEGRATED RENEWABLE POWER PLANT

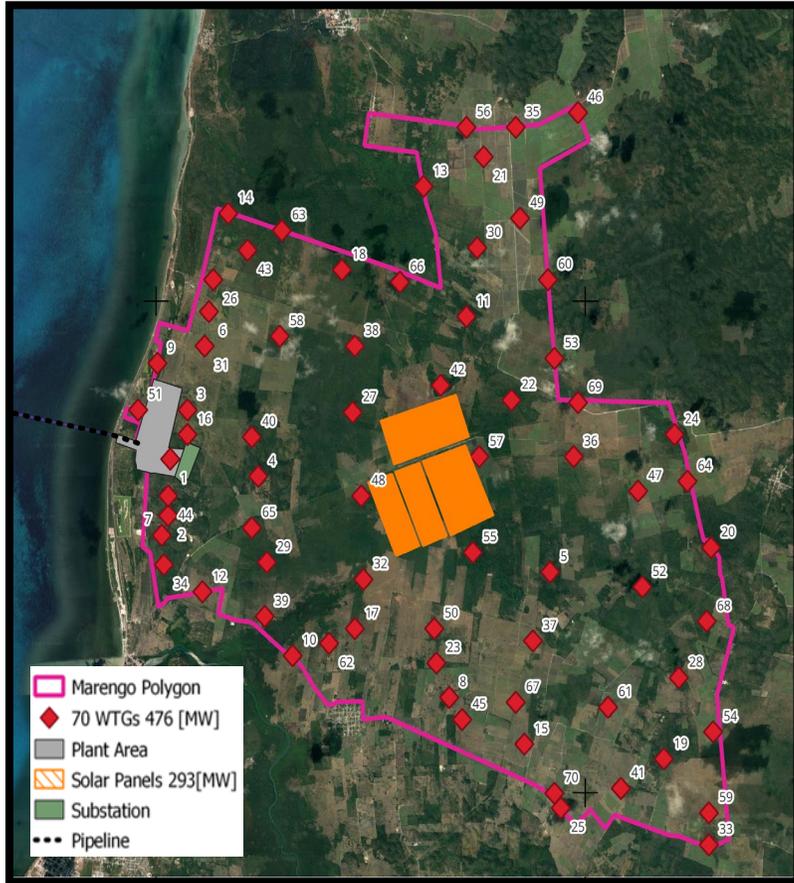
MexCo
MEXION CORPORATION



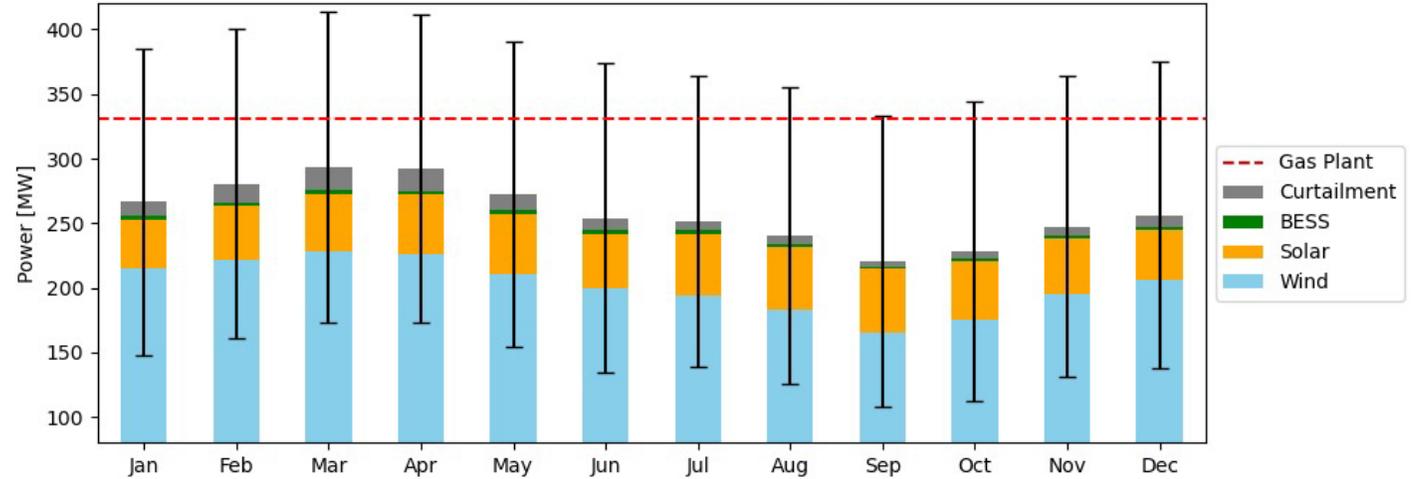
- **Green Ammonia production facility with off-grid renewable power plant**
 - 300 MW electrolyzer (supplied by a brackish desalination plant), 26 MW Haber Bosch (N₂ air capture and NH₃ synthesis)
 - Subsea pipeline with CALM Terminal for ship loading
 - Green Ammonia production of ~ 205,000 tons / year
 - Green hydrogen production of ~ 36,000 tons / year
 - 476 MW wind power → 1,787 [GWh/year] / Net Capacity Factor ~ 43%
 - 293 MW PV power → 472 [GWh/year] / Net Capacity Factor ~ 22%
 - 42 MWh BESS (lithium iron phosphate - LFP)
 - Other energy storage technologies to be analyzed
- **Economic & Financial Considerations**
 - Preliminary CAPEX of ~ 1,250 MUSD
 - Preliminary LCoA_{production} < 600 USD/ ton (WACC and logistics not included)
- **Social Considerations**
 - Creation of > 200 direct jobs during operation + indirect jobs
 - Creation of ~1,000 direct jobs during construction + indirect jobs
 - Significant impact on the Income Per Capita in the project area
 - Mangrove reforestation and protection program / other high impact social programs

MARENGO PRELIMINARY LAYOUT

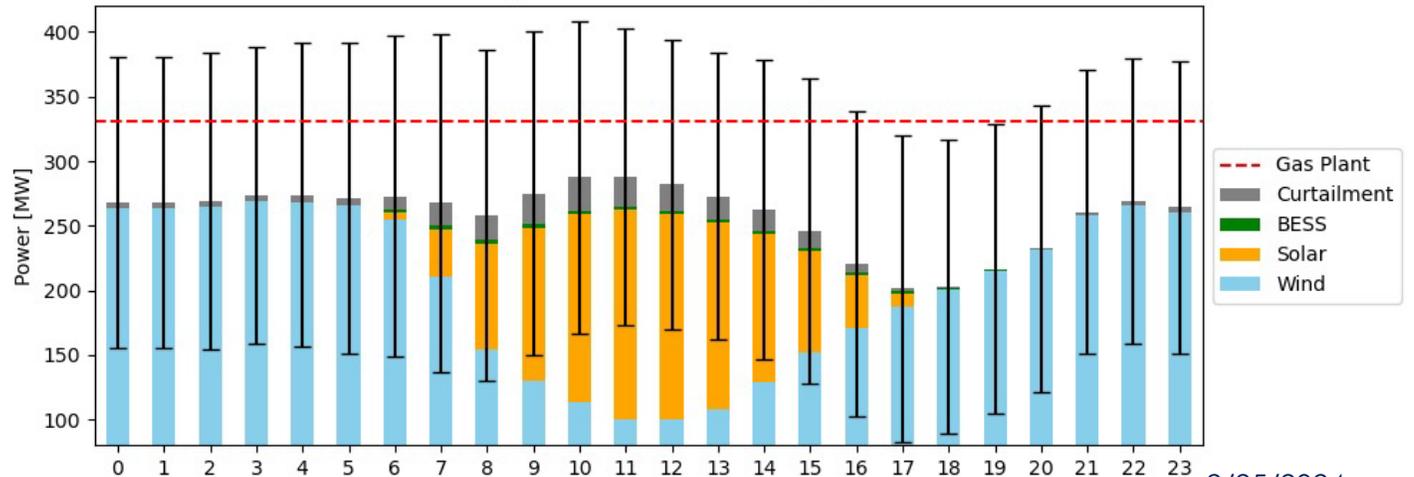
PRELIMINARY DESIGN AND POWER GENERATION PROFILE



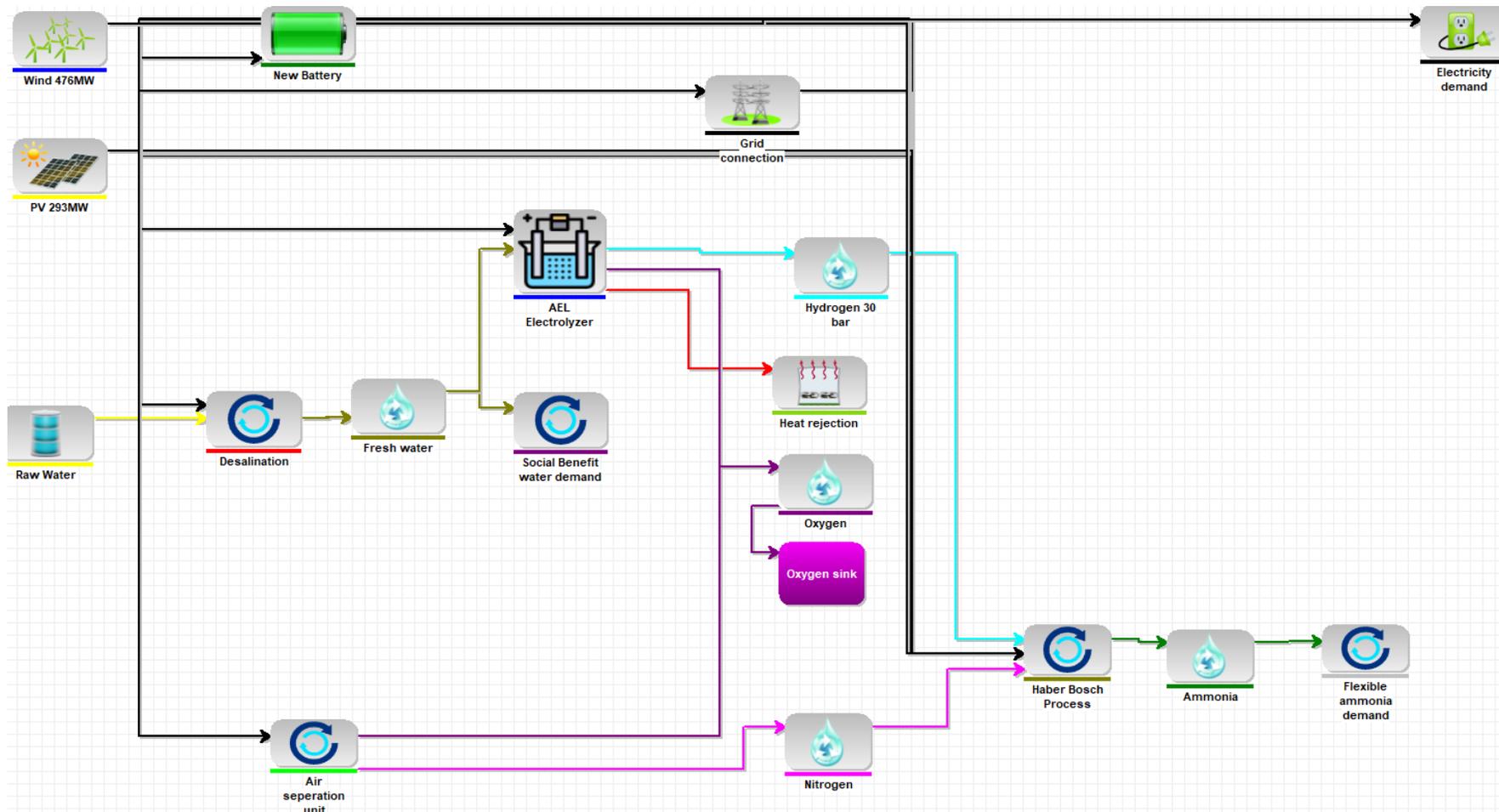
Monthly Power Generation Average



Hourly Power Generation Average



SCHEMATIC DIAGRAM



Calculations include

- Hybrid Generation (Wind + Solar)
- Battery Energy Storage System (BESS)
- Water Desalination
- Electrolizer
- Hydrogen Storage
- Air Separation Unit (ASU)
- Nitrogen Storage
- Haber Bosch

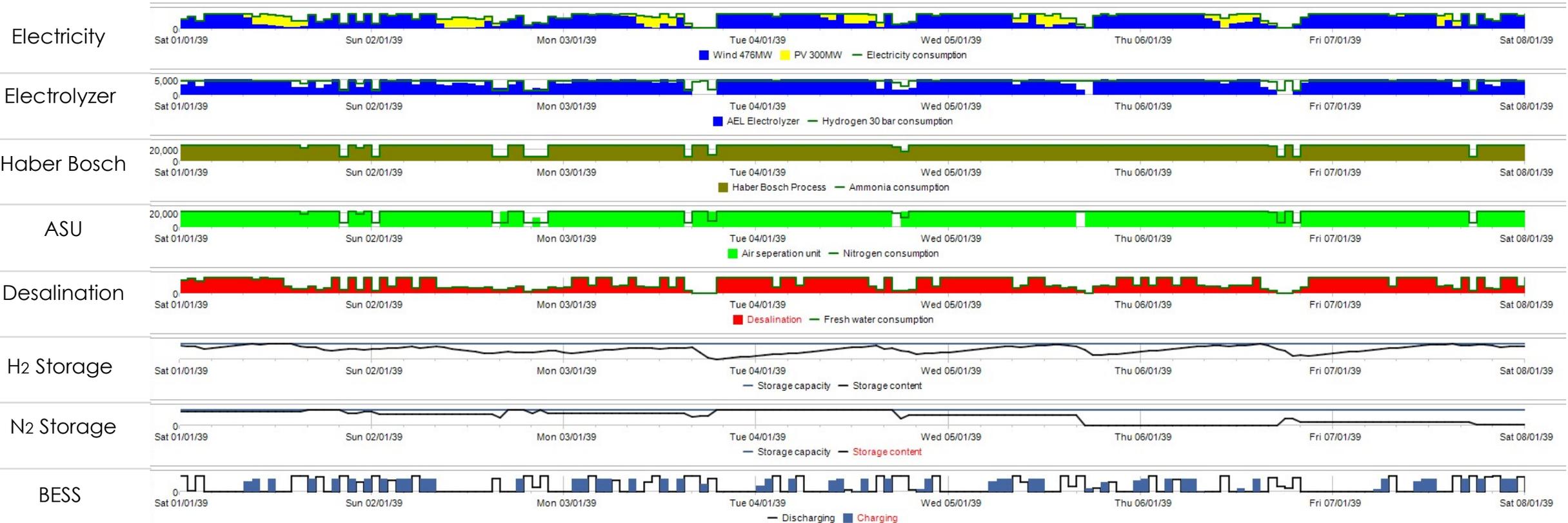
AMMONIA PRODUCTION DIMENSIONING AND OPTIMIZATION

A 7-DAY EXTRACT OF THE OPERATION SIMULATION ENERGY PRO FOR 25 YEARS



■ ~ 68 % Load Factor Electrolyzer

■ ~ 87% Load Factor Haber Bosch



INTEGRATION OF LOCAL CONTENT VALUE CHAINS OF GREEN HYDROGEN PROJECTS

O&M Products & Services

- Renewable power plant
- Water treatment
- Electromechanics
- Chemical supplies
- Pumps and compressors
- HS Training & Certification
- H&S equipment
- Laboratories
- Certification authorities
- Civil works and Construction companies
-
- Biomass production?

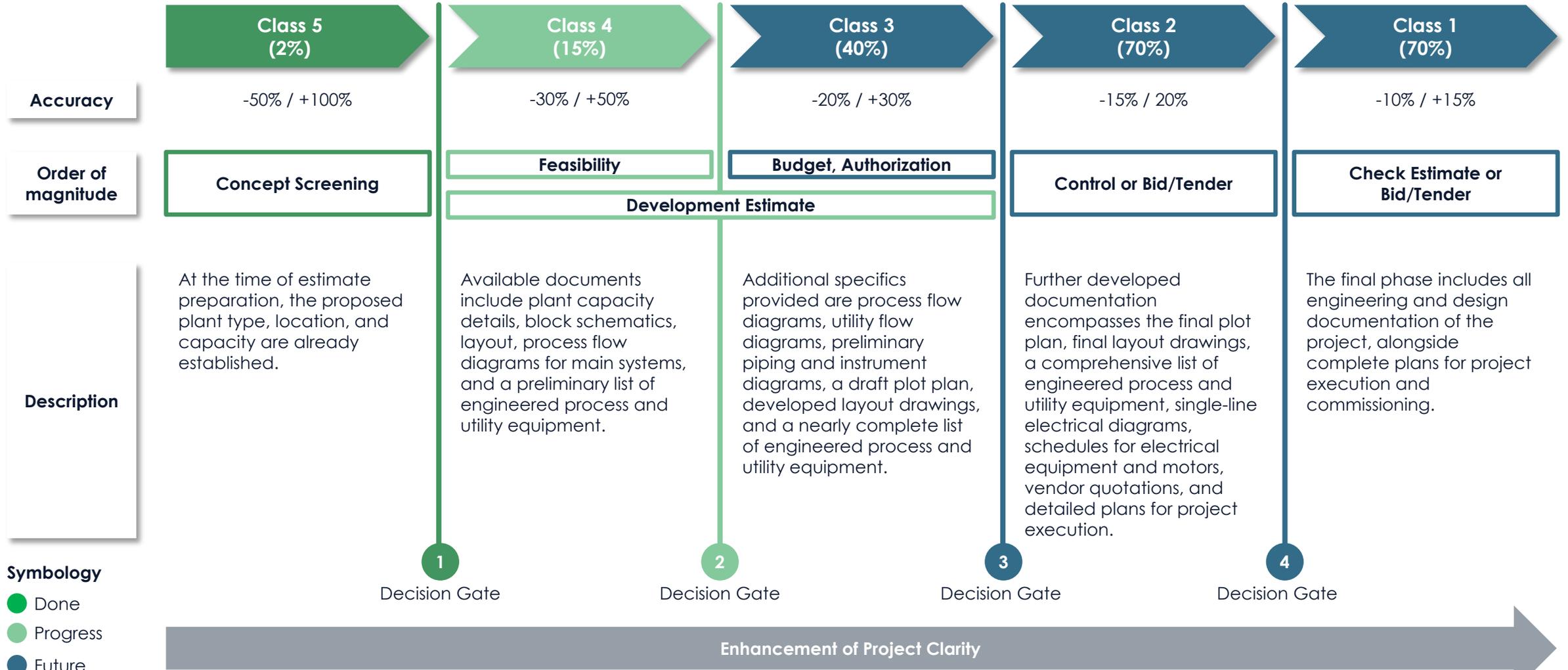


Byproducts and opportunities for local industry

- Heated water from Electrolyzer 70 – 80 °C
- Vapor from HaberBosch process at medium pressure (~ 5 MW each 200,000 tons/y NH₃)
- High purity oxygen from electrolyzer and nitrogen capture
- Hydrogen for local application for industry and mobility
- Master control room for additional facilities
-

CONCEPTUAL WORKFLOW CHRONOGRAM

ADHERING TO AACE 18R-97 INTERNATIONAL STANDARDS FOR PROCESS INDUSTRY PRACTICES



MARENGO'S ROADMAP

INNOVATION FROM RENEWABLE POWER PLANT TO PTX

Symbology

- Done
- Progress
- Future





MexCo

MEXIÓN CORPORATION

Your partner for renewable PtX projects in Mexico.
Ask for your investment opportunity.

Ralph Wegner
Managing Partner

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