



Completion of South Pacific's largest storage projects in Tonga,  
an enabler to the energy transition in the Pacific Islands

# Pacific Power Association

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September 2023



*Technology and Finance Readiness for a Green, Sustainable and Resilient Power System Network*

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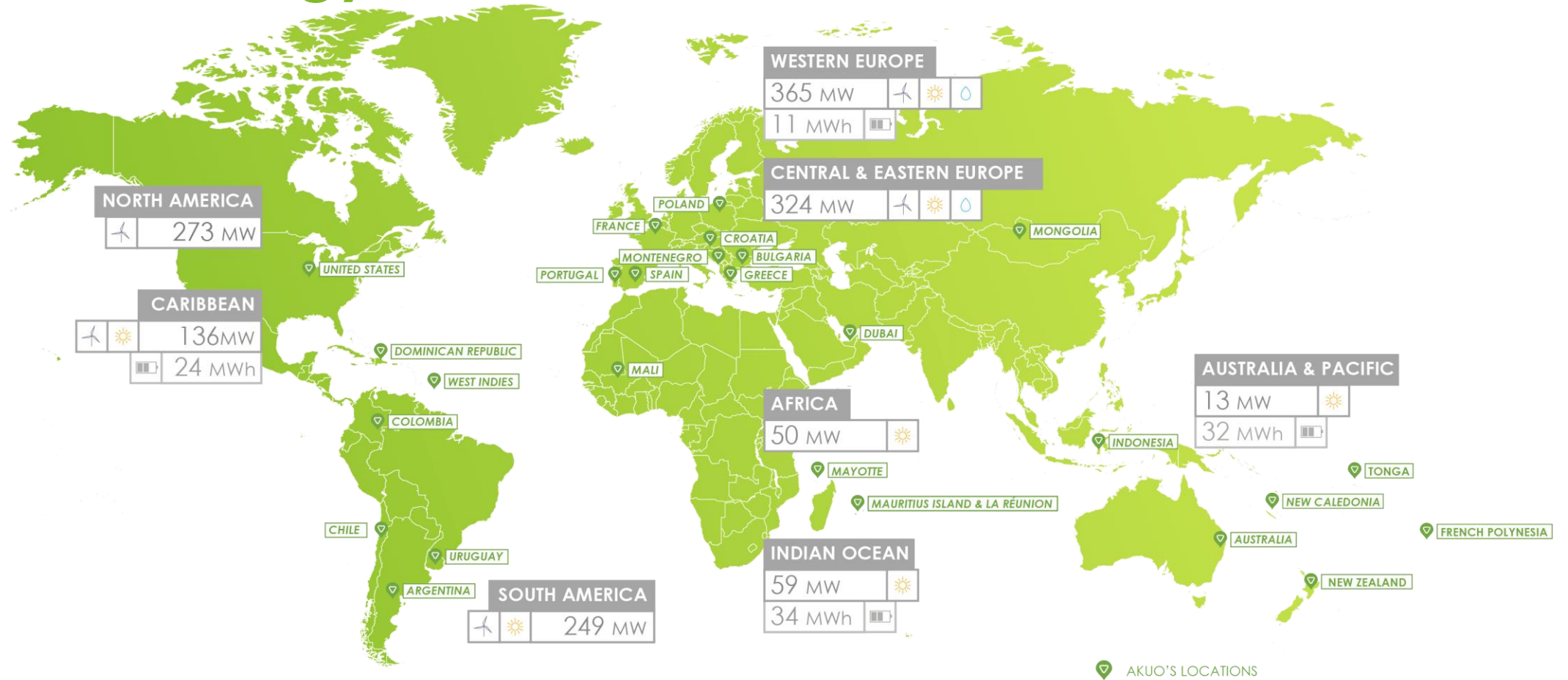
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# | Akuo Energy



| Capacity in operation and under construction:

**1,5 GW**  
Electric power

**> 70 MWh**  
Storage

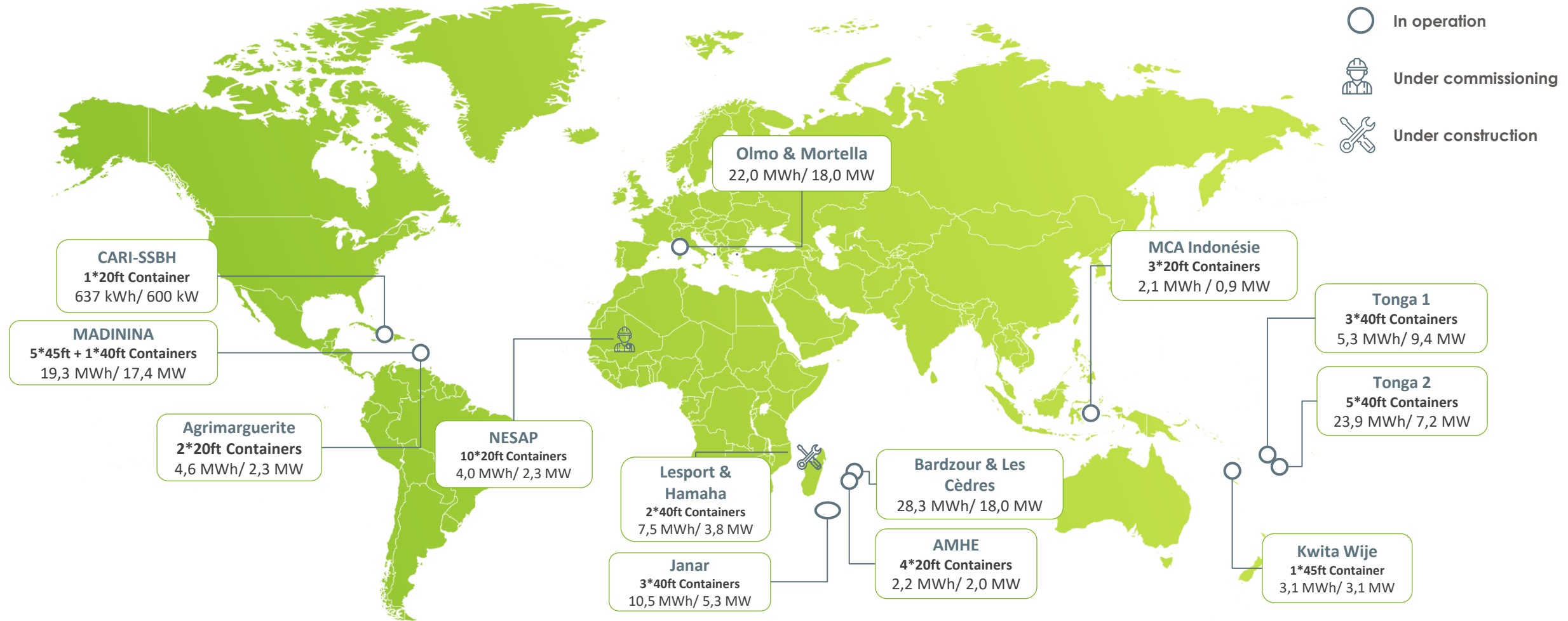
| Technologies:



Note: Figures at the end of March 2022

# Zoom on storage

Akuo has currently **16 projects / 133 MWh** in operation or under construction





# Akuo – Success story in New Caledonia



**FOCOLA**  
1,7 MWp Agrinerie



- In operation since 2019
- **Cyclone-proof greenhouses**
- In partnership with a local farmer



**OUACO**  
4,4 MWp ground-mounted PV  
+ 0,6 MWp Agrinerie



- In operation since 2020
- In collaboration with local authorities



**KWITA WIJE**  
6 MWp ground-mounted PV + Agrinerie  
+ 3MW/3MWh Storage



- In operation since 2022
- Incl. BESS storage
- **Local tribes as shareholders**



**BOULOUPARIS BESS**  
50 MW / 150 MWh storage



- Project awarded, under development
- **Largest storage project in France and the Pacific Islands**
- Enable energy tranistion, including Nickel mining



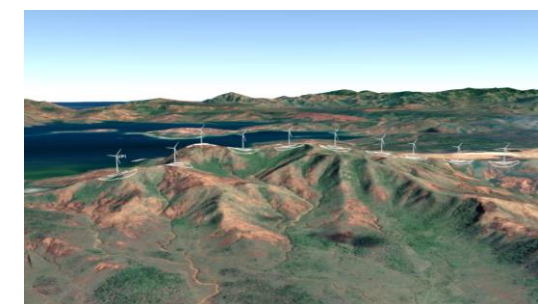
**Soleil de l'Aiguillon**  
35 MWp ground-mounted PV  
& Agrinerie



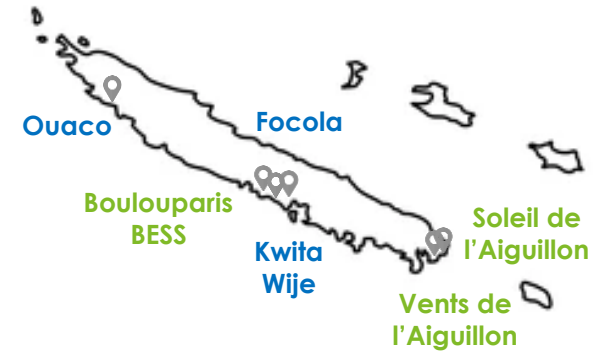
- Project awarded, under development
- Local tribes as shareholders
- Tribes involved in agricultural activities on project site



**Vent de l'Aiguillon**  
30 MW, wind



- Project awarded, under development
- Local tribes as shareholders
- Tribes involved in agricultural activities on project site



# Replicating in French Polynesia



## SWEET

2,5 MWp ground-mounted PV and Agrinergie



- Under development
- Cyclone-proof greenhouses



## VANI-RA

2,1 MWp Agrinergie + 2 MWh battery



- Under development
- **Cyclone-proof greenhouses**
- **Including battery**



## HINE-RA

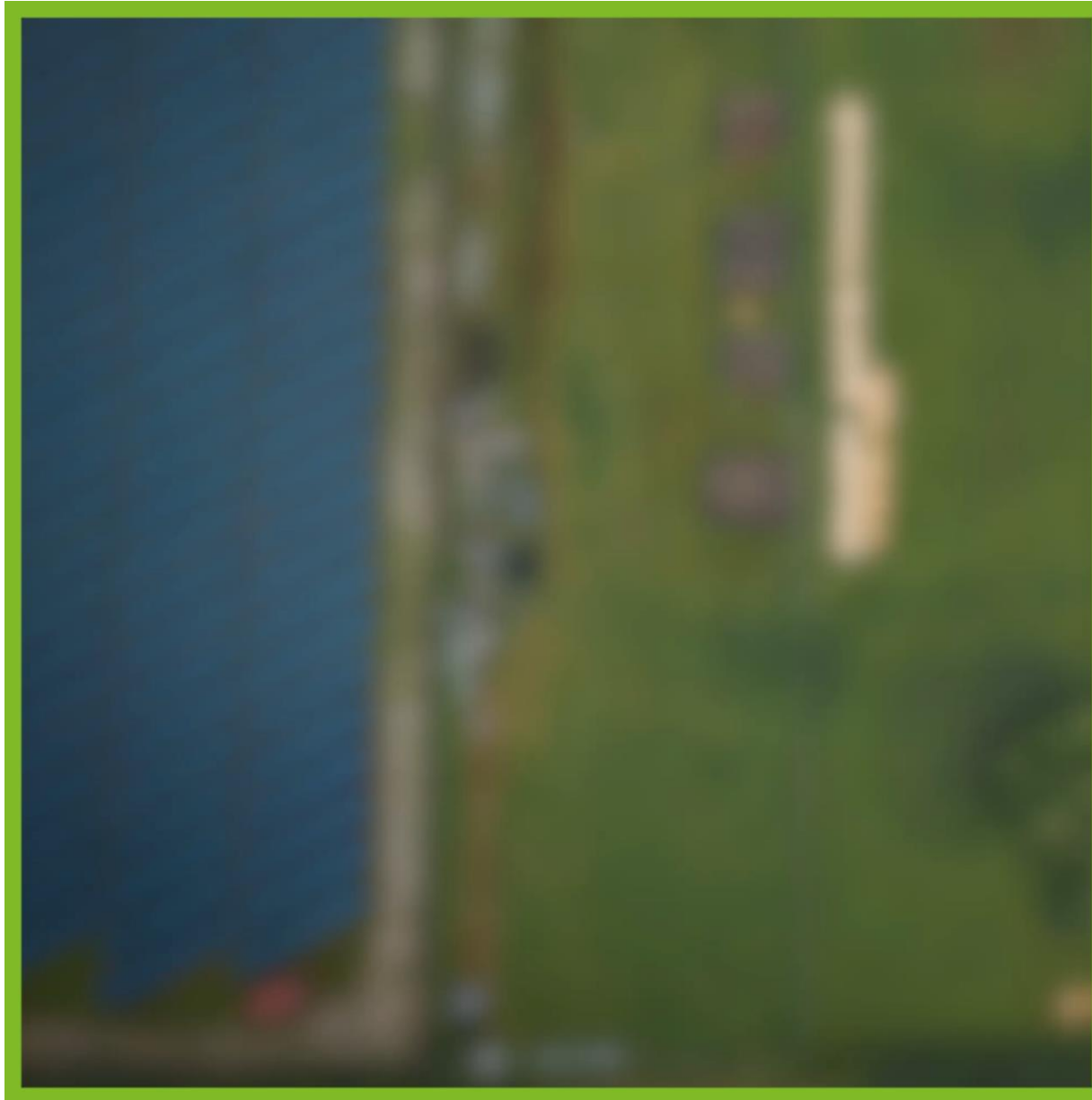
3,2 MWp ground-mounted PV and Agrinergie + 7,3 MWh battery



- Under development
- **Cyclone-proof greenhouses**
- **Including battery**



# | Project Summary





# Project Summary – Engineering, Procurement and Contracting

## Tonga Renewable Energy Program 1 (TREP1 / Tonga 1)

- 10 MW / 5 MWh (30 min) installed
- Grid stability purpose
- 3 Storage GEM / 40-feet
- Internal inverters
- **Contract: ~5 mnUSD** (2019)  
(multi-currency)
- Client: **Tonga Power Limited**
- Funding Program: **Tonga Renewable Energy Project**
- Battery cells supplier: **Samsung**
- Inverters supplier: **JEMA**

- **5-year** battery + PCS warranty (material & performance)
- 540-day Defect Liability Period + 5-year extended DLP on battery and PCS

## Tonga Renewable Energy Program 2 (TREP2 / Tonga 2)

- 7 MW / 24 MWh (3.5 hours) installed
- Load-shifting purpose
- 5 Storage GEM / 40-feet
- External inverters
- BESS substation
- **Contract: ~10.5 mnUSD** (2019)  
(multi-currency)
- Client: **Tonga Power Limited**
- Funding Program: **Tonga Renewable Energy Project**
- Battery cells supplier: **Samsung**
- Inverters supplier: **JEMA**

- **10-year** battery + PCA warranty (material & performance)
- 540-day Defect Liability Period + 5-year extended DLP on battery and PCS



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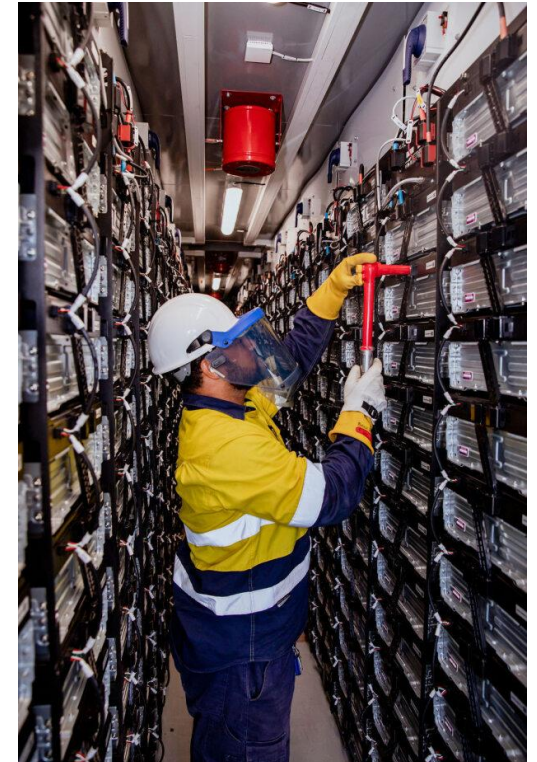
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# | The context



*Tonga Renewable Energy Project (TREP) is a 53,2 mUSD Donor funding program by The Asian Development Bank, Green Climate Fund, Australian Government, Government of Tonga and Tonga Power for large BESS in Tongatapu, electricity generation in the Outer Islands and Grid Upgrade*

- Energy mix in Tongatapu (prior to BESS completion)
  - 14 MW **diesel** (**90%** production)
  - 4.3 MW solar (3 plants, incl. 1 privately-owned)
  - 1.3 MW Wind
- Energy mix in Tongatapu (since BESS completion)
  - 14 MW diesel (**80%** production)
  - 4.3 MW solar (3 plants) + **6 MW** (3 sites, privately-owned)
  - 1.3 MW Wind
- Target **Renewable Energy** penetration
  - **70% by 2025**
- Upcoming project:
  - ~20 MW + 50-60 MWh BESS (privately-owned)



# | Tongatapu





# | Tonga 1 (10 MW / 5 MWh)



# | Tongatapu





# | Tonga 2 (7 MW / 24 MWh)

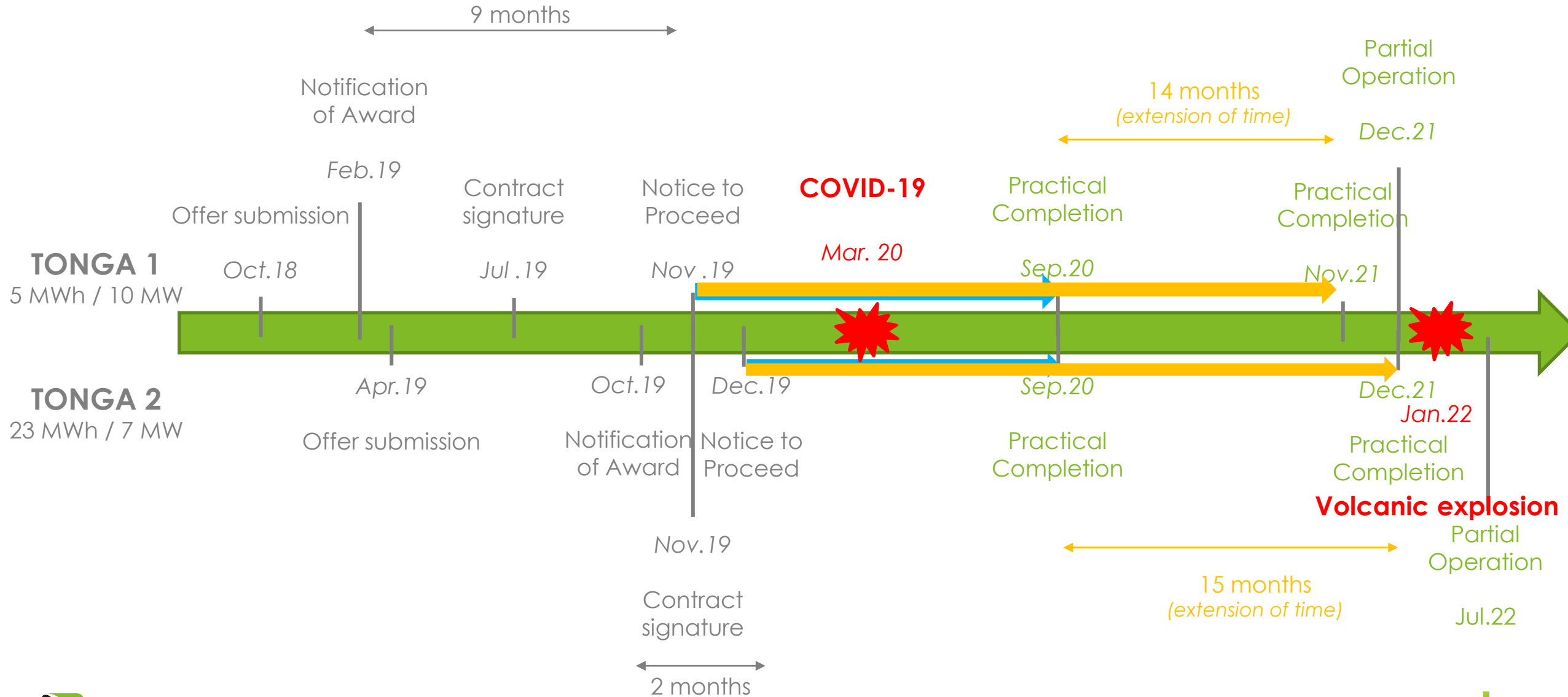


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# Timing



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?



-> Insurance  
monopolistic

- Volcanic explosion



# | The feat – What is so special?

## CHALLENGES we faced

- Covid-19 hit during project execution
  - **Tonga borders close in March 2020...** only re-opened one year ago!
    - Remote island & limited available skills
  - > Subcontractor couldn't send team in Tonga
  - > Physical commissioning became impossible with mandatory quarantines (> 5 weeks)
  - > Insurance became very tight, almost monopolistic market
- Volcanic explosion
- 12-hour time difference with Europe

## OPPORTUNITIES we saw

- Covid-19 hit during project execution
  - **Tonga borders close in March 2020...** only re-opened one year ago!
    - Remote island & limited available skills
  - > Client (TPL) executed some MV electrical works
  - > **Remote commissioning of the 2 x BESS**
    - Improved internal processes
    - **Costs + margin approach agreed with Client**
    - Soften contractual warranties
  - > Pass-through costs after Extension of Time
  - > Round-the clock work





# | The feat – What is so special?



**AKUO and Tonga Power Limited delivered in 24 months** (instead of 10 months)

- **two technologically-complex projects** (15.5 -> 16.7 mnUSD in total)
- **in a complex** (remote, limited skills) **and closed location**
- **with multiple price increase** due to Covid-19
- **with positive gross margin** for the Contractor



Thanks to



- The **resilience, commitment and flexibility** of the team
- The **trust relationship and understanding** built between Akuo, Tonga Power and ADB
- **Some luck** to build the largest Battery Energy Storage System in the South Pacific





# Malo'aupto

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