

JCM Webinar

Renewable Energy Opportunities in Maldives for Japan under JCM

February 28th , 2022

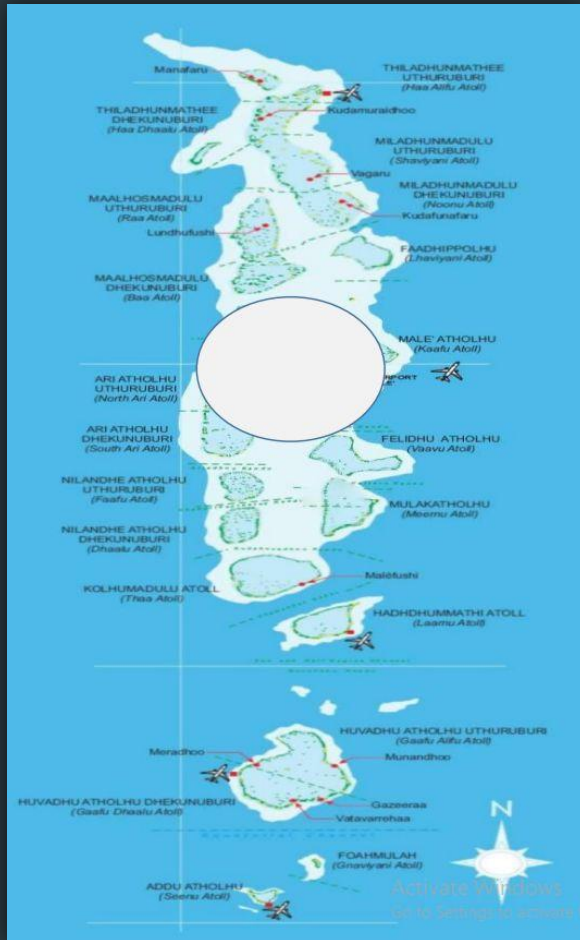
Webinar on the Joint Crediting Mechanism(JCM) Implementation in Republic of Maldives – Innovation for carbon Neutrality through JCM

Strategies for electricity in remote islands of Maldives
by FENAKA Corporation Limited.

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Introduction

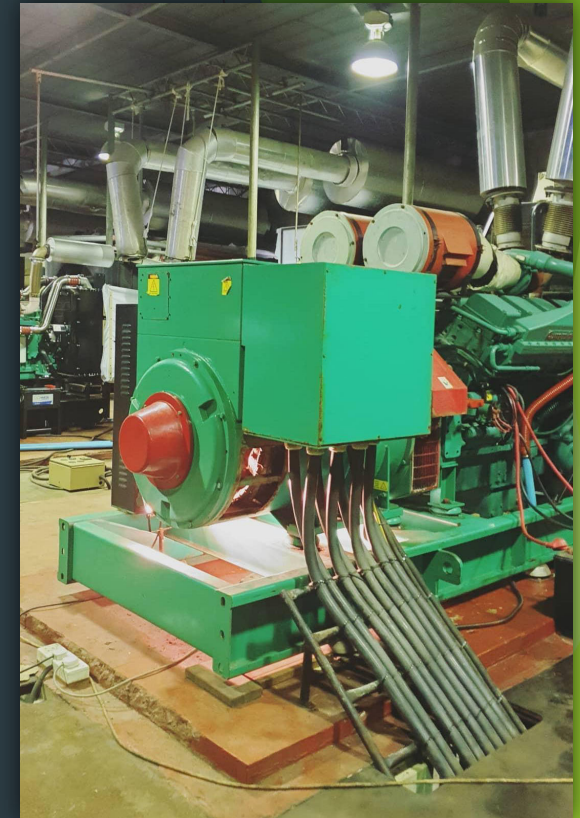


Fenaka operates in all areas except the islands located within the white circle (Male' and surrounding islands)¹

- Maldives is the only country to have electricity provided for the entire population by the government.
- FENAKA Corporation Limited is a 100% Government owned utility company with a mandate to provide the outer island communities of the Maldives with electricity, water and sewerage.
- FENAKA operates in 154 islands as of 2022 and each island has a separate branch , a designated powerhouse with diesel powered generator sets.
- The key objectives of this company is to provide;
 - Supply of clean water
 - Sewerage treatment
 - Electricity Generation and Distribution

Strategies for Electric Supply

- Provide a reliable and sustainable electricity supply that caters for the exponentially growing demand.
- In comparison to 70 years , total energy capacity has doubled in past 3 years.
- Investments are mostly made on Diesel Gensets to expand the Generation Capacity.
- Met the government pledge to deliver 24/7 electricity to 152 islands as of 2022.



Generator sets located in S.Hithadhoo and S.Hulhumeedhoo in Addu respectively

Strategies for Electric Supply

The reliability of the electricity delivered is strengthened through investments in ;

- Upgrading Electricity Distribution Networks in all islands.
 - 39 New Upcoming Powerhouses.⁹
 - 31 Existing Powerhouses are being upgraded this year.⁹

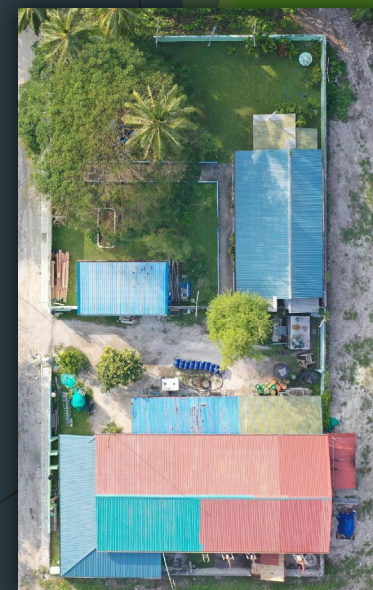


Kulhudhufushi City , One of the large islands maintained by FENAKA

- Establishing the latest control systems and synchronizing panels for generator sets.
- Capacity building to improve the skills of local technicians to better meet the O&M Requirements.¹



Powerhouses Located in Hdh. Hirimaradhoo and Hdh. Hanimaadhoo



Renewable Energy Initiatives

- Solar are implemented into the main grid for more sustainable power generation.
- A strategic plan to replace 70% of diesel power gensets with renewable sources by 2030.¹
- As of 2022 , a total of 36.5MW of solar PV have been installed 128 islands.⁹
- Out of this , a total of 8.35 MWp of solar systems have been installed across all Fenaka operations.²
- ~ 25MW of Solar PV to be installed in 89 other islands this year.⁹
- The new Fenaka powerhouses have a more sustainable structure along with solar installed on most of their roofs.
- Fenaka also encourages households to invest in own solar PV systems.



The 1 of many newly built Fenaka powerhouses to have solar installed on to power the entire building (26.28 kWp system on N.Miladhoo)³

Renewable Energy Initiatives

- The presently established solar projects are done in collaboration with the Ministry of Environment and international bodies consisting of IRENA , World Bank , ADB.
 - POISED , ASPIRE and ARISE projects (Solar PV along with BESS and EMS systems)
- Fenaka has commenced installing solar as in-house projects without outsourcing to solar contractors.
- Training is given for technicians in all branches will enable more systems to be installed and maintained more effectively.
- Home solar plan will aim to install over 1000+ households in 2020.⁹
- This plan will help achieve the NetZero RE Target of the government soon.



Solar PV Installation at Addu City under POISED ⁴

Challenges in RE Implementation

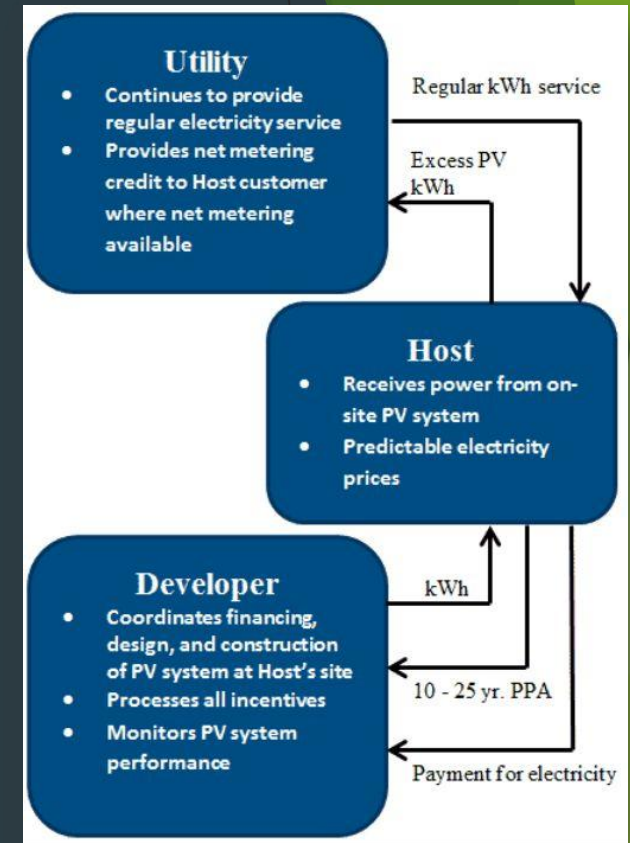


Solar Systems Implemented by POISED Project ,
Phase 1 and 2 , Courtesy of MOE , POISED ⁴

- The 4 main delivery challenges encountered in the implementation of solar technology in the Maldives⁴;
 - 1) Limited knowledge , technical expertise and relevant training.
 - 2) Limited capacity/ space restrictions.
 - 3) Constraints in finance and high initial capital.
 - 4) Reticence towards renewable energy.

Solar Power Purchase Agreement (PPA)

- In a Solar Power Purchase Agreement (PPA) , one party , the 'seller'/Developer , is responsible for all aspects of the solar system
- The other party , the 'host' , will purchase the generated energy at a reduced cost or a fixed rate.⁵
- Typical PPAs range from 10 to 25 years
- Developers remain responsible for the O&M of the system.⁵
- Positive Financial Incentives of a PPA ;
 - 1) Little or no upfront capital
 - 2) Increased value in property
 - 3) Less financial risk and no loans are required
 - 4) Reduced monthly energy bills



Generic PPA Process explained , Courtesy of SEIA.org ⁵

PPAs in the Maldives

- Features of PPAs that have occurred in the Maldives ;

- Typical rates* that the solar generated can be sold at ;
 - ❖ ~ below 12 cents per kWh without battery storage.
 - ❖ ~ below 15 cents kWh with battery storage.
- Existing PPA rates are agreed for a maximum of 20 years.
- For the first 10 years, the rate cannot be changed.
- On the 10th year, the rate can be changed based on relative market rates worldwide.
- The rate can also be revised on the 15th Year.

- Example of a notable PPA recently signed includes the PPA for a 4.5 MWp PV plant at Addu between Fenaka and Clear Future Synergies Limited (CFS) as the Developer ⁸

- The Plant's O&M will be under CFS for the next 20 years.
- Rates are within the range described above*
- Fenaka will purchase renewable energy from CFS under the PPA
- The annual savings from the project is an estimated 2.1 Million Liters of diesel and 5500 Tones of CO₂ emission reduction ⁸

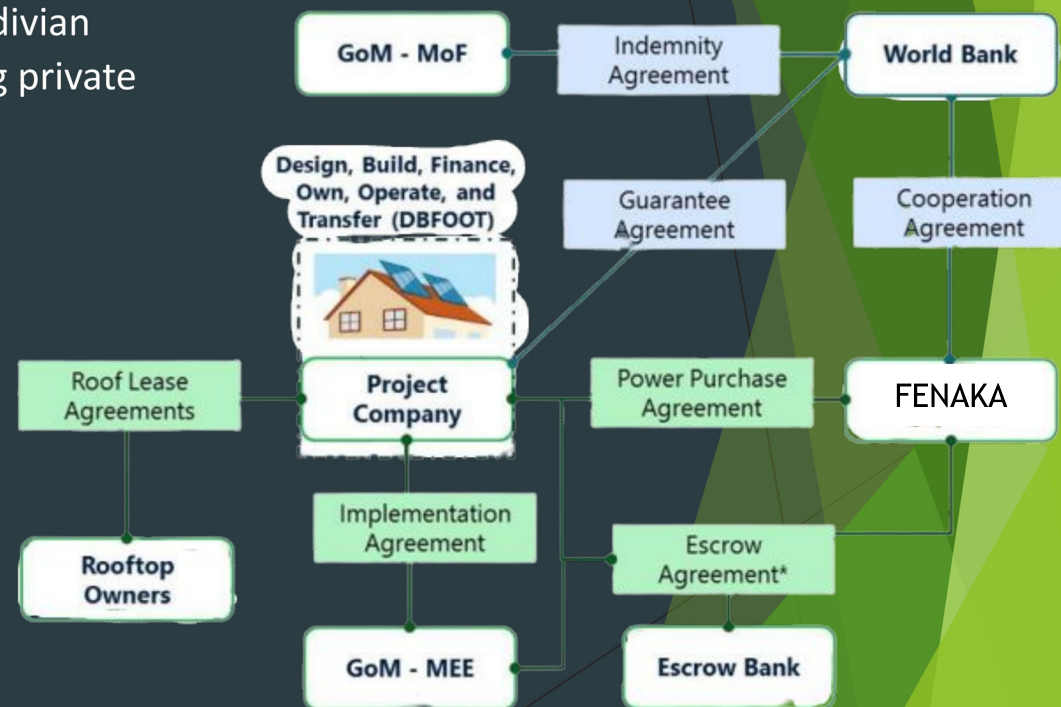
FEATURES



ADDU Gan Airport where half of the the 4.5 MW project will take place ⁸

PPAs in the Maldives : ARISE PPA

- The PPA for the ARISE Project is devised between a potential limited liability company (developer/seller) and Fenaka
- ARISE is a program that is initiated and lead by the Maldivian government with support from other parties for inviting private sector generators to develop solar PV projects. ⁷
- Under this PPA ;
 - The 'seller' or developer is the limited liability company ,responsible for the DBFOOT ⁷
 - The electrical energy is purchased under Fenaka.
 - Fenaka is identified as the state utility for the purchase of electric energy generated by the seller.
 - 11MW was given for a rate of 9 cents.



Flow chart that demonstrates the PPA and Escrow agreement structure between all parties involved in the ARISE Project ⁷

References

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Thank you



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