

Introduction of Energy Saving and Renewable Energy projects ~Potential JCM project~

10 November 2023

Hiroki AOYAGI

Yachiyo Engineering Co., Ltd.

Confidential

1. Yachiyo's Company Profile
2. Introduction of Energy Saving Project
3. Introduction of Renewable Energy Project

Company Outline

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Headquarters	5-20-8, Asakusabashi, Taito-ku, Tokyo, Japan
Establishment	January 29, 1963
Number of employees	1,265(including 223 administrative staffs)
Paid-up Capital	450 million yen(Approximately 3million\$)
Contract Amount Grand total for Jul.2022-Jul.2023	26,774 million yen(Approximately 180million\$)
Contract Amount of Overseas Business for Jul.2022-Jul.2023	3,237 million yen(Approximately 22million\$)

FIELDS OF EXPERTISE



Private Sector



Urban & Regional Development



Architecture



Public Transportation



Road and Bridge



Solid Waste Management



Sewerage & Sanitation



Water Resources Management



Electricity



Broadcasting & ICT

Plan

- Survey
- Simulation

Feasibility Study

- Basic Design
- Cost Estimate

Implementation Support

- Financial Arrangement
- Project Promotion

Consulting Services

- Detailed Design
- Tender Assistance,
- Supervision

Project Experience in 150 countries



Yachiyo Engineering Co.,Ltd.
has a wide variety of experiences around the world.

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Basic Information

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PREPARATORY SURVEY (F/S) FOR TASHKENT THERMAL POWER COGENERATION PLANT CONSTRUCTION PROJECT

Country : UZBEKISTAN

Client : JICA

Scheme : Soft Loan (12 billion Japanese Yen(Approx. 80 million US\$))

Period :December 2014~ June 2016

Outline : Covers the following studies required for the review of a yen loan for the Project.
Overall design, work plan, project cost estimation, implementation plan,
operation and maintenance plan, etc.



Tashkent Thermal Power
Cogeneration Plant



Heat exchanger room



Gas turbine room



- The lowest temperature in the Republic of Uzbekistan in the winter falls below zero degrees in the capital (Tashkent)
- Heat generated by heat and power plants is used for supplying hot water and heating

Tashkent has similar problems like Moldova

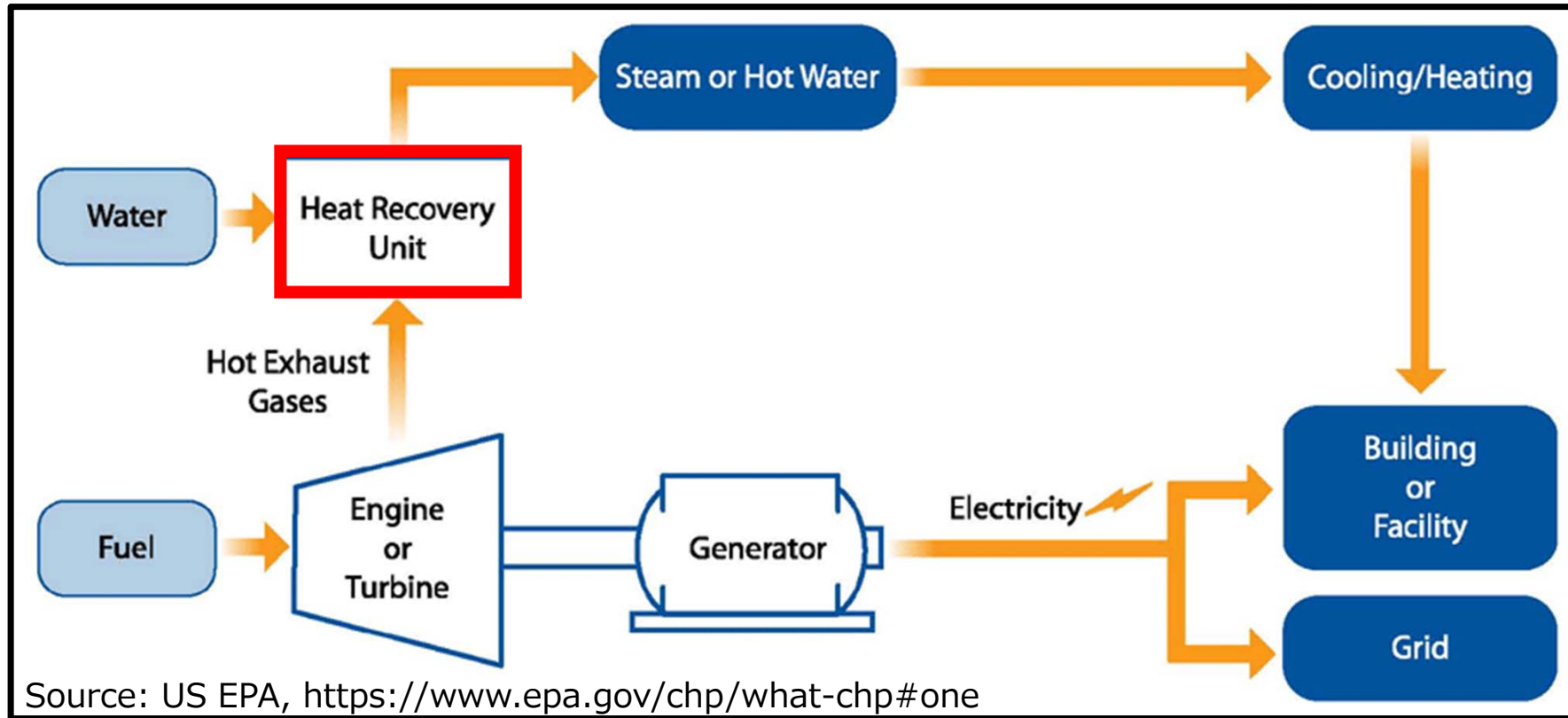
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- Rehabilitation and modernization of obsolete and inefficient heat supply infrastructures which were built 40–50 years ago is an urgent task for stabilizing heat supply and improving energy efficiency
- This picture is Cogeneration power plant of Tashkent, construction of which was completed in 2013 NEDO Grant Project

What is the Cogeneration plant (CHP) system?

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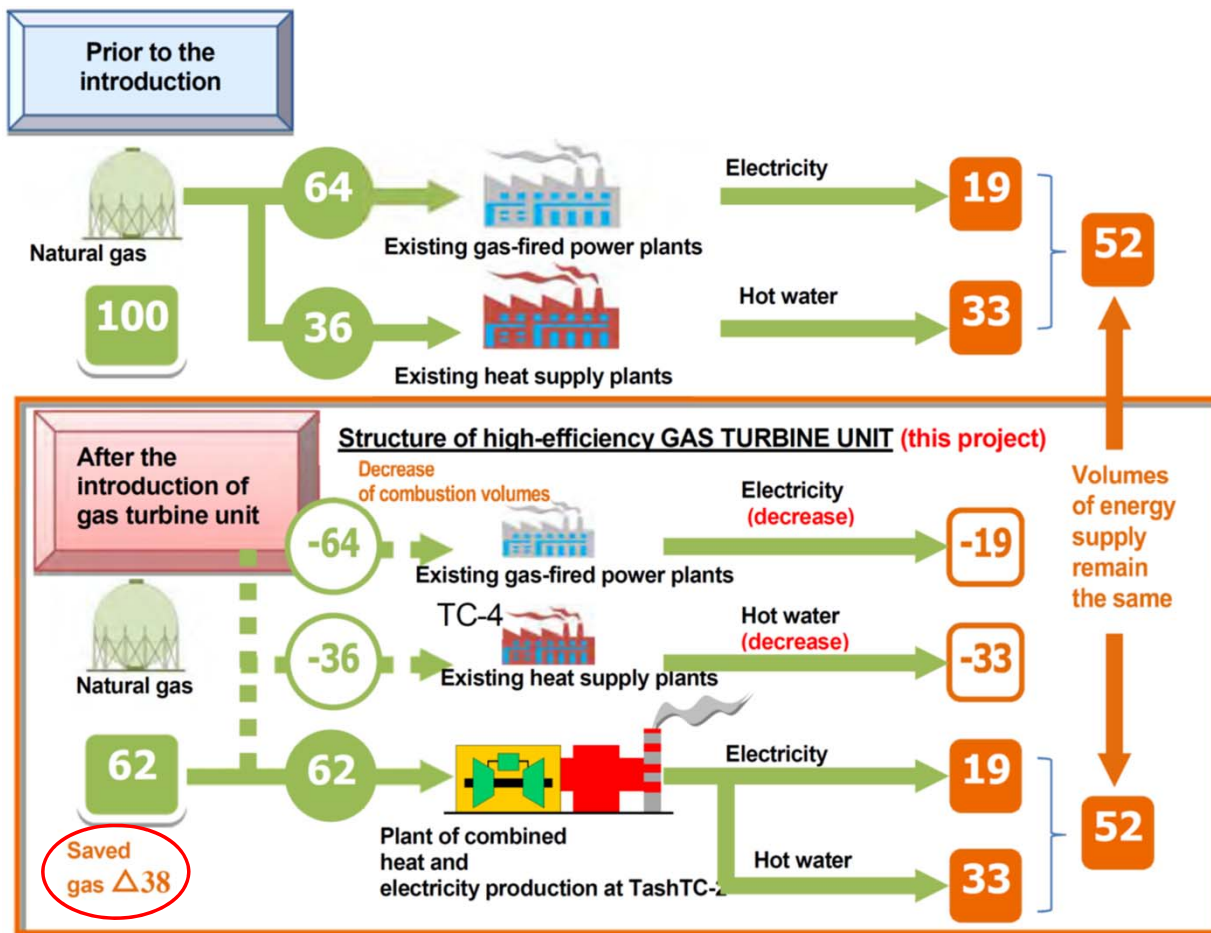
Combustion turbine or reciprocating engine Cogeneration (CHP) systems burn fuel to turn generators to produce electricity and use heat recovery devices to capture the heat from the turbine or engine. This heat is converted into useful thermal energy, usually in the form of steam or hot water. Thus, **higher energy efficiency can be achieved** compared to individual heat or power generation plants.

Configuration of this Cogeneration plant

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Unit Configuration	4 Units
Heat generation output	160 Gcal/h(40 Gcal/hx4units) (About 10% of Tashkent's heat demand)
Electric power generation(gas turbine) output	120 MW(30 MW x4units)
Unit output	30 MW+ 40 Gcal/h
Heat-to-Power ratio	1.55 $40\text{Gcal/h} \div (30\text{MWh} \times 0.86\text{Mcal/MWh})$
Reliability and operational characteristics	Impact in case of one unit shutdown is small
Budget	Soft loan : 12 billion Japanese Yen (Approx. 80 million US\$)
CO₂ reduction	308,312 ton/ year

Configuration of this Cogeneration plant

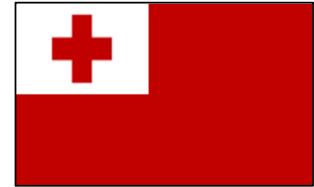


It saves about 38% energy compared to supplying electricity and heat separately

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Basic Information

Project for Introduction of a Micro-grid System with renewable energy for the Tonga Energy Road Map



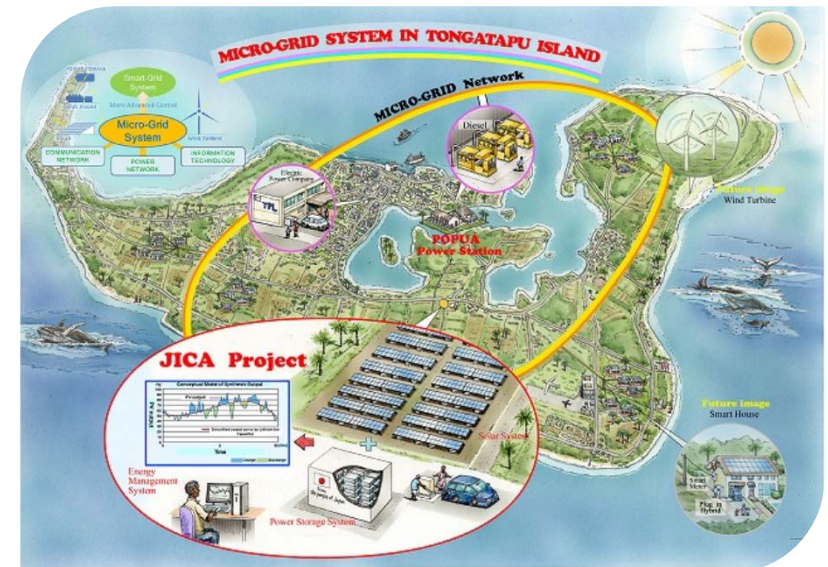
Country : Kingdom of Tonga

Client : JICA and Government of Tonga

Scheme : Grant Aid

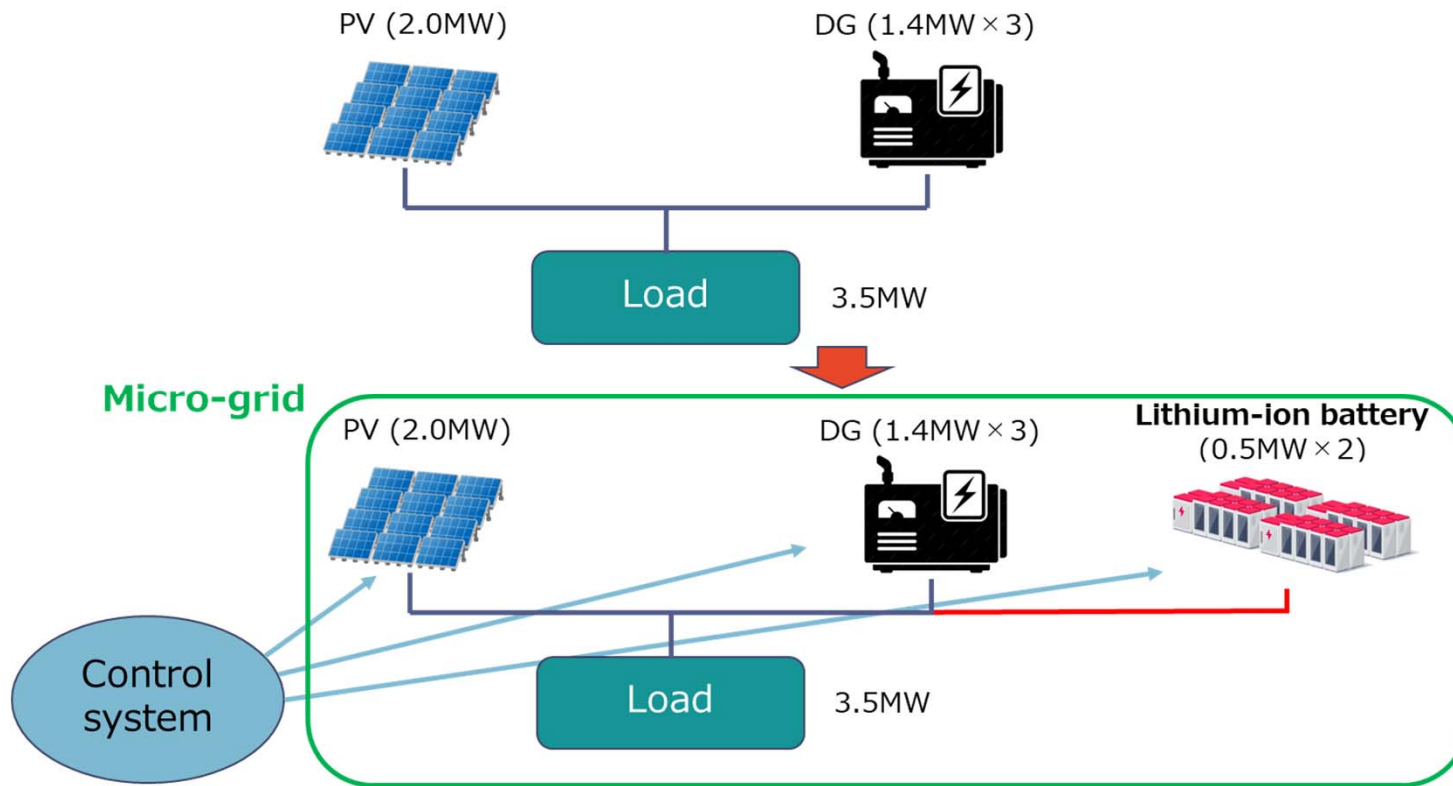
Period : August 2012 ~ March 2015

Outline : YEC provided Consulting Services for Introduction of Micro-grid system by introduction of PV system, Li-ion Capacitor, and Micro-grid controller. The service included feasibility study, support for tendering, and supervision.



What is the Micro-grid System ?

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Fluctuation
Large

Minimize
the Fluctuation

The effect due to fluctuation in the amount of energy generated is significant due to the small scale of electricity usage. Therefore, in order to expand the introduction of renewable energy on the island, measures are required to establish batteries to adjust the short term fluctuation in the amount of renewable energy generated

Configuration of PV System and Micro-Grid

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Micro-grid system	2 Units (Micro-grid controller, Power system stabilizing system)
Power storage system	1MW(500kW x2units) (Lithium-ion, electric double-layer, and other physical cells)
PV system(Total capacity)	1000 kWp
Reduction in diesel fuel consumption	327 kℓ /year
CO₂ emissions reduction	886 t-CO₂/year
Annual electric energy	1,308 MWh/year
Budget	Grant aid : 1.6 billion Japanese Yen (Approx. 10 million US\$)

Other Experiences on Clean Energy Projects(1/2)

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Project	Country	Period	Service
Capacity Building and Sector Reform for Renewable Energy Investments in the Pacific - Preparing Sustainable Investment Program	Palau	2021-2023	TA (Technical Assistance)
Data collection survey on Development of Small Hydropower and Rural Electrification in Southern Africa	Eswatini & Malawi	2021-2022	F/S
Preparatory Survey for a Small-Hydropower Development Project	Lesotho	2021-2022	F/S
Rehabilitation of Inga 2 Hydropower Station	DRC	2016-2017	F/S
Introduction of Clean Energy by Solar Electricity Generation System (1,000kWp grid-connected PV)	Nigeria	2013-2017	F/S,D/D, S/V

Other Experiences on Clean Energy Projects(2/2)

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Project	Country	Period	Service
Project for Introduction of a Micro-grid System with renewable energy for the Tonga Energy Road Map	Tonga	2012-2015	F/S,D/D, S/V
Emergency Repair and Overhaul Works for the Jebba Hydro Power Station	Nigeria	2011-2015	F/S,D/D, S/V
Project for Introduction of Clean Energy by Solar Electricity generation System (315kWp + 400kWp, grid-connected PV)	Ghana	2009-2015	F/S,D/D, S/V
Introduction of Clean Energy by Solar Electricity Generation System	Palau	2010-2013	F/S,D/D, S/V
Introduction of Clean Energy by Solar Electricity Generation System	FSM, Marshall & Tonga	2010-2013	F/S,D/D, S/V
Introduction of Clean Energy by Solar Electricity Generation System	Maldives	2010-2014	F/S,D/D, S/V

Contact Address

Takeshi GUNJI

tk-gunji@yachiyo-eng.co.jp

Thank you!



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