

Energy Management System - KYUDENKO EMS

providing stable renewable energy supply in micro-grid



September 2021

KYUDENKO CORPORATION



Our Demonstration Site in Sumba Island, Indonesia

KYUDENKO OVERVIEW



Kyudenko is a leading company of

- Electrical Construction work
- Heating, Air conditioning and Mechanical Installation work
- Power distribution line work
- Renewable Energy plant – Construction, O&M

Over 2,200MW experience of Photovoltaic Power Plant construction in Japan

Corporate profile

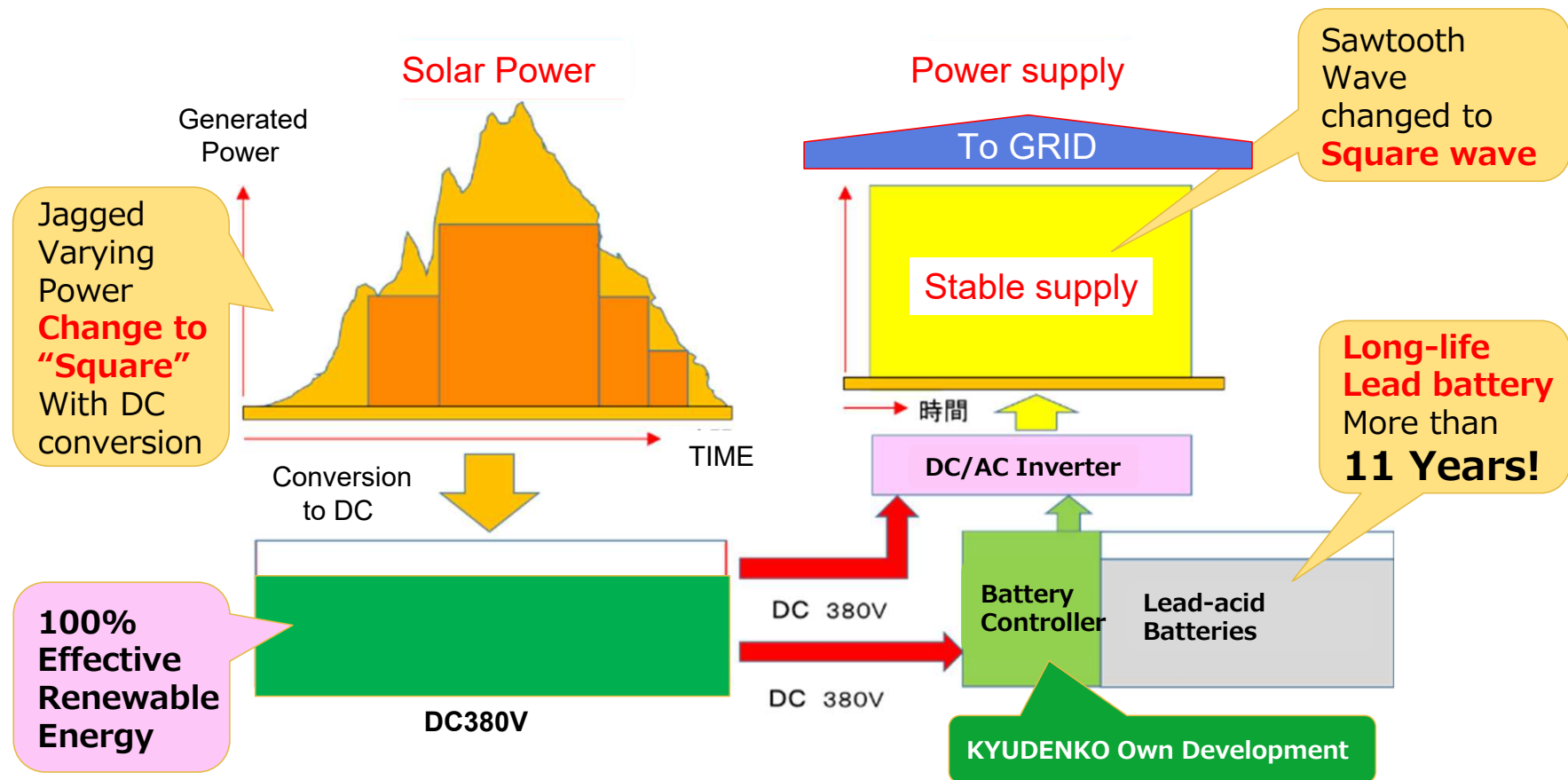


Company name	Kyudenko Corporation
Established	December 1, 1944
Capital	¥ 12,561 million
Listed market Code	1st Section of Tokyo Stock Exchange, Fukuoka Stock Exchange 1959
Head office	1-23-35 Nanokawa, Minamiku, Fukuoka city
Tokyo head office	Sunshine 60 3-1-1 Higashi-Ikebukuro, Toshima-ku, Tokyo
Bases	Head office, Tokyo head office, 10 branches in Japan, 120 sales offices, / 5 overseas subsidiaries
Approval for construction	Approved by Minister of Land, Infrastructure, Transport and Tourism (Sp. 29) No. 1659
Number of employees	Consolidated: 10,198 persons (March 31, 2021)

"Kyudenko EMS" is Stable Supply System



Gathering our technology based on top-class number of construction of Renewable energy facilities



Demonstration project in Sumba Island, Indonesia, By Financing Programme to Demonstrate Decarbonization Technology for Realizing Co-Innovation (Started from Dec.2017)

Connecting renewable energy through Kyudenko EMS to currently operating micro-grid in the west of Sumba Island (population : approx. 650,000), Indonesia. It is our attempt to make unstable renewable energy be the core of local grid.

Current Situation

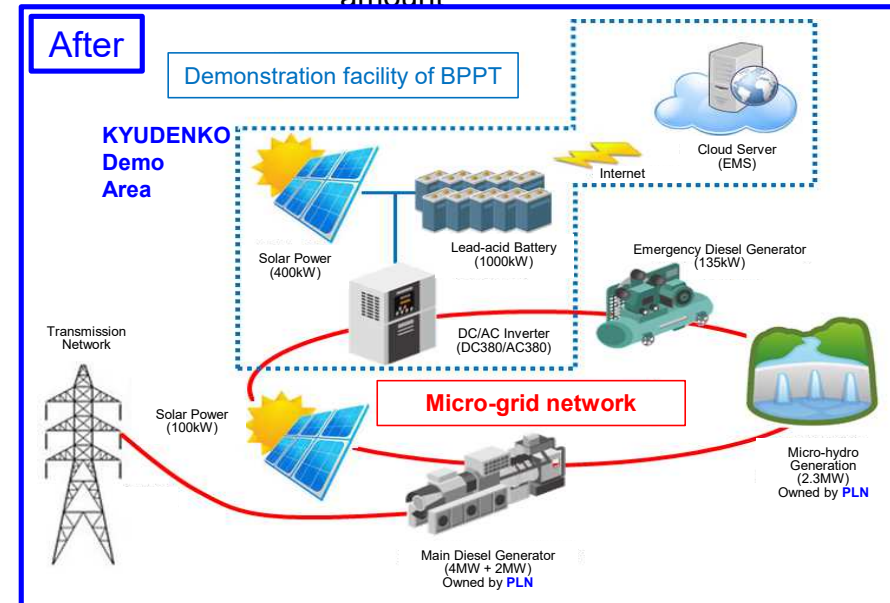
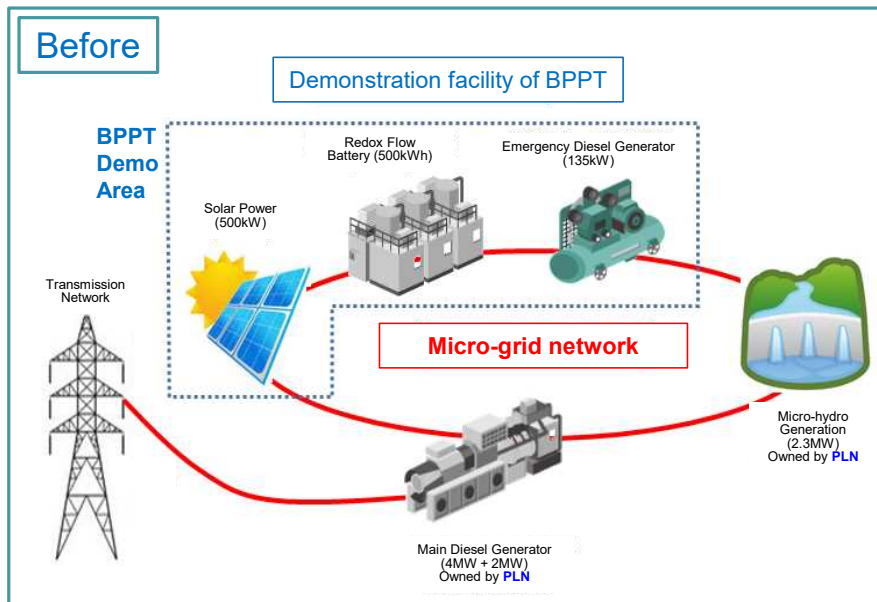
- Generation and storage do not function well.
- Incorrect supply-demand operation

Demonstration Model on Sumba Island

Kyudenko EMS was introduced, by cooperation with BPPT

Target

- To control renewable generation and storage by EMS
- To provide stable supply autonomously for a fixed time and amount

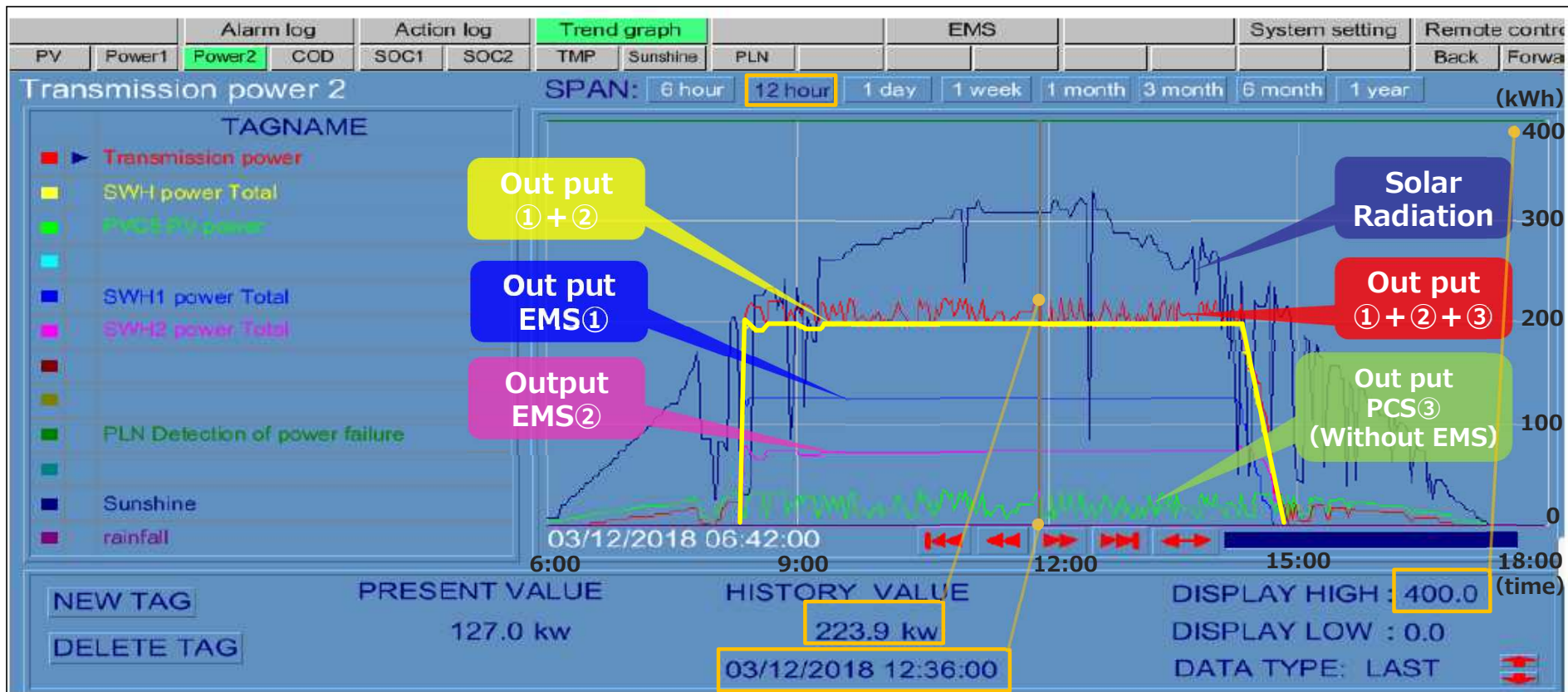


Micro-grid demonstration facility on Sumba Island, Indonesia

Transmit Electricity Trend Graph

EMS demonstration project in Sumba Island

Subsidized Project in Ministry of Environment, Japan



Stable Supply !

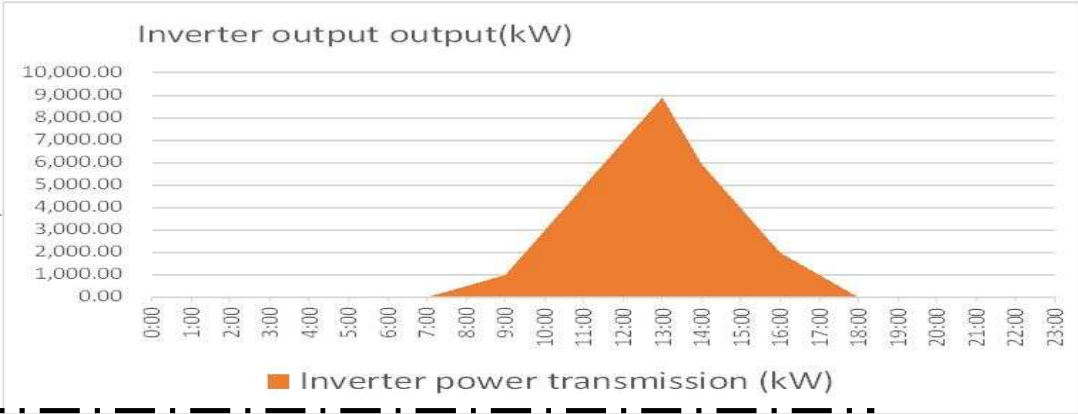
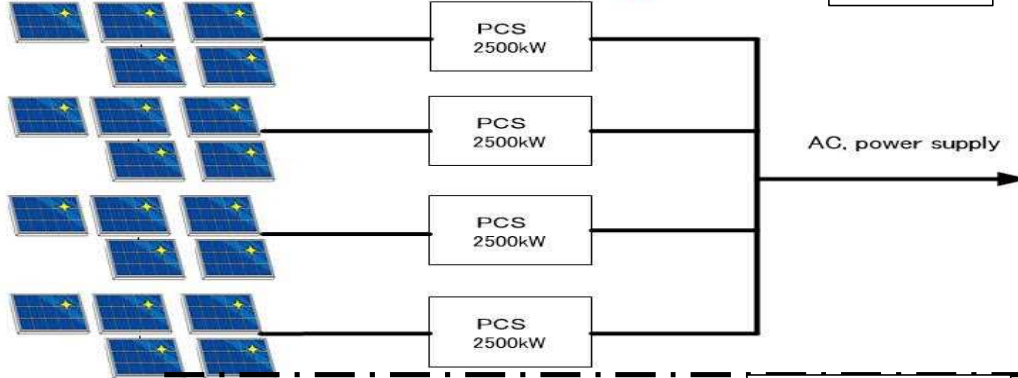
Comparison between PCS type PV power transmission method and Kyudenko EMS type PV power transmission method

Renewable energy power supply comparison table

PV power generation panel: 10MW

Conversion efficiency = 99%

PCS Type

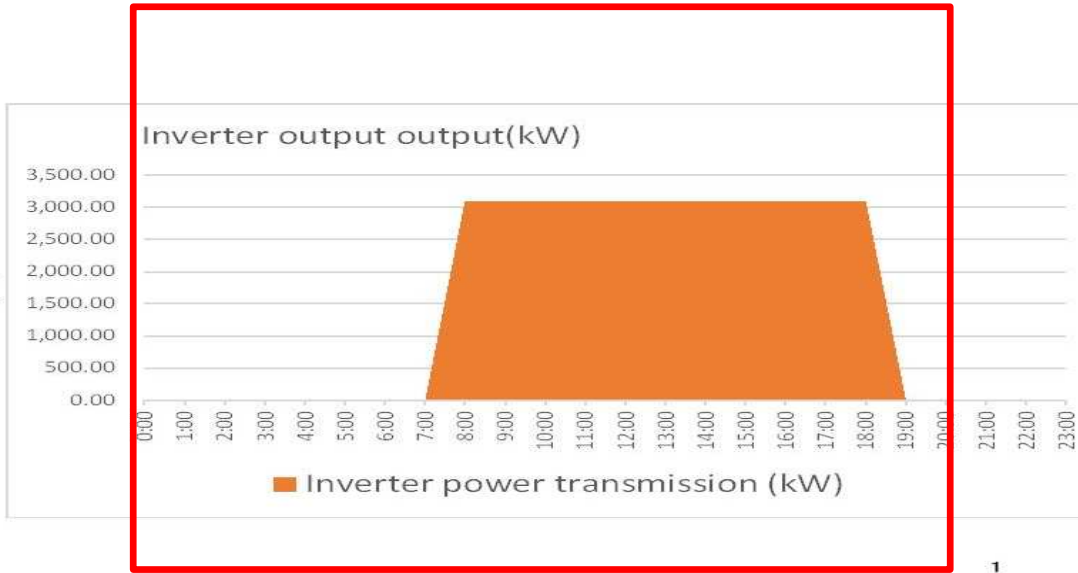


PV power generation panel: 10MW

Conversion efficiency = 97.1%

Conversion efficiency = 92.5%

Kyudenko EMS Type



Confidential

Summary of “Sumba Demonstration”

Difficulty

How to disseminate new Technology from Japan ?

How to build up the demonstration site At remote island ?

How to transport heavy Equipment safely ?

How to maintain The facilities In remote island ?

Counter-measure

Not only proposal by papers, We can show “real working” Demonstrator at site!

Collaboration with BPPT was Most important for us. BPPT Is familiar to foreign technologies.

We had tried preliminary survey And make transport plan with Local government.

Our system has cloud connection. But cost of mobile network is our Head ache...

Next Step

Commercial Project (EPC / IPP)

Challenge 24hrs Supply By RE only

Challenge 24hrs Supply By RE only

Challenging to be applied to
 **JCM** THE JOINT CREDITING MECHANISM

Thank you

