Paris Session 2022

Economical Evaluation of Conversion from Existing Distribution System to Off-grid

SC C6

PS2 and Question13

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Group Discussion Meeting

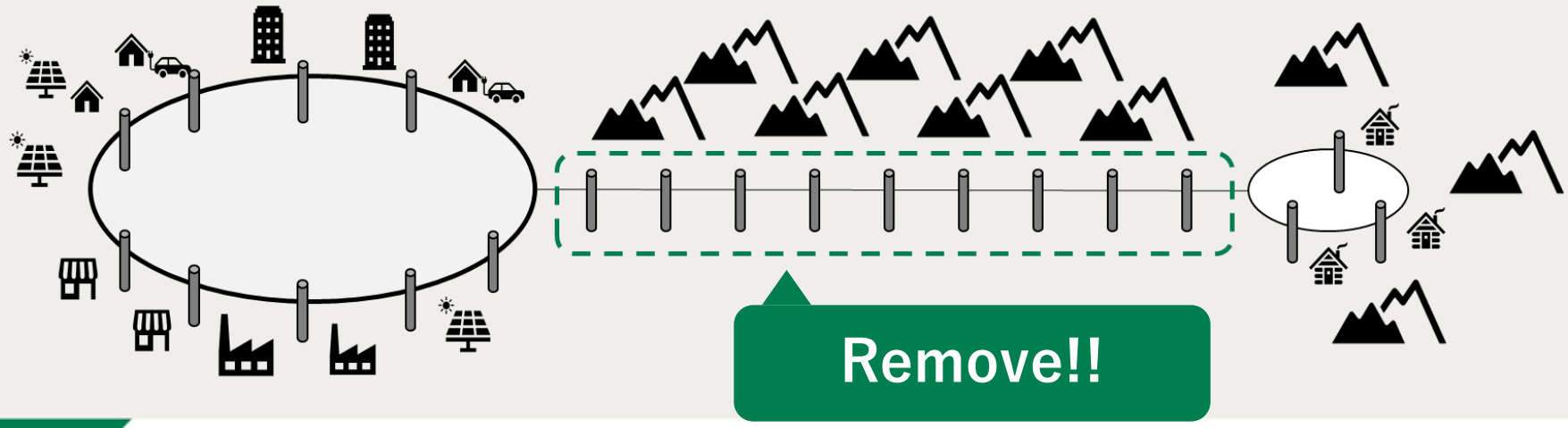
Background

- In Japan, electricity demand is expected to decline as the aging society and depopulation.
- In low-demand areas such as mountainous villages, the financial burden will increase because “Wheeling charges ＜ Facility maintenance costs".
- Converting low-demand areas to off-grid is under consideration to reduce the burden.

Purpose

- We evaluated the economic efficiency of converting to off-grid.

  We selected a mountain village, where contract power is 9.7 kW and distribution line is 4.9 km.



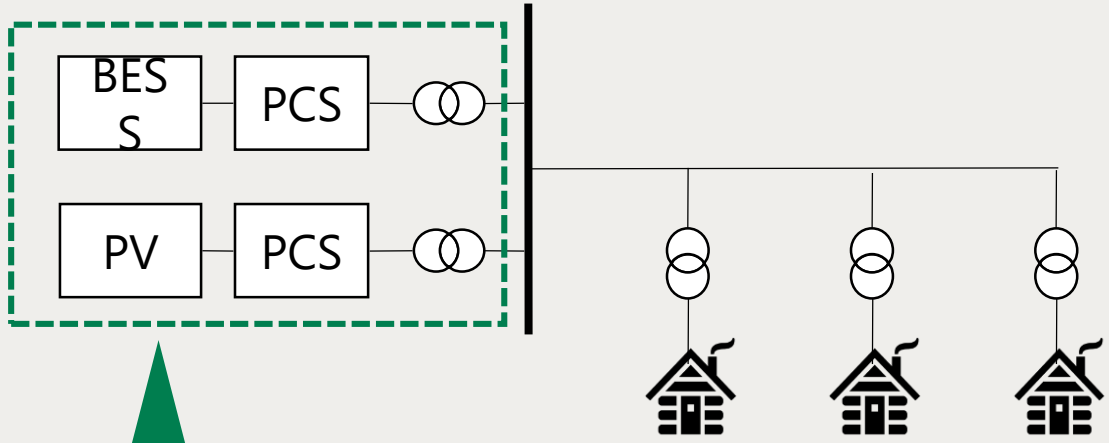
Simulation conditions

- The evaluation was conducted under the followings with an evaluation period of 50 years.
- The DCF method was used, because the business balance for each year was evaluated.

Existing system	Off-Grid
- Facility repair cost - Monitoring & inspection costs - Facility site cost - Logging cost - Logging patrol cost etc.	- Removal cost of existing facilities - PV installation costs - BESS installation costs - Control system installation cost - Facility repair cost - Monitoring and inspection expenses etc.

Group Discussion Meeting

Off-Grid Model



Composed of carbon-free power sources for de-carbonization

Results

- The area was economical in the 20th year, when the existing system is upgraded.
- In low-demand areas with long line lengths, converting to off-grid was economical.
- In the future, we will review for any missing conditions and conduct evaluations in other regions.