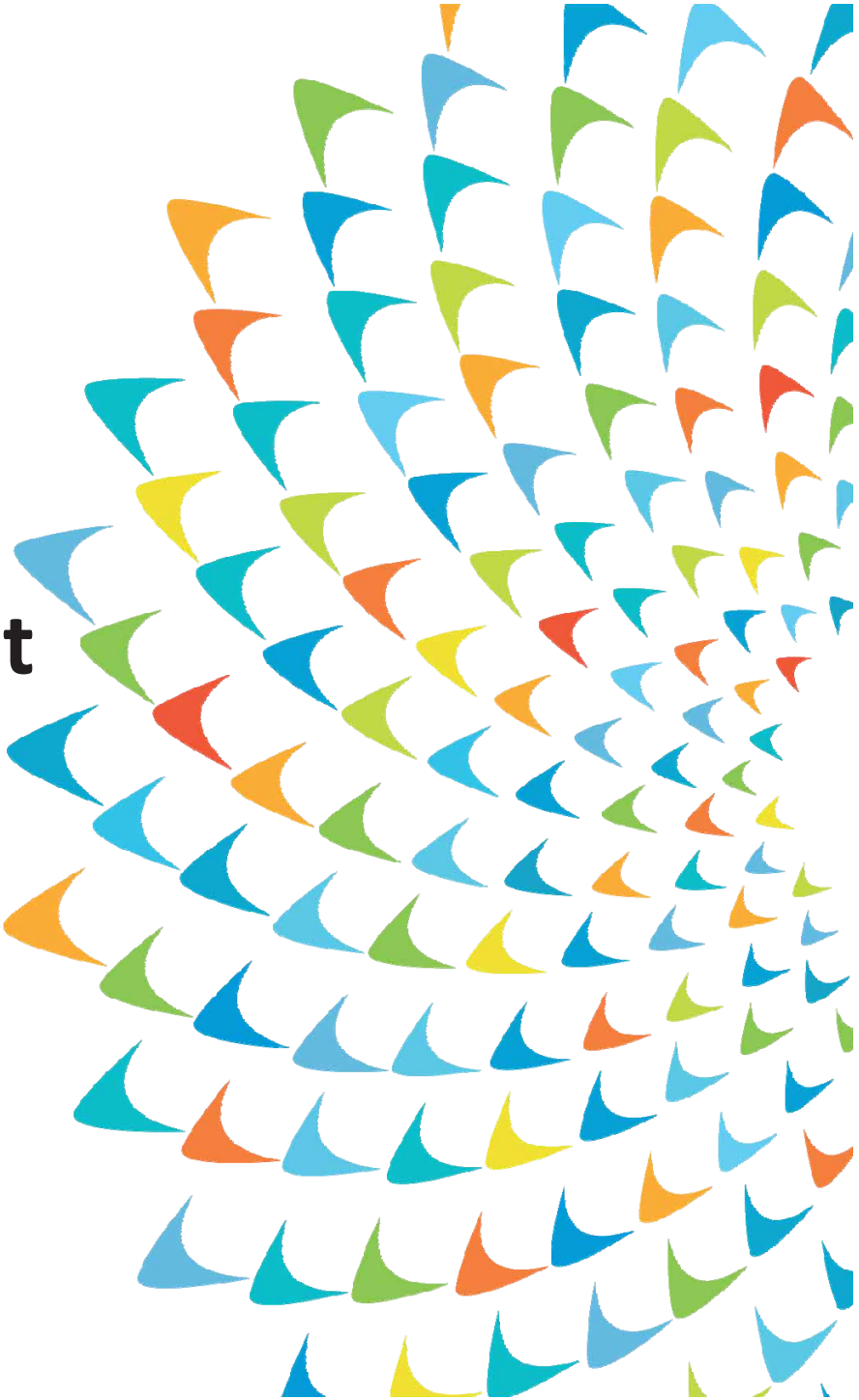
Japan Fund for the Joint Crediting Mechanism (JFJCM)

July 2019



Overview of the Asian Development Bank

- Established in 1966
- 68 members, 49 regional members, 41 borrowing members
- 3,000+ employees globally
- 32 offices
- Triple-A credit ratings (Moody's / S&P / Fitch)
- Approvals in 2018:

($ million)	Total ADB
Loans, Grants and others*	**21,581**
Sovereign	**18,446**
Loan	17,022
Guarantee	-
Grants	1,423
Nonsovereign	**3,136**
Loan	2,862
Guarantee	-
Equity Investment	274

* Does not include technical assistance and cofinancing

Japan Fund for the Joint Crediting Mechanism

- Established in June 2014 as one of ADB's trust funds
- Contribution by Government of Japan: $60.7M (2014-2018)
- Provides financial incentives (grants) for adoption of advanced low-carbon technologies in ADB-financed projects that use the Joint Crediting Mechanism (JCM)*
- Both sovereign and nonsovereign projects are eligible

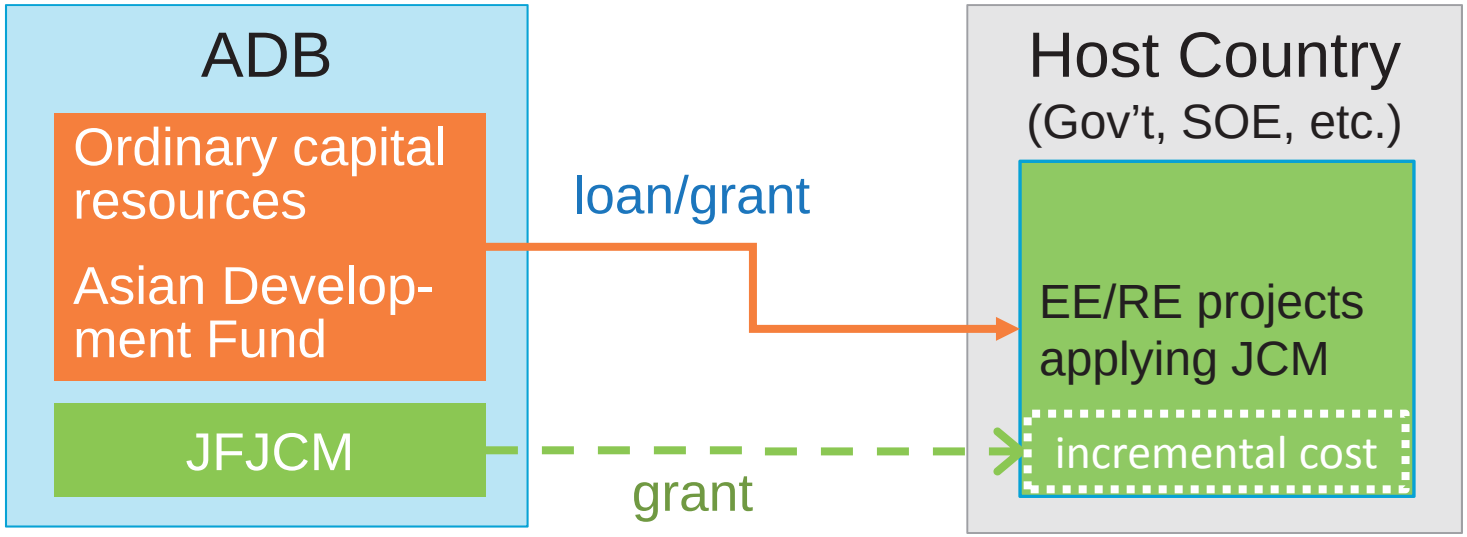
* JCM is a bilateral carbon market mechanism initiated by the government of Japan

JFJCM eligible countries

11 out of 17 JCM host countries are ADB Developing Members

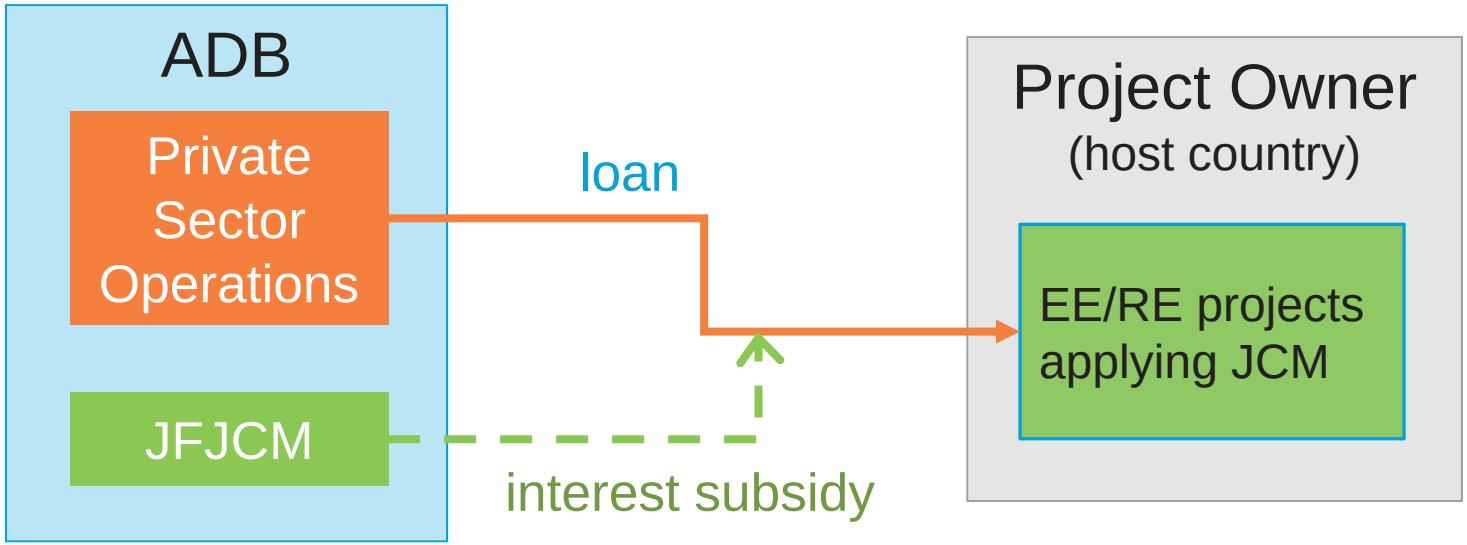
2013	2014	2015	2016	2017
Mongolia				
Bangladesh				
Maldives				
Viet Nam				
Lao PDR	**Palau**	**Myanmar**		
Indonesia	**Cambodia**	**Thailand**		**Philippines**
Ethiopia	Mexico	Saudi Arabia		
Kenya		Chile		
Costa Rica				

JFJCM support to ADB projects (sovereign)



- JFJCM provides grant for incremental cost of advanced low-carbon technologies
- Amount of grant, maximum of:
  i. 10% of the project cost (capped to $10 million)
  ii. $5 million if the project cost < $50 million

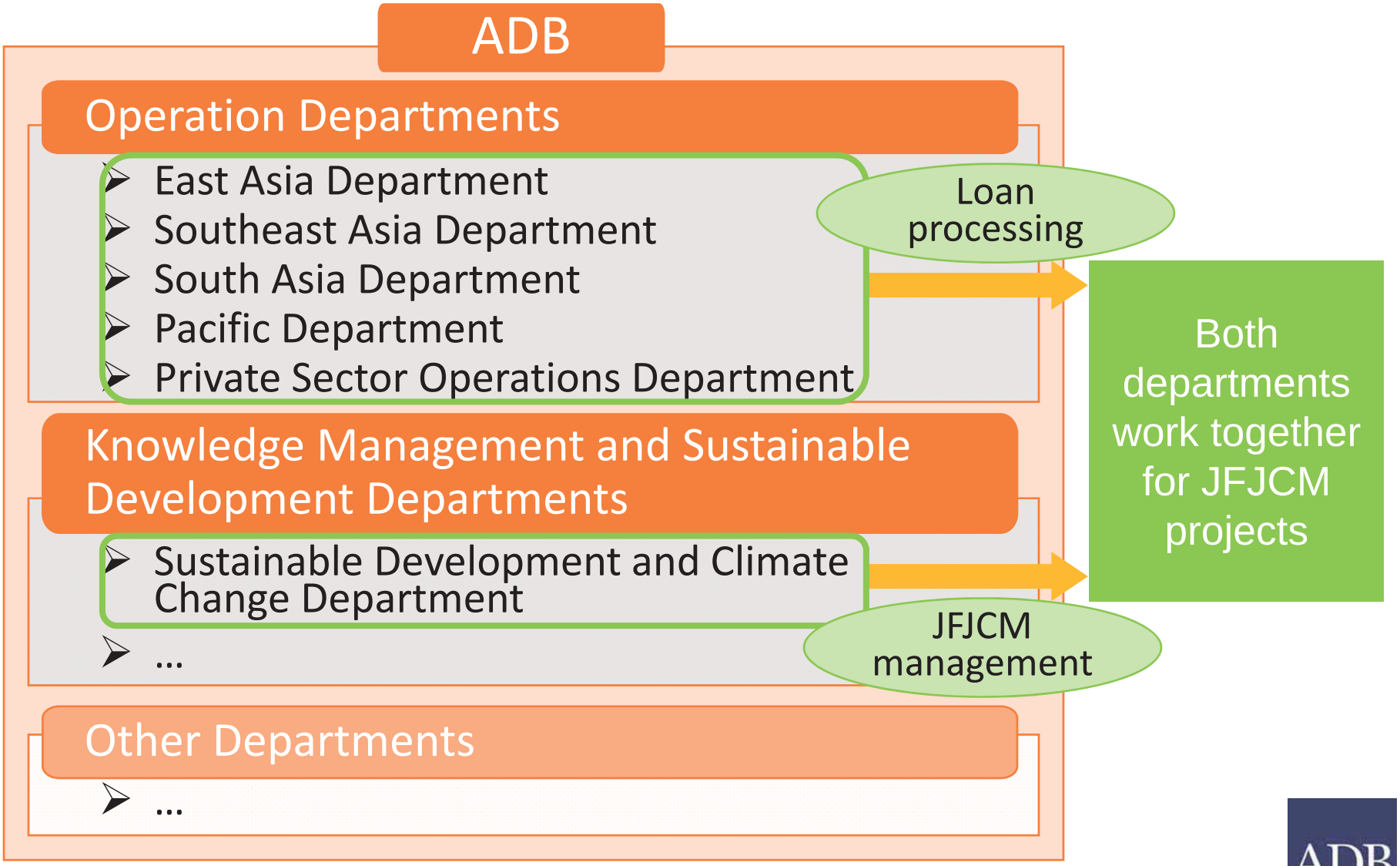
JFJCM support to ADB projects (nonsovereign)



- JFJCM provides interest subsidy to ADB's loan to energy efficiency / renewable energy projects applying JCM
- Amount of interest subsidy, maximum of:
  - 10% of project cost (capped to $10 million)

  * Principle of minimum concessionality applies

Relevant ADB departments for JFJCM projects



Eligible projects and technologies

Eligible Project

- Project co-financed with an ADB or ADB administered funds.

  * Can be used for additional financing to ongoing ADB project.

Eligible Technology

- Advanced low carbon technologies that reduce greenhouse gas (GHG) emission including CO_2 from energy source.
- The technologies must have a proven implementation and operation record of its technical effectiveness.

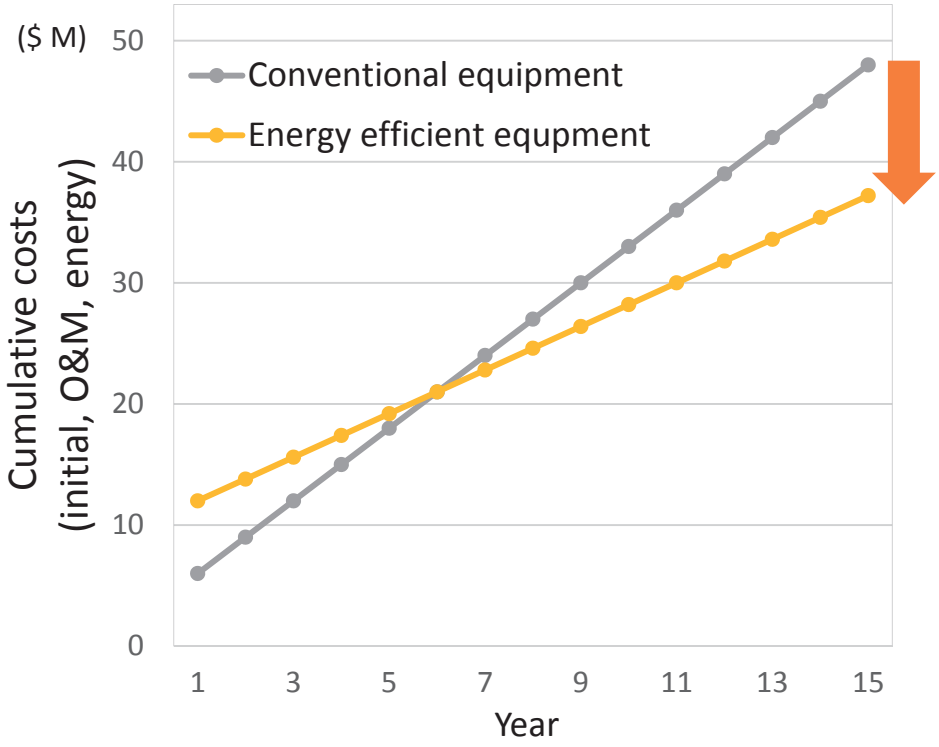
Points considered in JFJCM evaluation

- Contribution to development goals of host country
- Technical feasibility, financial and economic viability of project
- Operational experience, track record and institutional capacity of project developer
- Use of advanced low-carbon technologies with:
  - ✓ clear and long-term GHG emission reductions
  - ✓ possibility of robust MRV
- Cost effectiveness*
  - ✓ cost of reducing 1tCO_2e ≤ $40

* grant amount / (annual GHG emission reduction x project period)

Life cycle cost consideration (sovereign projects)

- International competitive bidding is required for ADB sovereign projects' procurement
- For JFJCM projects, life cycle cost (LCC), as well as technical performance, is considered at the bid evaluation process



LCC

Energy Efficient Equipment < Conventional Equipment

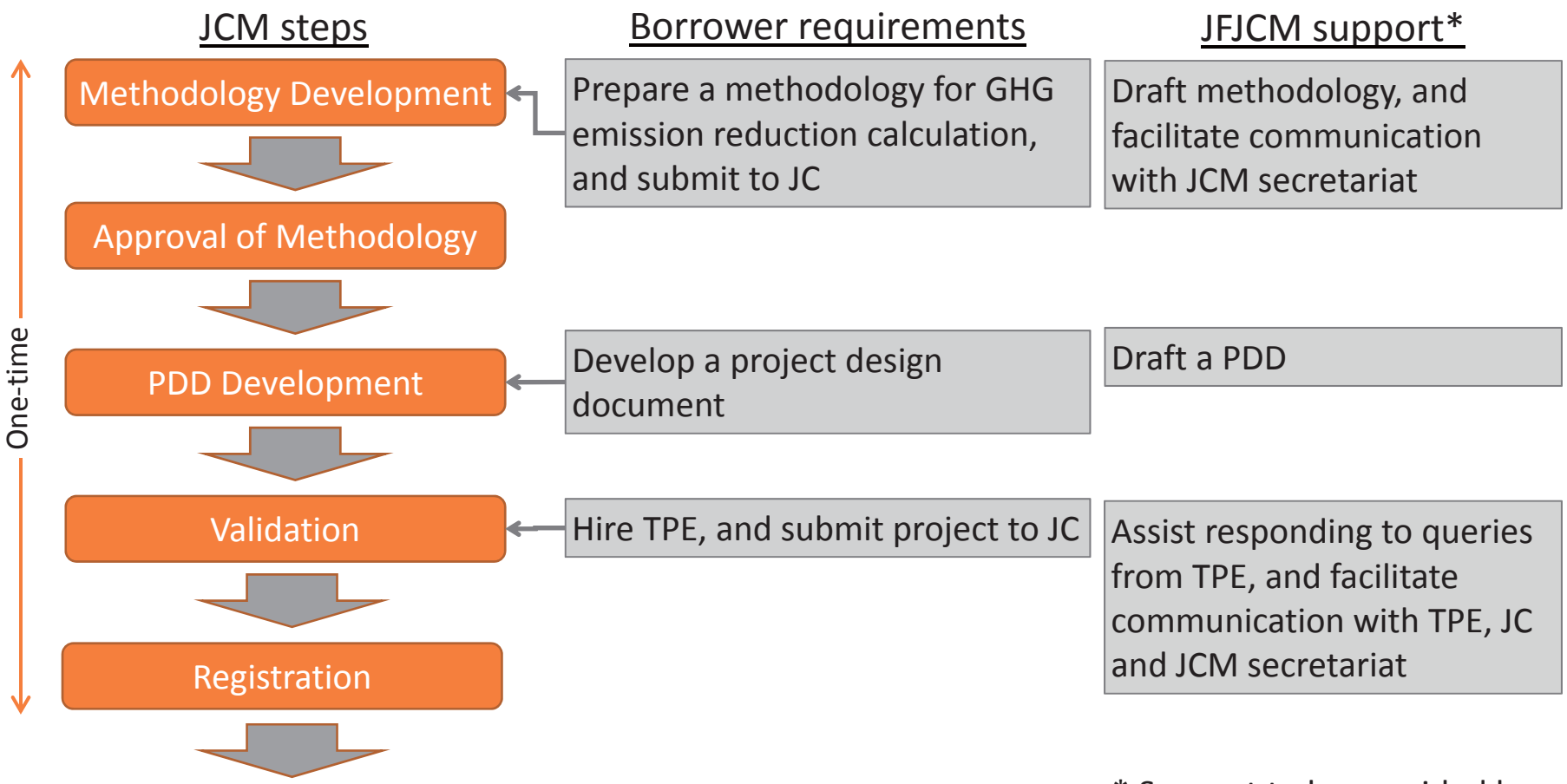
Requirements under JFJCM: JCM application

JCM Application

- Preparation and approval of JCM Methodology
- Preparation of Project Design Documents (PDD)
- Validation by Third Party Entities (TPEs), and registration of the project
- Monitoring, reporting and verification of GHG emission reduction
- Issuance of the JCM credits and delivery to government(s)

JFJCM support may be provided by consultants hired by the fund

JCM project cycle and requirements (1)



* Support to be provided by consultants hired under the grant

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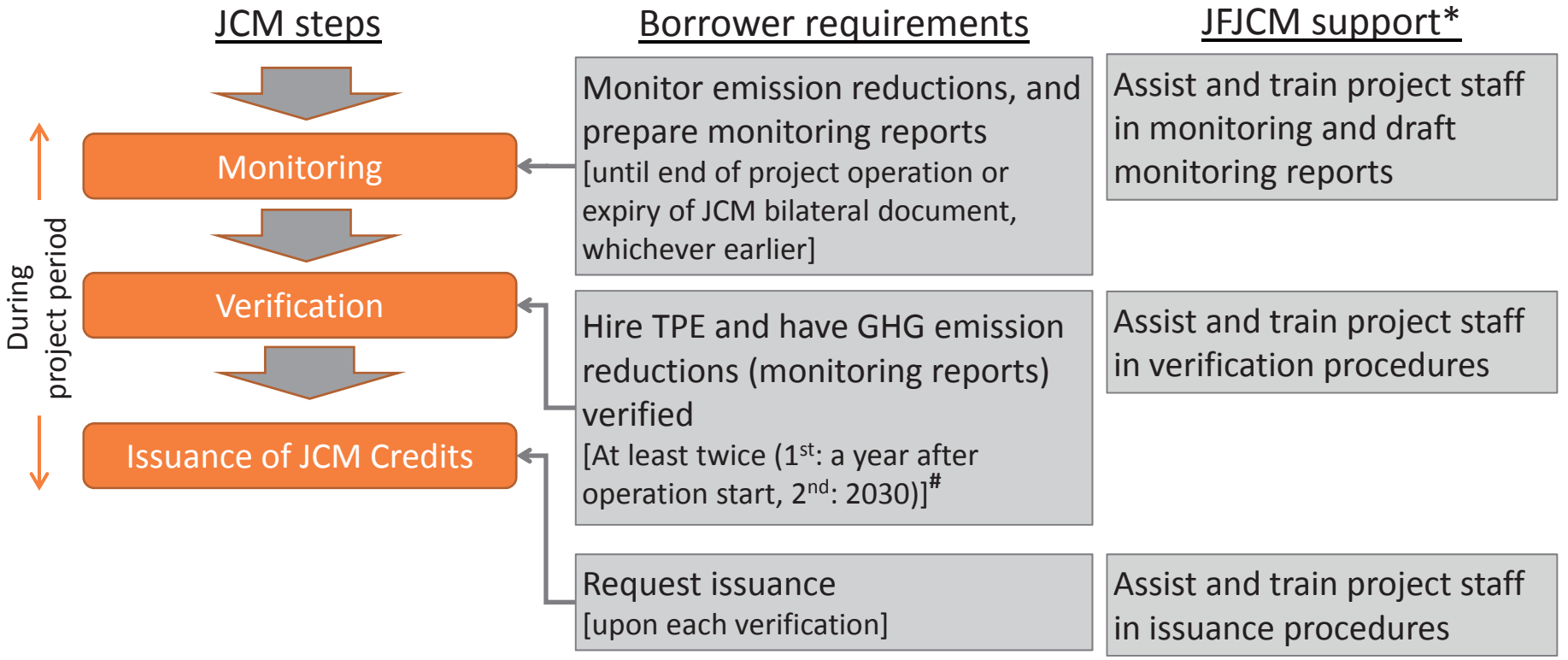
JCM project cycle and requirements (2)



Cost for TPE will be borne by Borrower if verification is done after implementation period.

* Support to be provided by consultants hired under the grant or loan

JFJCM approved projects

#	Project	Country	JFJCM grant	Approval	Technologies supported
1	Preparing Outer Islands for Sustainable Energy Development Project (POISED)	Maldives	$5 million	Mar 2015	Advanced battery system and energy management system (EMS)
2	Provincial Water Supply and Sanitation Project	Cambodia	$10 million	Dec 2017	Energy efficient wastewater treatment system
3	Southwest Transmission Grid Expansion Project	Bangladesh	$7 million	Jul 2018	Energy efficient transmission lines
4	Upscaling Renewable Energy Sector Project	Mongolia	$6 million	Sep 2018	Solar PV with advanced battery system and EMS
			$28 million		

Case study 1: micro-grid technology in Maldives

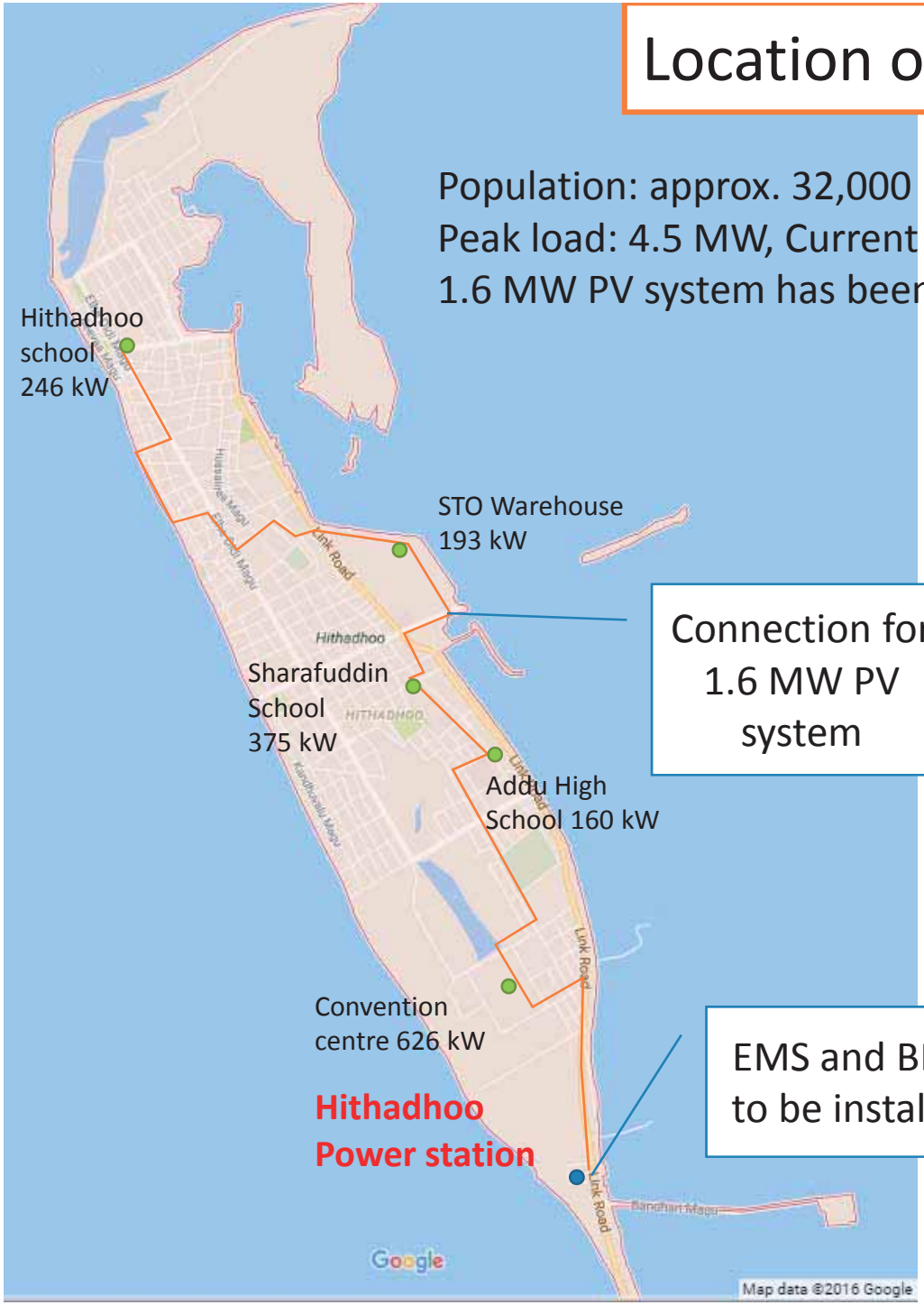
Project name	Preparing Outer Islands for Sustainable Energy Development Project
JFJCM grant	$5 million
Technology supported	Advanced battery system and energy management system
Description	On top of 1.6 MW of solar PV installed under the project, battery storage and EMS supported by JFJCM will: ➢ Smooth out the fluctuation of solar PV generation ➢ Optimize diesel generator operation ➢ Integrate large amounts of renewables to the grid
Location	Addu, Maldives
Emission reductions	1.3 thousand tCO_2/yr (estimate)

Signing ceremony for the contract on battery system and EMS

Project Site / Source: Ministry of Environment and Energy, Maldives

Location of PV system, EMS, and BESS

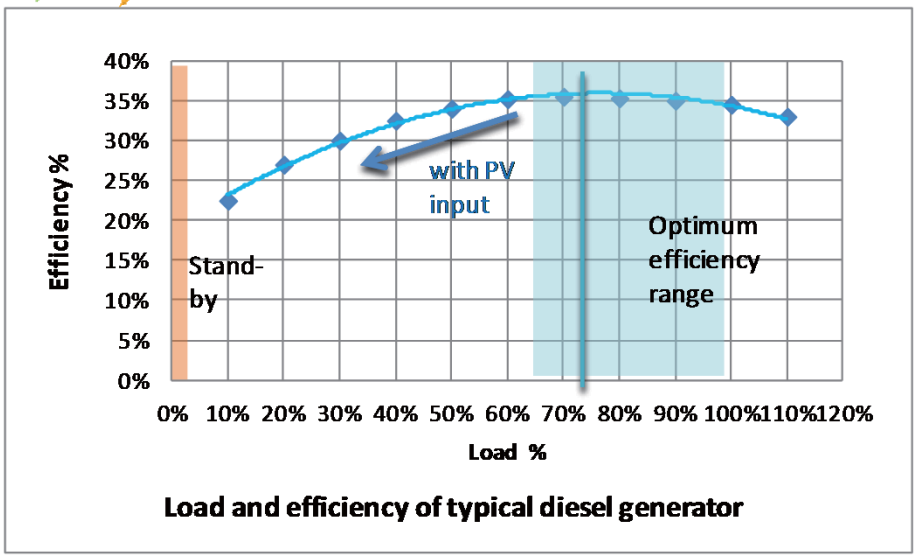
Population: approx. 32,000
Peak load: 4.5 MW, Current power supply: by 9 nos of diesel
1.6 MW PV system has been installed.



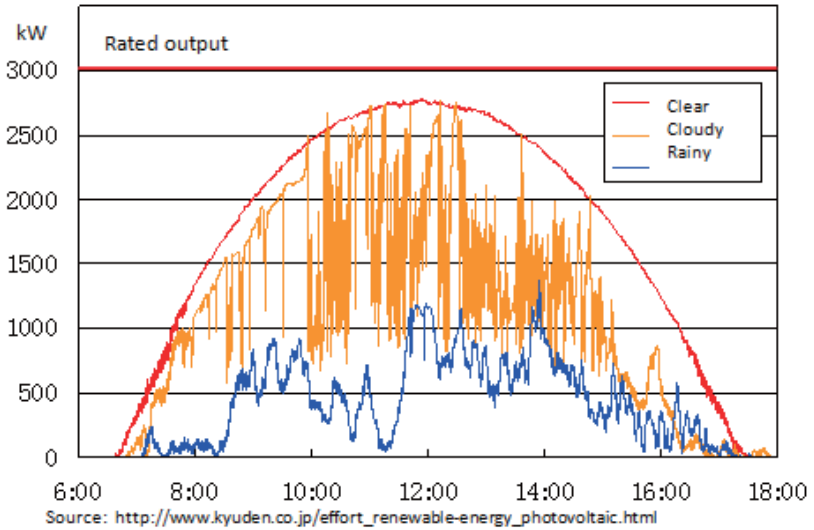
EMS and BESS installation in Hithadhoo Power station

ADB

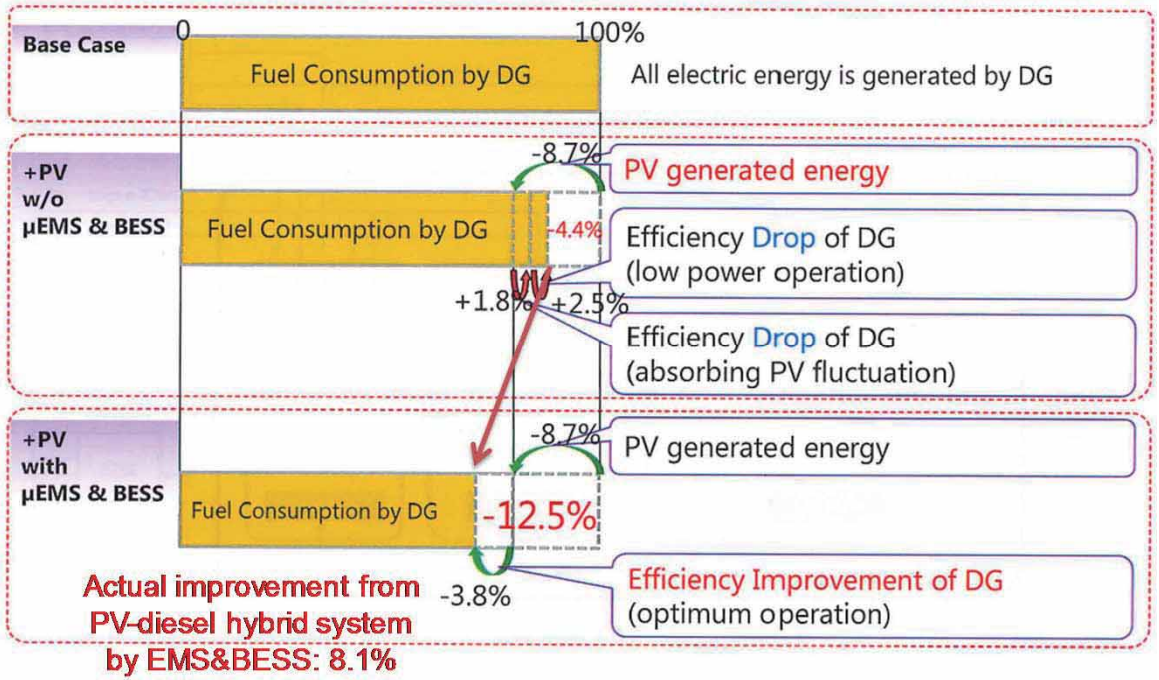
Concept of EMS-BESS with simple PV system



Load and efficiency of typical diesel generator



Source: http://www.kyuden.co.jp/effort_renewable-energy_photovoltaic.html

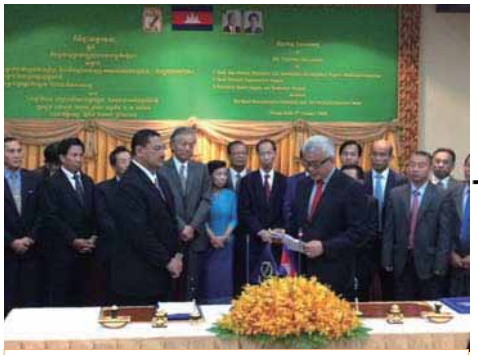


- Due to PV output fluctuation, low load operation and spinning reserve of DG needs more fuel.
- To minimize efficiency drop of DG, EMS and BESS needs to be installed.

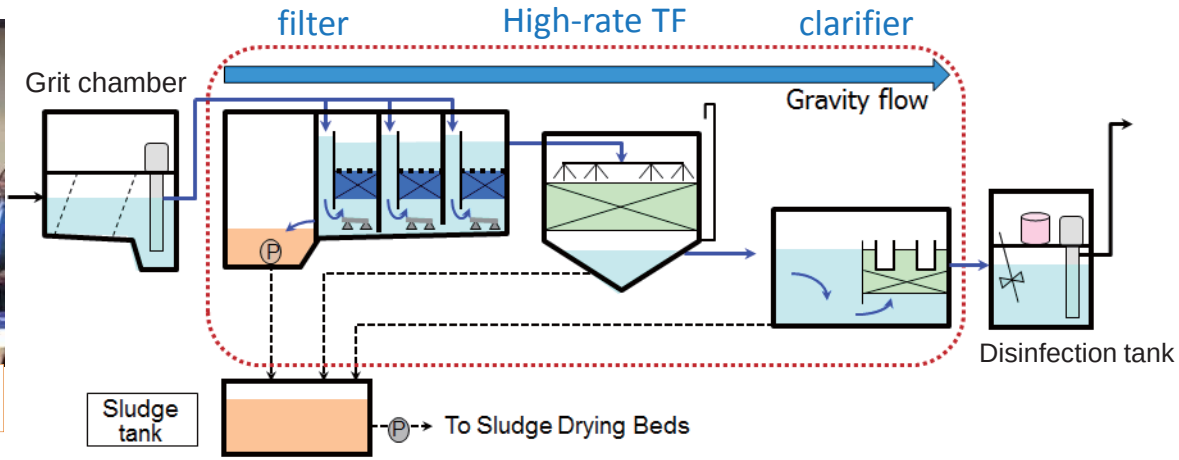
This is conceptual figure and needs to be reviewed according to demand increase. Simulation is conducted in case of 1.7 MW PV system with 4.5 MW diesel grid. Source: "Micro-grid System in the Addu Atoll", March 2014

Case study 2: wastewater treatment in Cambodia

Project name	Provincial Water Supply and Sanitation Project
JFJCM grant	$10 million
Technology supported	Energy efficient wastewater treatment
Description	Existing lagoon system will be replaced by a system consisting of high-rate trickling filter combined with filters and clarifiers, requiring a small area of land and less than 0.1 kWh/m^3 of power for treatment
Location	Battambang, Cambodia
Emission reductions	6.4 thousand tCO_2/yr (estimate)

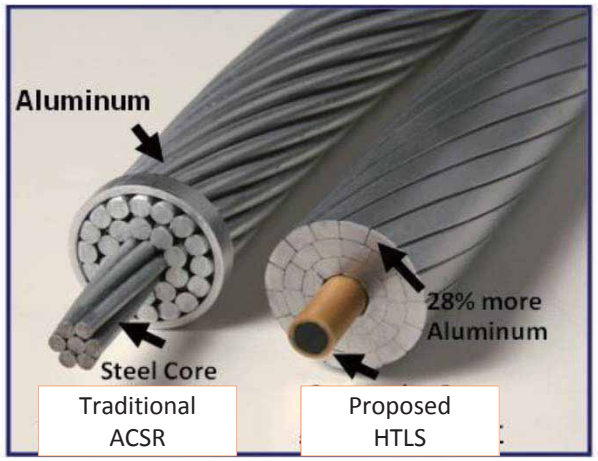


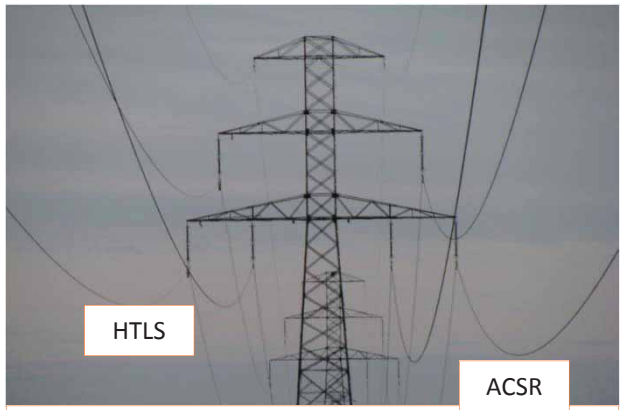
Signing ceremony for ADB financing agreement



Case study 3: Advanced transmission lines in Bangladesh

Project name	Southwest Transmission Grid Expansion Project
JFJCM grant	$7 million
Technology supported	Energy efficient transmission lines
Description	Energy efficient transmission lines will increase high-voltage network capacity while reducing transmission losses and emissions including carbon dioxide. The key technology is high-temperature low-sag (HTLS) conductors.
Location	Between Gopalganj and Barisal, Bangladesh
Emission reductions	23.1 thousand tCO_2/yr (estimate)

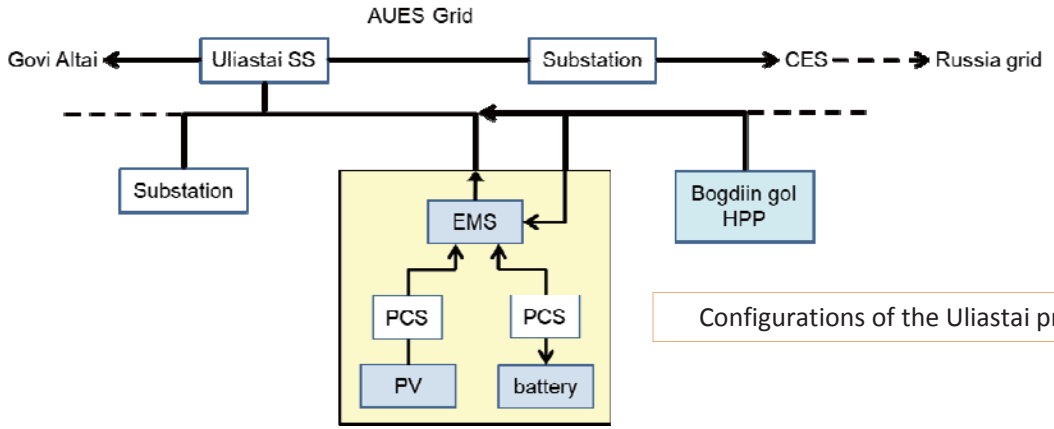




Sag characteristics

Case study 4: Upscaling renewables in Mongolia

Project name	Upscaling Renewable Energy Sector Project
JFJCM grant	$6 million
Technology supported	5MW solar PV system, advanced battery system of 3.6 MWh and energy management system
Description	This solar power plant with battery and EMS can supply as much locally produced renewable energy as possible to local consumers, reducing carbon intensive domestic and imported grid electricity, while strengthening the country's power self-sufficiency.
Location	Uliastai, Mongolia
Emission reductions	6.4 thousand tCO_2/yr (estimate)



Configurations of the Uliastai project site

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Thank you.