



# Seminar on the Joint Crediting Mechanism (JCM) Project Implementation in Indonesia

Utility Facility Operation Optimization Technology  
“RENKEI” Control

12th July, 2017  
Azbil Corporation



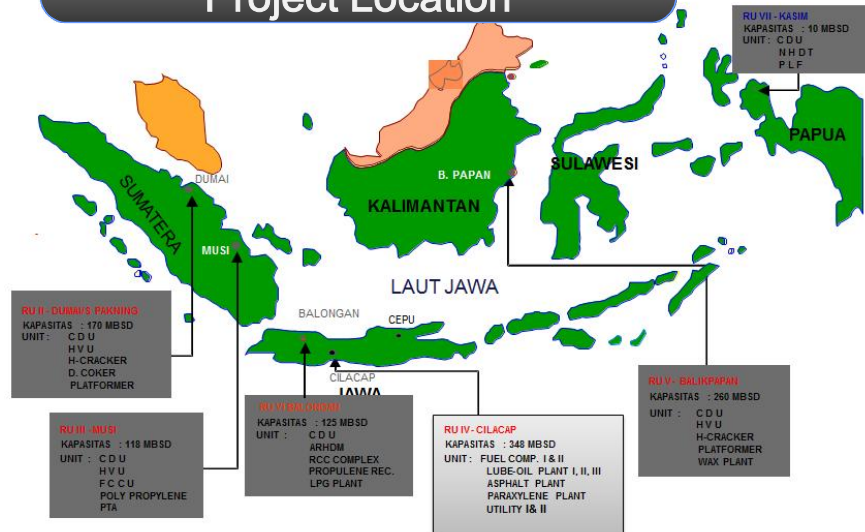
# Agenda



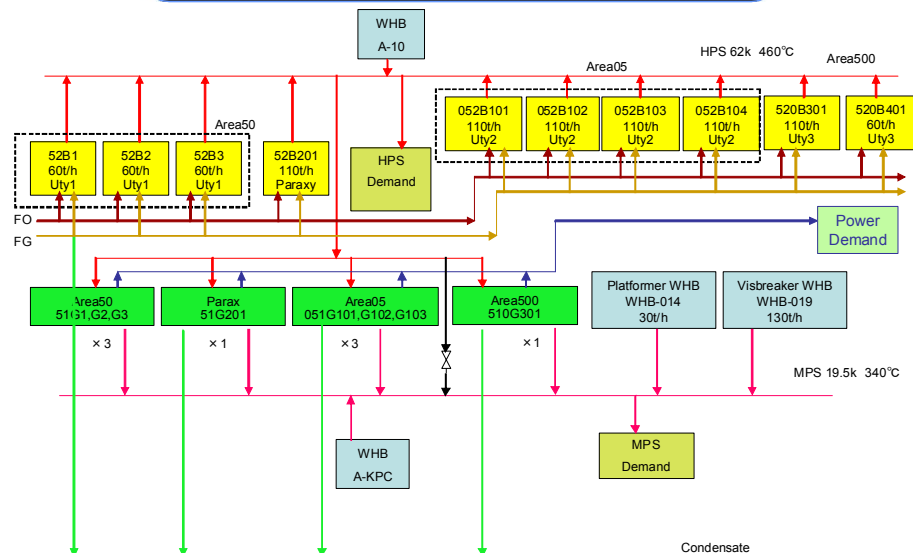
1. Project Overview
2. Project Implementation
3. GHG emission reductions and MRV

# Project Overview

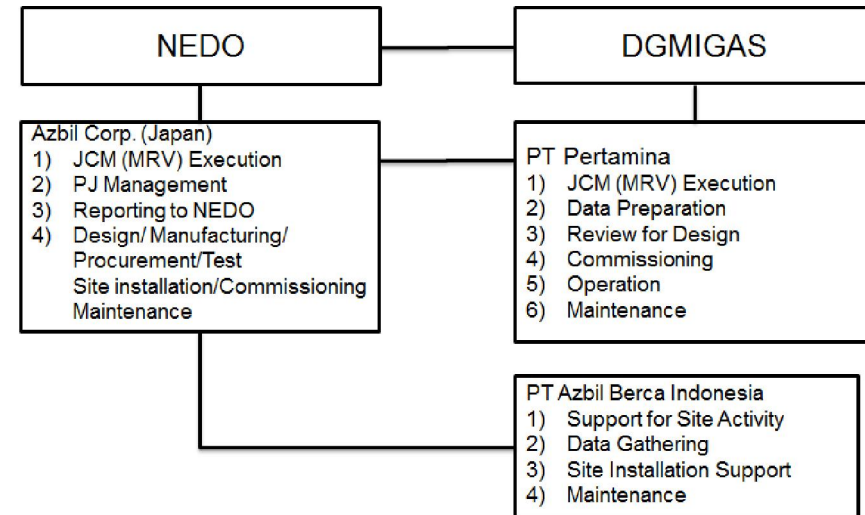
## Project Location



## Target Facility



## Project Organization & Role



# Project Overview



## Optimization Strategy ("RENKEI" Control)

- CO2 Emission Reduction by Optimization Control
  - Optimal Number of Boilers
  - Optimal PC Master Boiler Selection
  - Optimal Boiler Load Allocation
  - Optimal O2 Excess Control

Target CO2 Reduction  
2% Fuel Reduction  
(From 10 Boiler's Fuel Consumption)  
Around 20,000t-CO2/Year reduction

"RENKEI" Control (Please refer IEC TR 62837)

The Japanese word "RENKEI" literally translated as "cooperation or coordination" which suggests that "RENKEI control" is to pursue energy efficiency optimisation with two or more elements interacting within one another to provide the most efficient and effective result from the control.

Total System Efficiency

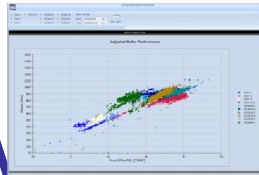
# Project Overview



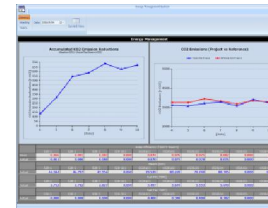
## Optimization Flow

### Energy Management System

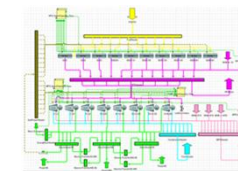
Boiler Efficiency Update



CO2 Emission Reduction Calculation



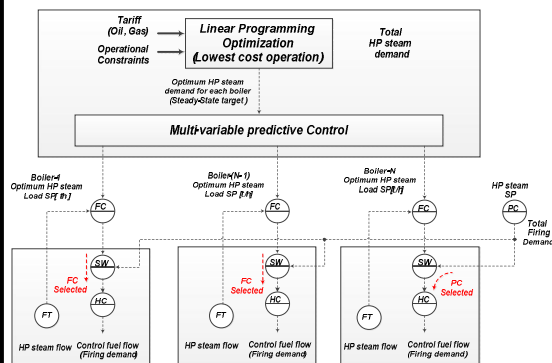
Event Basis



### Off Line Optimization

Every one minute

### On Line Optimization



Optimal Load Allocation

Optimal Number of Boiler  
Optimal Boiler Selection  
Optimal Master Boiler Selection

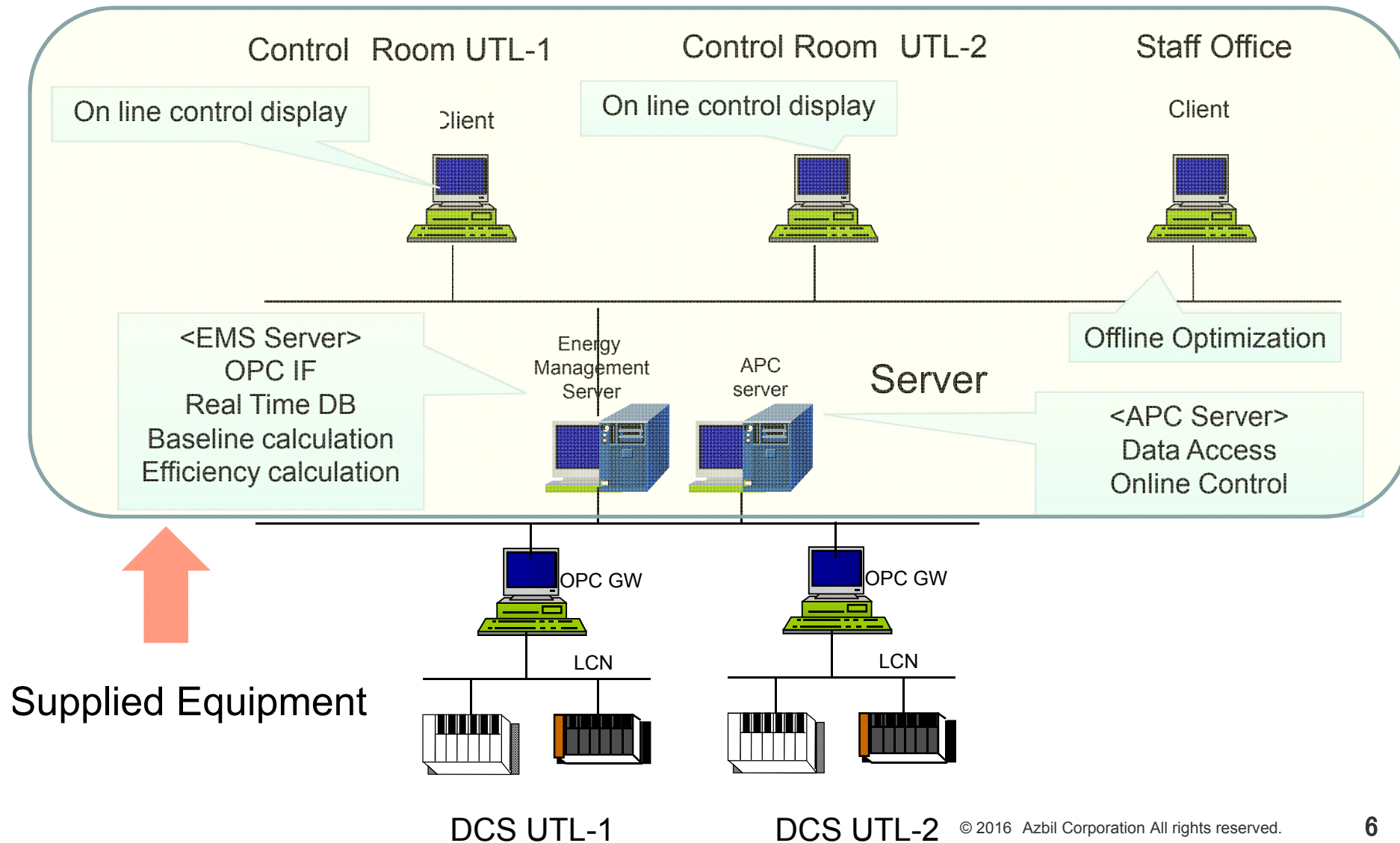
Guidance for  
DCS Manual Operation

Existing DCS  
Control

PID Tuning  
Loop Modification

# Project Overview

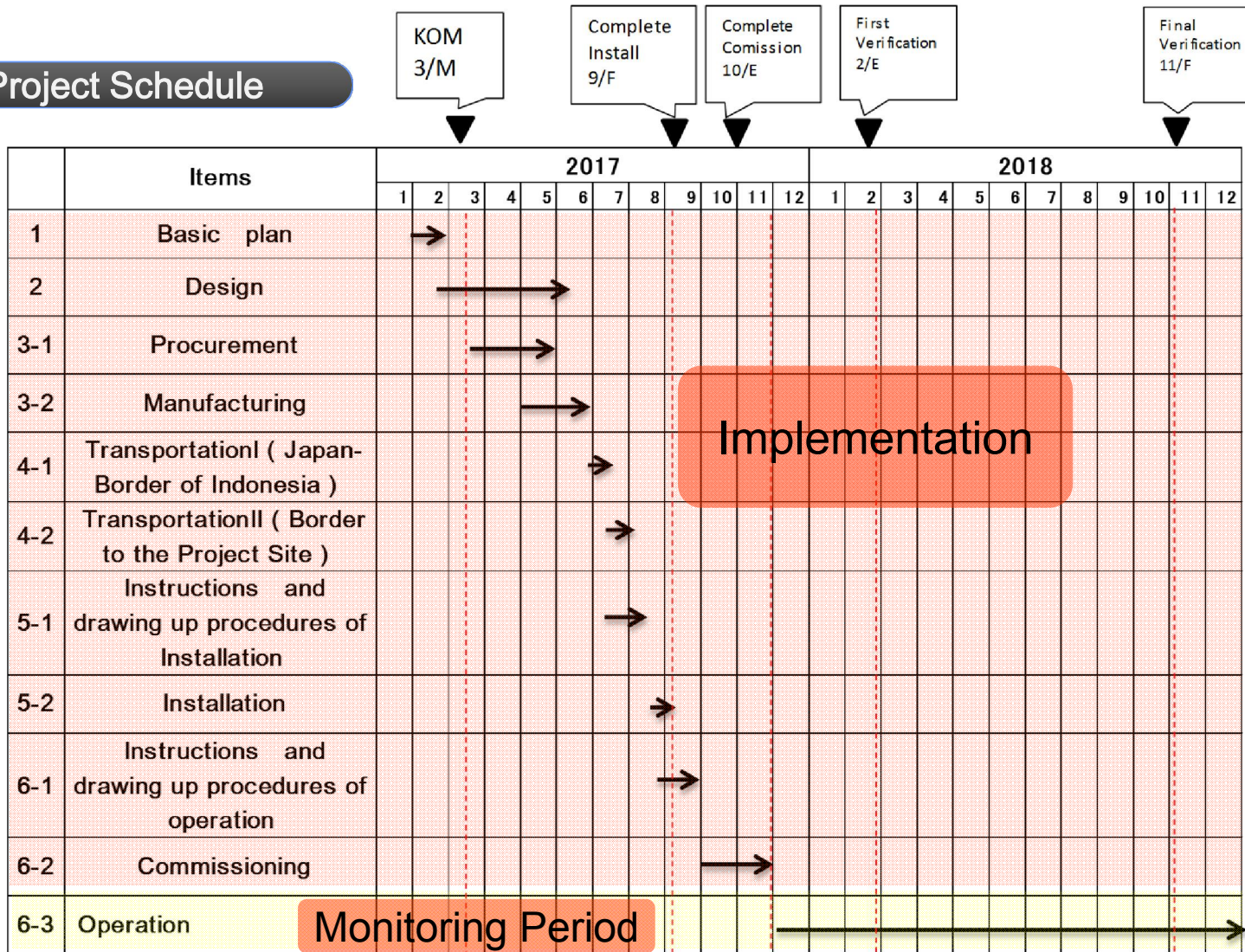
## System Configuration





# Project Implementation

## Project Schedule



# Project Implementation

## Technology Replication Opportunities

**“RENKEI” Control** maximize Total System Efficiency.

Project Duration => Short

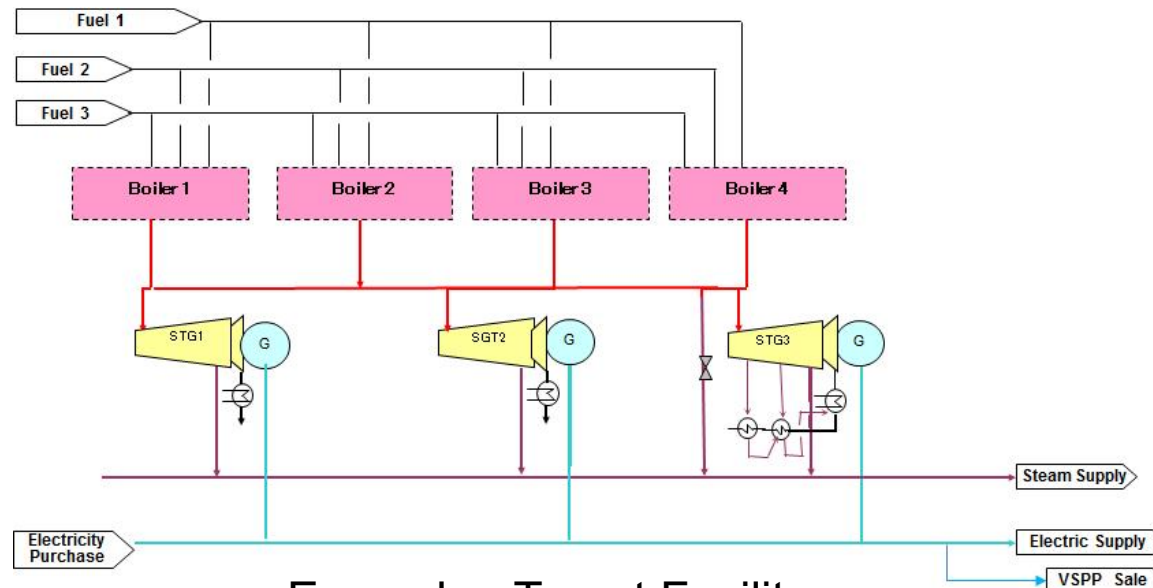
Investment => Much Smaller than H/W investment

Many Opportunity in Indonesia.

(Not only for **Refinery** and also for **P&P**, **Textile**, **Fertilizer** and **Petrochemical** etc.

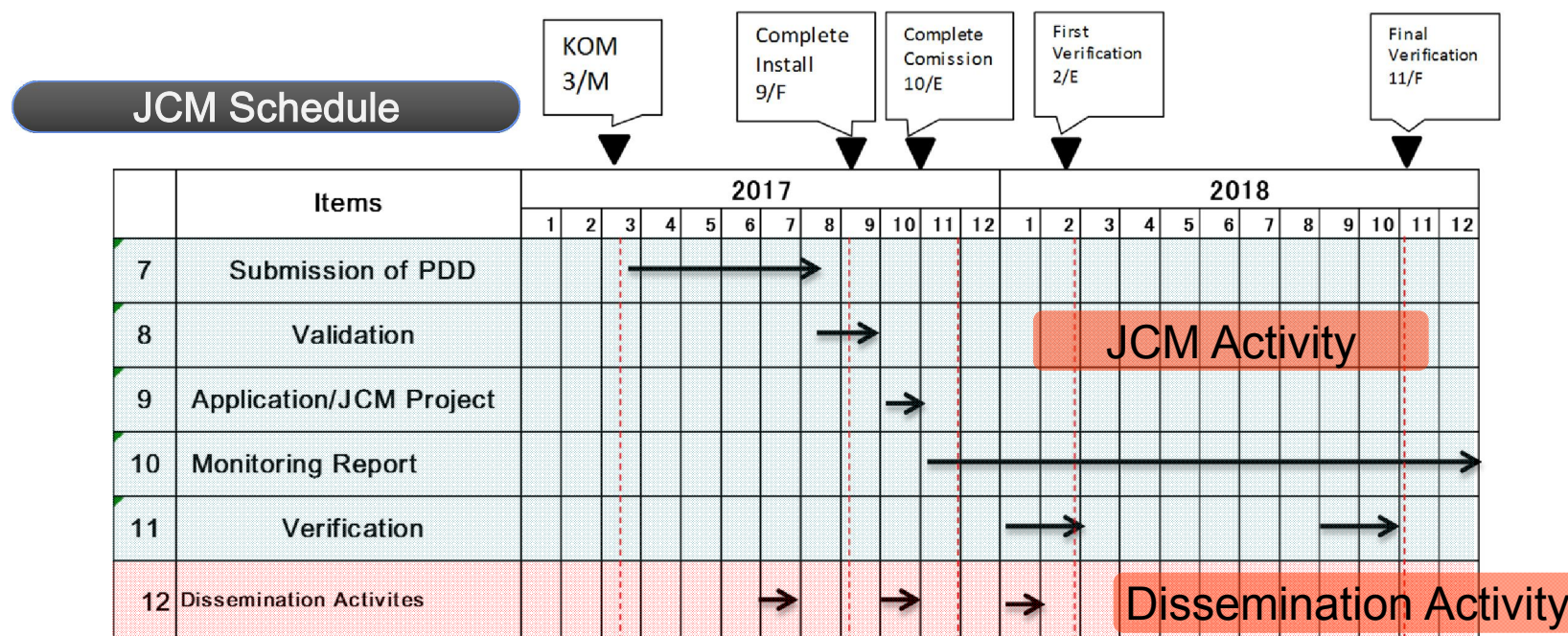
**Multiple Boilers** under same header, **Multiple Steam Turbine system**)

**Target Saving** from **2% to 5%** reduction by “RENKEI” Control





# GHG Emission Reduction and MRV



<Selected Approved Methodology>

ID\_A M007

GHG emission reductions through optimization of boiler operation in Indonesia



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