

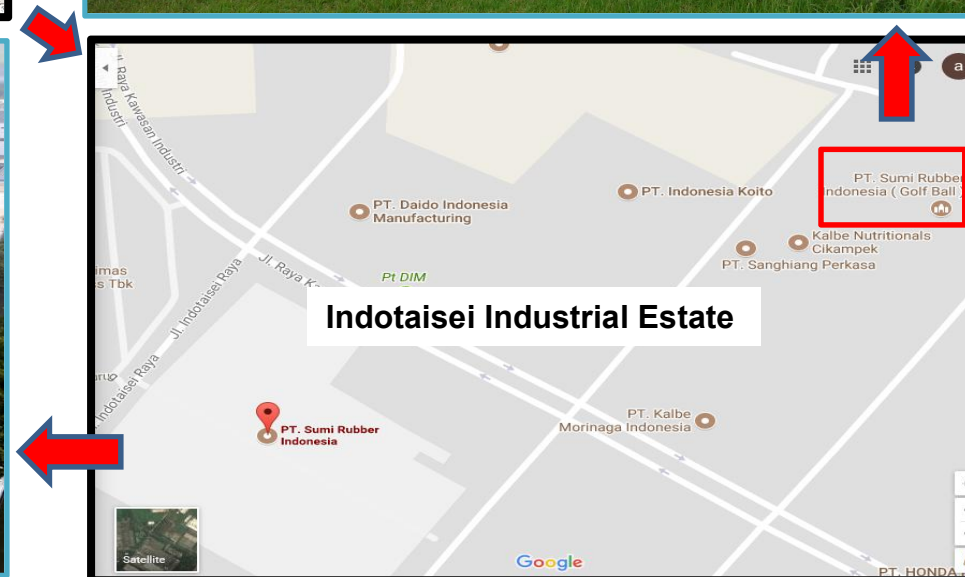
Introduction of High Efficiency Once-through Boiler In Golf Ball Factory of PT. Sumi Rubber Indonesia



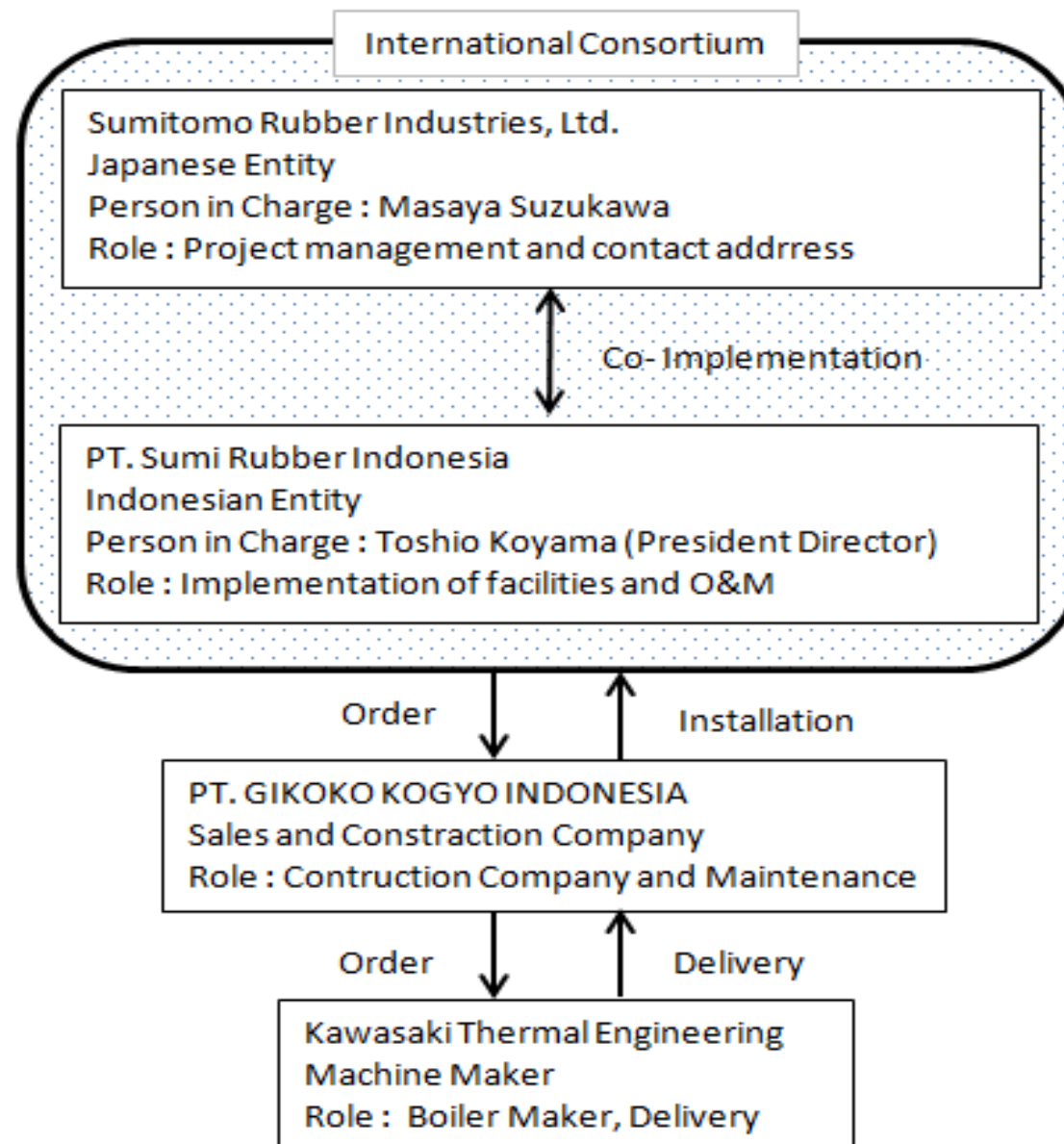
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1. Project Overview

1.1. Location of JCM Model Project



1.2. Structure and Role of JCM Model Project



1.3. Background

1.3.1. Boiler is needed for production of golf ball

Function of BOILER :

Change water become **steam** for production process

In Golf Ball Factory, mainly steam is for :

- Curing the plug rubber become core ball in Press Machines



Plug of rubber



Core ball press machines



Core Ball



Golf ball Construction
(1pcs type)

- Humidity & Temperature Control of Finishing Room



Finishing Room



Finished Goods

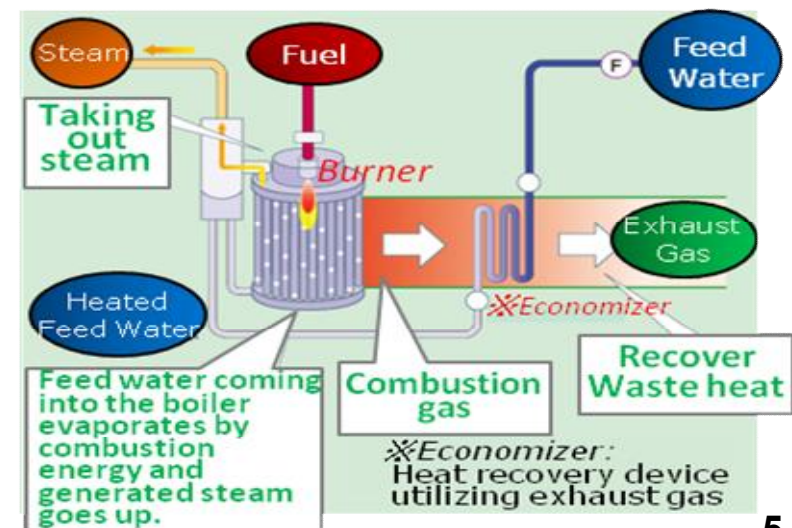
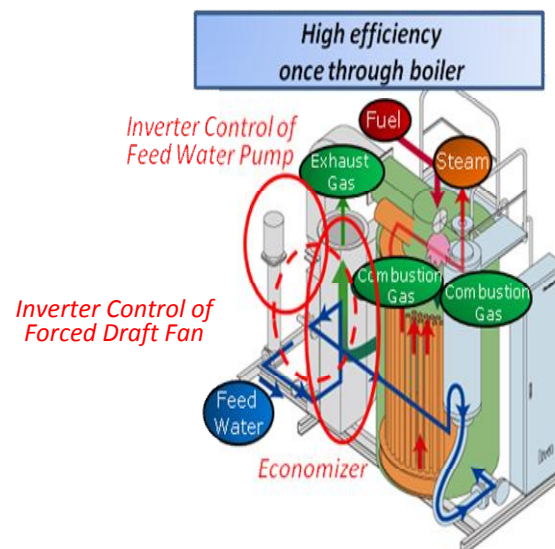
1.3.2. Old Boiler (#1 factory boiler)



- Model Fire Tube Boiler
- Fuel Natural Gas
- Efficiency 89 %
- Capacity 4000 L /hour

1.4. Install The Facility of JCM Model Project

- A high efficiency (95%) once through boiler will install at a Golf Ball factory
- The boiler reduces fuel consumption by incorporating gas single fuel type. Furthermore, electricity consumption is also reduced by inverter function of feed water pump and forced draft fan.



2. Project Implementation

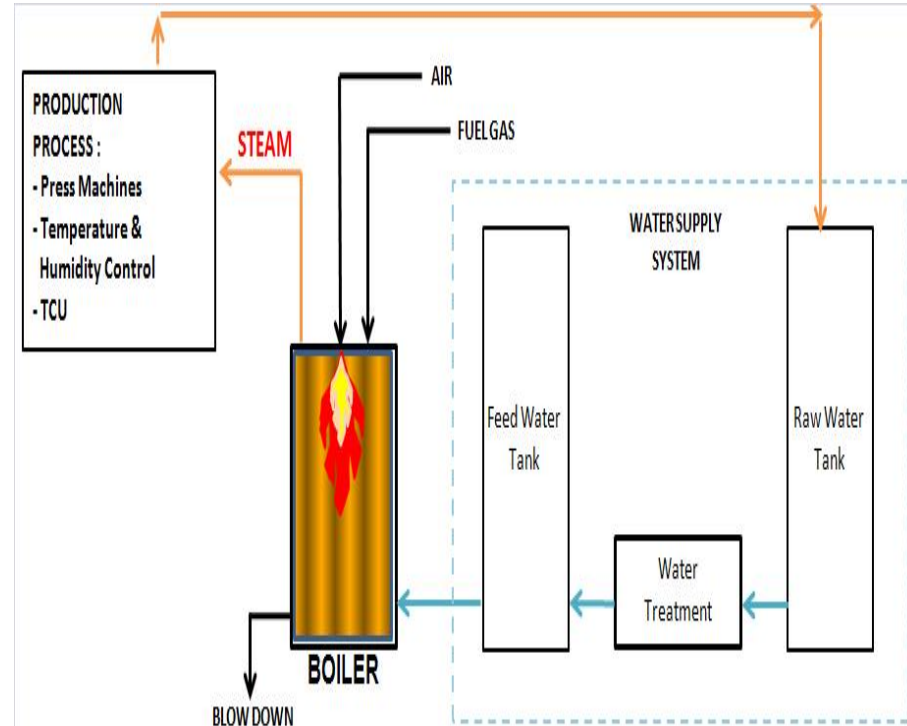
2.1. Schedule of Project

ACTIVITIES	2015		2016						
	Nov	Des	Jan	Feb	Mar	Apr	May	June	July - Dec
Document submit to JCM	→ →								
Unofficial announcement			→ →						
Approval of decision				→ →					
Boiler Installation								→ →	
Approval of operation								→ →	
Operation monitoring								→ →	→ →
→ : PLAN → : ACTUAL									

2.2. Installed Facility of JCM Model Project

- A high efficiency (95%) once through boiler is installed at a Golf Ball factory

BOILER SPECIFICATION		
Boiler Model	Unit	Kawasaki IF Boiler IF-3000CMGE
Equivalent evaporation	kg/h	3000
Actual evaporation	kg/h	2516
Normal Pressure	Mpa	1.3
Used Fuel		Natural gas
Boiler Efficiency	%	95
Fuel consumption	m ³ /h	179
Feed Water Temperature	°C	90



2.3. Current Progress of Project

Since 18 June 2016, Boiler is already continuously running until now

2.4. Challenges of Project

This project have been done by cooperation between Indonesia company and Japanese company.

For getting faster effect, we did short time for installation and start up.

- We can Install for 4 month after project decide
- Short time delivery of boiler by japanese company
- Short time start up with Indonesia and Japanese company
- The Boiler is not same type with the previous boiler
- We must changed many piping by Indonesia company
- Tuning the boiler control to fulfill our factory demand only 3 days by two company

Install area is small for old type boiler

- Select one through boiler

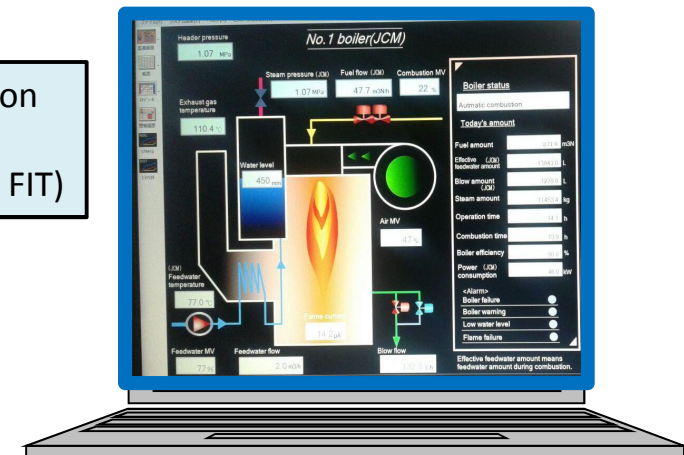
2.2. Benefits of Project

- Get special cost support (50%)
- High boiler Efficiency (until 95%, Cost Reduction = USD 13,532 / year)
- Low electricity consumption (down 30%, Cost Reduction = USD 3,935/year)
- More environmental friendly (CO₂ reduction)
- Contribution to sustainable development of Indonesia
(by technology transfer, energy saving activity, level up employee)
- Easy Operation for start, run and stop Boiler
- Easy monitoring for Boiler Operation / Performance

• *Fuel consumption*
• *Steam consumption*
• *Electricity consumption*
• *Water consumption*
• *others*



Automated data collection
with Comprehensive
monitoring system(EVERY FIT)



3. GHG Emission Reduction

Item	Unit	Reference Boiler	Project Boiler
Efficiency	%	89	95
Fuel Consumption	m3/h	79.61	71.23
	kg/year	1,122,797.00	1,004,607.00
Fuel Emission (A1)	tCO2/year	3,032	2,712
Electric Consumption	kWh/year	126,000	113,525
Electric Emission (A2)	tCO2/year	105.84	95.361
Total Emission (A1+A2)	tCO2/year	3,137	2,808
Expected CO2 Reduction	tCO2/year	329.6	
Actual CO2 Reduction	tCO2/year	181.0	

We have not achieved the target yet, because :

- The golf ball production is down compare with original plan
- Energy saving another activity, makes reduce steam consumption
- The JCM Boiler is running as main supply parallely with another boiler to maintain normal steam, it doesn't make fully capacity.

This condition is now improving with the project company

4. Measurement, Reporting, Verification (MRV)

To keep these effect we do

- Maintenance program weekly, monthly and yearly done correctly
- Daily inspection use data logging system to easy control
- Boiler water conductivity and blowdown rate keep in range standard

To keep good environment

- Measuring data in every year to make sure O₂, CO, NO_x emission in range standard

Progress of the JCM Project Cycle is not yet decided the Methodology and The JCM methodology is under development.

5. Next plan

1. In our company

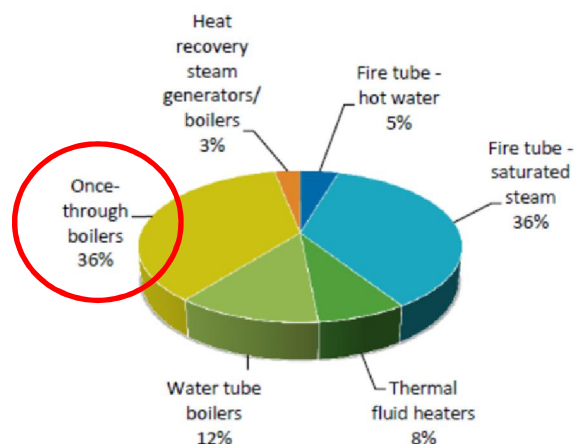
we will change old type boiler to one through boiler when renewal for #1 GB factory boiler and tire factory boiler.

2. In Indonesia

It is said that annually 1,000 unit of boilers are newly installed / replaced in Indonesia in many sectors.

(i) “**water tube boiler**” imported from China

(ii) Euroasiatic (leading) and other brands: “**fire tube boiler**”



2015



Higher efficiency “**Once-through Boiler**” will have over 50% of share in near future from 36% in 2015

In Japan once through boiler share is already **89%(2013)**