PT. OKI PULP & PAPER MILLS
Executive Summary Report

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DIREKTORAT JENDERAL ENERGI BARU TERBARUKAN DAN KONSERVASI ENERGI (EBTKE)
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Danish Energy Agency

EMBASSY OF DENMARK *Jakarta*

PT. Konservasi Energi Solusi Indonesia
KEnSI

Project no:	**Mapping/benchmark on Energy Efficiency in Industries under the Energy Partnership Programme between Indonesia and Denmark (INDODEPP)**
Report:	**Executive Summary of Energy Audit Report**
Date:	**2nd September, 2024**
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1 Description of Company

PT. OKI PULP & PAPER MILLS is an integrated plant consist of Timber Forest Products Primary Industry Business, Industrial Business (Pulp and Basic Chemical Industry) and Industrial Business (Tissue Paper). It is located in Jalan Raya Riding - Air Sugihan Km 62, Desa Bukit Batu Kecamatan Air Sugihan Kabupaten Ogan Komering Ilir Provinsi Sumatera Selatan.

The energy use for the process is more than 80% renewable energy such as bark, liquor, pin and fibre.

Based on agreement during Kick off Meeting, boundary of audit is power generation system Unit Power boiler 1 and 2 covering boiler units, auxiliary and utilities.

Capacity Power Boiler are 840 TPH (2 x 420 TPH), the biomass consumption is 4,800 T/day of Bark and the carbon Avoidance: 2,417,885 ton CO2e/year.

OKI Power Boiler was designed to produce high pressure steam to support ± 15% of total HP steam demand from wood bark. OKI mill is a low carbon emission operation mill by using Wood bark as biomass impact on low carbon emission. To maintain biomass availability, OKI mill initiatives use Empty fruit bunch (EFB) and palm fibre from palm oil plantation near OKI Mill location.

2 Specific Energy Consumption

The scope of the energy audit is the organizational activities (pulp and paper mills) and utilities supporting these activities, including electrical systems, boiler water systems and cooling systems.

The energy sources included in the scope of the audit are wood, coal, bark and electricity. Fuel (oil) is not included in the scope of the audit because the amount is insignificant and does not have a direct effect on the Organization's production process.

The physical limitations of the energy audit carried out are Power Boiler Plant #1, #2.

Based on daily data collected on March 2024, the energy performance of Power Boiler #1 at average 2,7 (T.steam/T.bark), boiler #2 at 2,61 (T.steam/T.bark).

Daily energy generated by all STG (STG#1, #2, #3 dan #6 in 2022 fluctuates, with average around 80% is sent to the network for use in the paper mill and around 20% consumed as auxiliary load.

3 Energy Saving Potential

3.1 Boiler

1. Controlling blowdown with projected total bark saved 89,25 ton/day = 26.775 ton/year equivalent to 240.975 US$/year (assumption-bark price 0,5 GJ/US$)
2. Controlling the boiler load operation configuration, the potential fuel savings (bark) about 4.9% = 7.15 Tons/Day = 2.145 ton/year equal to 19.305 US$/year
3. Bark drying installation, the potential saving is 0,165-ton bark/ton steam = 341,414.50-ton bark/year equivalent to 4.297.583 US$/year. Bark dryer investment is estimated tobe 20 million USD equivalent with IDR 340 billion
4. Reduce soot blower intensity of power boiler 3% or 0,03 ton steam/ton total steam and Power Boiler 2 0.43% or 0,0043 ton steam/ton total steam 35.735 Ton bark/year = 643.231 GJ/year equivalent to 321.615 US$/year
5. Reduce condenser pressure from 0,09 bara to 0,07 bara. Potential saving for Power Boiler 1 is 1,56% and Power Boiler 2 is 2,52 %. Total potential saving is 21.304 Ton bark/year = 383.474 GJ/year equal to 191.737 US$/year
6. Routine maintenance potential saving is 2%-ton steam/day = 193 ton steam/day = 69 Ton bark/day = 20.837 Ton bark/year = 375.062 GJ/year equal to 187.531 US$/year

3.2 Electricity

1. Replacement of motor Fan a PB#2 with a super-premium efficiency motor with projected electricity saving of 181.828 kWh/year equal to 10.910 US$/year (assumption electricity price 0,06 $US/kWh), payback period of9,17 years.
2. Replacement of motor FD Fan 1APB#2 with a super-premium efficiency motor with projected electricity saving of 71.257 kWh/year equal to 4.275 US$/year, payback period of11,6 years.
3. Installation VSD in cooling tower fan, the potential saving is 218.203 kWh/year, pay back periode 1,3 year.

3.3 Summary

Recommendation of energy saving opportunities are summarized as follow.

Table 1 Energy saving opportunities

No	Energy Saving Opportunity	Energy source	Annual Saving/ Reduction			Investment	Pay-back	Type of investment
			Ton	kWh	IDR Million	IDR Million	(Year)	
1	Blowdown control	Bark	26,775		4,096	-	-	No
2	Boiler load control	Bark	2,145		328	-	-	No
3	Bark drying installation	Bark	341,414.50		73,058	326,040	4.46	High
4	Soot blower intensity reduction	Bark	35,735		5,467	-	-	No
5	Condenser pressure reduction	Bark	21,304		3,259	-	-	No
6	Steam distribution routine maintenance	Bark	20,837		3,188	-	-	No
7	Motor fan PB-2 replacement	Electricity		181,828	185	1,700	9.17	Medium
8	Motor FD Fan PB-2 replacement	Electricity		71,257	72	843	11.60	Medium
9	VSD Installation in cooling tower fan	Electricity		218,203	222	289	1.30	Low