

FLY ASH AND BOTTOM ASH UTILIZATION

INDONESIA POWER OCTOBER 13th 2022



4 Proper Emas PT Indonesia Power Tahun 2021
PLTGU Grati, PLTGU Priok, PLTDG Pesangaran,
PLTP Kamojang-Darajat.

Disclaimer

1. The success of faba utilization depends on the characteristic analysis of FABA and other material elements mixed with FABA, such as soil conditions, sand and gravel. In addition, the FABA utilization program refers to standards, procedures and regulations applied in Indonesia.
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CERTIFICATE OF FLY ASH & BOTTOM ASH CHARACTERISTICS ANALYSIS



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LAPORAN HASIL PENGIJILAN
 No. AAS LHP 18.2020.0410

Nama Pelanggan: PT Indonesia Power Substansi Power Generation Unit 05/04
 Gedung/Marka: Perumahan
 Parameter: Sampel

No.	No. Sampel	Kode Sampel	Parameter Uji	HASIL	Satuan	Metode Pengukuran	Keterangan
			SiO ₂	50,83	%	12-13/SMM-AAS	
			Al ₂ O ₃	24,48	%	12-13/SMM-AAS	
			Fe ₂ O ₃	0,91	%	12-13/SMM-AAS	
			CaO	6,16	%	12-13/SMM-AAS	
			MgO	0,53	%	12-13/SMM-AAS	
			SO ₃	3,89	%	12-13/SMM-AAS	
			Na ₂ O	0,06	%	12-13/SMM-AAS	
			K ₂ O	0,15	%	12-13/SMM-AAS	
			H ₂ O	0,19	%	12-13/SMM-AAS	

FLY ASH

18.2020.0410
Fly Ash (Unit 1-7)

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No.	No. Sampel	Kode Sampel	Parameter Uji	HASIL	Satuan	Metode Pengukuran	Keterangan
			SiO ₂	60,96	%	12-13/SMM-AAS	
			Al ₂ O ₃	30,54	%	12-13/SMM-AAS	
			Fe ₂ O ₃	0,20	%	12-13/SMM-AAS	
			CaO	1,27	%	12-13/SMM-AAS	
			MgO	0,27	%	12-13/SMM-AAS	
			SO ₃	0,08	%	12-13/SMM-AAS	
			Na ₂ O	0,04	%	12-13/SMM-AAS	
			K ₂ O	0,09	%	12-13/SMM-AAS	
			H ₂ O	1,80	%	12-13/SMM-AAS	
			Loss of Ignition (LOI)	5,31	%	20-08/00/00/00 AAS	

BOTTOM ASH

18.2020.0410
Bottom Ash Mix (Unit 1-7)

SERTIFIKAT AKREDITASI
 LP-565-IDN
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 Berlaku hingga: 15 Maret 2025

Otoritas terakreditasi:
PT Anugrah Analisis Semperna
 Jl. Raya Jakarta Bogor Km. 37, RT.05/04, Kel. Sukamaju, Kec. Cilodong, Depok

yang telah mencukupkan kompetensinya sebagai
LABORATORIUM PENGIJILAN
 dengan mengadopsi standar kompetensi:
SNI ISO/IEC 17025:2017 (ISO/IEC 17025:2017)
 Persyaratan Umum Untuk Kompetensi Laboratorium Pengujian dan Laboratorium Kalibrasi
 untuk bidang/kegiatan/kegiatan sebagai berikut:
KOMITE AKREDITASI NASIONAL
Prof. Dr. BAMBANG PRASETYA
KETUA

Sertifikat ini diterbitkan berdasarkan hasil pemeriksaan dan verifikasi pada sertifikat laporan yang diterbitkan. Agar valid, akan dipergunakan sebagai dasar tindakan yang berlaku.
 Sertifikat ini tidak boleh dipergunakan sebagai bentuk jaminan kualitas, seperti itu sendiri dan tidak diterbitkan kembali.

Kode Sample	Parameter Uji	HASIL	Satuan	Metode Pengukuran
Fly Ash Mix (Unit 1-7)	SiO ₂	50,83	%	12-13/SMM-AAS
	Al ₂ O ₃	24,48	%	12-13/SMM-AAS
	Fe ₂ O ₃	0,91	%	12-13/SMM-AAS
	CaO	6,16	%	12-13/SMM-AAS
	MgO	0,53	%	12-13/SMM-AAS
	SO ₃	3,89	%	12-13/SMM-AAS
	Na ₂ O	0,06	%	12-13/SMM-AAS
	K ₂ O	0,15	%	12-13/SMM-AAS
	H ₂ O	0,19	%	12-13/SMM-AAS



Sample CHARACTERISTICS ANALYSIS RESULT

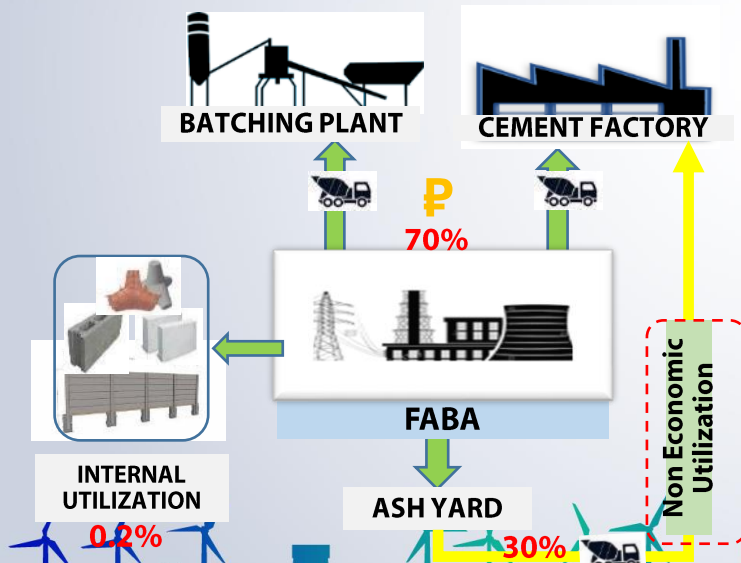
Unit	FABA	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	SO ₃	Na ₂ O	K ₂ O	LoI	Class
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	
Suralaya 1-7 CFSP	Fly Ash	50.97	20.31	2.82	15.88	1.49	0,76	1.05	1.07	0.19	F
	Bottom Ash	53.58	16.79	2.73	7.41	1.6	0,2	1.19	1.07	4.51	F

Unit	FABA	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	SO ₃	Na ₂ O	K ₂ O	LoI	Class
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	
Banten 3 Lontar CFSP	Fly Ash	63.15	16.88	9.23	4.4	1.93	0.1	0.44	0.68	2.48	F
	Bottom Ash	63.15	16.88	9.23	4.49	1.93	0.1	0.44	0.68	2.48	F

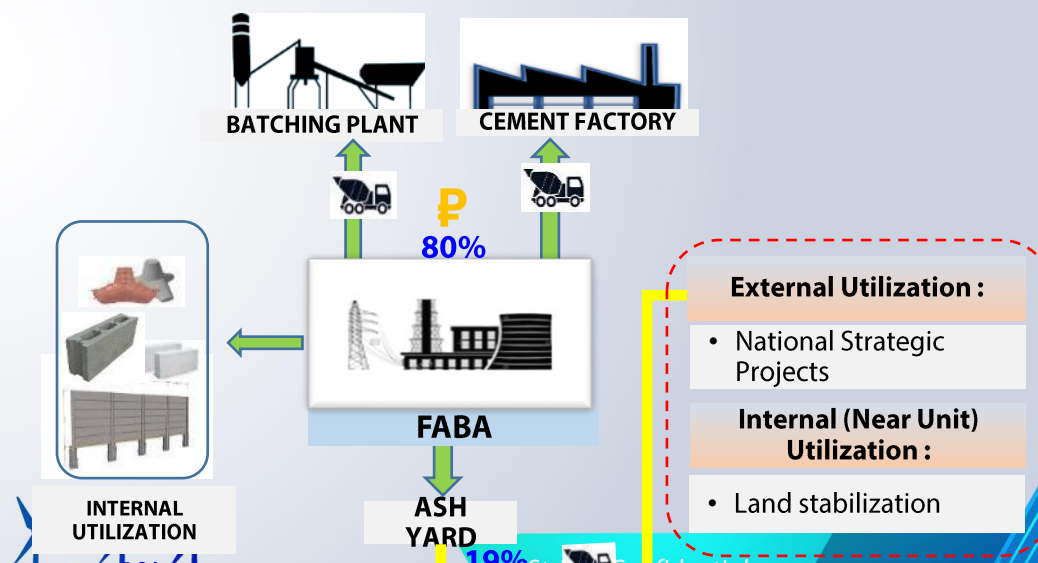
Changes in Government Regulation to increase FABA Utilization

1. In accordance with PP No.101 2014 FABA enacted as hazardous waste, with such strict regulations resulting in limited utilization and incurring high cost
2. The change of regulations from PP No.101 2014 to PP No.22 2021, FABA was enacted to Non Hazardous Waste, with more flexible regulations driving more massive utilization and lowering costs

BEFORE (FABA as HAZARDOUS WASTE)



AFTER (FABA as Registered Non HAZARDOUS WASTE)



Note : (FABA = Fly Ash and Bottom Ash)

Fly Ash & Bottom Ash PLN Group Utilization Map



01 SUMATERA island

- CFSP (13 Unit)**
1. Nagan Raya
 2. Pangkalan Susu
 3. Labuhan Ajin
 4. Tanjung Balai Karimun
 5. Tembilahan
 6. Tenayan
 7. Ombilin
 8. Teluk Sirih
 9. Bukit Asam
 10. Tarahan
 11. Sebalang
 12. Air Anyir
 13. Suge

436.043,75 Ton FABA
7.552 MW
 Utilization 1.542.160,29 Ton

02 JAVA island

- CFSP (13 Unit)**
1. Suralaya
 2. Banten I Suralyaa
 3. Lontar
 4. Labuan
 5. Pelabuhan Ratu
 6. Adipala
 7. Tanjung Jati B
 8. Rembang
 9. Pacitan
 10. Indramayu
 11. Tanjung Awar-awar
 12. Paiton 1&2
 13. Paiton 9

2.222.408,44 Ton FABA
19.594 MW
 Utilization 476.813,95 Ton

03 KALIMANTAN island

- CFSP (7 Unit)**
1. Asam-asam
 2. Pulang Pisau
 3. Teluk Balikpapan
 4. Ketapang
 5. Sanggau
 6. Sintang
 7. Bengkayang

136.880,88 Ton FABA
1.896 MW
 Utilization 17.675,25 ton

04 SULAWESI island

- CFSP (5 Unit)**
1. Amurang
 2. Punagaya
 3. Barru
 4. NII Tanasa
 5. Anggrek

79.168,67 Ton FABA
1.777 MW
 Utilization 77.763,87 ton

05 NUSRA Island

- CFSP (4 Unit)**
1. Roppa
 2. Bolok
 3. Sumbawa Barat
 4. Jeranjang

35.622,08 Ton FABA
143 MW
 Utilization 26.141,26 Ton

06 MALUKU Island

- CFSP (1 Unit)**
1. Tidore

6.057,40 Ton FABA
166 MW

07 PAPUA island

- CFSP (1 Unit)**
1. Holtekamp

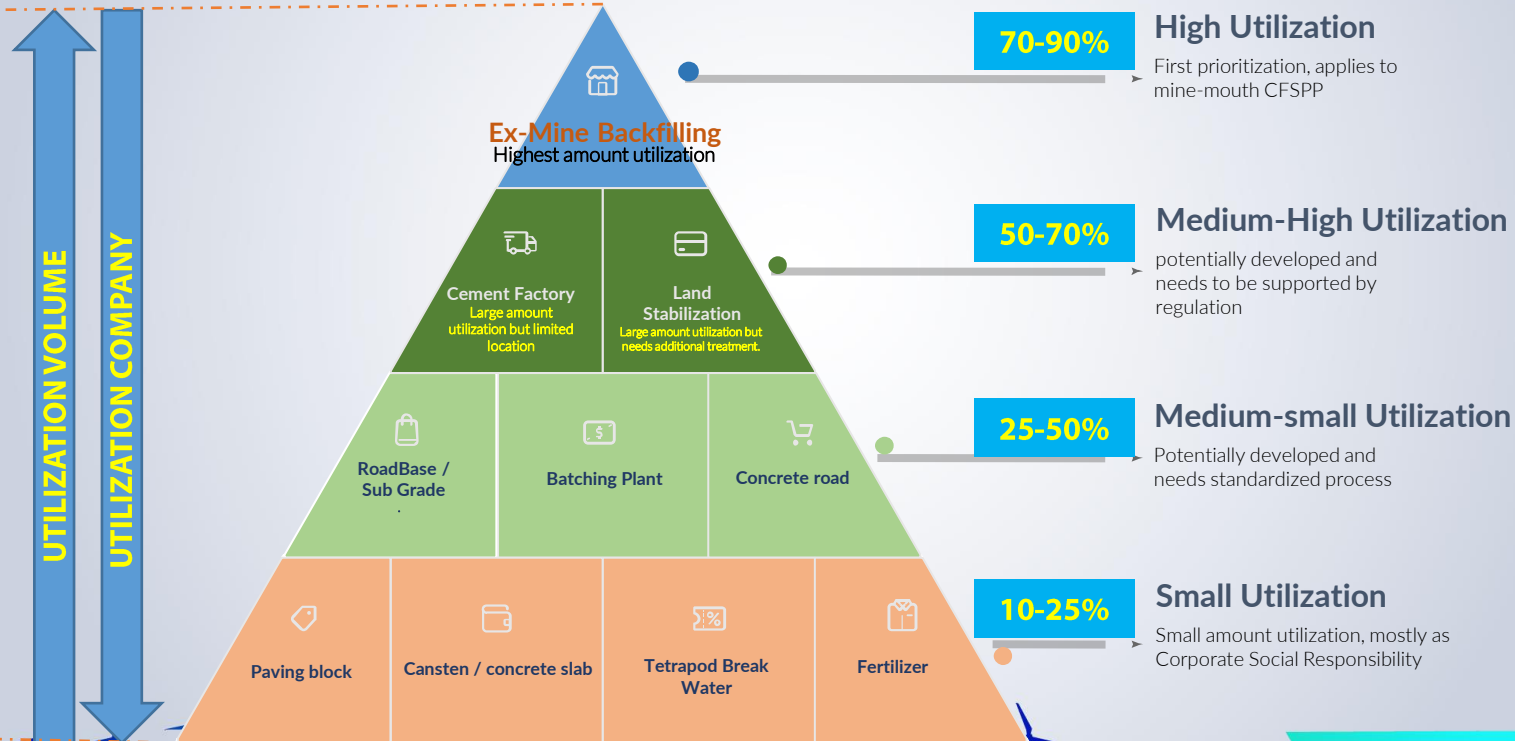
1.534,76 Ton FABA
160 MW

* Data Tahun 2020

Note : (FABA = Fly Ash and Bottom Ash)

Faba Utilization Hierarchy

FABA Utilization supports 4R and Nature Conservation Programs



- 4R :**
- 1. Reduce**
 - 2. Reuse**
 - 3. Recycle**
 - 4. Replace**

Fly Ash and Bottom Ash Utilization Products



Rehabilitation of mining land

Sumatra, Kalimantan, Sulawesi have the potential to rehabilitate mining land through acid mining neutralization and mine pit reclamation



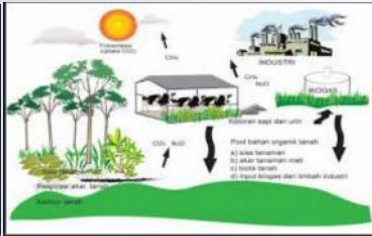
Community Empowerment through Circular Economy



Production rate : 250 - 1000 pcs/day



- PLTU TJB
- PLTU Barru
- PLTU NII Tanasa
- PLTU Sebalang
- PLTU Suralaya 1-7
- PLTU Labuan



FABA for Fertilizer
Fertilizer for agriculture



Material substitution



Land Stabilization



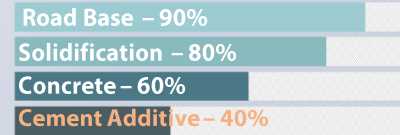
Bridge



Concrete



Percentage of FABA use :



FABA CREATIVE AND UTILIZATION

FABA UTILIZATION AS COVER LAYER FOR SOLID WASTE LANDFILL



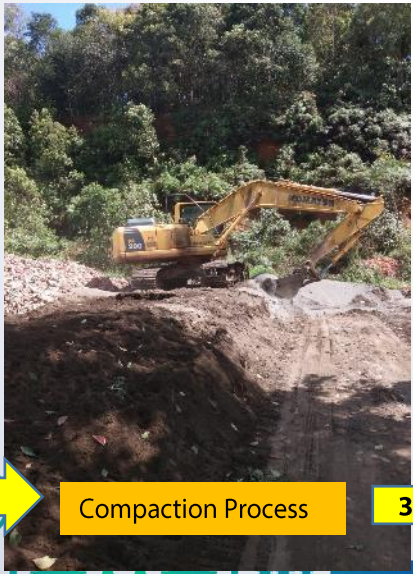
Solid Waste Pile



1 Leveling of the solid waste cover layer



2 Compaction Process



3 Finish



- Positive Impact :**
- 1. Reduce Unpleasant Odors** that have been disturbing the surrounding community
 - 2. Reduce vector disease** in the rainy season such as mosquitoes including flies and rats
 - 3. Neutralizing Acidic leachate water** in the presence of ALKALINE FABA
 - 4. Helps in neatly organizing waste pile** The scattered piles of waste become neatly organized and aesthetically pleasing
 - 5. Save local government budgets** in providing waste cover materials

BOTTOM ASH UTILIZATION ON THE CONSTRUCTION PROJECT SURALAYA 9 – 10 CFSP



THE TOTAL OF FAB A UTILIZATION AS A SUB GRADE MATERIALS FOR THE SLA 9-10 CFSP CONSTRUCTION PROJECT ARE :
204,504.82 TONS PER JUNE 30, 2022



BEFORE Sept 19th 2022



Initial pH = 5-6.5 (Acid)

1. Location survey
2. Measure pH



AFTER Sept 27th 2022



The pH of the water becomes pH 7.2 – 8.2 (Alkali)



1. Adding FABA and compaction
2. Measure pH

LAND STABILIZATION



TOTAL FABA UTILIZATION 55.467 TON



**MATERIAL DEPLOYMENT USING DOZER
HEAVY EQUIPMENT**



**COMPACTION USING A VIBRATOR
ROLLER MACHINE WITH A THICKNESS
PER LAYER OF 25 CM**

FABA CONCRETE PRODUCT APPLICATION



COMPANY'S CSR PROGRAM FOR THE SURROUNDING ENVIRONMENT & STAKEHOLDERS THROUGH THE APPLICATION OF FABA CONCRETE PRODUCT

ECOPARK



PAVING BLOCK



SPORTS FACILITIES



PARKING AREA

THANK YOU.....

Terima kasih.....

