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ACEH IRON SAND PROCESSING TO PRODUCE PIG IRON

Oleh:

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International Conference on Prospectsand Promotion of Trade, Intercommunication and Historical Ties:Andaman-Nicobar Island (ANI) and Weh Island-Sabang (Aceh, Indonesia)

UNIVERSITAS ALMUSLIM

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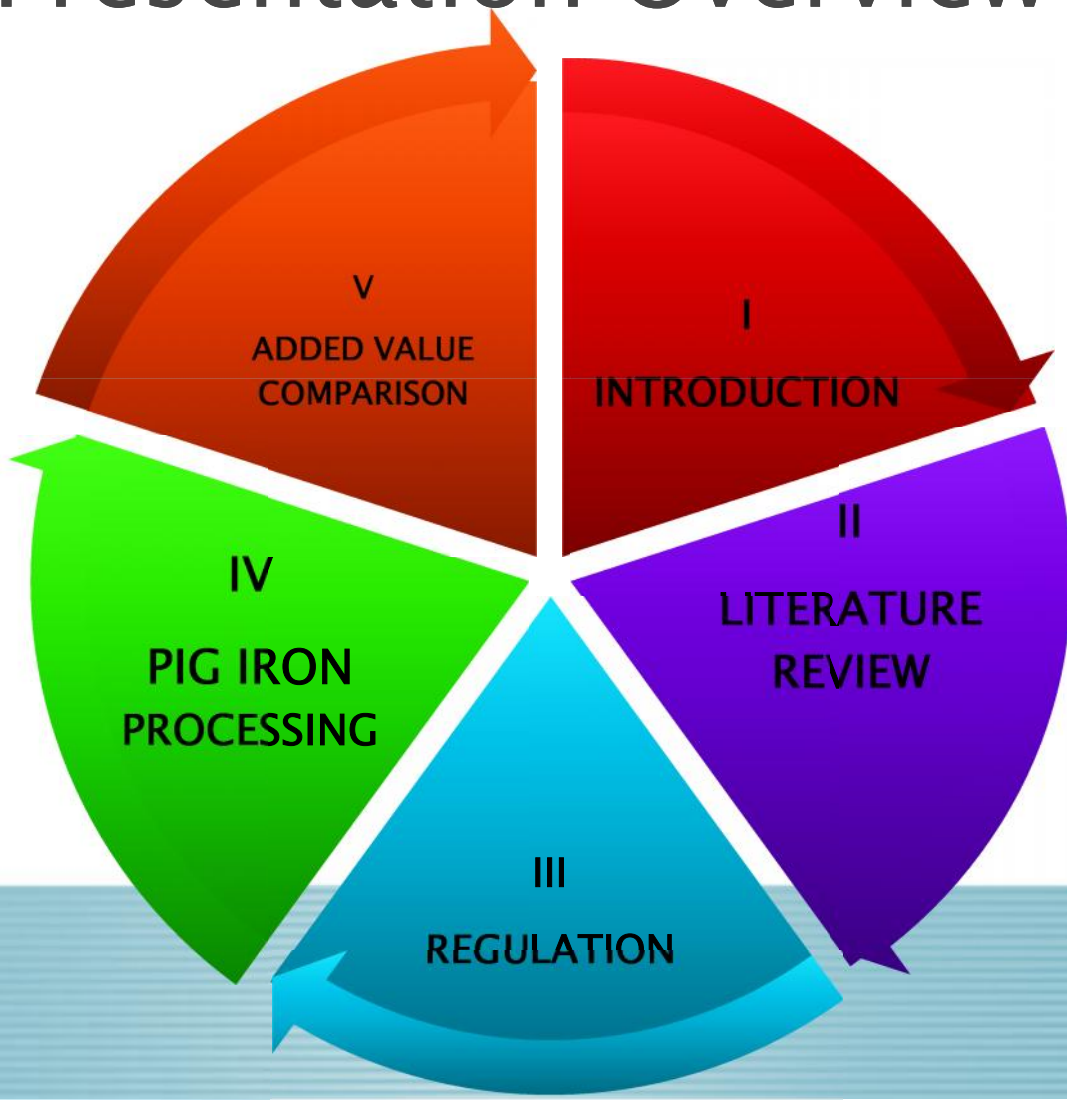
Presentation Overview



INTRODUCTION

The Aceh province has a large amount of the minerals resources; iron ore, iron sand, gold, copper, molibdenit, and bentonit. Considering this, the government of Aceh place these minerals as one of the Aceh first ranked comodities.

The iron sand is classified as Group B minerals (vital minerals) based on the Government Regulation No. 27, 1980 about the classification of the minerals.

The Aceh iron sand can mostly be found in the regions of Great Aceh, West Aceh, South Aceh, Pidie, North Aceh, Bireuen, and Sabang. This iron ore with the potential of having the economic value has a deposit of 92,3 millions of tons, either in the form of stones or sand deposits in the rivers or estuaries.

The macro issues today is that most of the iron sand products taken from Aceh do not have significant added value because the iron sand is exported in the raw form without any further processing. Moreover, iron sand in Aceh is only exploited and exported by the companies of small and medium-scale, where the mineral products, after being mined, are delivered directly to the buyer countries such as China to be processed further

Ideally, the iron sands that are found in Aceh are very likely to have the added value when it is processed into pig iron and/or steel and its alloys before it is being exported. The process that can be done includes the beneficiation process or refining process, pelletizing that is ready to be used as raw materials in the manufacture of sponge iron or pig iron, the reduction process that produces sponge iron and pig iron and the melting process that produces steels. The products produced from each process vary in price. The price of iron sand as a mined material is the lowest and the price of the pig iron as a product is the highest

BESI	
Kabupaten	Potensi (ton)
Aceh Besar	36,800,000
Gayo Lues	22,000,000
Aceh Barat	-
Aceh Selatan	28,000,000
Subulussalam	24,000,000
Aceh Barat Daya	48,000,000
Aceh Tamiang	42,0000,000
Pidie	10,000

BESI BERTITAN (PASIR BESI)	
Kabupaten	Potensi (ton)
Aceh Besar	7,200,000
Pidie	1,200,000
Pidie Jaya	
Bireuen	3,800,000
Aceh Jaya	-
Aceh Barat	-
Aceh Singkil	-

Source: Distanben Aceh, 2011

The purpose of this article is to provide a solution to the Aceh government to do the environmentally friendly production process of the pig iron from the iron sand so that it will have the added value, rather than exporting the iron sand directly without any further production process.

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PERTAMBANGAN ACEH

Menyatukan visi dan konsep Aceh kedepan de
sumber daya mineral untuk meningkatkan ke

www.pertambangan-aceh.blogspot.com

Operasi Tambang Pasir Besi Lhoong Ditutup Sementara

Diposkan oleh Pertambangan Aceh di 11.26 . Kamis, 18 Februari 2010

BANDA ACEH - Eksploitasi tambang pasir besi di Gampong Jantang dan Tuha Peuet, Kecamatan Lhoong, Kabupaten Aceh Besar, oleh PT Lhoong Setia Mining (LSM) ditutup sementara selama seminggu untuk menyelesaikan berbagai persoalan antara apa yang dituntut masyarakat dengan apa yang seharusnya menjadi kewajiban pihak penambang.

X-ray diffraction (XRD),

Result : hematite (Fe_2O_3) 93,88%,

PERTAMBANGAN ACEH

Menyatukan visi dan konsep Aceh kedepan deng
sumber daya mineral untuk meningkatkan kema

www.pertambangan-aceh.blogspot.com

Pasir Besi di Pidie Siap Dieksplorasi

Diposkan oleh Pertambangan Aceh di 11.02 . Sabtu, 22 Agustus 2009

PASIR BESI
Serambi Indonesia, 22 Agustus 2009
SIGLI - Sedikitnya 48,02 Hektare dari ratusan hektare hamparan pasir besi di Kecamatan Muara Tiga dan Simpang Tiga Kabupaten Pidie dinyatakan siap untuk di ekplorasi oleh panambang. Kepala bidang Pertambangan dan energi Dinas Perindustrian, Perdagangan, dan Koperasi (Disperindagkop) Pidie, Wardi Findani SE

PERTAMBANGAN ACEH

Menyatukan visi dan konsep Aceh kedepan deng
sumber daya mineral untuk meningkatkan kem

www.pertambangan-aceh.blogspot.com

Bijih Besi tak Mengandung Emas

Diposkan oleh Pertambangan Aceh di 16.20 . Senin, 22 Februari 2010

TAPAKTUAN-Direktur Utama (Dirut) PT Pinang Sejata, Hj Latifah Hanun, mengatakan, tambang bijih besi yang sedang di ekpolitasinya di kawasan Gunung Desa Simpang Dua, Manggamat, Kecamatan Kluet Tengah, Kabupaten Aceh Selatan, tidak mengandung emas. "Bongkahan batu itu tidak mengandung emas, tapi mengandung bijih besi," katanya.

X-ray diffraction (XRD),

Result : Manggamat (Aceh Selatan) 85,31%

Consumption of Steel with Different Countries.

Negara	Kg/Kapita/Tahun
Indonesia	37.3
India	54.9
Vietnam	139.8
Thailand	211.0
Amerika Serikat	267.3
Malaysia	315.8
Cina	427.4
Jepang	500.9
Singapura	570.1

Sumber : World Steel Association. 2011

Indonesia Iron Sand

Unsur/ Senyawa	Lokasi				
	Kutoarjo	Bengkulu	Tasikmalaya	Aceh	Sukabumi
Fe Total	34.26	45.73	56.18	45.89	33.33
SiO_2	22.33	15.62	8.60	14.63	31.40
CaO	8.12	3.72	0.59	3.17	1.96
MgO	7.11	0.03	1.13	3.56	3.81
Al_2O_3	8.37	5.62	1.94	5.24	8.63
TiO_2	3.17	5.08	5.68	5.53	4.59
V_2O_5	0.21	0.27	0.74	0.37	-
Cr_2O_3	0.02	0.04	0.09	0.13	0.03

Sumber: Statistik Direktori Geologi dan Sumberdaya Mineral

Content Intensity of Aceh iron sand and Cilacap : Using X-ray fluorescence (XRF)

No	Unsur Terdeteksi	Intensitas	
		Pasir Aceh	Pasir Cilacap
1.	C	4,09	3,57
2.	O	2,02	1,94
3.	Mg	0,00	0,00
4.	Al	0,80	2,09
5.	Si	16,20	20,95
6.	S	53,71	48,24
7.	K	1,93	2,82
8.	Ca	10,30	18,95
9.	Ti	87,13	71,07
10.	V	6,89	6,03
11.	Cr	0,89	0,91
12.	Mn	13,83	11,88
13.	Fe	853,19	644,32
14.	Cu	3,97	3,68

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Akhyar Ibrahim et al., [2006 and 2012], have conducted a research on the metal compound identification and manufaturing process of the pig iron conversion from iron sand found in Lam Panah in Aceh Besar district and Mon Keulayu in Bireuen district.

The results shows that the iron sands from Lam Panah and Mon Keulayu share the dominant compounds, ie hematite (Fe_2O_3), silica (SiO_2), alumina (Al_2O_3) and titanium oxide (TiO_2).

The chemical composition (%) :

Fe	C	Si	S	Cr	Mn	Ti	Al	V
92	2,71	2,5	0,13	0,12	0,54	0,74	0,94	0,2

Average hardness : 377 HV

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Regarding the mineral management practice, the Indonesian government has regulated it in the legislation, including; Law of the Republic of Indonesia Number 4 Year 2009 on Mineral and Coal Mining, Article 103 paragraph (1) which reads: "Holders of Production Operation (IUP) and IUPK required to perform processing and refining of mining Production in the country".

And the government regulation of the Republic of Indonesia Number 23 of 2010 regarding Implementation of Business Activities of Mineral and Coal, Article 112 paragraph (4) c, which reads: "do the processing and refining in the country within a maximum period of five (5) years from the enactment of the No. 4 of 2009 Law on Mineral and Coal Mining "(until January 12, 2014).

The Mining Law no. 4 in 2009 and the Ministery regulation no. 7, 2012 which prohibits the exportation of all mineral materials in raw form and it is also in line with the instructions of the President of Republic of Indonesia No 3, 2013 on the Acceleration of Mineral Added Value through Domestic Processing and Refining.

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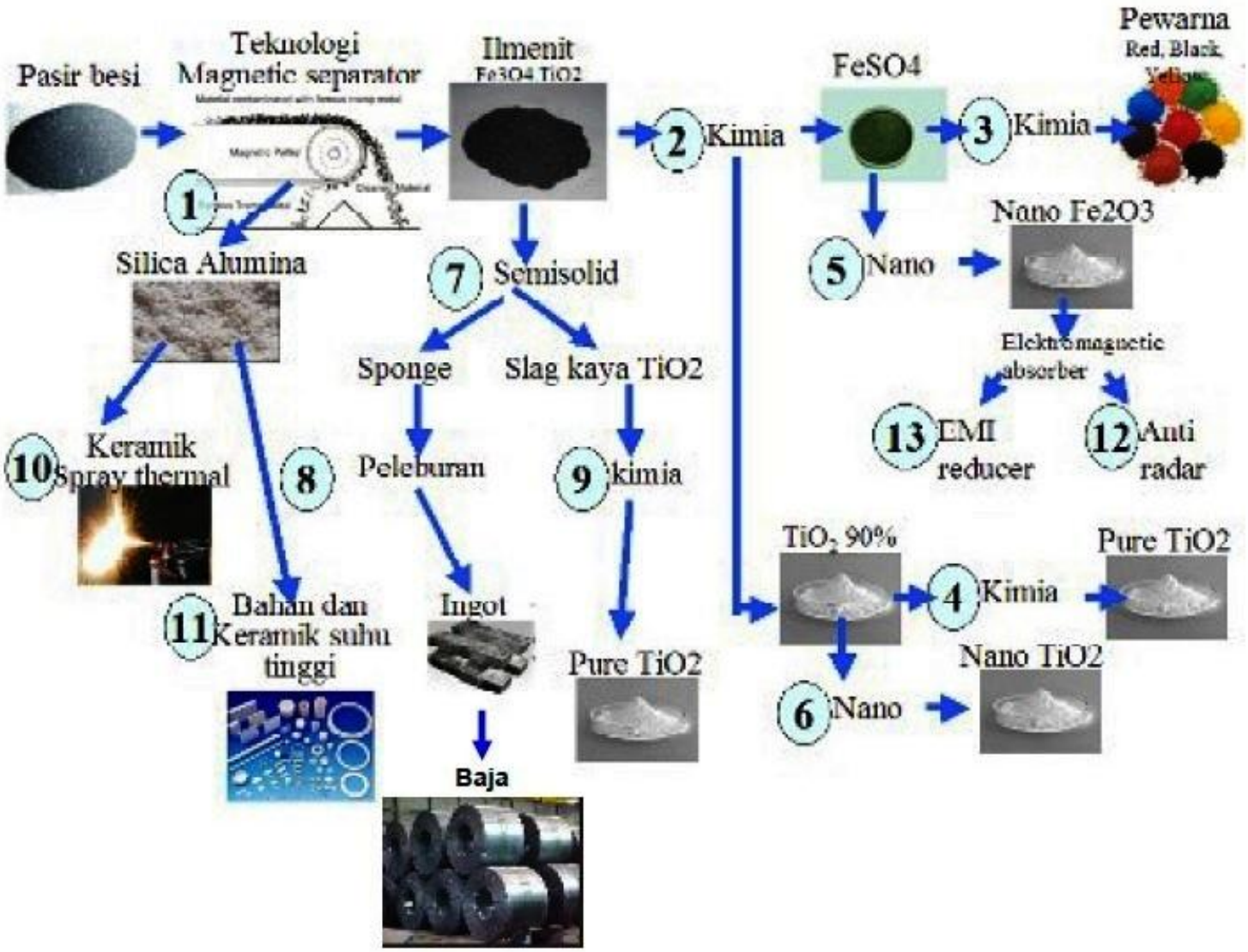
There are several technologies available for the melting process such as;

- Sub-merged Arc Furnace (SAF),
- Electric Arc Furnace (EAF),
- Blast Furnace,
- Hismelt, and so forth.

But conventionally, iron sand processing can be done with blast furnace (blast furnace) to produce pig iron or cast iron.


Pasir besi
Teknologi
Magnetic separator
Ilmenit
Fe3O4 TiO2
1
2 Kimia
FeSO4
3 Kimia
Pewarna
Red, Black,
Silica Alumina
7 Semisolid
5 Nano
Nano Fe2O3
Elektromagnetic
absorber
Sponge
Slag kaya TiO2
13 EMI
reducer
12 Anti
radar
10 Keramik
Spray thermal
8
Peleburan
9 kimia
TiO2 90%
4 Kimia
Pure TiO2
11 Bahan dan
Keramik suhu
tinggi
Ingot
Pure TiO2
Nano TiO2
6 Nano
Baja

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Iron sand processing (35 $ per ton)
(iron sand : 1000/kg=0,07$)
Melting processing 80$ per ton,
Others 30 $ per ton
Total production cost:145 $ per ton.

sponge iron (prize) : 420 $ per ton.


Arctic OCEAN
Arctic OCEAN
N
(DENMARK)
SVALBARD (NORWAY)
ICELAND
SWEDEN
NORWAY
FINLAND
ESTONIA
LATVIA
LITHUANIA
UNITED KINGDOM
BELARUS
POLAND
GERMANY
UKRAINE
RUSSIA
KAZAKHSTAN
MONGOLIA
UZBEKISTAN
TURKMENISTAN
AFGHANISTAN
CHINA
NORTH KOREA
JAPAN
SOUTH KOREA
North Pacific OCEAN
PORTUGAL
SPAIN
TURKEY
ARMENIA
SYRIA
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IRAN
KUWAIT
PAKISTAN
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