

GEEA-SBS Biomass Treatment Project in Alegrete, Rio Grande do Sul, Brazil (CDM ref. 1092)

Surplus biomass analysis

As part of the biomass used in the project activity will be transported from other localities, PROBEM¹ developed a transport technology for the biomass, called *Disperse Biomass Transport*. Aiming to improve the transport efficiency, a biomass compactor is adapted to a truck. This compactor will compact the rice husk from 125 kg/m³ to 315 kg/m³, i.e. a compacting factor of 2.5 is obtained. The compactor can compact 40 tonnes of rice husk per hour. According to tests, the compactor will consume 0.3 liters of diesel oil per ton of biomass compacted. Also aiming to improve the transport efficiency and decrease the fuel consumption, the transportation trucks will carry two 40-foot containers in each trip. Each container has an internal volume of 78m³ and can carry around 20-22.5 ton of rice husk. With this technology, it will be possible to carry at least 45 tonnes of biomass per truck per trip. This technology will also make feasible to transport rice husks for a long distance (around 250-300 km each way).

In the absence of the project activity, the rice husks generated in the Southwest part of Rio Grande do Sul State would be left to decay. The production of rice in Rio Grande do Sul State amounts 6.3 million ton in 2003/4 harvest (IRGA, 2006)². Since 22% of the weight of the rice corresponds to husks, there was a generation of 1.39 million ton of rice husks in 2003/4 harvest. Considering only Alegrete City, the rice production was 332 thousand ton in 2003/4 harvest, generating an amount of 73 thousand tons of rice husks. Rice fields occupy an area of 45,000 hectares in Alegrete. More than half of the rice husk generated from rice mills in Rio Grade do Sul State are currently being left to decay in open air and the practice will continue in absence of the Project.

Table 1 shows the application of rice husk for different purposes according CIENTEC. The rice husk surplus of 60% is considerable, thus indicating that will not occur competition use of the biomass. Table 2 presents the total rice husk surplus generation within a radius of 300 km far from the project site; the surplus generation is over 400,000 ton per year of rice husk.

Table 1. Use of the rice husks in Rio Grande do Sul State (Rucatti and Kayser, 2004)³

Application	Percentage (%)
1.Destined to grain drying	15.2
2.Destined to steam generation	14.0
3.Used as cement additive	7.0
4.Used for motor power generation	4.2
5.Rice husks Surplus (landfilled)	59.6

¹ Technology PROBEM[®] – Programa de Biomassa – Energia - Materiais (Materials – Energy – Biomass Programs) which belongs to RM Materiais Refratários Ltda, Lorena, SP, Brazil. The Group Pilecco obtained exclusive rights to use PROBEM[®] Technology in Rio Grande do Sul State, Uruguay, and Argentina. RM Materiais Refratários Ltda. is a company of the Peixoto de Castro Group (GPC).

² IRGA – Instituto Rio Grandense do Arroz: Rice production ranking in different regions. Available online: <http://www.irga.rs.gov.br/arquivos/ranking.pdf> (retrieved on February 2006)

³ RUCATTI, Evely Gischkow, KAYSER, Victor Hugo, 2004. Produção e Disponibilidade de Arroz por Região Brasileira. Instituto Riograndense do Arroz. Rio Grande do Sul, Brasil.

Table 2. Surplus generation of rice husk in Southwest and Mid-west regions of Rio Grande do Sul State⁴

Municipality	Rice processing (ton/y)	Rice husk generation (ton/y)	Distance to project site (km)
Alegrete	291,577	64,146	0
Uruguaiana	466,231	102,570	140
Quarai	66,039	14,528	120
Santa Maria	45,940	10,106	218
São Pedro do Sul	19,984	4,396	187
São Gabriel	138,242	30,413	165
São Sepé	107,856	23,728	279
Livramento	60,404	13,288	200
Rosario do Sul	110,072	24,215	100
São Francisco de Assis	18,591	4,090	80
São Vicente do Sul	52,750	11,605	178
Manoel Viana	17,263	3,797	48
São Borja	227,423	50,033	224
Itaqui	311,610	68,554	139
TOTAL	1,933,982	425,469	0

Notes: For Alegrete, only the amount generated by Pilecco Rice Mill is accounted above. As a conservative measure, the generation by other rice mills in Alegrete is not shown in this table.

The total amount of rice husk available in a radius of 300 km far from the project site corresponds to 425,469 ton/y, which is an amount much higher than the necessary to carry out the projects developed there. Therefore, this project will not lead to biomass leakage or scarcity in the region.

Table 3. Surplus analysis

Project	Annual rice husk consumption (ton/y)
GEEA Biomass power plant project (project 1089)	67,320
GEEA-SBS Biomass Treatment Project in Alegrete, Rio Grande do Sul, Brazil.	55,440
Total	122,760
Minimum (25% surplus)	153,450
Biomass surplus in the region	425,469

This analysis indicates that the amount of biomass to be used is relatively small compared to the surplus existing in the region; therefore it will not lead to a leakage due competing use of biomass.

⁴ Source: Rice processing associations in South and Mid-west parts of Rio Grande do Sul State