

Pellets derived from biomass residues a new market perspective



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3rd LAMNET Workshop – Brasilia, 4 December 2002

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Biomass Residues?

Most economical forms of biomass

Agricultural residues



Wood residues



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Agricultural residues



More than 2,500 million tons*/y world availability

- Wheat straw
- Corn stover
- Orchard trimmings
- Rice husks
- Bagasse



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Wood Residues



Around 1,000 million tons/y world availability

- Mill Residues
- Urban Wood Residues
- Tree Trimmings
- Forest Residues

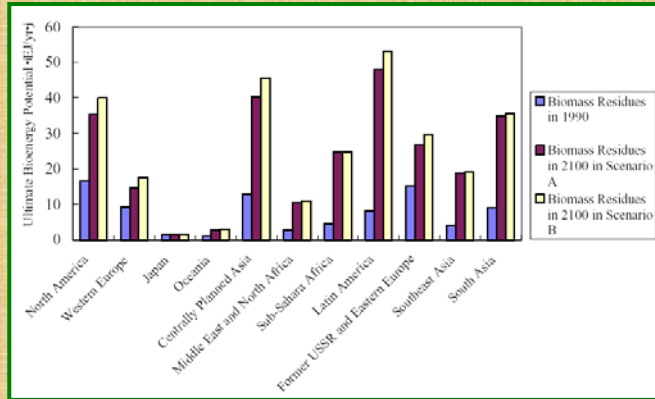


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Bio-Residues Potential



Global world energy consumption: 450 EJ (10^{18} J)

Constraints

Large volume to weight ratio

Various granulometry → difficult management

Difficult storage, possibilities of fermentation, fungi....

Few MJ/m³ → high transport costs





... Residues are often burnt in the field



Pellets

Transforming wastes into fuel

Increase energetic value

Lower volume for storage

Easier handling, lower transport costs

Eliminate fermentation problems





The process

Material preparation (milling)



Drying (6-7% moisture)



Refining milling



Pelleting process



Cooling

Shortcomings

Only biomass with low moisture content can be processed

Drying requires about 12% of the pellet LHV
→ 1,000,000 € for 4t/h plant

Specifications



Specification	Pellet: 6 to 8 mm diameter	Raw material
Humidity (%)	8 to 10	30 to 50
LHV (MJ/kg) (total weight)	16.7 - 17.5	9 - 12
Ash Remainder (%)	0.5 to 2	10 to 20
Density (kg/cubic meter)	600 to 700	200 to 300
Energy use per kg of product (watt)	120 to 200 + drying	-
Production Cost (EUR/ton)	65 to 90	-
Wholesale Price (EUR/Ton)	100 to 120	40 to 60
Retail Price (E/kg)	0.25 to 0.27	0,08



Innovative approach

Low energy input required

No drying- no cooling

Raw materials with high moisture content can be processed

650,000 € for
4t/h plant



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Why pellets

Suitable for small/medium/large systems

Excellent cooking fuel

Similar to fluid fuel →

→ combustion, small quantity of ashes

→ Easy charging and discharging

→ High automation is possible

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An enormous market potential



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Conclusions



All industrial processes generate vast quantities of waste materials

Agricultural and forestal waste are free renewable energy source

Its potential is highly limited by difficulties in waste management and conversion

Pellets allow to overcome many constraints – valuable solution to exploit this market potential

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Further information

LAMNET thematic leaflet

Pellets for Europe – EC supported project :

- state of the art of pellet market in Europe:
- evaluation of market potential



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