



ADVANCED PELLETING TECHNOLOGY

Francesco Cariello, ETA–Florence, Italy

LAMNET – Joint Workshop



Durban, South Africa



Modern Bioenergy Technologies and Sustainable Development

- no CO₂ emissions into the atmosphere
- Small local environmental impact
- New incomes, new jobs

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QUOTATION OF CONVENTIONAL FUELS: HYDROCARBONS



Product	Costs (€/ton)	Calorific Value(kcal/kg)
Fuel Oil	270	8,000
Natural Gas (untreated)	268	12,000
Diesel	370	10,000
Methanol	271	5,000
Coal	42	6,000

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BIOFUEL QUOTATIONS (Year 2001)



Product	Moisture	Cost (€/ton)	Calorific Value (kcal/kg)
Woody Biomass (chips and branches)	30 to 50%	40 to 50 (ex plant)	2,200 to 2,600
Bioethanol		231	7,000
Charcoal		225	7,000
Biomethanol		300	5,500

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Upgraded wood fuel:



PELLETS



- High energy content
- Easy to store and handle
- Suitable for small and large scale combustion
- Fixed energy value

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Wood Pellets quotations (year 2001)



Product	Descriptions	Moisture	Cost (€/ton)	Calorific Value (kcal/kg)
Industrial Use	Traditional Technology	10%	100/120 Ex plant	3,800/4200
Industrial Use	Traditional Technology	10%	140/170 Ex distrib.	3,800/4200
Domestic Use	Traditional Technology	10%	250/270 Customer	3,800/4200

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Pellets play a major role in the energy markets:

However the traditional production process has several shortcomings:

- Requires drying the raw material
 - Requires a constant granule size
- Requires a final cooling phase
 - Requires high heat input of about 400 to 500 W for every kg/h of pellets produced
- Limitations in using many available biomasses

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Kemyx S.p.A.'s new process is extremely versatile:

- Only limited energy consumption is required, as no drying or cooling is necessary
- It can process biomasses of every origin
- Moisture content of 40 – 50% in the raw material does not represent a problem

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- A variation of the process can treat moisture content up to **75 – 80%**
- Material with variables size granules can be processed
- Product stability, homogeneity and density are guaranteed

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Only **50 – 100 W (like a light bulb)** for processing 1 kg/h of material with a moisture content of 15 to 40% !

A difference of up to tenfold with the traditional method (400-500 W)

Personnel of limited experience can operate the pelletizer

The process is automated, the pelletizer is easy to install, maintenance is kept to a minimum

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Comparison of wood pellets:



Characteristics	Kemyx φ 10-15 mm	Conventional φ 6 -8 mm	Chopped Woody Biomass
Moisture %	8 to 10	8 to 10	30 to 50
Cal. Value (kcal/kg)	4,000 / 4,400	3,800 / 4,000	2,200 / 2,600
Ash Remainder(%)	0.5	0.5 to 2	10 to 20
Density (kg/m ³)	700 / 750	600 / 620	200 / 300
Power used for kg/h (W)	70 to 100	120 to 200 + drying	-
Production Cost (€/ton)	30 to 50	60 to 90	-
Wholesale price (€/ton)	80 / 85	100 / 120	40 / 60

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Pellets from **sugar cane bagasse**

(KEMYX plants in CUBA)

- 4,000 to 4,300 kcal / kg

- Ash remainder : < 1%



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Installed power depends on the volume of production and the material to be processed varies from

100 to 400 kW for a 4 ton/h plant

Average price for a 4 t/h plant is about 650,000 €

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Each plant can be optimized for processing various materials:

A specific agricultural and forest waste

Food and animal industry by-products or waste

Waste water sludges

Plastics related waste (packaging, fluff, plastic films...)

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Contacts:

KEMYX S.p.A.

WIP-Munich

ETA-Florence

Tel. +39 055 5002174

Fax +39 055 573425

E-mail: eta.fi@etaflorence.it

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