

Grass for the pellet fuel industry
The perspective from a
manufacturer



Presented by:
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Energex Pellet Fuel Inc.



With the collaboration of:
Pellet Fuel Institute (PFI)
Wood Pellet Association of Canada
Ministère de l'Agriculture Pêcheries
et Alimentation du Québec



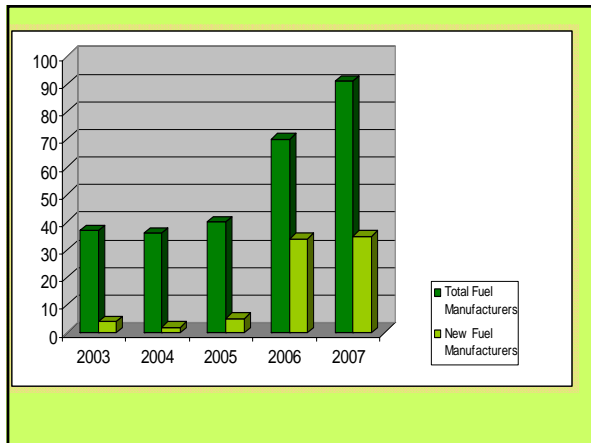
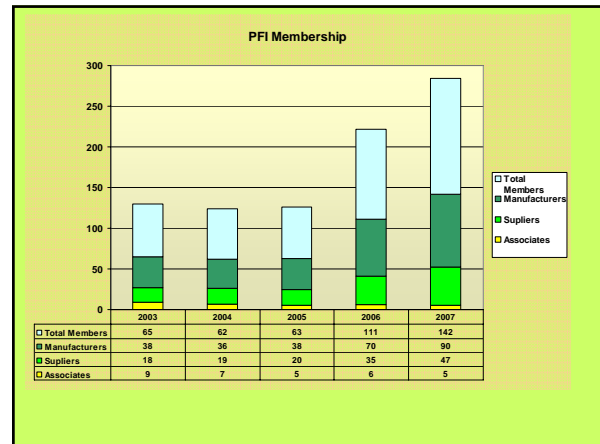
•**Energex Pellet Fuel Inc.**

- Construction 1982 (BioShell)
- >200,000 mt/yr capacity (over 2,000,000 tm produced) in two plants PQ & PA
- Market is North East (95% US)
- Exporting overseas since 1991
- Member of PFI and WPAC





Pellet Fuel Institute PFI



Pellet standards

New Fuel Standards being considered by PFI

Development of New Standards for these Categories:

- Residential Densified Fuel
- Residential Grain Fuel
- Commercial Fuel



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- **Residential Densified Fuel**
- Residential Grain Fuel
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Industry Wide Quality Control & Assurance Program

- Product Registration, Testing, Sampling

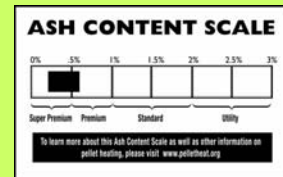
New RESIDENTIAL DENSIFIED Fuel Standards Being Considered by PFI

- Super Premium $0 \leq .5\%$ Ash
- Premium $0 \leq 1\%$ Ash
- Standard $0 \leq 2\%$ Ash
- Utility $0 \leq 6\%$



Proposed New Labelling

- Identical Sliding Scale Standards on Both Pellet Fuel and Appliances
- Purpose: Make it Easy for Consumers



Proposed New PFI Fuel Standards

Analysis Parameter	Residential/Commercial Densified Fuel Standards				Residential/Commercial Open Ends		Open Fuel Standards	Industrial Fuel Standards
	Super Premium 0% - .5%	Premium 0.5% - 1%	Standard 1% - 2%	Utility 2% - 6%	Premium 0% - 1%	Standard 1% - 2%		
Moisture, % (oven-dry)	≤ 0.250 (0.35max) to 0.285 (0.25max)	≤ 0.250 (0.35max) to 0.285 (0.25max)	≤ 0.250 (0.35max) to 0.285 (0.25max)	≤ 0.250 (0.35max) to 0.285 (0.25max)	0% over 5.8 inches	0% over 3.4 inches	To	To
Pellet Durability Index	≥ 97.5	≥ 97.5	≥ 95	≥ 95			Do	Do
Fines, % (at the mill gate)	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	[0-1]	[0-1]	Determined	Determined
Inorganic Ash, %	0-0.5	0-1	0-2	0-6				
Length, % Greater than 1.5 inches	≤ 1	≤ 1	≤ 1	≤ 1				
Moisture, %	≤ 4	≤ 4	≤ 4	≤ 4	≤ 10	≤ 10		

UTUs - Need to specify on the bag

As-Built: (1-2003) As-Built: (1-2003) As-Built: (1-2003) As-Built: (1-2003) As-Built: (1-2003) As-Built: (1-2003)

It is required that PFI manufacturer members label their product as to which grade of material is in the bag and that they disclose the type of materials (e.g. oak, maple, cedar, fir, spruce, white pine, etc.) as well as all additives being used, and if there are any chemically treated materials.

It is recommended that manufacturers include on their bags the membership logo and in a printed block the guaranteed analysis.

It is recommended that all Residential/Commercial Pellet Fuel limit chloride content to below 300 ppm.

It is recommended that all feedstock materials be evaluated initially for ash fusion properties and then periodically thereafter if ash fusion problems arise to minimize problems with ash fusion in the appliances.

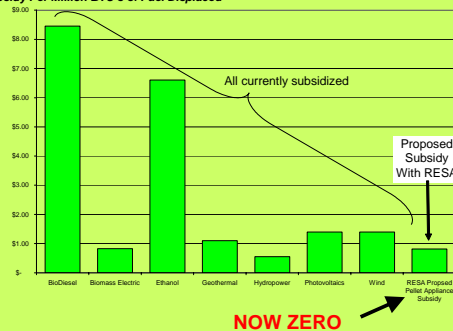
PFI prohibits the use of wood chips that have been chemically treated with insecticides in Residential/Commercial appliances.



U.S. Government Relations

RESA Appropriation May Level Playing Field

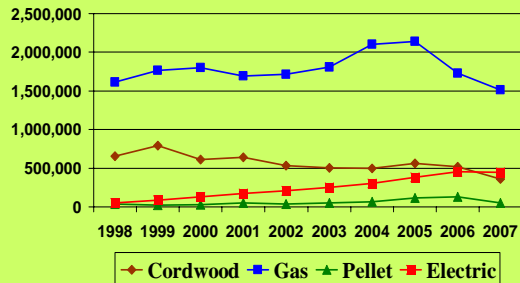
Subsidy Per Million BTU's of Fuel Displaced



Statistics

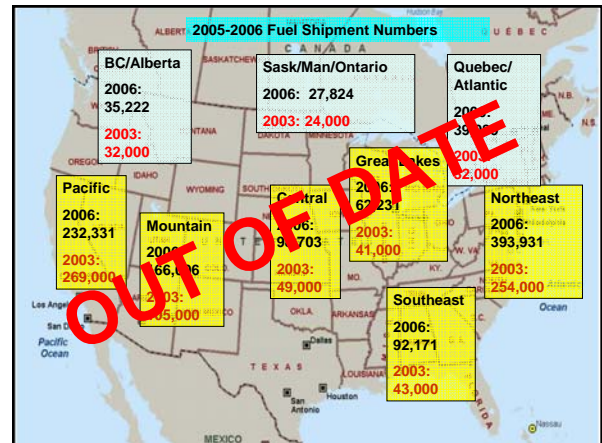
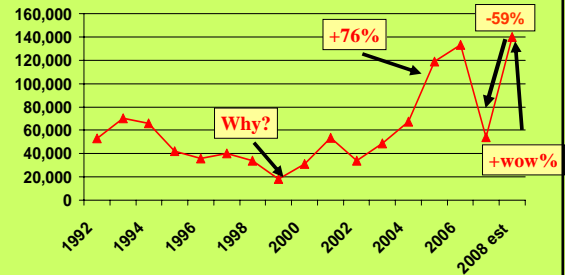
Hearth Appliance Shipments

1998--2007



Pellet Appliance Shipments

1992--2008



Ongoing Developments

- Market Diversification
 - Bulk residential green comfort
 - Bulk middle market
 - Export
- Raw material diversification

Potential for the production of agricultural biomass Eastern Townships

Bernard Saucier, agronome

In collaboration with Huguette Martel agronome

2008

Agriculture, Pêcheries
et Alimentation
Québec

Reed Canary – August 1 2007



Switchgrass –Sept 7 2007 - 120 cm



Wheatgrass – October 6 2006



Challenges

- Ash content
- Outskirt adapted crops
- Profitability

Market needs

	Wood pellets	Wheat straw	Switchgrass	
			Fall harvest	Spring harvest
Energy (GJ/t)	20,3	18,6–18,8	18,2-18,8	19,1
Ash (%)	0,6	4,5	4,5-5,2	2,8-3,2
N (%)	0,30	0,70	0,46	0,33
K (%)	0,05	1,00	0,38-0,95	0,06
Cl (%)	0,01	0,19-0,51	n/a	n/a

Source : Samson, Roger - REAP

Production Budget

- Hypothesis :

- Yield: 8,8 mT/ha (3,23ton/acre)

- Selling Price: In 2008 = 45 \$ /bdt
Forecast for 2010 = 60 \$/bdt

- Budget pricing : 60 \$/mT

- Revenue hectare : 528 \$/ha \$213/acre

- Costs : 329 \$/ha \$133/acre

- Margin : 199 \$/ha \$80/acre



Production Budget

- **Main cost items:**

- Implantation: 4,66 \$/ha per yr
(12yr rotation) = 5,6 %
- Fertilizer & lime/yr : 52,40
\$/ha per yr = 15,9 %
- Harvesting (from cut to pressing) :
75,70 \$/ha = 23,0 %
- Transport : 126 \$/ha per yr =
38,3 %



Field results 2007

2007 Harvest					
	Sampled yield @ 15% M.C.	Weighed yield @ 15% M.C.		Ash on stalk	Ash in bale
Reed Canary grass	kg/ha	kg/ha	Ton/acre	%	%
Highest Value	9315	5865	2.62	7.85	5.78
Lowest Value	4680	4881	2.18	4.1	2.04
Average	7431	5374	2.40	5.19	4.27
Wheatgrass Agropyron intermedium					
Highest Value		4180	1.86	5.92	7.02
Lowest Value		2712	1.21	2.95	2.41
Average		3446	1.54	4.43	4.57
Switchgrass Dakota					
		1193	0.53		6.77

Field results 2008

2008 Harvest					
	Sampled yield @ 15% M.C.	Weighed yield @ 15% M.C.		Ash on stalk	Ash in bale
Reed Canary grass	kg/ha	kg/ha	Ton/acre	%	%
Highest Value	10515	5187	2.31	6.29	13.2
Lowest Value	5374	2406	1.07	3.46	3.86
Average	7374	4070	1.82	4.8	6.3
Wheatgrass Agropyron intermedium					
Highest Value		4630	2.06	5.46	6.88
Lowest Value		3304	1.47	3.29	3.57
Average		4217	1.88	4.18	4.79
Switchgrass Dakota					
		N/A			

What does the future hold?

- Biomass worth in a few years?
- GHG limits in Québec & elsewhere?
- Government intervention ?
- Technological advances in Burners & pellets?

Small business heating



Small business heating



Small business heating



School heating



School heating

