

FAO 1

WHAT IS THE S.A. FORESTRY INDUSTRY ALL ABOUT?

MR. MIKE EDWARDS
JUNE 2008

SOUTH AFRICA - WHERE ARE WE? FAO 2

FAO 3

FORESTRY PRE-1994

- Inward looking focus intent on self-sufficiency
- Exclusion from global economy
- Impacts of afforestation of little concern
- Environmental and social concerns not an issue
- Land readily available for planting trees
- Politics favoured the privileged
- Unlimited government support (education, research, infrastructure)
- Conservation focus, exclusion of people from the forest

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FORESTRY POST 1994

- Outward looking focus intent on globalization
- Highly regulated operating environment
- Limited government support
- Politics ensures that South Africa part of global dictates
- Global competition driver of business
- Impacts of afforestation a major concern
- Limited land available for forestry
- Focus on sustainable development and participatory forestry

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LEGISLATIVE CONTEXT

- South African forestry governed by two acts, The National Forests Act (1998) and the National Veld and Forest Fires Act (1998)
- The cornerstone of the National Forests Act is sustainable forest management – All the provisions are interpreted and applied within the framework of SFM
- The NFA defines principles to guide decisions affecting forests and also provides for the Minister to promote and enforce SFM through regulation and/or certification
- The Minister is obliged to monitor and report on the state of the forest resources at least once in three years.
- The National Veld and Forest Fires Act 1998 was put in place to prevent and combat veld, forest and mountain fires throughout South Africa. A variety of institutions, methods and practices are provided for under the Act for achieving the purposes of the Act.

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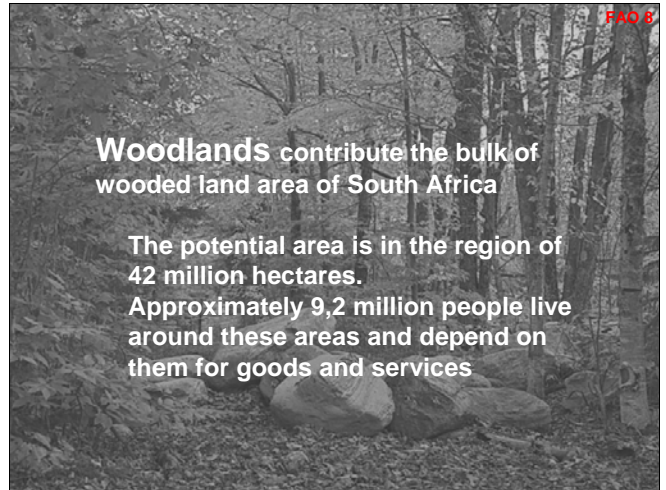
IMPORTANT SOUTH AFRICAN CHARACTERISTICS

<u>CLIMATE</u>	Generally temperate (e.g. Warm and Dry)
<u>RAINFALL</u>	Annual Average ± 460 mm 65% of country less than 500 mm/p.a. Erratic and unreliable Frequent droughts
<u>LAND USE</u>	13% only suitable for cultivation 60% semi-desert (Western parts).
<u>SOILS</u>	Generally poor and unstable
<u>POPULATION</u>	Estimated current population 48 million 57% urbanised L.T. growth rate 1.5% p.a. (i.e. double in 40 years) Unemployment rate 30% 46% of population live below poverty datum line

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COMPONENTS OF THE FORESTRY SECTOR

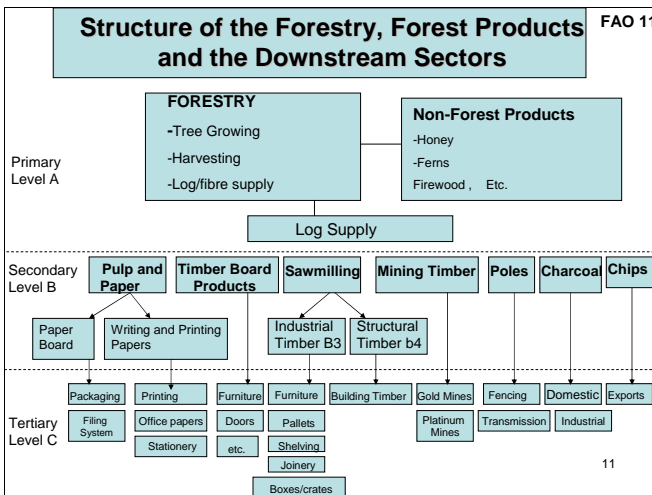
	LAND COVERAGE		UTILIZATION
	Ha's	% to Total	
Non-Commercial			
(1): Indigenous Forests	500,000	0.5%	Recreation Conservation Education
(2): Woodlands	42,000,000	35.0%	Conservation, subsistence, fuel wood
TOTAL	42,500,000	35,5%	
Commercial			
(1): Plantations	1,281,519	1,1%	Industrial production fuel wood



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SOUTH AFRICA'S FOREST RESOURCES

- Indigenous Forests cover about 470 000 hectares.
- Almost three-quarters of this forest type is conserved either as declared State forests or within formal protected areas
- Access and harvesting of products was typically restricted for decades, until significant policy shifts post 1994 when more participatory policies and programmes came into being



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PROBLEMS IN BEING ABLE TO MEET PLANTING REQUIREMENTS

- Availability of suitable land.
- Competition from Agriculture.
- Land reform imperative.
- Water licensing restrictions.
- Environmental consideration.
- No tax or afforestation incentive schemes

SA Particularly Risk Prone to Pests & Diseases

- S.A.'s entire timber production comes from plantations of fast growing exotic tree species.
- Much of the timber estate is now planted with genetically improved material.
- High growth rates, high stocking rates produce higher levels of tree stress.
- S.A. is a semi arid country with lower than average rainfall. Most plantations are situated in areas of rainfall of less than 1000 mm/p.a with periods of drought being common.
- Fire damage is severe.
- Global trade is increasing, hugely escalating threats of importation of undesirable pests and pathogens.
- Biocontrol and monitoring at ports of entry lacking.
- Movement of timber and timber products internally is uncontrolled.

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PESTS AND DISEASES

- It is estimated that at least 50% of Plantations are affected.
- Frequency and intensity escalating
- Lose up to 20,000/p.a. as result.

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DAMAGE TO PLANTATIONS BY FIRES 1980 TO 2007

Total area damaged to 2006	- 733,000 ha
Total area damaged by fire to 2006	- 387,000 ha (53%)
Average fire damage 1980 to 2006	- 14,300 ha p.a.

THE ABOVE SAYS IT ALL

FAO 29

(3) CLIMATE CHANGE

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CLIMATE CHANGE IS NOT A MYTH, IT IS A REALITY*

Recommendations from S.A. Forestry Climate Change Study.

- (1): Seriously consider mixing species.
- (2): Match species to site for both soil and climate reasons.
- (3): Include climate change predictions in species selection.
- (4): increase research into temperature tolerant and drought resistant hybrids.
- (5): Increase research efforts on climate change.

BUT REPORT SAYS

- (1): Hybrids more robust than commonly planted species.
- (2): Pinus family is most robust to climate change

THE PULP AND PAPER SUB-SECTOR

FAO 31

FAO 38

CONTRIBUTION FROM A SOCIAL PERSPECTIVE

Estimated Sawmilling Employment

Estimated Employment	20,000
Estimated Remuneration	R304 million / p.a.
Employees Plus Dependents	100,000

Environmental Impacts

Item	Cost/Impact (R mill/p.a.)
Energy Usage	R 34.5
Landfill Waste	R 92.2
Air Emissions	R 7.2
Water Quality	Not Quantified
Total Environmental Cost	R 133.9

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OTHER SUB-SECTORS

- WOODCHIPS
- BOARD PRODUCTS
- MINING TIMBER
- TREATED POLES
- CHARCOAL

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OVERVIEW OF FINDINGS

Benefit/Cost Contribution	Value (R mill./p.a.)		
Value addition ex Production	R2,055		
Less: Environmental Impact Cost	R 807		
Net Economic Contribution/GDP	R1,248		

RSA GDP	1,248,730	1,248	0,1%
Manufacturing	219,234	1,248	0,6%

Net Foreign Trade Earnings R 2 billion

Estimated Employment	19,200
Estimated Remuneration	R532 million / p.a.
Employees Plus Dependents	96,000



FAO 42

OVERVIEW OF FINDINGS - ALL SUB-SECTORS

1. Net Economic Contribution

Benefit/Cost Contribution	Value (R mill./p.a.)
Value addition ex Production	12,274
Less: Environmental Impact Cost	2,352
Net Economic Contribution	9,922

2. Contribution to GDP

Sector GDP	Total R Million	Sector	Sector % to Total
RSA GDP	1,248,730	12,274	1,0%
Agricultural GDP	39,473	2,921	7.4%
Manufacturing GDP	219,234	9,353	4,3%

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OVERVIEW OF FINDINGS - ALL SUB-SECTORS (Cont.)

3. Contribution to Employment

Total Employment Creation	170,025
Total Remuneration	R 4,136 million
No of persons Dependent on Industry for their livelihood	867,924

4. Forex Earnings

Net Foreign Exchange Earnings	R 6,960 million
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CONCLUSIONS

- (1): The FTTP cluster makes a significant contribution to the S.A. economy.
- (2): Pro-poor development potential is inherent in the cluster and BBBEE opportunities are considerable.
- (3): Growth in downstream processing is dependent on growth in plantations.
- (4): Economic and socio-economic benefits far outweigh environmental costs.
- (5): Inequities in the water regulatory environment in particular are impacting on development potential of the cluster and need to be reconsidered.

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A sector growth and development strategy must be developed and implemented

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FOREST SECTOR CHALLENGES

1. Greater equity in the entire value chain
2. Increase in the local supply of roundwood to underpin growth throughout the value chain
3. Sustainable supply and better utilisation of limited saw-timber resources
4. Increased local beneficiation
5. Greater empowerment and profitability of existing small scale forest enterprises
6. Linking forestry as a rural based industry with poverty eradication and local economic development

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OPPORTUNITIES

- Forestry Transformation Charter
- Sector agreement on Charter as medium term strategy for forestry
 - ✓ Growth and transformation charter
 - ✓ Addresses sector challenges
 - Growth of sector
 - Roundwood shortage
 - Land reform
 - Skills shortage
 - Access to finance for emerging entrepreneurs
 - Forest protection
 - Research and innovation
 - Local beneficiation
 - Empowerment of emerging black entrepreneurs

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Geographic Location of Forests

FORESTRY SOUTH AFRICA

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SA Commercial Forestry Estate

- ▲ 100% plantation based
- ▲ Genera & species planted
 - ▲ Pines: *P patula, P elliottii, P taeda, P radiata*
 - ▲ Eucalypts: *E grandis, E nitens, E macarthurii*
 - ▲ Acacia: *A mearnsii*
- ▲ Rotation lengths
 - ▲ Pines: Sawlogs (25-28 yrs) Pulpwood (12-18 yrs)
 - ▲ Eucalypts: Sawlogs (25-28 yrs) Pulpwood (7-10 yrs)
 - ▲ Acacia: Pulpwood (8-11 yrs)
- ▲ Yields (m³/ha/yr)
 - ▲ Pines: 16 - 18
 - ▲ Eucalypts: 18 - 35
 - ▲ Acacia: 8 - 11

FORESTRY SOUTH AFRICA

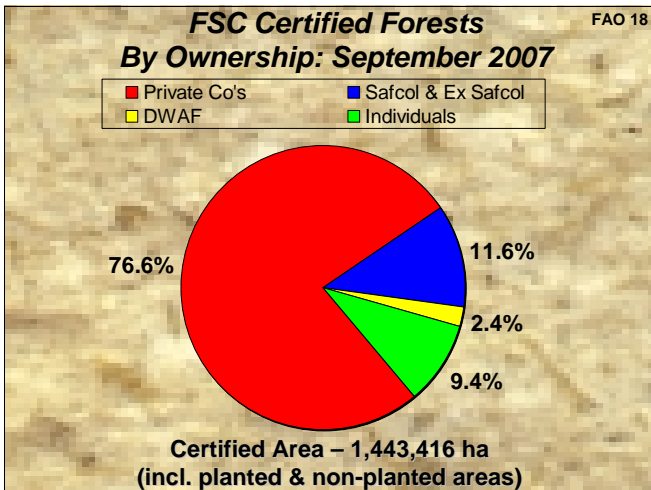
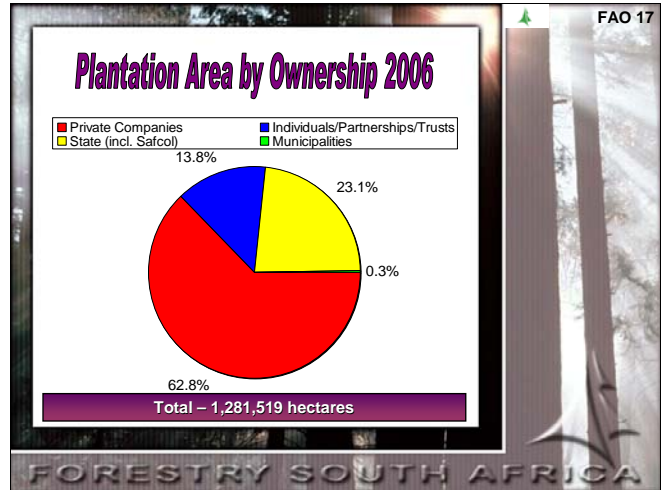
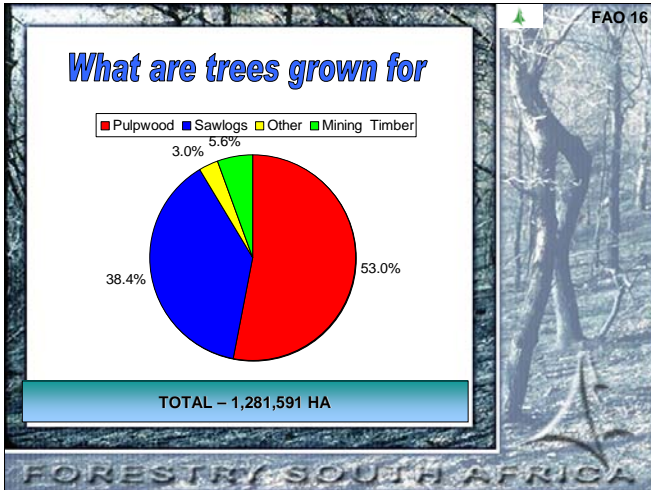
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Plantation Area by Genera, 2006

Genus	Percentage
Pine	53.7%
Eucalyptus	37.3%
Wattle	8.2%
Other	0.8%

TOTAL – 1,281,519 ha

FORESTRY SOUTH AFRICA



WHAT DO WE PRODUCE FROM PLANTATIONS

Product	Production		% to Total m ³
	M ³	tons	
Sawlogs	5,778,023	6,159,976	25,3%
Poles	478,793	345,210	2,1%
Mining Timber	911,007	634,592	4,0%
Pulpwood	15,182,720	12,046,402	66,5%
Other	476,648	386,829	2,1%
Total	22,827,191	19,573,009	100,0%

(82% of total comes from, privately owned plantations)

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CONTRIBUTION TO THE S.A. ECONOMY

1. Value Addition

Value of Production (i.e. output of Plantations)	R5,100 m
Less: Input Costs (Excl. Labour Cost)	R2,434 m
Plus: Adjustment for VAT	R 255 m
∴ NET VALUE ADDITION/GDP	R2,921 m

2. Contribution to GDP

Sector GDP	Total	Forestry	For. as % of Total
R.S.A. GDP	R 1,248,730 m	R 2,921 m	0.23%
Primary Sector GDP	R 121,708 m	R 2,921 m	2.40%
Agricultural GDP	R 39,473 m	R 2,921 m	7.40%

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CONTRIBUTION FROM A SOCIAL PERSPECTIVE

Contribution to Employment

Type of Employment	Numbers
Direct (e.g. Co. employment)	37,469
Indirect (e.g. contractors)	30,000
Small Growers - owners	31,500
- employees	7,875
Total Employment	106,844

Total Remuneration	R1,2 billion
Employees & Dependents	576,000

FAO 21

FAO 22

ENVIRONMENTAL IMPACT OF PLANTATION FORESTRY

Impact	Estimated net cost (R)
Stream flow reduction (CSIR assessment)	Fully internalised
Plantation waste	Not significant
Carbon sequestration	+R89,3 million
Air emissions :Forestry transport	-R34,8 million
Biodiversity	Not quantified. Lower than annual agricultural crops
Water quality (as affected by fertilizer use)	Not significant
Soil (fertilizer)	Not significant
Soil erosion	Not quantified. Lower than annual agricultural crops
Total Benefit	+R54.5 million

THE INDUSTRY HOWEVER HAS

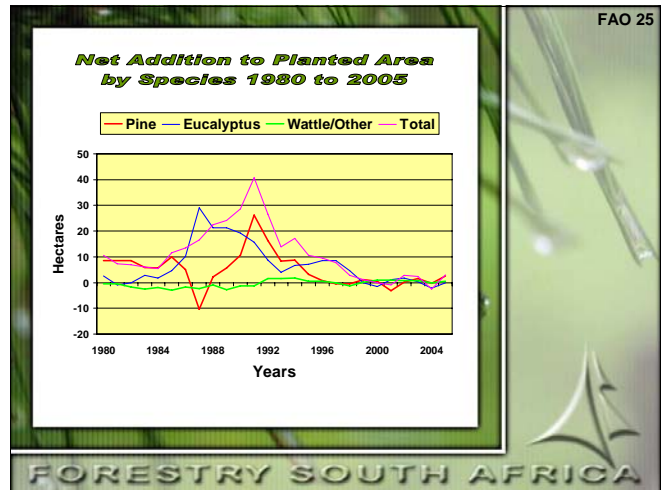
- (1): THE NEED TO INCREASE ITS PRODUCTION.
- (2): THE NEED TO PROTECT PLANTATIONS FROM PEST AND DISEASES.
- (3): THE NEED TO REDUCE LOSSES THROUGH FIRES.
- (4): THE NEED TO UNDERSTAND IMPACTS OF CLIMATE CHANGE

FAO 23

INCREASED PRODUCTION LONG TERM DEMAND AND SUPPLY SCENARIO

Five Year Period	Total Supply (tons)	Total Demand (tons)	Surplus (+)/Deficit(-) (tons)	(%)
2005-2009	20,550,761	23,249,214	-2,698,453	-13.1
2010 - 2014	20,087,199	23,932,910	-3,845,711	-19.1
2015 - 2019	18,609,931	24,650,053	-6,040,122	-32.5
2020 - 2024	19,454,356	25,448,516	-5,994,160	-30.8
2025 - 2029	18,666,332	26,372,899	-7,706,567	-41.3
2030 - 2034	18,134,701	27,501,409	-9,366,708	-51.7
Estimated sustainable supply:	19,250,547	25,192,500	-5,941,953	-23.2

FAO 24






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World Food Security, Planted Forests and Bioenergy

BRAZIL

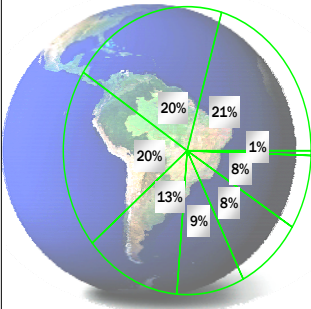
June, 2008

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Brazilian Geographic Distribution (Occupation)



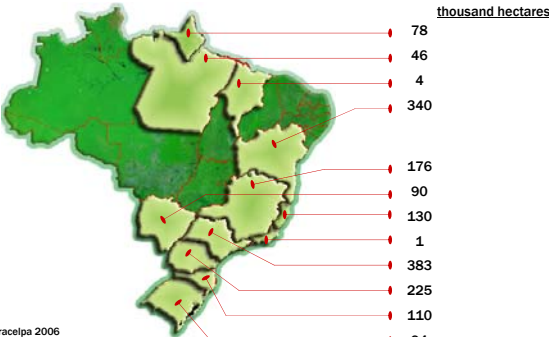
	2007	Million Hectares	Share %
Federal and State Conservation Areas		176	20.7%
Grazing Areas (comprising Pasture)		172	20.2%
"Devolutionary" and other uses		171	20.1%
Indigenous Areas		107	12.6%
Rural Settlements		77	9.0%
Agriculture (crops)		72	8.5%
Available for agriculture (not comprising Amazon Forest)		71	8.4%
Planted Forests		5	0.6%
BRAZIL		851	100%

Source: IBGE, MAPA, Conab, ABRAF, INCRA and MMA

2

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Planted Forests by the Pulp and Paper Industry Brazilian States 1.7 million hectares




State	thousand hectares
AC	78
AP	46
DF	4
ES	340
GO	176
MA	90
MG	130
MS	1
MT	383
PA	225
PR	110
RS	94

Source: Bracelpa 2006

3

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Brazilian Lands - Biomass



- Tropical Rain Forest (Amazon)
- Swampland (Pantanal)
- Savanna (Cerrado)
- Tropical Semideciduous (Mata Atlantica)
- Thorny Scrub (Caatinga)
- Grassland (Pampa)

Source: IBGE

4

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Contribution to the Environment by the Sector's Planted Forests

- ✓ 1.7 million hectares of planted area for industrial use
- ✓ 2.8 million hectares of preserved forests
- ✓ Total certified forest area: 2.2 million hectares
- ✓ Planted forests do not compete with traditional agriculture
- ✓ Restoration of degraded land
- ✓ Soil conservation
- ✓ Using land not fit for agriculture
- ✓ Mixing plantations and natural forests
- ✓ Biodiversity protection
- ✓ Watershed protection
- ✓ CO₂ sequestration
- ✓ Less pressure on natural forests



5

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Brazilian Forests Certification

- ✓ 2.2 million hectares of pulp and paper industry forests certified.
- ✓ 6.0 million hectares of certified forests in Brazil.



- ✓ Brazilian certification by CERFLOR/PEFC is recognized internationally.
- ✓ Brazilian forests are also certified by FSC.

6

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Brazilian Planted Forests – Productivity Evolution

REASONS FOR HIGH PRODUCTIVITY LEVELS

- ✓ Climate and soil
- ✓ Research
- ✓ Organized private sector
- ✓ High qualified labor force

TECHNOLOGICAL ADVANCES

- ✓ Genetics
- ✓ Biotechnology
- ✓ High quality raw material
- ✓ Socio-environmental planning
- ✓ Sustainable Forest Management
- ✓ Rotation


WOOD FOR PULP PRODUCTION					
Productivity (m ³ /ha/year)					
	1980	2006	Growth Rate	Potential	Growth Rate
• Eucalyptus	24	39	63%	50	108%
• Pinus	19	30	58%	40	111%

7

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Brazilian Pulp and Paper Sector Carbon Sequestration

1.7 Million hectares of Planted Forests



1 hectare (eucalyptus)
= 18 tons of CO₂ (absorbed) / per year

Absorption

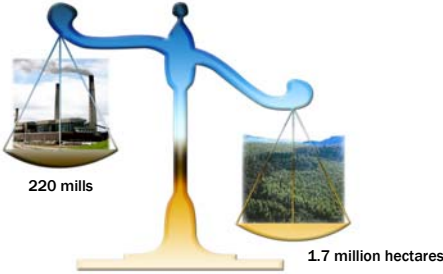
1.7 million ha x 18 = 30.6 billion tons

8

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Brazilian Pulp and Paper Sector Carbon Sequestration Balance

Emission 1 ton = Absorption 3 tons



220 mills

1.7 million hectares

9

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Pulp and Paper Industry Main Investments - Brazil 2007

Completed			
	Location	Product	US\$ Million
Aracruz	ES	Market Pulp	200
Bahia Pulp	BA	Dissolving Pulp	400
Suzano	BA	Market Pulp	1,350
Klabin	PR	Paperboard	1,090
Total			3,040

2008 - 2009 Ongoing			
	Location	Product	US\$ Million
VCP	MS	Market Pulp	1,500
International Paper	MS	Printing and Writing Paper	260
Total			1,760

2010 - 2012 Investment Planned			
	Location	Product	US\$ Million
Aracruz (*)	RS	Market Pulp	1,800
Veracel	BA	Market Pulp	1,500
VCP	RS	Market Pulp	1,500
Conibra	MG	Market Pulp	680
Stora Enso	RS	Market Pulp	1,500
Total			6,980

(*) Approved Project. Start up in August/2010.

10

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Pulp and Paper Investment Program 2003 - 2012

	Original Program			Finished	Revised Program		
	2003	Forecast 2012	Change 2012/2003	2003 - 2007	Investments Planned 2008 - 2012	Forecast 2003 - 2012	Change 2012/2003
Investments (US\$ billion)		14.4		6.5	8.7	15.2	
Production (Million tons)							
- Pulp	9.1	14.5	59%	11.9		17.5	92%
- Paper	7.9	11.5	46%	9.0		11.5	46%
Exports (Million tons)							
- Pulp	4.5	7.4	64%	6.6		10.5	133%
- Paper	1.8	2.0	11%	2.0		2.0	11%
Exports (US\$ billion)							
- Pulp/Paper	2.8	4.3	54%	4.7		7.5	168%

11

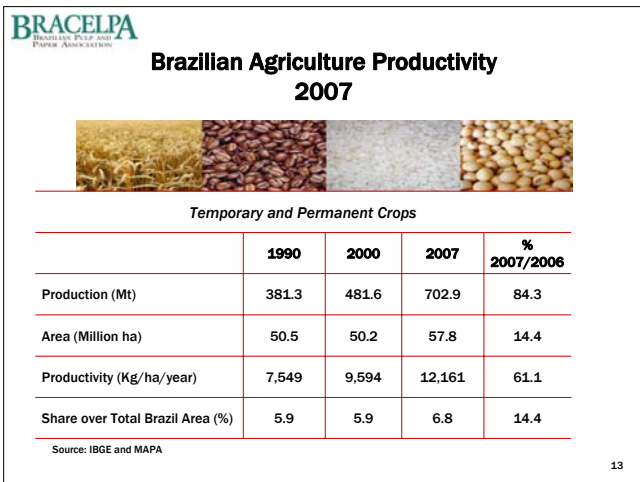
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Brazilian Agribusiness Map

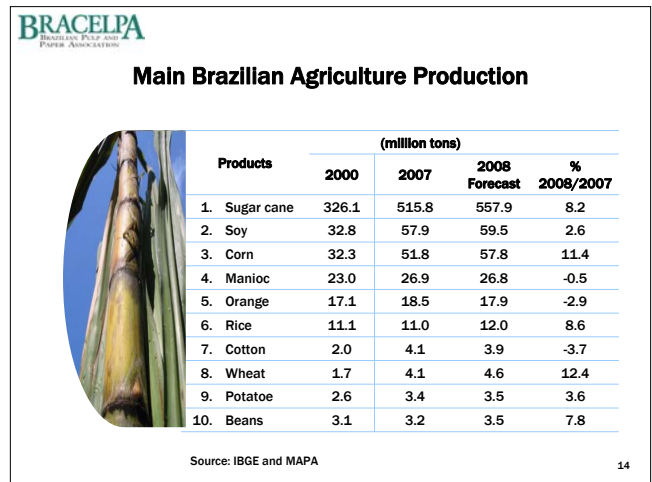


- Mixed Culture - Policultura
- Grains Culture - Culturas de grãos
- Monoculture - Monocultura
- Mixed Culture and Livestock - Culturas diversificadas e de criação
- Grains Culture and Livestock - Culturas de grãos e de criação
- Mixed Culture and Livestock - Policulturas criação
- Improved Livestock - Criação melhorada
- Extensive Livestock - Criação extensiva
- Extensive Livestock and Mixed Culture - Criação extensiva e policultura
- Forests - Florestas
- Extractivism - Extrativismo
- Dairy Cattle - Concentração leiteira

12



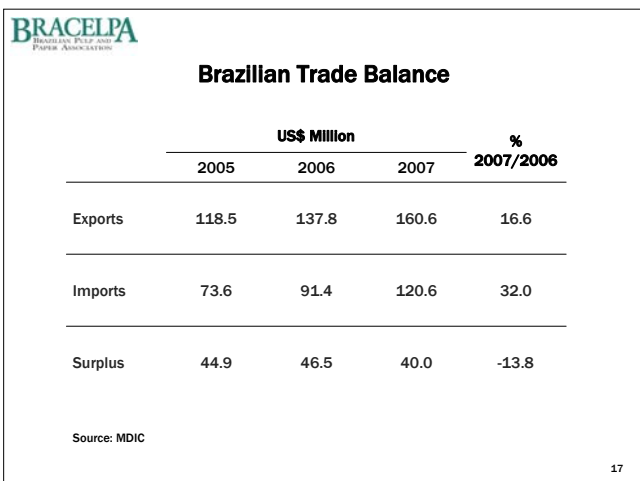
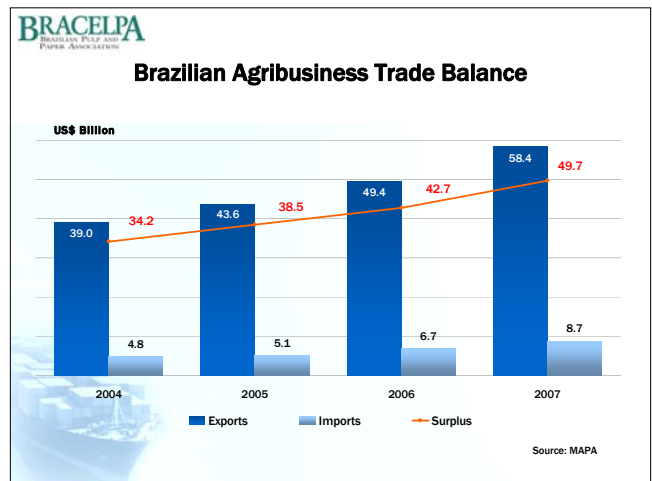
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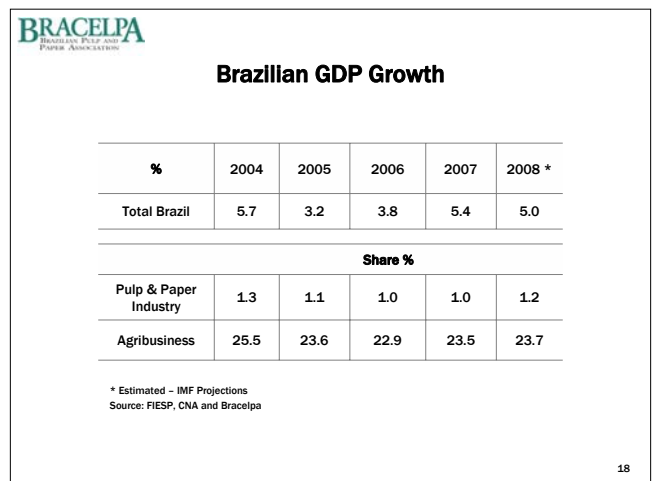
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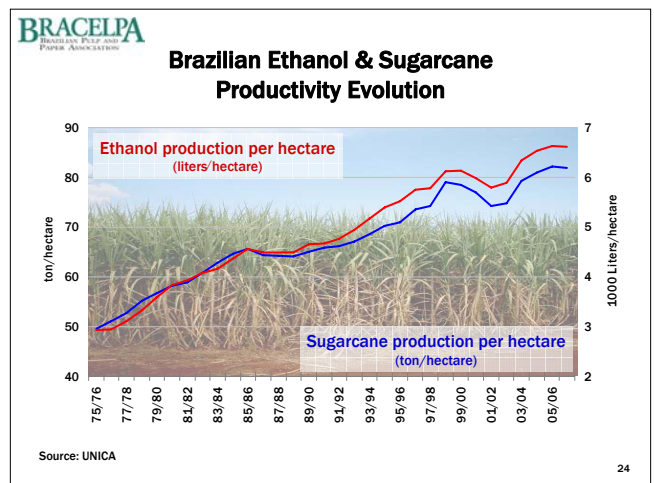
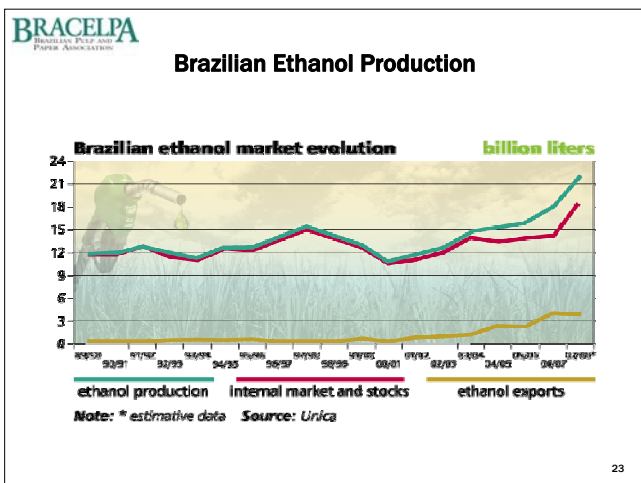
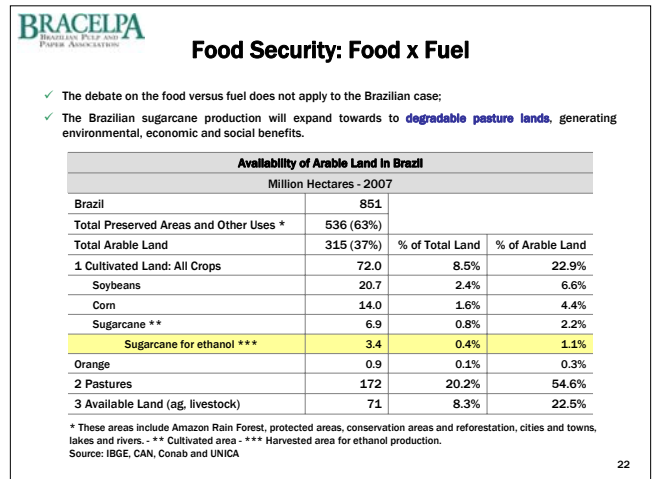
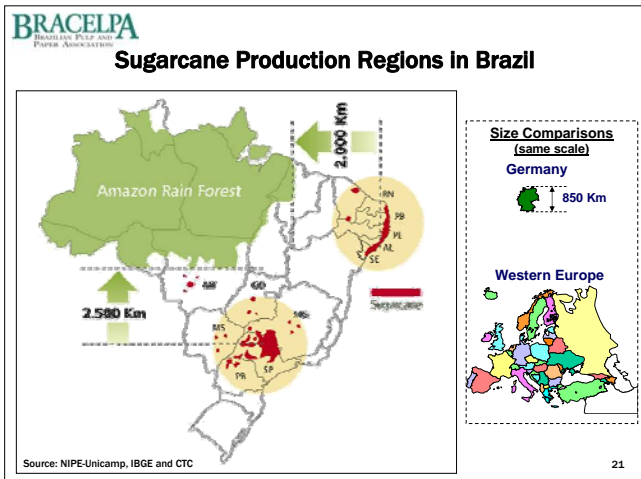
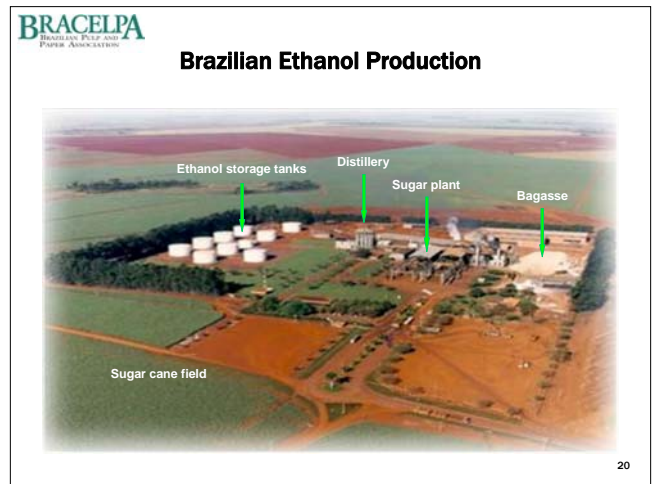
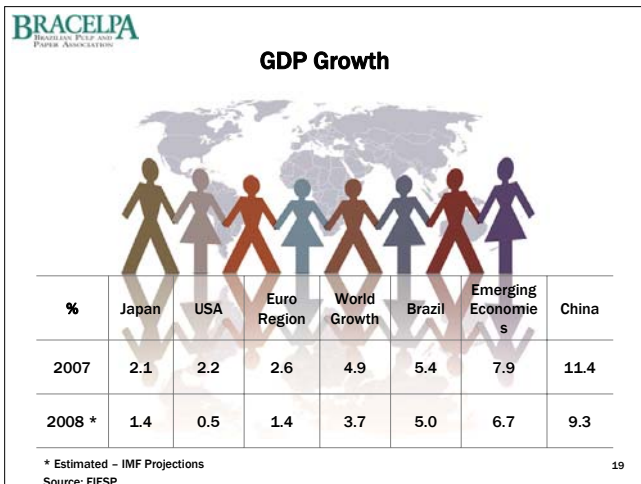
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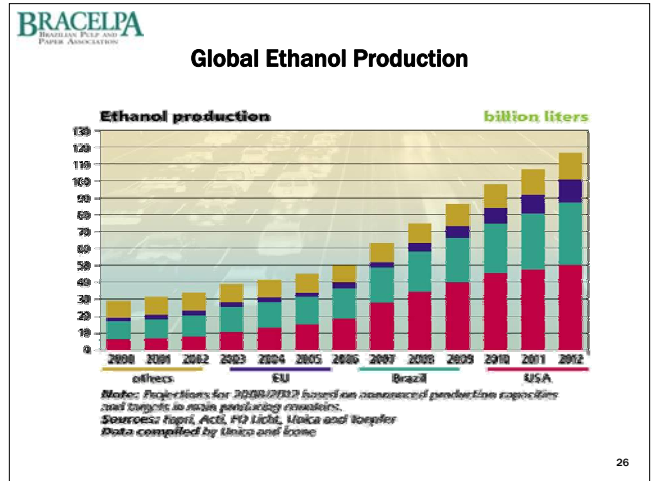
Expected Sugarcane Industry Expansion

	2006/07	2010/11	2015/16	2020/21
Sugar Cane Production (M t)	430	601	829	1,038
Cultivated area (M ha)	6.3	8.5	11.4	13.9
Sugar (million t)	30.2	34.6	41.3	48.0
Domestic Market	9.9	10.5	11.4	12.1
Export	20.3	24.1	29.9	32.9
Ethanol (billion liters)	17.9	29.7	46.9	65.3
Domestic Market	14.2	23.2	34.6	49.6
Export	3.7	6.5	12.3	15.7
Bioelectricity (MW)	1,400	3,300	11,500	14,400
Share (%)	3%	6%	15%	15%

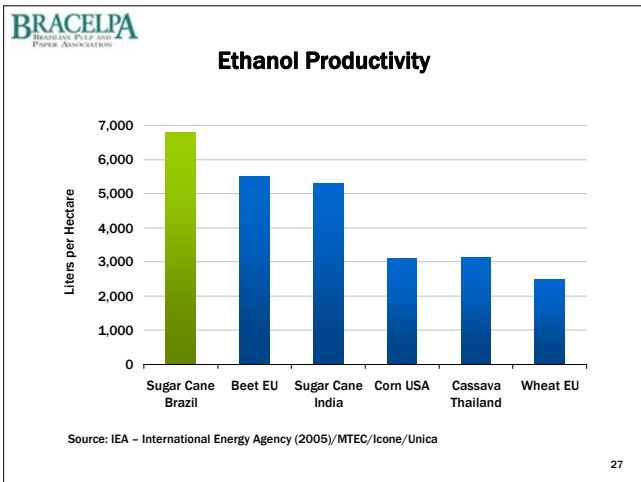
Expansion is being carried out mostly in reclaimed pasture land in the Center-South Region

Source: UNICA, COPERSUCAR and COGEN

25



26



27

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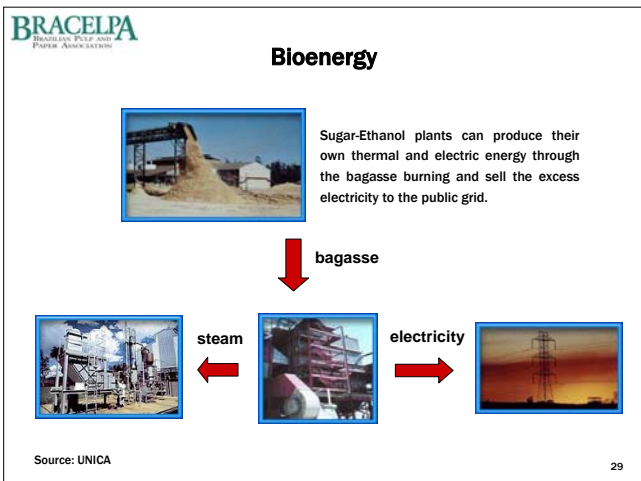
Energy Balance

Feedstock	Renewable Energy Output / Fossil Energy Input
Wheat (EU)	1.2
Cassava (Asia)	1.2
Beet Sugar (EU)	1.9
Corn (USA)	1.3 - 1.8
Sugarcane (Brazil)	8.3

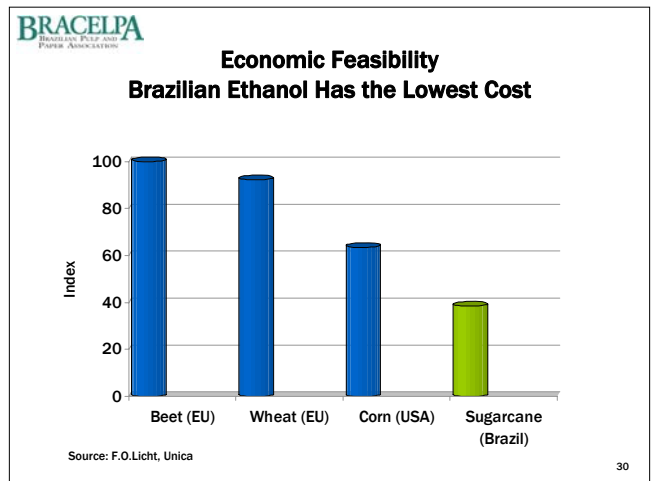
Gasoline/Diesel 0.8 (fossil energy output/fossil energy input)

Note: Data refers to life-cycle energy balance
Source: F.O. Licht, Macedo, I et alii 2004, NREL 2002

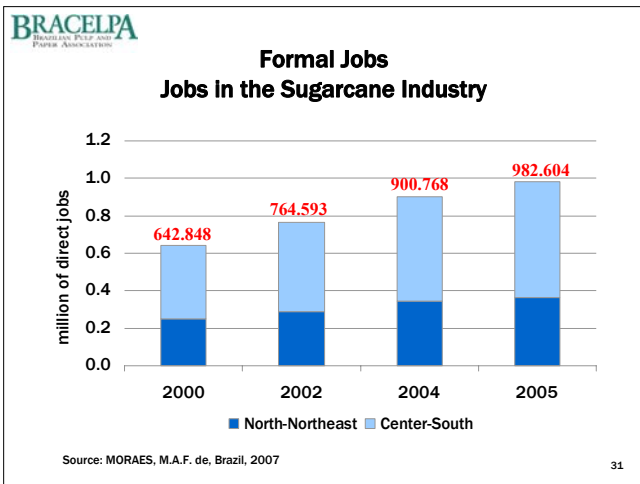
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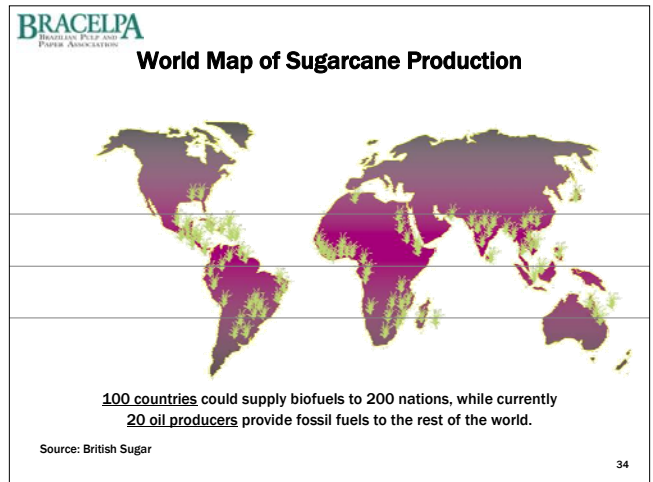
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	Ethanol	Gasoline
Sulfur content & sulfur compounds emission	☺	☹ \$\$\$
CO ₂ , CO, VOC and fine particles	☺	☹
NOx	☺	☹
Volatility	☺ / ☺ ☺	☹
Toxicity of fuel & combustion products	☺	☹ \$\$\$
Life-cycle Greenhouse impact	☺	☹ \$\$\$
Renewability	☺	☹
Biodegradability in soil & water	☺	☹ \$\$\$

Up to 5% Ethanol	Up to 10% Ethanol	More than 10%
European Union (moving to 10%) (?) India (moving to 10%) Philippines Ecuador Bolivia Japan (E-3/ETBE-7)	USA, Canada, China, Thailand, Australia, Pakistan, Colombia, Peru, Venezuela, Jamaica, Dominican Republic, South Africa, Ethiopia Nigeria, South Korea	Brazil (25%) Paraguay Malawi USA** Canada** Sweden** UK**

Programs at different stages of development
 ** Flex-fuel vehicles



Flex Fuel Vehicles (FFV)
 Introduced in the Brazilian Market in March of 2003

These vehicles are designed to be fueled with gasoline, ethanol or any blend of gasoline with ethanol.

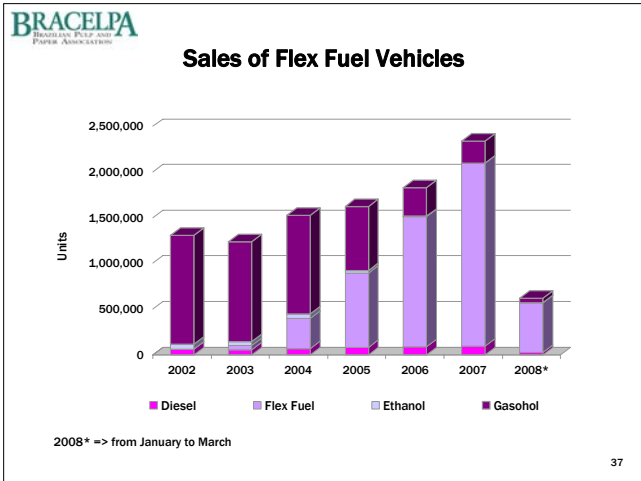
At this moment: 10 brands and 63 models.

Images of cars from brands: Chevrolet, Fiat, Renault, Honda, Volkswagen, Peugeot, Citroën, Toyota, and VW.

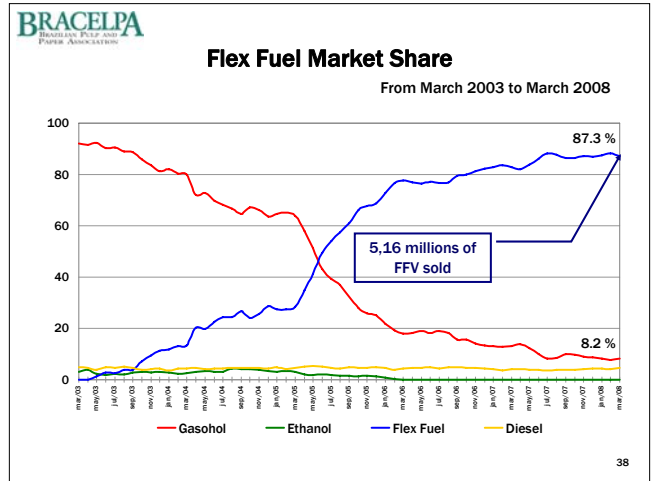
Flex Fuel Vehicles (FFV)

- ✓ The Total Flex Vehicles are designed to be indistinctly fueled with gasoline, ethanol or any blend of these two fuels.
- ✓ For the customers, the meaning of the Total Flex Vehicles is to choose the fuel at each vehicle refueling, according to fuel price, characteristics of quality, performance or even availability.

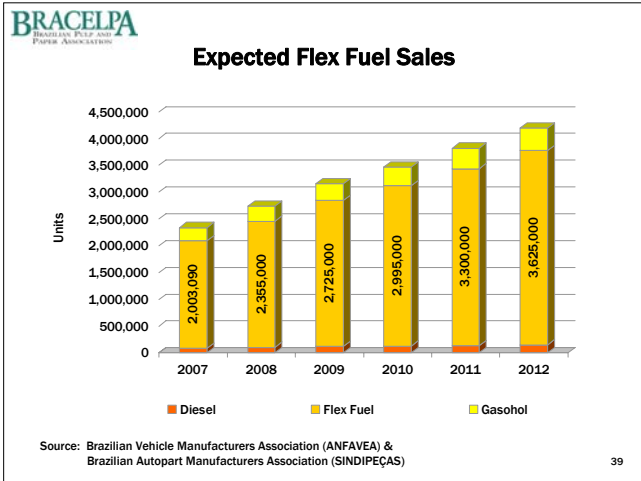
Images: GASOLINE pump, ALCOHOL pump, and a question mark icon.



37



38



39



40



41

NZ Perspective on Biofuels and Food Security

Presentation to ACPWP
10 June, Bakubung, South Africa.

David Rhodes, Chief Executive Officer
New Zealand Forest Owners Association

International trends and issues

- Trend is up (US\$38B investment now, US\$100B by 2010)
- Strongly influenced by subsidies and policies
- Much global debate now about sustainability of this.
- Causes distortions in the supply of biofuels
- Biofuels are also contributing to food price crisis
- It is an emotive issue and FAO has been outspoken
- Role of wood is underutilised

International impact on NZ

- Corn production for ethanol production in the US estimated 33% by 2009
- Corn is a primary feed source for dairy which has flowed through to NZ land prices

NZ Government policy and issues

- Biofuels Bill before parliament (3.4% by 2012)
- Opposition widespread
- Key issues – CO2 emissions not accounted for, negative impact on domestic production
- New sustainability standard proposed but no international benchmark

Forestry biofuel potential in NZ

- Currently only surplus material used for biofuel but many wood processors use residues
- Estimated 35PJ of energy from forest biofuel out of total energy from renewable of 237PJ
- Subsidies elsewhere act against development of the resource
- Significant quantity available for use. Scion estimate enough for commercial scale ethanol refinery

Conclusions

- Biofuel will be important but current policies are creating distortions
- Greater focus needed on forestry biofuel potential
- Biofuel strategies that determine land use outcomes need aligning with social strategies and avoid negative impacts on other sectors

Potential upside

- NZ whey is used to produce methanol
- The other use of this is in NZ Vodka
- What will this mean for the price of Vodka?



U.S. Climate Change & Bioenergy Policy

Donna Harman

President & CEO

American Forest & Paper Association

June 10, 2008



Voluntary Industry Actions

- Climate VISION –
 - U.S. power and energy-intensive industrial sectors improved their combined emissions intensity by 9.4% during 2002-2006. In 2006, GHG emissions for these sectors fell a combined 1.4%.
 - AF&PA members have reduced the intensity of their CO₂ emissions by 14% from 2000 to 2006.

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2

Federal Regulation of CO₂

- EPA to decide on endangerment finding
- EPA developing a mandatory rule for all sectors of the economy to report GHG emissions – proposed rule due in September
- Transportation Department raises fuel efficiency standard for cars by 25% by 2015
- Interior Department lists Polar Bear as a “threatened” species under the Endangered Species Act

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3

State and Regional Regulations

- The Western Climate Initiative
- California – AB32 Implementation
- Midwestern Climate Initiative
- Northeast Greenhouse Gas Reduction Accord
- Washington – SB2518

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4

Lieberman-Warner Bill

- Lieberman-Warner Bill in Senate (revised as Boxer bill)
 - Mandatory cap and trade program
 - Approved by Senate Environment and Public Works Committee December 5, 2007
 - Debated on the Senate floor 1st week of June
 - Not particularly friendly to industry
- AF&PA is working with coalition of energy-intensive manufacturing industries in advancing changes to limit economic burden

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5

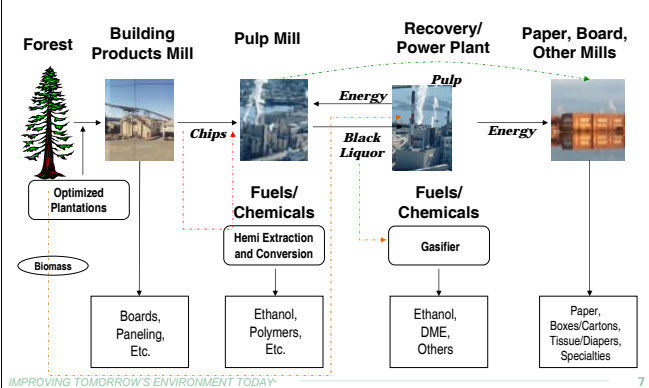
A Strong Record On Energy Efficiency

- Seventy-four percent of U.S. wood products facility energy requirements are supplied by biofuel
- Sixty-four percent of pulp and paper mill energy needs are met by renewable energy including wood waste and black liquors
- Fossil fuel use per ton of paper production has declined by 56% since 1972 and 9% between 2004 and 2006
- Nearly 90% of the electricity generated at U.S. pulp and paper mills is cogenerated

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6

Agenda 2020: Integrated Forest Products Biorefinery (IFBP) Concept



AF&PA Biomass Policy

- Market forces should be primary stimulant for use of wood and wood waste.
 - Incentives or mandates for renewable energy should maintain regional agricultural and silvicultural capability and consider impacts to existing regional fiber markets.
 - Federal R&D efforts for breakthrough technologies.
 - Access to forest debris from public lands for biomass energy.
 - Tax credits for renewable energy should be transparent.
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National Policy Driving Bioenergy Production

- Energy Policy Act of 2005
 - Energy Independence and Security Act of 2007
 - Food, Conservation and Energy Act of 2008 – 'Farm Bill'
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Experience of Corn Ethanol

- Increasingly used in U.S.
 - Government Policies Drive Production
 - Lesson for cellulosic ethanol?
- IMPROVING TOMORROW'S ENVIRONMENT TODAY 10