

Argentina Vision on Biofuels Sustainability

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Conclusions

- Every little step counts
- Social involvement is necessary
- Biofuels are here to stay
- If we go for electric cars still we will need jet kerosene that can be produced as biodiesel
- Biomass can be used for biofuels, but also for electricity and heat, and for chemicals
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Holistic approach on Energy production and use

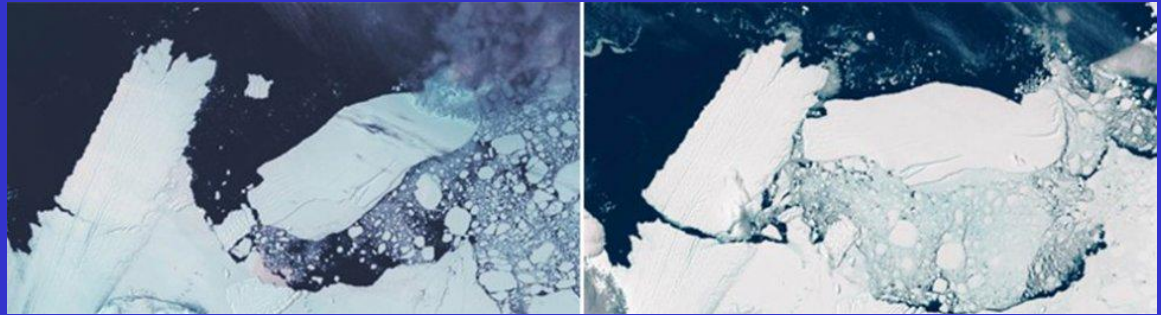
- Energy Sources

- Electricity

- Gas and fuels
 - Atomic
 - Hydroelectric
 - Wind, solar, geothermal, biomass
 - Savings through improved efficiency

- Fuels

- Fossil fuels
 - Renewables
 - Non conventional



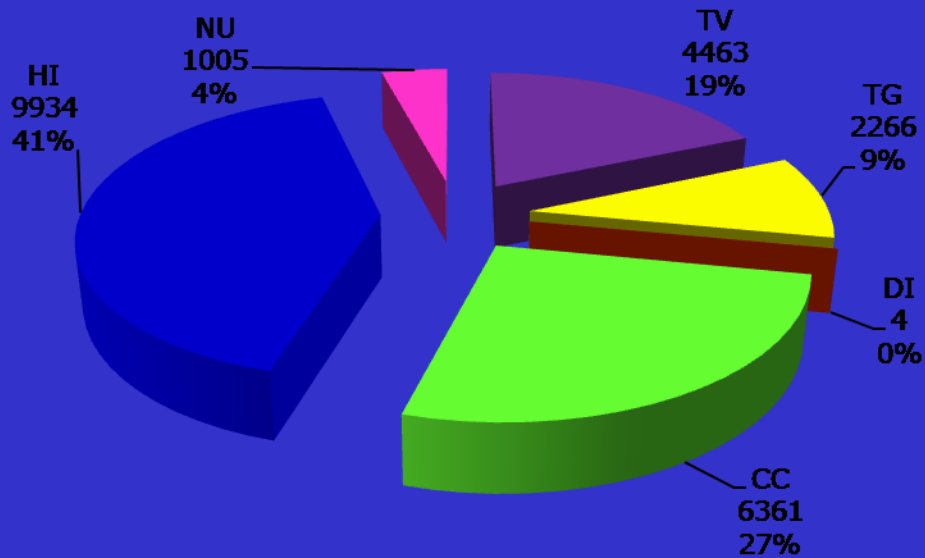




Holistic approach on Energy production and use

- Energy transport
 - Electric grid
 - Distance from source to use
- Social habits and perceptions
 - Transportation
 - Dwellings
 - Food vs Fuels
- Concentrated vs distributed energy production
- Legal framework
 - Legislation
 - Norms

POTENCIA INSTALADA

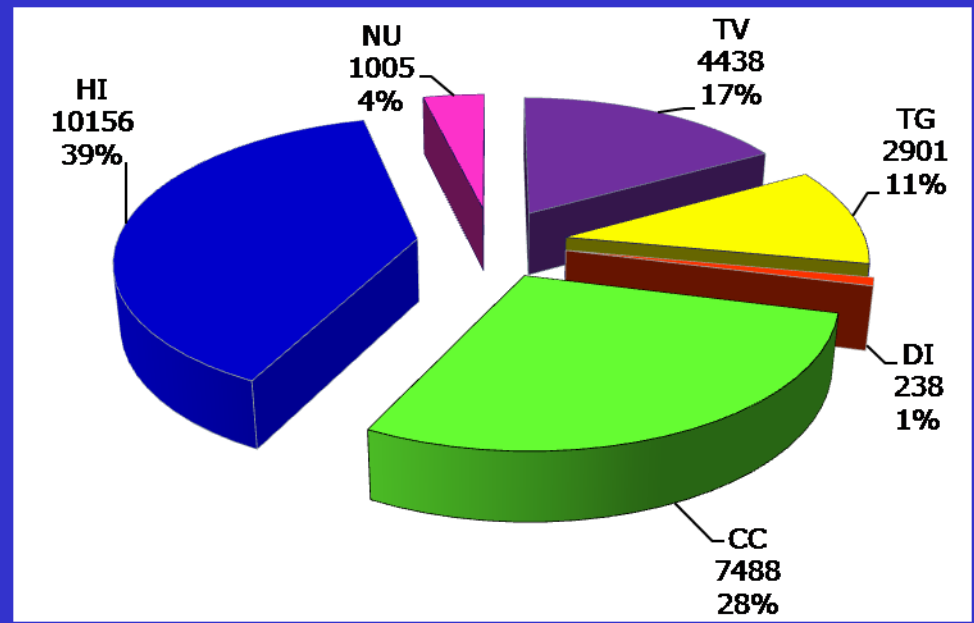


Potencia Instalada 2006

24350 MW

Potencia Instalada 2008

26226 MW



Some facts

- 1 Wood for cooking is one of the factors of deforestation in poor parts of the country
- 2 Revival of atomic energy
- 3. New hydroelectric plants
- 4. Contract of 1,000 Mw of new electric plants with renewables
- Introduction of solar cooking systems and efficient ovens
- One central to be finished – Other to be built completely with local technology

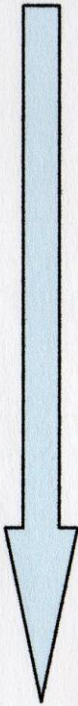
Fuels Use

- Electricity Generation
 - Gas: 71
 - Fuels: 29
 - Coal : zero
- Land Transportation
 - Diesel aprox 15 Million m³
 - Gasoline aprox 8 Million m³
- Agriculture
 - Diesel: 4.9 Million m³ (This is the target for small plants for private use)
 - Gasoline: -----

Fossil fuel use in Argentina

Producto	Participación
Gasoil	50,6%
Naftas	32,6%
Combustibles para aviones (JP-1)	7,6%
Fuel Oil	4,8%
Asfalto	2,3%
Kerosene	2,1%
TOTAL	100%

Use of gasoil in Argentina

Producto	Participación	Demanda (m3)	Proyección 2010
Transporte de Cargas	41%	5.000.000	
Sector Agropecuario	37%	4.500.000	
Automotores Diesel	14%	1.700.000	
Transporte Urbano de Pasajeros	6,5%	830.000	
Transporte Interurbano de Pasajeros	1,5%	210.000	
Total	100%	12.240.000	15.000.000



Liquid biofuels in this context

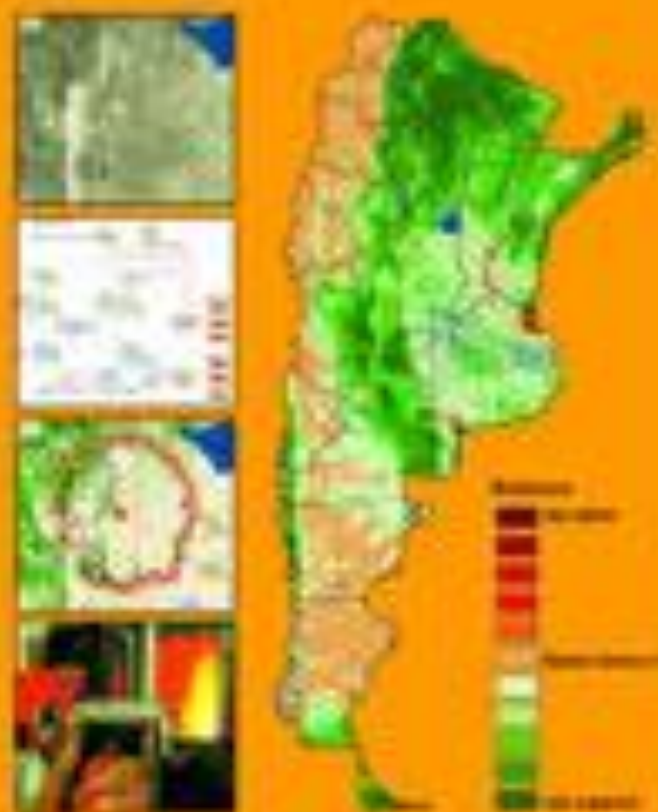
Renewable fuels Use

- Electricity Generation
 - Biogas and wood (Starting to be used in connection with animal and agricultural wastes)
- Land Transportation
 - Diesel: 20 Million Tones
 - Gasoline: 8 Million Tones
- Agriculture
 - Diesel 95%
 - Gasoline 5%
 - Others (Biogas)

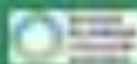
Análisis del Balance de Energía derivada de Biomasa en Argentina

- WISDOM Argentina -

Informe Final



FAO Departamento Forestal
Desarrollo

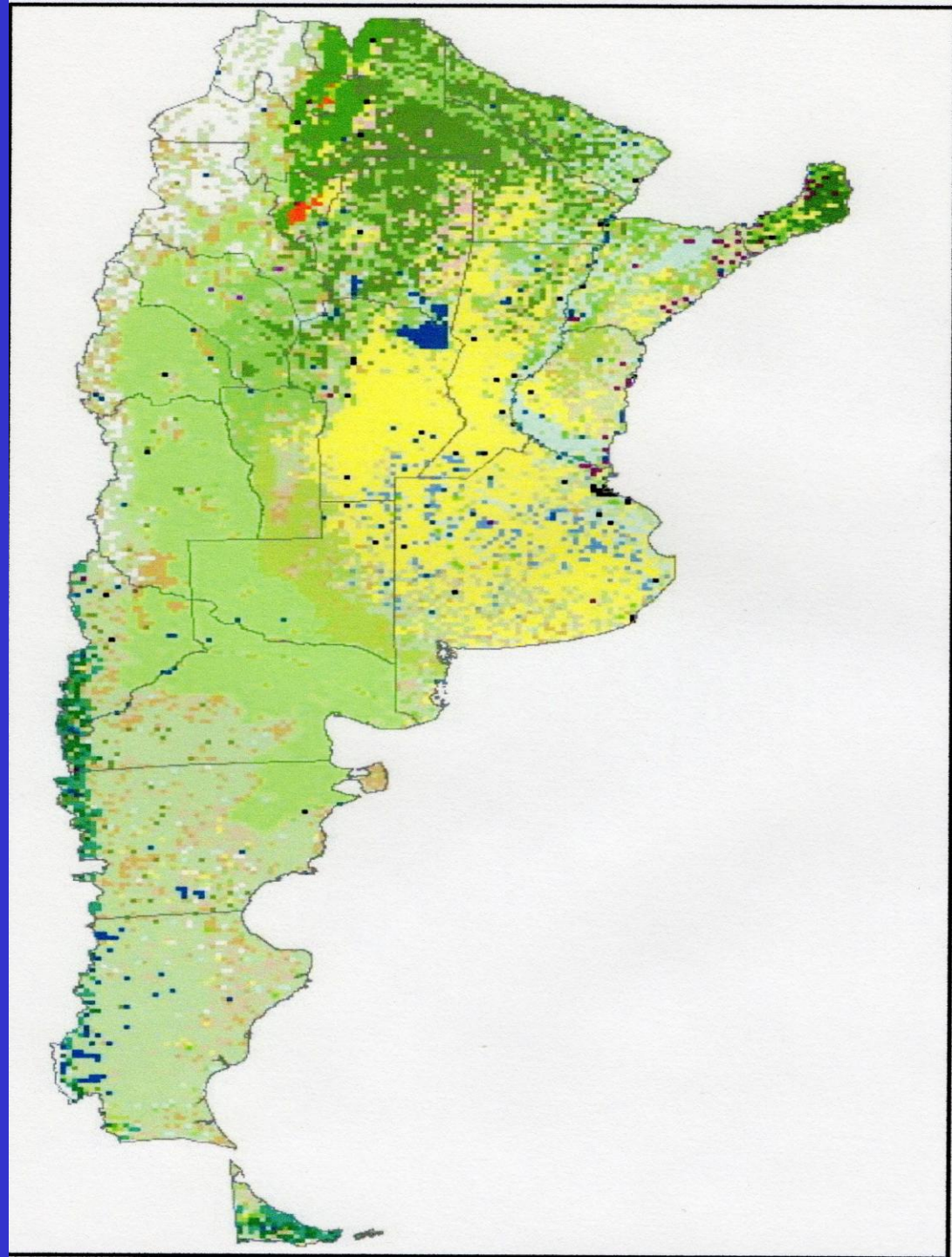


**Biomass distribution.
The reddish dots
correspond to sugar
cane.**

WISDOM Argentina

**Informe Técnico
Final**

2009



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correspond to sugar
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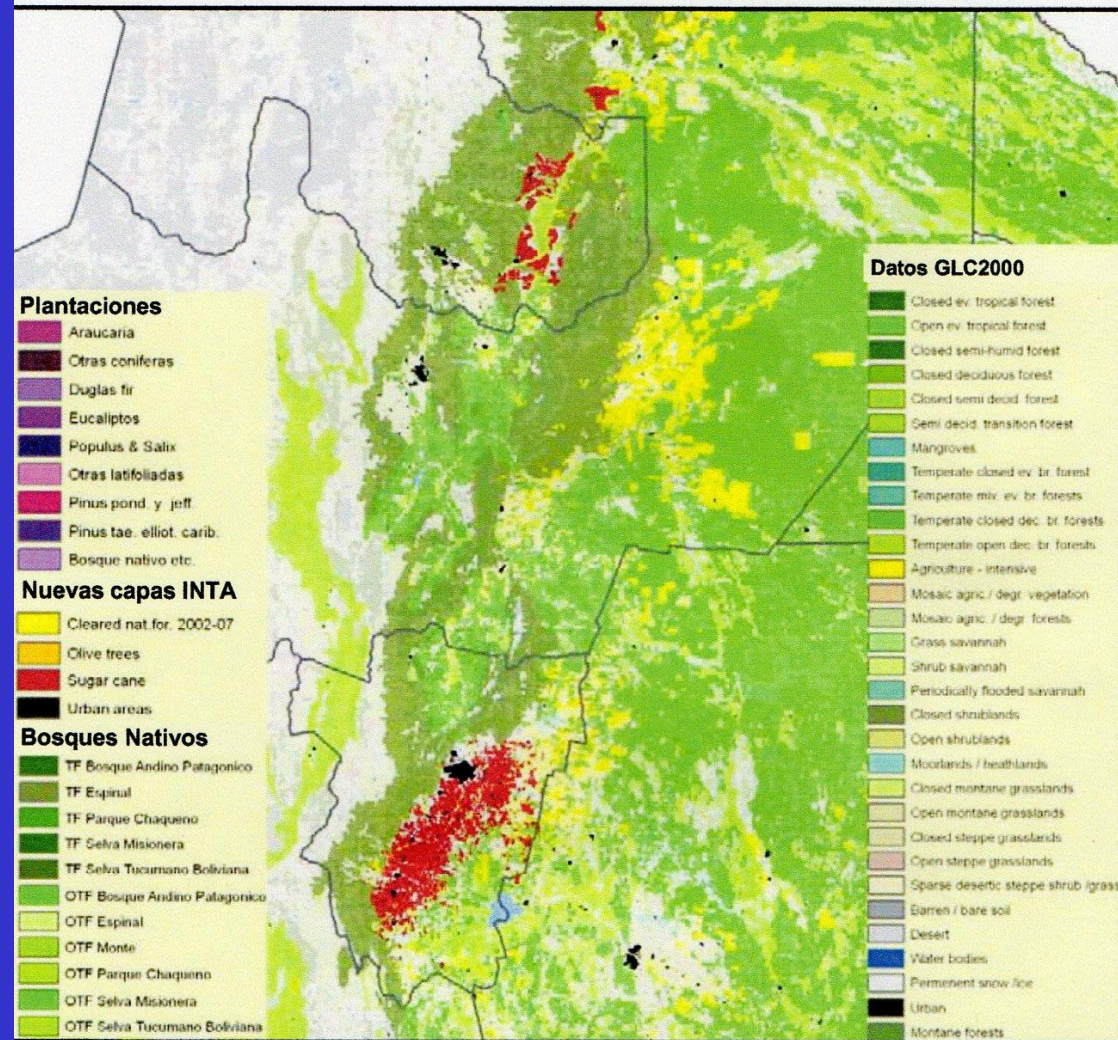
WISDOM Argentina

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Figura 4: Vista del mapa de Usos y Coberturas de Suelo de un área específica.

(lc_250_4.grd), en el que se combinan datos de plantaciones forestales, monte nativo, sus actualizaciones, plantaciones de caña de azúcar y olivo, zonas urbanas, y datos del GLC2000 para las áreas restantes.





**Sugar mills own only 29 % of the crop
71 % is in small to medium size farms**

Bioethanol Gasoline Situation to-day

- By law 5% substitution by renewables is due since January 2010
- That would mean the production of roughly 400,000 m³ bioethanol just for fuel use.
Increase of 100,000 H
- Producción actual: aprox. 200.000 m³ used for chemistry, pharmaceuticals and beverages.

Argentina 100% replacement 8,000,000 m³/yr

- Only alcohol
 - Increase of 1,000,000 de Ha of sugar cane producing 7,000 litres per Ha.
 - This is feasible using one time sugar **producing areas**

Main constraints

- The distilleries own only 29 per cent of the cane – mostly small farmers
- Environmental problems with vinasse or vinhoto – Popular mobilization counts – Road blockages were invented there!
 - 2 anaerobic treatment plants (UASB) of 1,000 m³ under construction. We would need more than **70,000 m³** of digesters.

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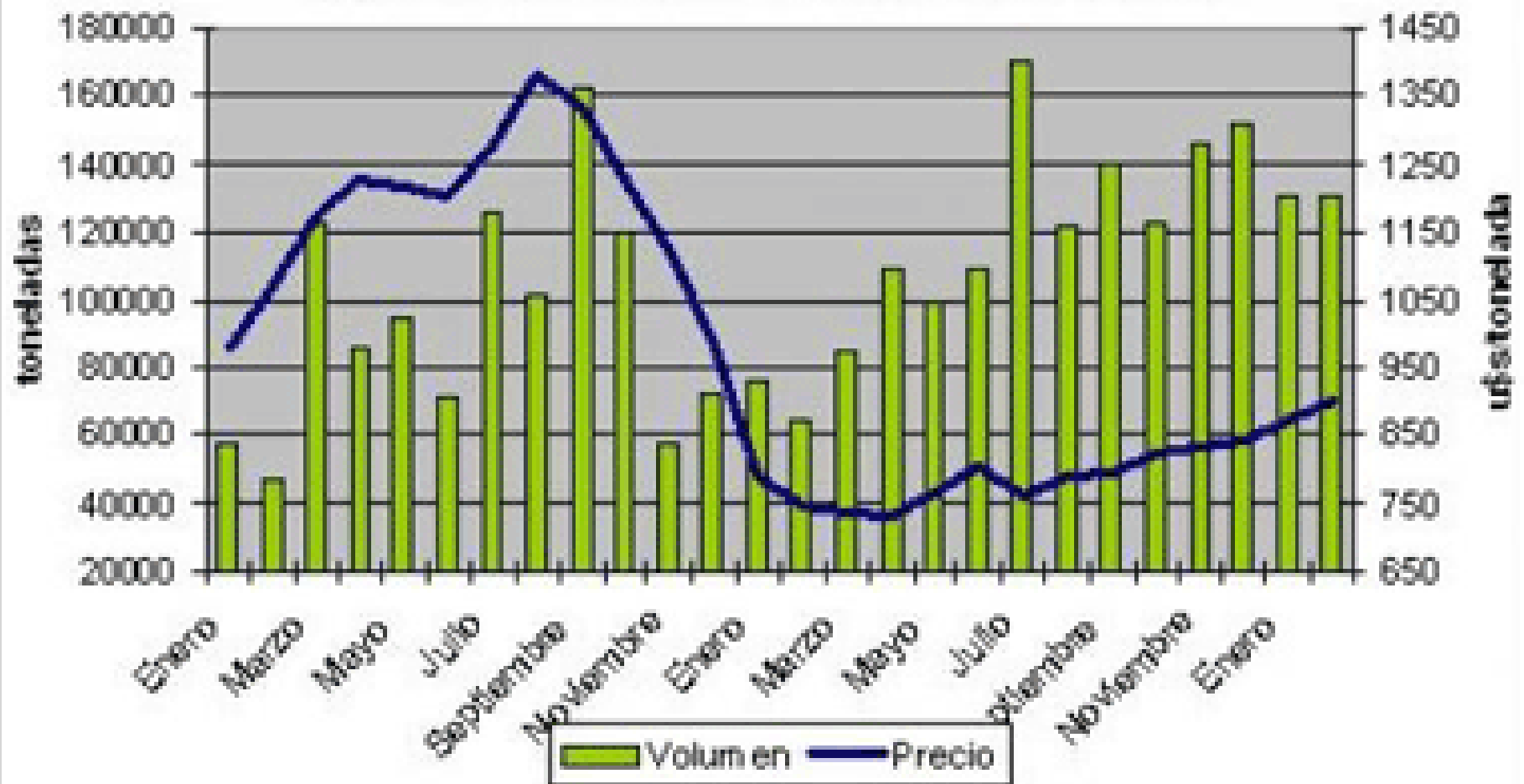


**B20
Biodiesel**
80% No. 2 Diesel

Diesel Situation to-day

- By law 5% substitution by renewables is due since January 2010
- That would mean the production of roughly 860,000 Tm biodiesel just for fuel use
- 2008 Production-Exports: ap. 2.700.000 m³
 - 37 % of the total would be needed to cover the domestic demand of 860,000 Tm

Volumen declarado de exportaciones de biodiesel y precio promedio ponderado mensual (ene.08 / feb.10)



2009: 2.770.000 Ton at 750-850 \$/ton. 2010 90% more than 1st bimester 2009!



**Plant of 200.000 T yr - Viluco SA – Frías – Santiago del Estero –
Complete processing of the soy bean**

Argentina Biodiesel 100% replacement

- Biodiesel
 - About 15.5 Million cubic meters vegetable oil
 - Equivalent to 30 Million Ha of soybean –
 - The actual land use for soy now is about 20 Mi Ha! We should need to increase by 50 %
- 5% REPLACEMENT
- About 2 million Ha would be enough
(roughly 10% of the acreage of soybeans!!!!)

The electric connection

Electricity from Biomass

The reddish dots
correspond to sugar
cane.

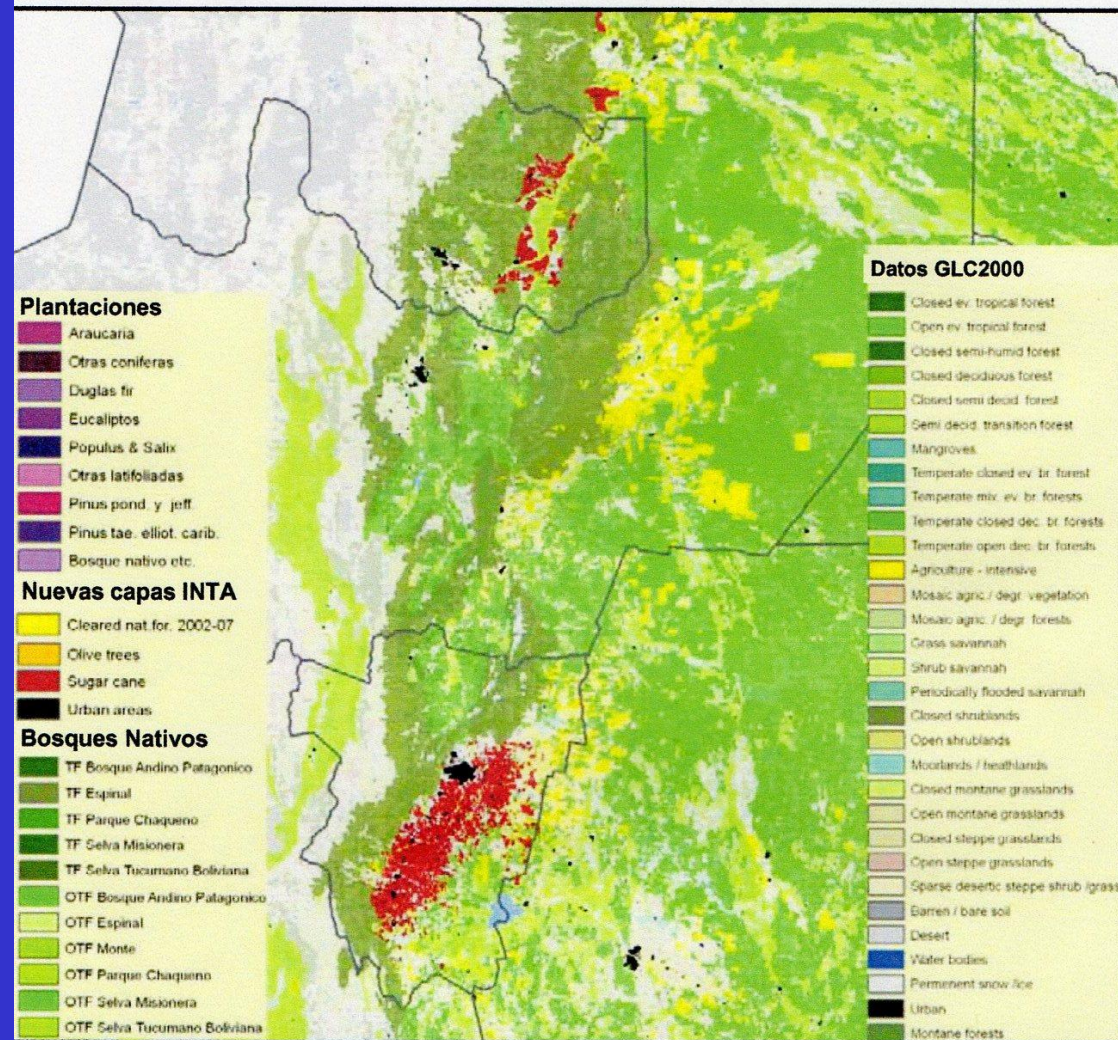
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View of the biogas generating plant CITRUSVIL



Torch of citrusvil (october 2 2009)



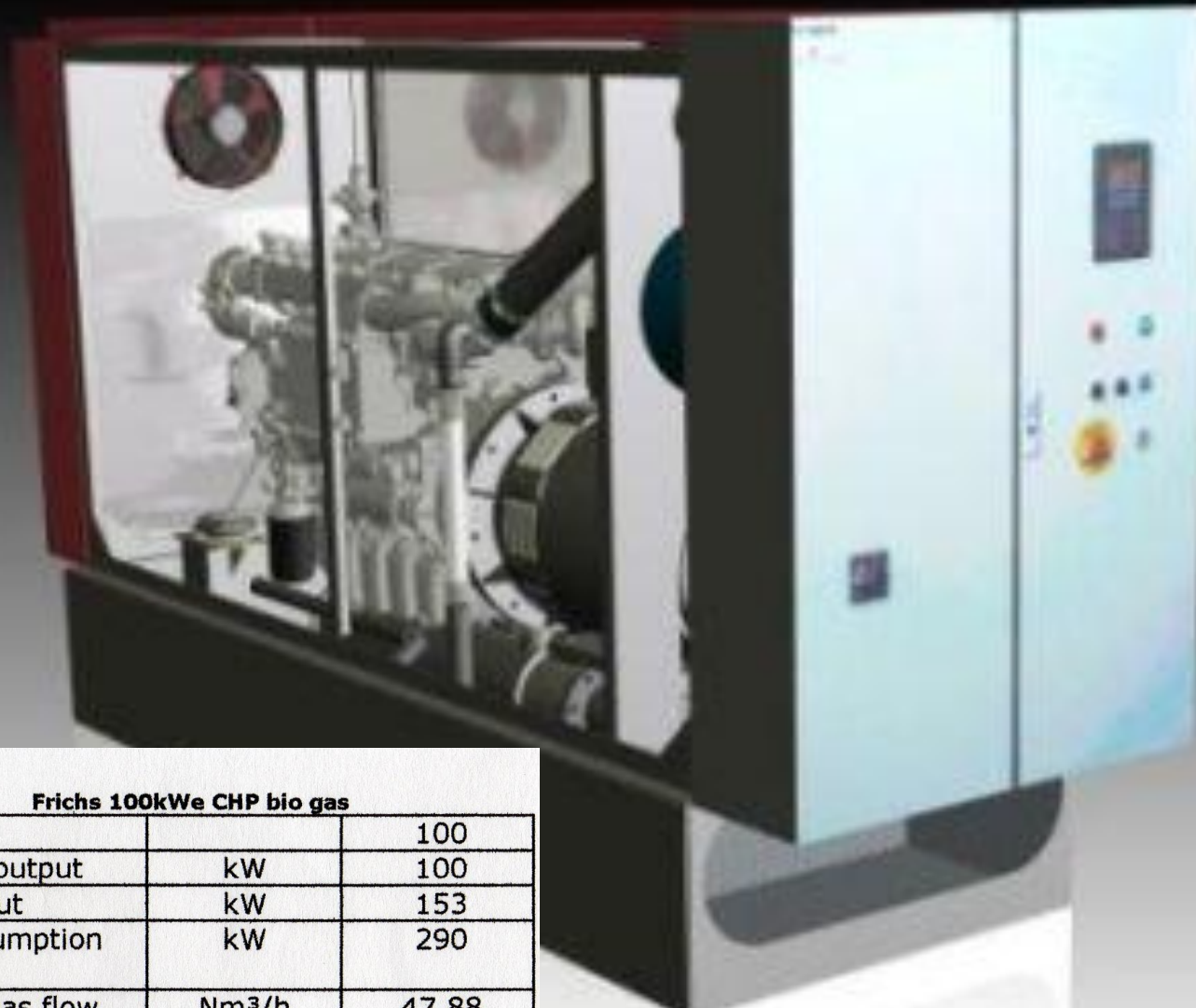
Production aprox. :
340 m³ of biogas
per hr

Production of biogas in the Tucumán area

Stillage from distilleries	Biogas M3 /hour	Kwh
15 + lemon processing 7		48m3/h biogas 100 Kwh
4 anerobic plants under construction	8,000	19,500

Biogas electric generator





Frichs 100kWe CHP bio gas

Type		100
Electrical output	kW	100
Heat output	kW	153
Fuel consumption 1)	kW	290
Digester gas flow 1)	Nm ³ /h	47,88
Minimum gas press	mbar	25
Maximum gas press	mbar	100
Maximum exhaust <d		

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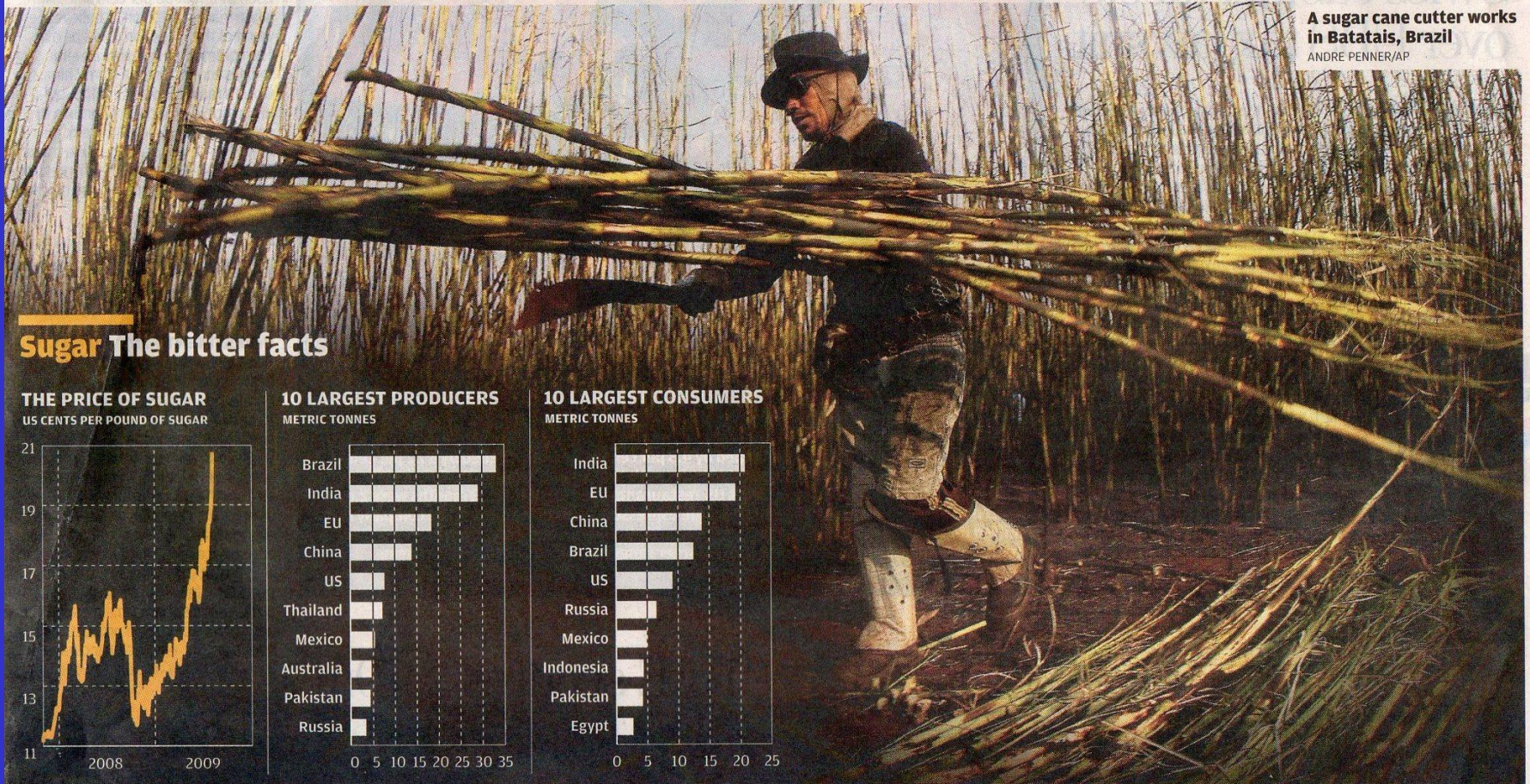
Thanks to Fapesp and you for
your patience

MUITO OBRIGADO

Chasing a sugar rush

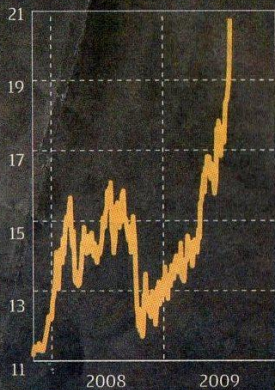
Drought, speculation and biofuels are pushing the price to new peaks, says **Sean O'Grady**

A sugar cane cutter works in Batatais, Brazil
ANDRE PENNER/AP



Sugar The bitter facts

THE PRICE OF SUGAR
US CENTS PER POUND OF SUGAR



10 LARGEST PRODUCERS
METRIC TONNES



10 LARGEST CONSUMERS
METRIC TONNES



Problemas de impacto ambiental

- En el caso de alcohol de caña de azúcar el principal impacto es el de los efluentes de destilería
 - Por cada litro de alcohol producido se producen de 10 a 15 l de vinaza
 - (40-80 Kg DQO/m³)
 - Para comparar un efluente cloacal tiene aprox. 0,3 Kg/m³

Tratamiento posible

- Conversión de la DQO en CH₄ y CO₂
 - Se recuperan unos 200 m³ de gas/Tn de DQO - CO₂ ↓
- Concentración y quema CO₂ ↑↑
- Riego CO₂ ↑↑
- Mezcla y compostaje CO₂ ↑↑

¿Qué pasaría si se quiere reemplazar totalmente la nafta?

- Superficie necesaria para caña:
 - Alternativa sólo etanol: aprox. 1.000.000 Hectáreas
- Inversión:
 - 200 millones de dólares en instalaciones