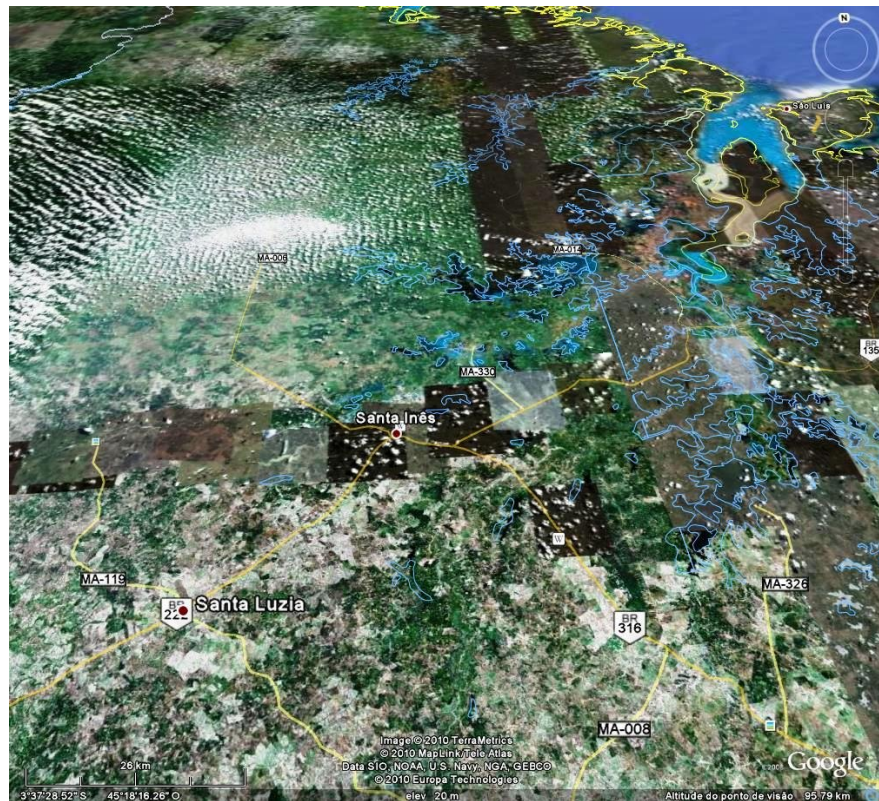




# INTEGRATED AGRIBUSINESS PROJECT IN MARANHÃO STATE, BRAZIL

## Complex for biofuels and biomass



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# Integrated Agribusiness Project in Maranhão State, Brazil

## Complex for biofuels and biomass

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### Abstract

Agribusiness complex formed by agricultural plantation, agro-forest, forest and agro-industries for production of biofuels and others, in the northeast of the state of the Maranhão comprising a surface area of 230.000 hectares, near the city of Lago da Pedra. Coordinates localization 5° of south latitude and 45° of longitude west, about the 300 km from road to the seaport of Itaqui. It encloses the totality of the farms Pedra Preta, Cunhãs and Morro do Sal. Priority for possible acceleration for the early initial production of ethanol destined to the export.

Region of humid equatorial tropical climate or semi-humid with two rainy seasons (October to February, and March to May) and a transition period in June. Dry season defined only from July to September, yet having some rainfall. Annual average precipitation varying between 1.500 mm/year to 1,800 mm/year defining excellent records for agricultural and forest cultures.

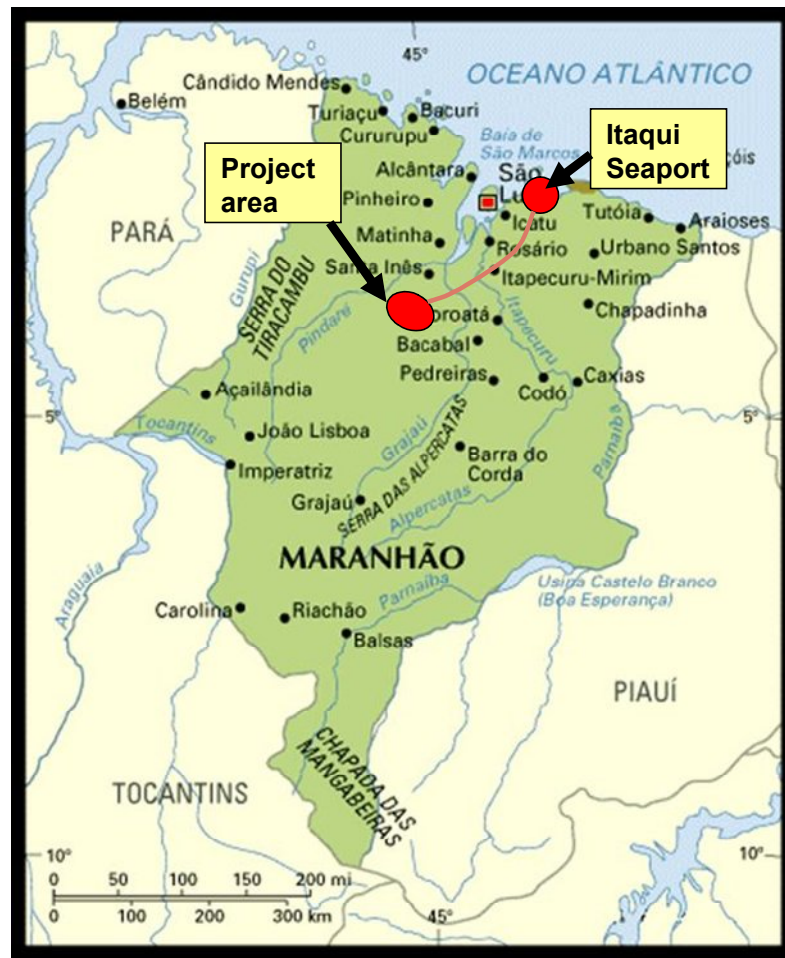
Total investment estimated in US\$ 463.4 million (being US\$ 185.3 million for the ethanol package), including plantations, forests, industries, thermo power stations, sawmill, logistic of transport and port terminal, as well as economic and social infrastructure. The current value of lands for the 230,000 hectares is evaluated in US\$ 150.0 million (US\$ 650/ ha) (not included in the US\$ 427.0 million) .

Production priority destined to the exportation of biofuels (ethanol and biodiesel), oils for industrial application, wood chips and pieces forming an operational gross revenue package superior the US\$ 278.0 million/year. The agribusiness will be self-sustained in electric power, industrial heat and fuel (stationary engines and fleet). It will use biodiesel B100 in its stationary engines, and B 20 in vehicle engines, and, moreover, it will produce electric energy and heat from firewood, wood chips and bagasse of sugar cane, in a total of up to 25 MW installed capacity.

## 1 – Project Location and the Investment

The biofuel, biomass, vegetal oil, timber & wood complex is envisaged to be built on the State of Maranhão, at the municipality of Lago da Pedra, about 300 km from the Port of Itaqui, by federal paved road.

It will involve the land forestry and agricultural development as well as the industrial and energy & power development in 200,000 hectares (500,000 acres) farm land on a 3-Farm complex. It includes the infrastructure and logistic required for huge “greenfield” projects either economic or social ones.

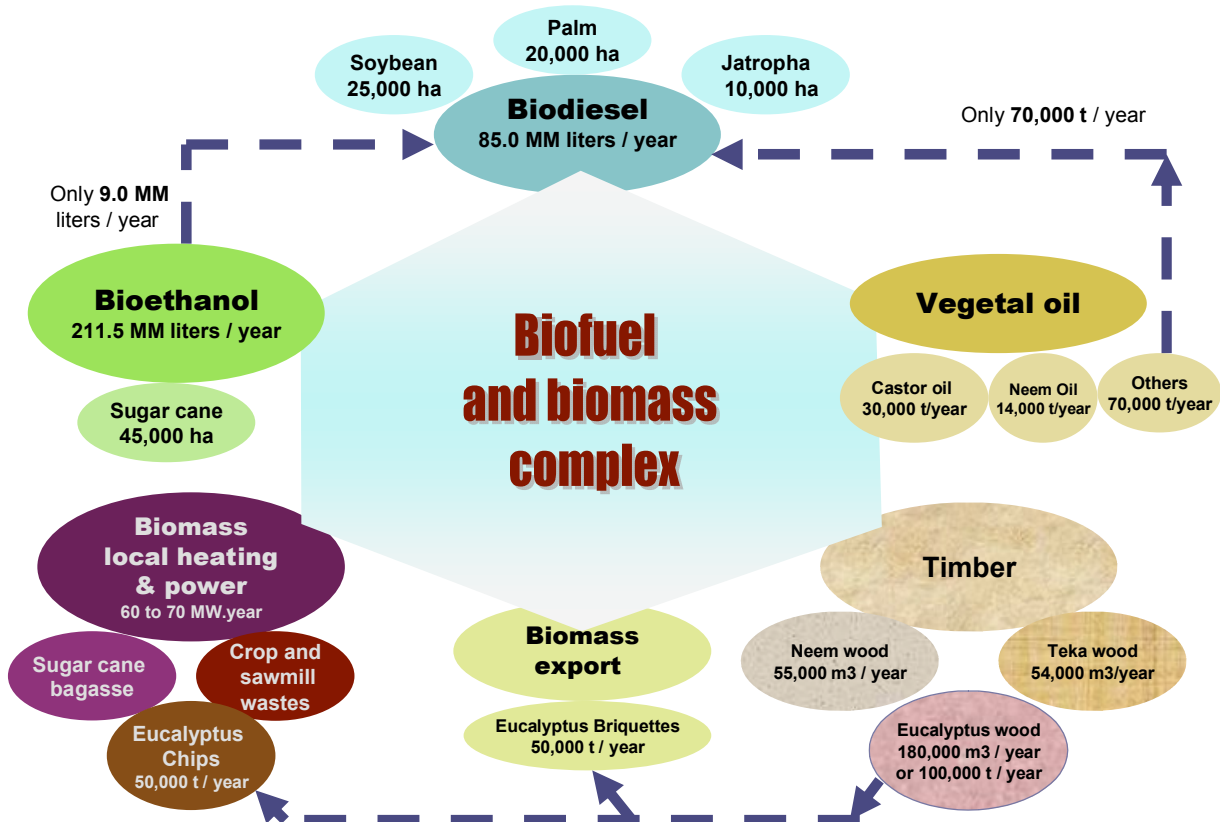


The main products to be produced in this complex are (minimum targets):

- Ethanol from sugar cane – **221.5 million liters /year**
- Biodiesel B100 from jatropha, palm and soy bean oils – **85.0 million liters/year**
- Vegetal oils from castor bean and neem (azadirachta indica) – **44,000 t/year**

- Biomass for heating & power from bagasse and forest & agricultural wastes – **Up to 60 MW**
- Timber & wood from teka and neem trees – **110,000 m<sup>3</sup> / year**
- Eucalyptus chips and briquettes – **100,000 t/year**

The biofuels, vegetal oils and timber are mostly envisaged to be exported, while biomass is to produce power for self consumption and regional demands. Figure as follows illustrates the complex and the integrations.



The value of outputs to be exported is in the range of **US\$ 258 million / year** at current FOB prices, for biofuels and oils (from which the ethanol will contribute at US\$ 96 million / year), and **US\$ 48 million / year** for wood & timber and briquettes, totaling **US\$ 296 million / year FOB** for the major products, at the project maturity (2015 and on).

The total investment is estimated on **US\$ 463.5 million**, with a highlight for the ethanol business in about **US\$ 185.0 million**, as follows:

**THE OVERALL COMPLEX – INVESTMENT – (Estimates on Appraisal level)**

<b>The Biodiesel Business</b>	US\$ 98,750,000
<b>The Biomass Heating &amp; Power Business</b>	US\$ 41,000,000
<b>The Ethanol Business</b>	US\$ 185.240,000
<b>The Vegetal Oil Business</b>	US\$ 78,500,000
<b>The Wood &amp; Timber Business</b>	US\$ 45.000,000
<b>General infrastructure and logistics</b>	US\$ 14,980,000
<b>Sub-total</b>	<b>US\$ 463,470,000</b>

From which the highlights for the Ethanol business are: ethanol, the biodiesel, the vegetal oils, and finally the biomass & power together with wood & timber.

**THE ETHANOL BUSINESS – (Estimates on Appraisal level)**

Sugar cane plantation	US\$ 66,600,000
Industrial facilities and distilleries	US\$ 94,905,000
Social infrastructure	US\$ 3,896,100
Economic infrastructure	US\$ 5,894,100
Logistics	US\$ 3,230,100
<b>Sub-total</b>	<b>US\$ 174,525,300</b>
Thermal Power Station (for project needs only) 10 MW	US\$ 10,724,700
Thermal Power Station for sale of excess (24 MW for only 6 month)	US\$ 25,700,000
<b>TOTAL</b>	<b>US\$ 210,949,300</b>

**2 – Capital Return**

The IRR for the complex is envisaged in the range of **32% to 35%**, while the ethanol is in the **22% to 28% range**. The Ethanol business as well the biodiesel may start generating revenues by the end 2011, if construction starts up in mid 2008. Figures expected are as follows:

- The Ethanol Business – **22% to 28%**
- The Biodiesel Business – **24% to 32%**
- The Vegetal Oil Business – **36% to 42%**
- The Wood & Timber Business – **14% to 18%**
- The Biomass Export Business – **30% to 34%** (briquettes)
- The Biomass Excess Thermal Power – **40% to 50%**

Lands for agriculture and forestry are to be leased, while for industrial facilities and utilities are to be acquired at very cheap prices.

### **3 – Premises and Statements**

The overall project complex is based on some premises and statements which follow:

- a) Long-term land property leasing for agriculture and forestry, for 20 years renewable for more 20 years. Industrial plants set on own land properties to be acquired at symbolic values.
- b) Projects fitting to environmental and legal Brazilian concerns, laws and regulations.
- c) Complete legal & auditing approach for the legal & financial framework and follow up, assigned to international companies with high reputation, focusing every SPC (Special Purpose Company) and related businesses.
- d) Pre-investment to be provided in 2007 by a Prime Investor and Developer through a proper agreement in order to perform the development stage, including studies, planning and design, assessments, etc., at several stages for the “Book for Investors”.
- e) SPC Holding to be created early after completion of development studies by Prime Investor, Developer, and Equity Fund. Rights of partnership on any new business derived from SPC Holding studies is to be guaranteed to partners of SPC Holding.
- f) Priority assigned to the Ethanol package business to be completed by 2011-2012.
- g) Concept of business integration by sharing common infrastructures an interdependence of inputs & outputs among businesses are contemplated with priority in order to reduce overall investment.

### **4 – Integration of Business**

Businesses and related facilities & utilities are to be conceived to take advantage of local integration on project site. Therefore an amount of US\$ 15 million is forecasted for all infrastructure and logistics taking advantage of such integration. This is referred to three different types:

- a) Integration of products and raw materials in the inputs & outputs schedules including local heating & power generation for self-consumption
- b) Integration of functions in industrial plants giving more flexibility and increasing annual utilization
- c) Integration of common infrastructure and logistics to reduce individual operation costs
- d) Some of the main integration items are:
  - The bagasse of sugar cane to be used as biomass in heating & power plants
  - The ethanol to be used as raw material for the production of biodiesel

- The vegetal oil crushing plant to be flexible to crush oil seeds either for biodiesel (palm, jatropha and soybean) or for vegetal oil final outputs (neem and castor bean)
- The solid wastes from agriculture and forestry to be complementary used as biomass by the heating & power plants
- The annual calendar for oil seed plants designed to increase the annual utilization factor of the crushing plant.
- The wastes from ethanol distillery to be used as liquid fertilizer in irrigated sugar cane crops

The envisaged common infrastructure includes internal roads, bridges and culverts, electrical grid, check points for surveillance and control, telecommunication towers & antennas, industrial water supply, hospital & medical center, schools, entertainment facilities, internal transportation for people, and other minor items.

The individual infrastructures for each business unity are: housing facilities and labor camp, food & beverage supply, office buildings, and other minor items.

## AGRIBUSINESS IN MARANHÃO STATE - BRAZIL

COMPLEX FOR BIOFUELS, VEGETAL OILS, BIOMASS AND TIMBER

FAZENDA PEDRA PRETA	Areas for plantation (ha)	Areas for forest reserves (ha)	Destination	Gross plantation area (ha)	Soybean and castor bean	Sugar cane	Palm tree	Teca tree	Neem tree	Eucalyptus tree	Irrigated seed plantation	TOTAL
Area PP 1	7.210		Soybean and castor	7.000	7.000							7.000
Area PP 2	6.250		Sugar cane	6.000		6.000						6.000
Area PP 3	15.925		Soybean and castor	15.000	15.000							15.000
Area PP 4	4.650		Sugar cane	4.500		4.500						4.500
Area PP 5	815		Sugar cane	700		700						700
Area PP 6		14.000	Palm tree	7.000			7.000					7.000
Area PP 7		10.000	Palm tree	5.000			5.000					5.000
Area PP 8		16.000	Palm tree	8.000			8.000					8.000
Area PP 9		6.340	Teca tree	3.170				3.170				3.170
<b>TOTAL</b>	<b>34.850</b>	<b>46.340</b>		<b>56.370</b>	<b>22.000</b>	<b>11.200</b>	<b>20.000</b>	<b>3.170</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>56.370</b>

FAZENDA CUNHÃS	Areas for plantation (ha)	Areas for forest reserves (ha)	Destination	Gross plantation area (ha)	Soybean and castor bean	Sugar cane	Palma	Teca tree	Neem	Eucalyptus tree	Irrigated seed plantation	TOTAL
Area CN 1	1.150		Irrig. seed plant.	1.000							1.000	1.000
Area CN 2	3.375		Sugar cane	3.200		3.200						3.200
Area CN 3	31.180		Sugar cane	30.000		30.000						30.000
Area CN 4	910		Sementeira irrig.	800							800	800
Area CN 5	1.310		Soybean and castor	1.200	1.200							1.200
Area CN 6	550		Irrig. seed plant.	500							500	500
Area CN 7	815		Irrig. seed plant.	700							700	700
Area CN 8	8.010		Soybean and castor	7.500	7.500							7.500
Area CN 9		6.000	Teca tree	3.000				3.000				3.000
Area CN 10		4.000	Teca tree	2.000				2.000				2.000
Area CN 11		1.230	Teca tree	600				600				600
Area CN 12		12.000	Neem tree	6.000					6.000			6.000
Area CN 13		17.000	Eucalyptus tree	8.500						8.500		8.500
<b>TOTAL</b>	<b>47.300</b>	<b>40.230</b>		<b>65.000</b>	<b>8.700</b>	<b>33.200</b>	<b>0</b>	<b>5.600</b>	<b>6.000</b>	<b>8.500</b>	<b>3.000</b>	<b>65.000</b>

FAZENDA MORRO DO SAL	Areas for plantation (ha)	Areas for forest reserves (ha)	Destination	Gross plantation area (ha)	Soybean and castor bean	Sugar cane	Palm tree	Teca tree	Neem tree	Eucalyptus tree	Irrigated seed plantation	TOTAL
Area MS 1	9.980		Soybean and castor	9.700	9.700							9.700
Area MS 2	3.720		Neem tree	3.600					3.600			3.600
Area MS 3	14.810		Soybean and castor	14.500	14.500							14.500
Area MS 4		22.627	Eucalyptus tree	11.000						11.000		11.000
Area MS 5		4.800	Neem tree	2.400					2.400			2.400
Area MS 6		3.450	Neem tree	1.700					1.700			1.700
Area MS 7		2.700	Neem tree	1.300					1.300			1.300
<b>TOTAL</b>	<b>28.510</b>	<b>33.577</b>		<b>44.200</b>	<b>24.200</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9.000</b>	<b>11.000</b>	<b>0</b>	<b>44.200</b>

<b>TOTAL FOR THE AGRIBUSINESS</b>				Soybean and castor	Sugar cane	Palm tree	Teca tree	Neem tree	Eucalyptus tree	Irrigated seed plantation	FINAL TOTAL	
Surf. area of farms (ha)				230.807								
Surf. area for plantation and industr.(ha)				165.570	54.900	44.400	20.000	8.770	15.000	19.500	3.000	165.570
Percentage				71,74%								



**AGRIBUSINESS IN MARANHÃO STATE - BRAZIL**  
**COMPLEX FOR BIOFUELS, VEGETAL OILS, BIOMASS AND TIMBER**

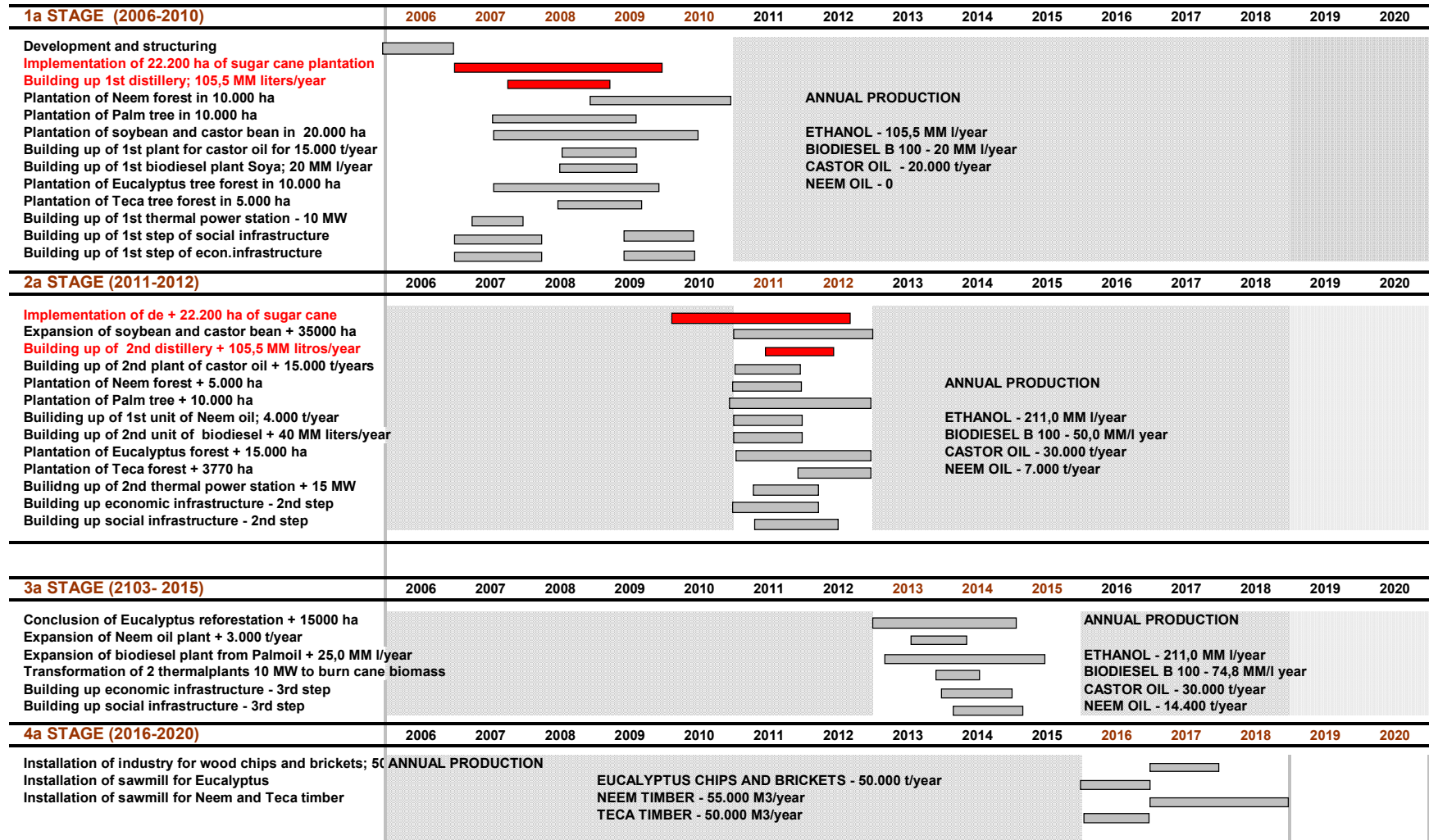
<b>FAZENDA PEDRA PRETA</b>	<b>Soybean and castor bean</b>	<b>Sugar cane</b>	<b>Palm</b>	<b>Teca</b>	<b>Neem</b>	<b>Eucalyptus</b>	<b>Seed areas</b>
<b>Agricultural or forest areas (ha)</b>	22.000	11.200	20.000	3.170	0	0	0
Investment on preparing lands for crops	\$26.400.000	\$16.800.000	\$36.000.000	\$4.279.500	0	0	0
Investment in irrigated areas for seeds							
Investment in social infrastructure							
Investment in economic infrastructure							
<b>Industrial units</b>	<b>Biodiesel and vegetal oil</b>	<b>Ethanol</b>	<b>Biodiesel</b>	<b>Timber and biomass</b>	<b>Timber, oil and biomass</b>	<b>Timber and biomass</b>	<b>Seeds and plants</b>
<b>Annual production in (t/year) (or Th liters/year)</b>	21.285	53.200	54.400	0	0	0	0
Investment in industrial plants	\$6.811.200	\$23.940.000	\$13.600.000	0	0	0	0
Investment in social infrastructure							
Investment in economic infrastructure							
<b>Others</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>xxxxxxx</b>
Invest. In logistics of transportation and port							
<b>FAZENDA CUNHÃS</b>	<b>Soybean and castor bean</b>	<b>Sugar cane</b>	<b>Palm</b>	<b>Teca</b>	<b>Neem</b>	<b>Eucalyptus</b>	<b>Seed areas</b>
<b>Agricultural or forest areas (ha)</b>	8.700	33.200	0	5.600	6.000	8.500	3.000
Investment on preparing lands for crops	\$10.440.000	\$49.800.000	\$0	\$7.560.000	\$8.100.000	\$10.625.000	\$13.500.000
Investment in irrigated areas for seeds							
Investment in social infrastructure							
Investment in economic infrastructure							
<b>Industrial units</b>	<b>Biodiesel and vegetal oil</b>	<b>Ethanol</b>	<b>Biodiesel</b>	<b>Timber and biomass</b>	<b>Timber, oil and biomass</b>	<b>Timber and biomass</b>	<b>Seeds and plants</b>
<b>Annual production in (t/year) (or Th liters/year)</b>	8.417	157.700	0	0	14.400	0	0
Investment in industrial plants	\$2.693.520	\$70.965.000	\$0		\$1.920.000		
Investment in social infrastructure							
Investment in economic infrastructure							
<b>Others</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>xxxxxxx</b>
Investment in logistics of transportation and port							
<b>FAZENDA MORRO DO SAL</b>	<b>Soybean and castor bean</b>	<b>Sugar cane</b>	<b>Palm</b>	<b>Teca</b>	<b>Neem</b>	<b>Eucalyptus</b>	<b>Seed areas</b>
<b>Agricultural or forest areas (ha)</b>	24.200	0	0	0	9.000	11.000	0
Investment on preparing lands for crops	\$29.040.000	\$0	\$0	\$0	\$12.150.000	\$13.750.000	
Investment in irrigated areas for seeds							
Investment in social infrastructure							
Investment in economic infrastructure							
<b>Industrial units</b>	<b>Biodiesel and vegetal oil</b>	<b>Ethanol</b>	<b>Biodiesel</b>	<b>Timber and biomass</b>	<b>Timber, oil and biomass</b>	<b>Timber and biomass</b>	<b>Seeds and plants</b>
<b>Annual production in (t/year) (or Th liters/year)</b>	17.969	0	0	0	0	0	0
Investment in industrial plants	\$5.749.920	\$0	\$0	\$0	\$0	\$0	\$0
Investment in social infrastructure							
Investment in economic infrastructure							
<b>Others</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>Fleet and port terminal</b>	<b>xxxxxxx</b>
Investment in logistics of transportation and port	\$1.622.693	\$3.230.100	\$992.000	\$236.790	\$443.400	\$487.500	\$270.000

Integrated Agribusiness Project in Maranhão State, Brazil - Complex for biofuels and biomass

TOTAL	Soybean and castor bean	Sugar cane	Palm	Teca	Neem	Eucalyptus	Seed areas	TOTAL
PLANTATION AREA (HA)	54.900	44.400	20.000	8.770	15.000	19.500	3.000	165.570
ANNUAL AGRICULTURAL PRODUCTION (t/year)	192.150	2.664.000	160.000	0	96.000	0	15.000	3.127.150
ANNUAL FORESTRY PRODUCTION (t/year)	0	0	0	0	0	0	0	0
ANNUAL INDUST. PRODUCTION (t/year) or TH liters /year)	47.671	210.900	54.400	0	14.400	0	0	327.371
INVESTMENT IN PLANTATION AND FORESTS	\$65.880.000	\$66.600.000	\$36.000.000	\$11.839.500	\$20.250.000	\$24.375.000	\$13.500.000	\$238.444.500
INVESTMENT IN INDUSTRIAL PLANTS	\$15.254.640	\$94.905.000	\$13.600.000	\$0	\$1.920.000	\$0	\$0	\$125.679.640
INVESTMENT IN SOCIAL INFRASTRUCTURE	\$2.281.493	\$3.896.100	\$1.352.000	\$355.185	\$645.900	\$731.250	\$405.000	\$9.666.928
INVESTMENT IN ECONOMIC INFRASTRUCTURE	\$4.257.893	\$5.894.100	\$2.432.000	\$710.370	\$1.253.400	\$1.462.500	\$810.000	\$16.820.263
INVESTMENT IN LOGISTICS	\$1.622.693	\$3.230.100	\$992.000	\$236.790	\$443.400	\$487.500	\$270.000	\$7.282.483
INVESTMENT IN THERMAL POWER PLANTS								\$30.000.000
<b>TOTAL</b>	<b>\$89.296.718</b>	<b>\$174.525.300</b>	<b>\$54.376.000</b>	<b>\$13.141.845</b>	<b>\$24.512.700</b>	<b>\$27.056.250</b>	<b>\$14.985.000</b>	<b>427.893.813</b>
							<b>TOTAL</b>	<b>\$427.893.813</b>
<b>ANNUAL PRODUCTION OF AGRIBUSINESS PROJECT</b>	<b>MAIN</b>	<b>ANN. REVENUES</b>	<b>SECONDARY</b>					
	ETHANOL FROM SUGAR C	\$118.104.000	XXXXXXXX					
	BIODIESEL FROM PALM OI	\$38.080.000	CAKE AND GLYCERIN					
	BIODIESEL FROM SOYA OI	\$17.670.750	CAKE AND GLYCERIN					
	CASTOR OIL	\$28.500.000	CAKE					
	NEEM OIL	\$0	CAKE AND PASTE					
	EUCALYPTUS BIOMASS	\$4.875.000						
	TECA BIOMASS	\$3.069.500						
	NEEM BIOMASS	\$5.250.000						
		\$215.549.250						
<b>PRODUCTION OF TIMBER AND BIOMASS</b>	<b>MAIN</b>	<b>REVENUES WHEN CUTTING</b>						
	EUCALYPTUS 8 YEARS							
	NEEM 11 YEARS	550.000 m3	\$220.000.000					
	TECA 10 YEARS	540.000 m3	\$221.600.000					

## AGRIBUSINESS IN MARANHÃO STATE -BRAZIL

COMPLEX FOR BIOFUELS, VEGETAL OILS, BIOMASS AND TIMBER



**The Ethanol Package:** The early priority will be assigned to the ethanol package from sugar cane, corresponding to **44,400 ha.** of crop area for an annual production of **211.0 million liters** of ethanol, and an investment of **US\$ 175.4 million** or **40%** of the total project investment. The two distilleries (**105.5 million liters/year** of nominal capacity, each) would be installed for full operation, respectively in 2009, the first, and 2012 the second, as function of the availability of the agricultural production of sugar cane in the mentioned 44,400 ha of crop area. (50,000 ha of farm land property)

The ethanol complex is foreseen to be implemented in two of the farms, namely Pedra Preta and Cunhãs, covering a plantation area of **44,400 ha** to allow for an annual production of **2.66 million tons** of sugar cane. This will give raw material for an annual production of **210.9 million liters**. The ethanol production will be provided in two steps, in two distilleries to be built in close sequence, each at a nominal capacity of **105.5 million liters/year**. Each of this will be in connection to a sugar cane crop area of **22,200 ha**, corresponding to **1.33 million tones/year** production output. At each distillery there will be an associated economic and social infrastructure, as well as logistics for stockade, transportation and embark on a port terminal in Itaqui seaport, then making an investment of **US\$ 87.25 million** (or **US\$ 0,83/ liter** of annual capacity for ethanol production, not included the farm lands). Tables which follow show the figures:

<b>AGRIBUSINESS IN MARANHÃO (Ethanol package)</b>			
<b>Fazenda</b>	<b>Fazenda Pedra Preta</b>	<b>Fazenda Cunhãs</b>	<b>Total</b>
<i>Crop surface area</i>	<b>11,200 ha</b>	<b>33,200 ha</b>	<b>44,400 ha</b>
<i>Annual production of sugar cane</i>	<b>672,000</b>	<b>1,992,000</b>	<b>2,664,000 t</b>
<i>Annual production of ethanol</i>	<b>53.2 MM liters</b>	<b>157.7 MM liters</b>	<b>210.9 MM liters</b>
<b>INVESTMENT IN ETHANOL PACKAGE (in US\$)</b>			
Sugar cane plantation		<b>\$66,600,000</b>	
Industrial facilities and distilleries		<b>\$94,905,000</b>	
Social infrastructure		<b>\$3,896,100</b>	
Economic infrastructure		<b>\$5,894,100</b>	
Logistics		<b>\$3,230,100</b>	
<b>Sub-total</b>		<b>\$174,525,300</b>	
Farm lands (50,000 ha)		<b>\$32,500,000</b>	
<b>Total</b>		<b>\$206,959,300</b>	

The preliminary project and investor financial analysis for the ethanol package is summarized in table which follows. One can see that the project exhibits a **Net IRR** after taxes, of **22.4%**, and for an **Investor** bringing 64,3% of the investment in Equity (US\$ 133.0 million) for controlling 49% of the SPC-Owner of the ethanol business the **capital return** would be in the range of **12.1% p.y.** (figures based on **US\$ 0.56/ liter** of ethanol – prices of March 2006).

### AGRIBUSINESS IN MARANHÃO STATE -BRAZIL

#### THE ETHANOL BUSINESS

(VALUES IN US\$ \* 1000)

PROJECT CASH FLOW	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Investment (lands) - 50.000 ha	8125	8125			8125	8125									
Investment (plantation)	11.089	22.178			11.089	22.178									
Investment (infrastructure)	1.958	2.937			1.958	2.937									
Investment (logistics)		646	969		646	969									
Investment (distillery)		4.745	33.217	9.491		16.608	30.844								
<b>Total Investment</b>	<b>21.172</b>	<b>38.631</b>	<b>34.186</b>	<b>9.491</b>	<b>21.818</b>	<b>50.817</b>	<b>30.844</b>								
<b>Gross revenues</b>		23.621	59.052	59.052	88.578	118.104	118.104	118.104	118.104	118.104	118.104	118.104	118.104	118.104	118.104
Operational taxes		2.008	5.019	5.019	7.529	10.039	10.039	10.039	10.039	10.039	10.039	10.039	10.039	10.039	10.039
Sale comissions		591	1.476	1.476	2.214	2.953	2.953	2.953	2.953	2.953	2.953	2.953	2.953	2.953	2.953
<b>Net revenues</b>	0	21.023	52.556	52.556	78.834	105.113	105.113	105.113	105.113	105.113	105.113	105.113	105.113	105.113	105.113
Operational costs		10.217	25.542	25.542	38.314	51.085	51.085	51.085	51.085	51.085	51.085	51.085	51.085	51.085	51.085
<b>Margin</b>	0	10.806	27.014	27.014	40.521	54.028	54.028	54.028	54.028	54.028	54.028	54.028	54.028	54.028	54.028
Depreciation and others		3.484	6.219	6.978	8.074	11.489	13.957	13.957	13.957	13.957	13.957	13.957	10.472	7.738	6.978
<b>EBIT</b>	0	7.321	20.795	20.036	32.447	42.539	40.071	40.071	40.071	40.071	40.071	40.071	43.555	46.290	47.050
<b>EBITDA</b>	0	10.805	27.014	27.014	40.521	54.028	54.028	54.028	54.028	54.028	54.028	54.028	54.027	54.028	54.028
IRPJ + CSLL	0	2.593	6.483	6.483	9.725	12.967	12.967	12.967	12.967	12.967	12.967	12.967	12.967	12.967	12.967
<b>CASH FLOW</b>	<b>-21.172</b>	<b>-30.419</b>	<b>-13.655</b>	<b>11.040</b>	<b>8.978</b>	<b>-9.756</b>	<b>10.217</b>	<b>41.061</b>	<b>41.061</b>	<b>41.061</b>	<b>41.061</b>	<b>41.061</b>	<b>41.061</b>	<b>41.061</b>	<b>41.061</b>
<b>ACUM. CASH FLOW</b>	<b>-21.172</b>	<b>-51.591</b>	<b>-65.246</b>	<b>-54.207</b>	<b>-45.229</b>	<b>-54.985</b>	<b>-44.767</b>	<b>-3.706</b>	37.356	78.417	119.478	160.540	201.601	242.662	283.723

**IRR (15 YEARS) 22,41%**

**ETHANOL FOB PRICE = USD\$ 0.56/ liter**

#### THE ETHANOL BUSINESS

EQUITY BY FOREIGN INVESTOR	USD	\$133.067	64,30%
EQUITY BY LOCAL INVESTORS	USD	\$32.500	15,70%
DEBT IN BRAZILIAN INVEST. BANK	USD	\$41.392	20,00%
<b>TOTAL INVESTMENT</b>	<b>USD</b>	<b>\$206.959</b>	<b>100%</b>

(VALUES IN US\$ \* 1000)

(Price 9% p.y.)

FOREIGN INVESTOR CASH FLOW	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Investment in Equity (64.3%)	8.813	22.780	27.349	7.592	9.329	32.529	24.675								
Capital return (49% shares)	0	4.024	10.060	7.802	12.833	17.862	17.863	17.863	17.863	17.863	17.863	17.863	17.862	17.863	20.120
<b>Investor cash flow</b>	<b>-8.813</b>	<b>-18.756</b>	<b>-17.289</b>	210	3.503	<b>-14.666</b>	<b>-6.813</b>	17.863	17.863	17.863	17.863	17.863	17.862	17.863	20.120

**IRR INVESTOR (15 years) 12,10%**

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