In June 1992 during the United Nations Conference on Environment and Development (UNCED), known as Earth Summit, held in Rio de Janeiro, The United Nations Framework Convention on Climate Change (UNFCCC) was negotiated and signed by 175 countries plus The European Union. Since then it has been called ‘Convention’.

It’s the supreme organ of the Convention and it has the responsibility of tracking the implementation of the Convention, as well as any legal procedures that the Conference of the Parties comes to adopt, besides taking the necessary decisions to promote the effective implementation of the Convention.

A COP-3 document accomplished in Kyoto
It establishes goals and terms related to the reduction or limitation of future Green House Gases emissions
It includes three flexibility mechanisms:
- Clean Development Mechanism - CDM,
- Joint Implementation - JI, and
- Emissions Trade
CDM was developed from a proposal of the Brazilian delegation that foresaw the constitution of a Clean Development Fund.
Plantar Group
Since 1967

Headquarters
Belo Horizonte - MG
Brazil

Certificates
Green Stamp - FSC

WELL-MANAGED PLANTATION CERTIFICATION

Plantar S.A. of Curvelo MG
Av. Rapalho, 1309 - 30350-110 - MG - Brazil

Certified species: Eucalyptus

Certificates
Certified Quality - ISO 9002

Social Responsibility - ABRINQ

Historical of the Project

- July, 1998 - Project Design
- March, 1999 - Presentation of the Project in the ASPEN Forum which had the presence of the World Bank
- July, 1999 - Prototype Carbon Fund (PCF) establishment
- April, 2001 - Signature of the Letter of Intention by the PCF/World Bank
- July, 2001 - Approval of the project by the PCF/World Bank
- October, 2001 - Expected conclusion of the agreement with the PCF/World Bank

Cultivated Biomass Project as a Source of Renewable Energy For Pig Iron Production
The Project

- It is a project of energetic substitution
- Renewable forests are grown for foundry pig iron production with the purpose to substitute the coal in the production process
- Our project should be framed on article 12 of the Kyoto Protocol, through the CDM and it is based on the following additionalities:
  - By avoiding CO₂ emissions through the NON USAGE of coal
  - By sequestering CO₂ and fixing carbon both in the forest plantations (dynamic stock) and in the pig iron

Our Project Starts Growing Trees ...

Not Exploring Mines!

We Use a New Technology of Cloned Trees

With this Technology we Reduced in 90% the Required Area for Plantation

CO₂ and O₂ Balance in the Production of Foundry Pig Iron in Mini-blast Furnace Utilizing Coal

One metric ton of pig iron produced with coal emits to the atmosphere 1.8 tons of CO₂.

CO₂ and O₂ Balance for the Production of Foundry Pig Iron in Mini-blast Furnace Utilizing Charcoal

One metric ton of pig iron produced with charcoal removes from the atmosphere 1.9 tons of CO₂.
The first samurai’s sword was made from steel smelted with charcoal. After 1708 the world began using coal, but only Brazil preserved and improved the technology of pig iron production based on charcoal. The quality of the pig iron produced with charcoal is higher because it does not contain sulfur. Nowadays the high productivity of the cloned trees makes this activity economically feasible and more environmentally friendly.

Pig iron is the basic component of the steel and foundry industries.

Project’s Figures

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Areas (ha.)</td>
<td>23,100</td>
</tr>
<tr>
<td>Charcoal Production (m³)</td>
<td>9,885,260</td>
</tr>
<tr>
<td>Pig Iron Production (ton.)</td>
<td>3,802,023</td>
</tr>
<tr>
<td>Carbon Fixed in the Dynamic Stock (ton.)</td>
<td>953,100</td>
</tr>
<tr>
<td>Avoided Carbon Emissions (ton.)</td>
<td>1,951,475</td>
</tr>
<tr>
<td>Carbon Fixed in the Pig Iron (ton.)</td>
<td>165,906</td>
</tr>
<tr>
<td>Direct Jobs</td>
<td>3,000</td>
</tr>
</tbody>
</table>

Notes:
- a) Plantar Company owns all the lands used for planting, including the natural reserves, in a total of 33,598 ha with all the necessary infrastructure.
- b) All charcoal produced will be consumed by the Group.

Blast Furnace Comparisons

<table>
<thead>
<tr>
<th>DATA</th>
<th>COAL</th>
<th>CHARCOAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Capacity</td>
<td>2,000,000 ton./year</td>
<td>90,000 ton./year</td>
</tr>
<tr>
<td>Internal Volume</td>
<td>2,708 m³</td>
<td>119 m³</td>
</tr>
<tr>
<td>Melting Pot Diameter</td>
<td>11.5 m</td>
<td>2.90 m</td>
</tr>
<tr>
<td>Height</td>
<td>101 m</td>
<td>17.09 m</td>
</tr>
<tr>
<td>Investment</td>
<td>US$ 300 million</td>
<td>US$ 5 million</td>
</tr>
<tr>
<td>Shipment System</td>
<td>Bell Less Top</td>
<td>Double Cone</td>
</tr>
</tbody>
</table>

Aerial View of the Farm

Aerial View of the Clones Nursery

Annual Production Capacity: 20 million cuttings

Production Chart

- Matrix Tree Selection
- Clonal Garden Formation
- Spatula Collector
- R & D
- Clean Propagation
- Shoot
- Greenhouse
- Acclimatization
- Final cutting
- Soil Preparation
- Planting
- Irrigation
- Forest
- Harvesting
- Charcoal Production
- Green Pig Iron
Matrix Tree Selection
The Beginning of the Process...

Clonal Garden Formation

Sprout Collect

Macro Shoots Preparation

Shoots Rooting

Clonal Garden of Mini-sprouts
A new technological stage: the clones are produced from here.

Each clonal garden matrix produces around 150 mini-sprouts, and after that it is replaced.
Greenhouse Sprouts Being Transported to the Greenhouse

Acclimatization

Cut-tings Ready for Planting

Exhausted Forest - 3rd Cycle

We are not making land-use changes, we are just replanting between old eucalyptus trees. (Exhausted forests)

Automated Planting: Plants, Irrigates, and Fertilizes at the Same Time
Four-month Old Forest

25 Meter-Height and 5 Year-Old Trees
Our forests are certified by the FSC:
- Environmentally fair
- Socially beneficial
- Economically feasible

Aerial View of an Area Being Harvested

Harvesting

Aerial View of a Charcoal Processing Unit

Charcoal Production
Aerial View of the Pig Iron Mill

The Green Pig Iron

Thanks
It is with particular pleasure that Plantar express its affectionate and deeply-felt gratitude to those that have collaborated in the elaboration and conduction of this project

Brazilian Government
Inter-ministerial Commission on Global Climate Change
Ministry of Science and Technology
Ministry of the Environment
Government of the State of Minas Gerais
City Hall of Curvelo
NGO - AMDA Associação Mineira de Defesa do Ambiente
Association of Brazilian Sylviculture Producers

Special thanks:
Prototype Carbon Fund - World Bank

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