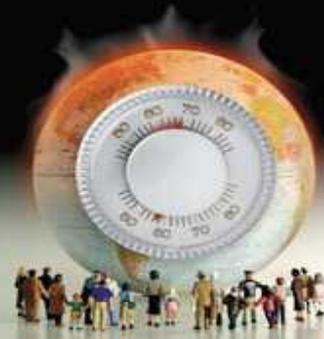


# Plantar Group



Forest Management and Metallurgy

## Climate Changes



## ECO/92

- 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'

## Conference of Parties - COP

- 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.

## Conference of Parties (COP)

- COP-1 Held from March to April, 1995 in Berlin - Germany;
- COP-2 Held in July, 1996 in Geneva - Switzerland;
- COP-3 Held in December, 1997 in Kyoto - Japan;
- COP-4 Held in November, 1998 in Buenos Aires - Argentina;
- COP-5 Held from October to November, 1999 in Bonn - Germany;
- COP-6 Held in November, 2000 in Hague - Holland, and in July, 2001 in Bonn - Germany.

## The Kyoto Protocol

- 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

Scientific Certification Systems does hereby certify that an independent Forest Management evaluation under the Forest Conservation Program has been conducted on the company or district named below and that this company or district has been shown to meet all of the necessary qualifications to be certified as a Well-Managed Plantation, in accordance with the Forest Stewardship Council's Principles and Criteria.

*Plantar, S.A. - Curvelo MG*

SCS Certificate Registration Number: SCS-PM-00004

Av. Raja Gabaglia, 1380 - Belo Horizonte, Minas Gerais - CEP 30380-090 - Brazil

Certified species: Eucalyptus

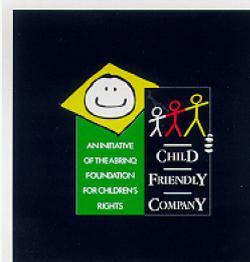


1550 Harrison Street, Suite 400, Oakland, CA 94612 USA  
Tel: 510-832-7411 Fax: 510-832-0359  
FSC - Registration #503  
100 Webster Street, Suite 200, Berkeley, CA 94702

September, 1998  
Valid until 9/2003

## Certificates

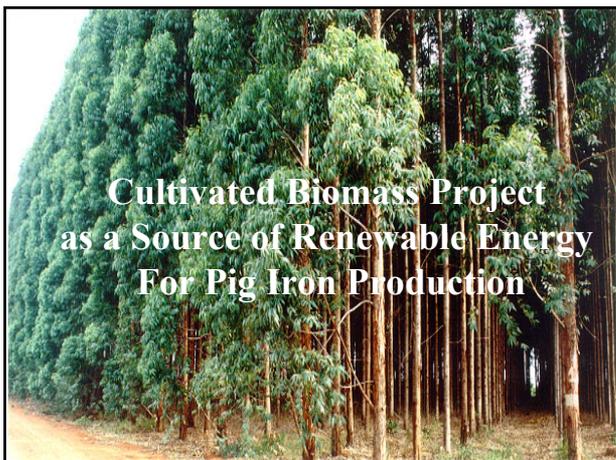
Certified Quality - ISO 9002



Social Responsibility - ABRINQ



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



## 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

## 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 CO<sub>2</sub> emissions through the NON USAGE of coal
  - By sequestering CO<sub>2</sub> and fixating carbon both in the forest plantations (dynamic stock) and in the pig iron

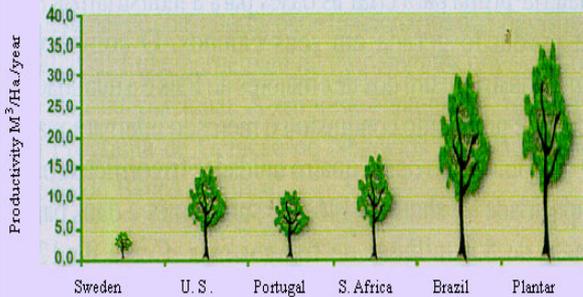
## Our Project Starts Growing Trees ...



**Not Exploring Mines !**



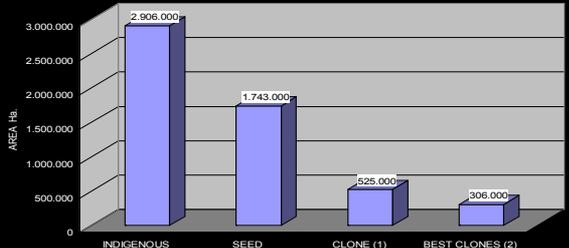
## We Use a New Technology of Cloned Trees



SOURCE: DBS 1994/SBS 1998

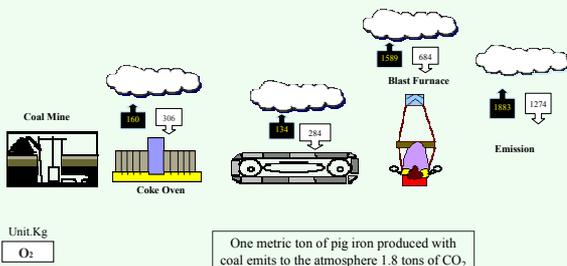
## With this Technology we Reduced in 90% the Required Area for Plantation

REQUIRED AREA FOR CHARCOAL PRODUCTION TO SUPPLY THE PIG IRON INDUSTRIES IN THE STATE OF MINAS GERAIS

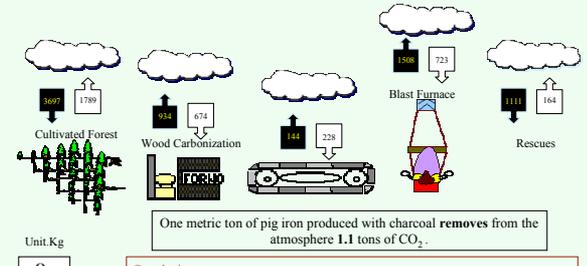


SOURCE: SINDFER CHARCOAL CONSUMPTION OF 174,358,350 KG IN 7 YEARS  
(1) CLONES THAT STARTED TO BE DEVELOPED 16 YEARS AGO AND ALREADY INCORPORATED TO OUR COMMERCIAL PLANTATIONS  
(2) NEW CLONES DEVELOPED THAT SHOW HIGHER PRODUCTIVITY

## CO<sub>2</sub> and O<sub>2</sub> Balance in the Production of Foundry Pig Iron in Mini-blast Furnace Utilizing Coal



## CO<sub>2</sub> and O<sub>2</sub> Balance for the Production of Foundry Pig Iron in Mini-blast Furnace Utilizing Charcoal





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

- 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

## Project's Figures

•Forest Areas (ha.) .....	23,100
•Charcoal Production (m <sup>3</sup> ).....	9,885,260
•Pig Iron Production (ton.) .....	3,802,023
•Carbon Fixed in the Dynamic Stock (ton.).....	953,100
•Avoided Carbon Emissions (ton.) .....	1,951,475
•Carbon Fixed in the Pig Iron (ton.) .....	165,906
•Direct Jobs .....	3,000

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 Coal x Charcoal

DATA	COAL	CHARCOAL
Production Capacity	2,000,000 ton./year	90,000 ton./year
Internal Volume	2,708 m <sup>3</sup>	119 m <sup>3</sup>
Melting Pot Diameter	11.5 m	2.90 m
Height	101 m	17.09 m
Investment	US\$ 300 million	US\$ 5 million
Shipment System	Bell Less Top	Double Cone

## Aerial View of the Farm

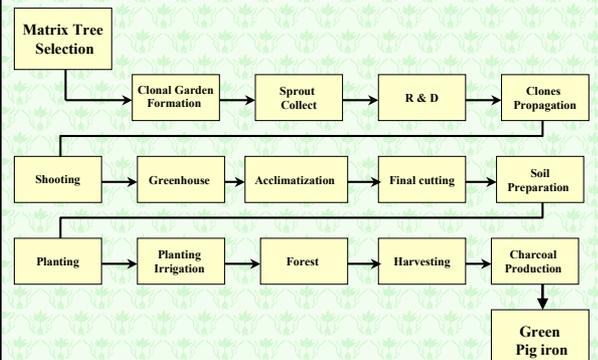


## Aerial View of the Clones Nursery

Annual Production Capacity: 20 million cuttings



## Production Chart



## 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.

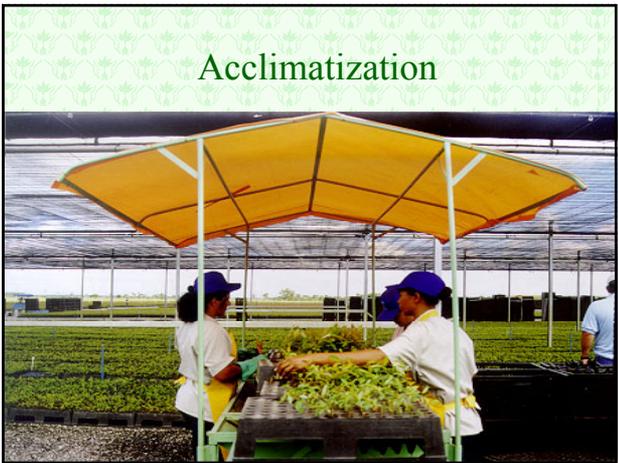




Sprouts Being Transported to the Greenhouse



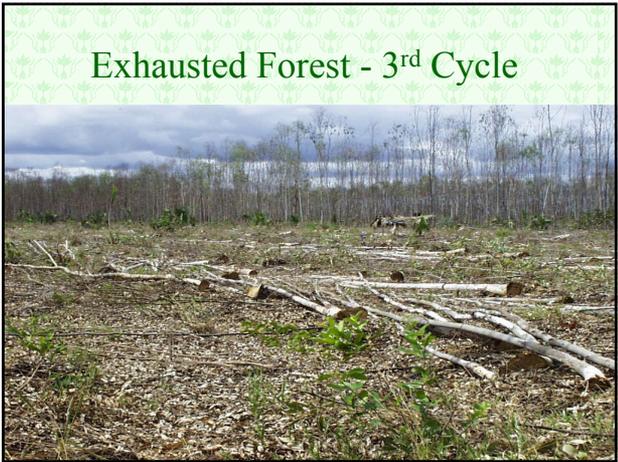
Greenhouse



Acclimatization



Cut-tings Ready for Planting



Exhausted Forest - 3<sup>rd</sup> Cycle



Tree Stumps

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



## Pig Iron Production



## 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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[www.prototypecarbonfund.org](http://www.prototypecarbonfund.org)