



**Acacia development synergizes with Pulp and Paper Industry
innovations towards Sustainability**

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by**

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Sustainable Development

The development that meets the needs of present without compromising ability of future generations to meet their own needs and development.

Pulp and Paper Industry has been working
Proactively to adopt this approach



P&PB Projected Annual Growth '10

Products	Annual Growth , %
Printing &writing	2.5
News Print	1.9
Tissue	3.8
Container board	5.0
Other paper and PB	3.0
Total P&P	3.5

RISI Report Dec.2008



Indonesian Pulp and paper Industry

Year	2008	2009
GDP growth (%)	6.2	4.3
GDP per capita (US\$)	2,077	2,030
Population (million)	230	235
Pulp and paper mills	84	84
Paper consumption (kg/capita)	27	28.5

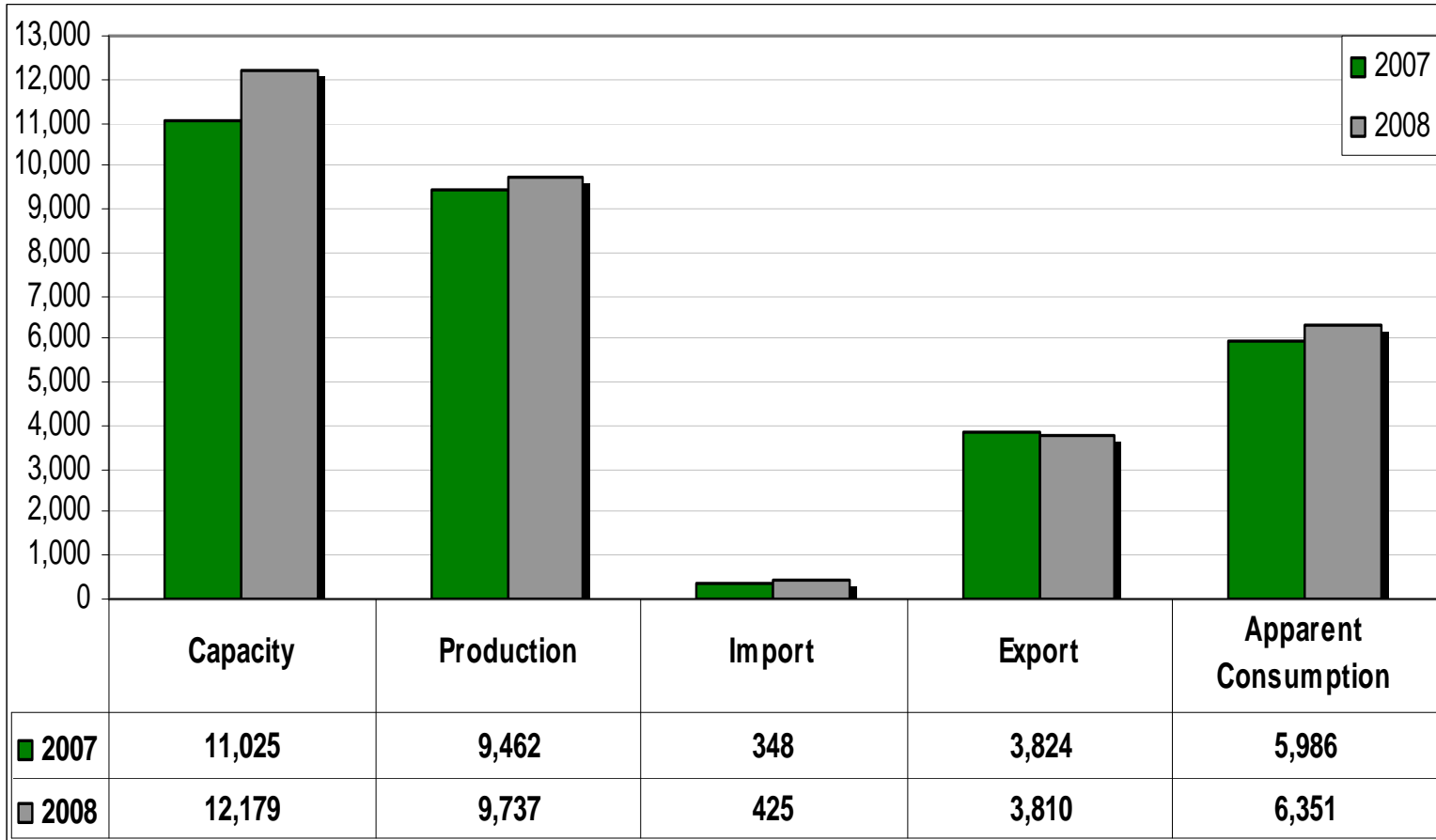


Indonesian Pulp and Paper mills Locations



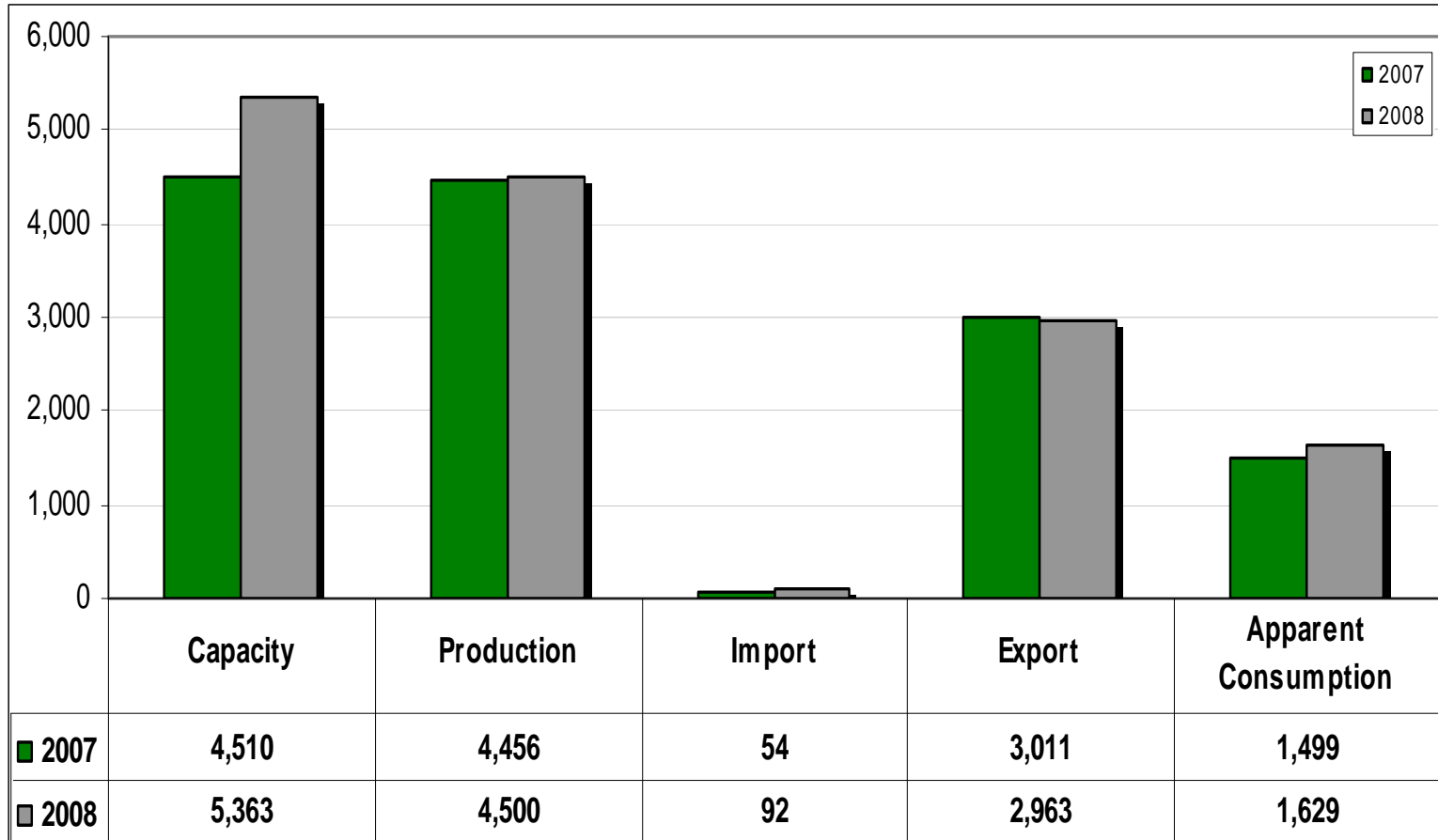


PAPER AND PAPERBOARD x 1000 MT



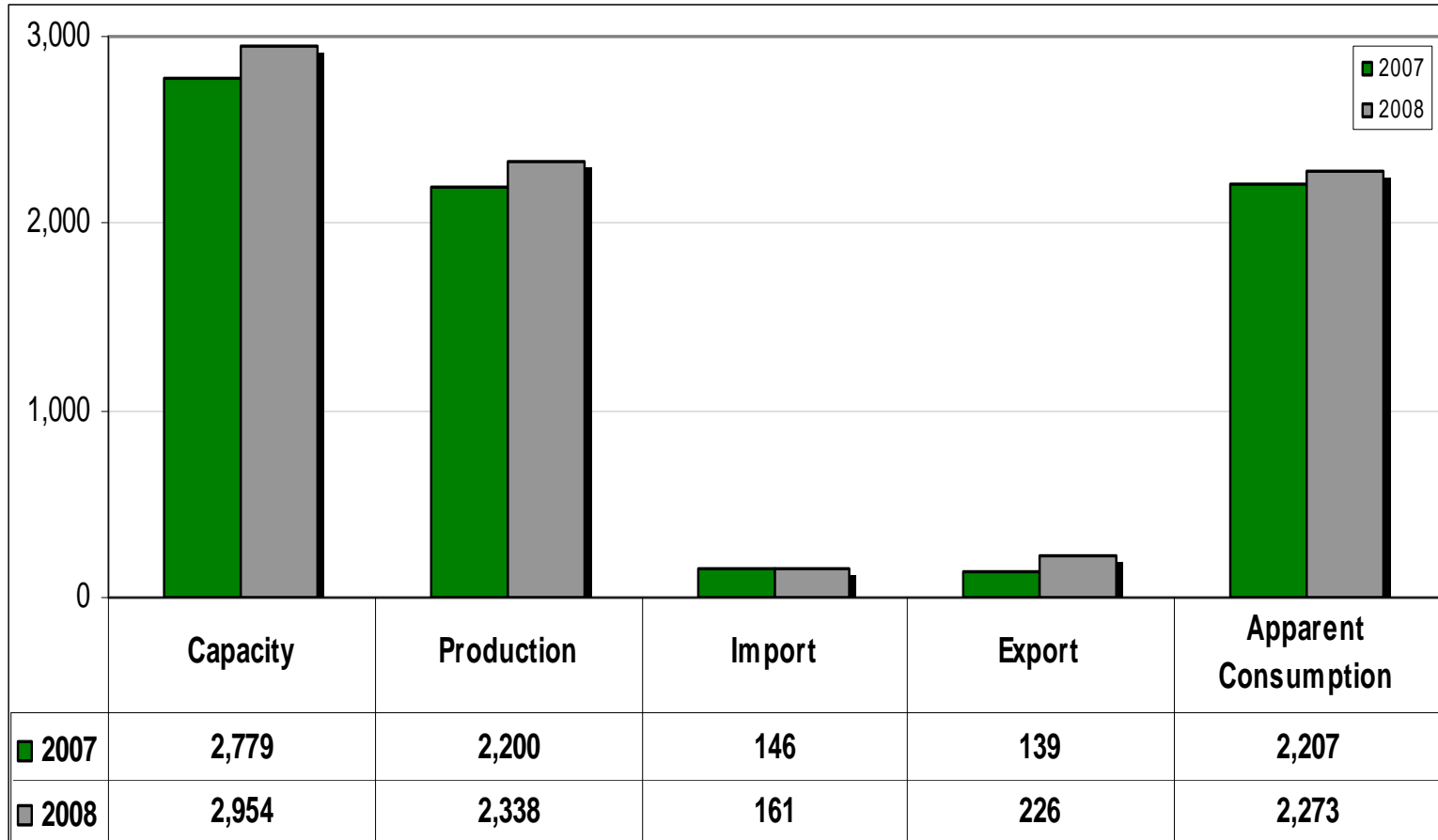


WRITING AND PRINTING PAPER x 1000



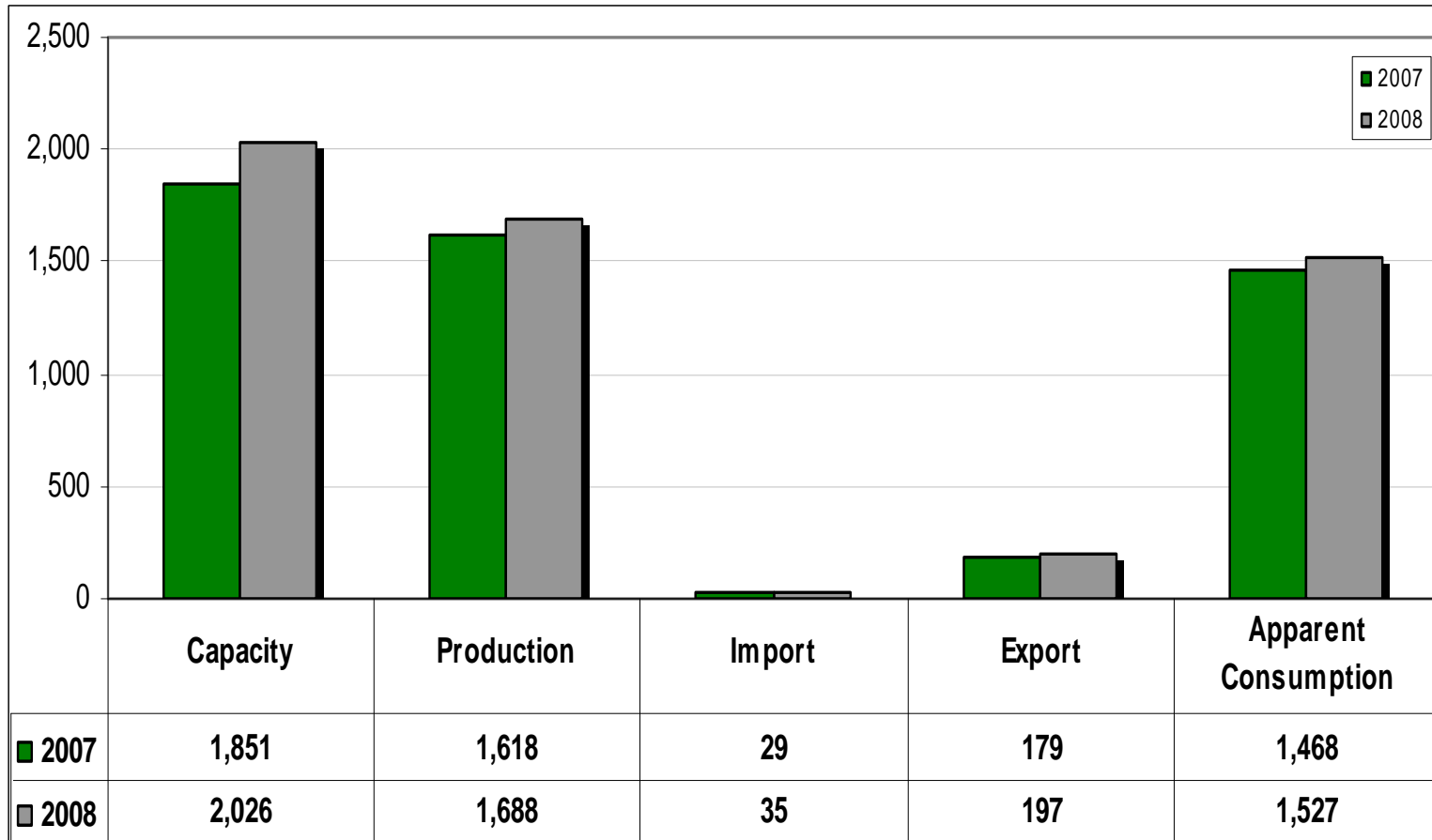


PACKAGING PAPER x 1000 MT



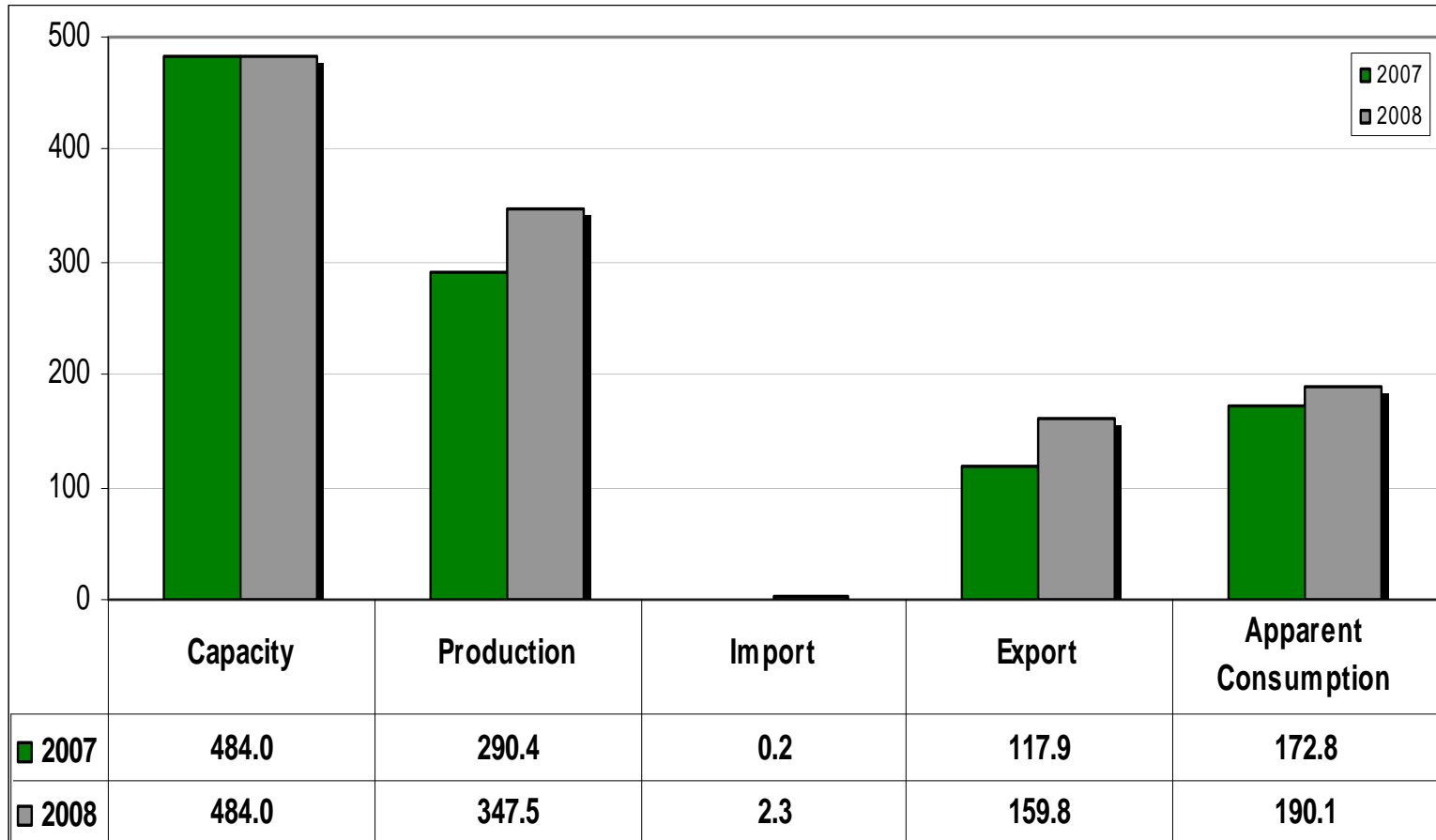


BOARD x 1000 MT



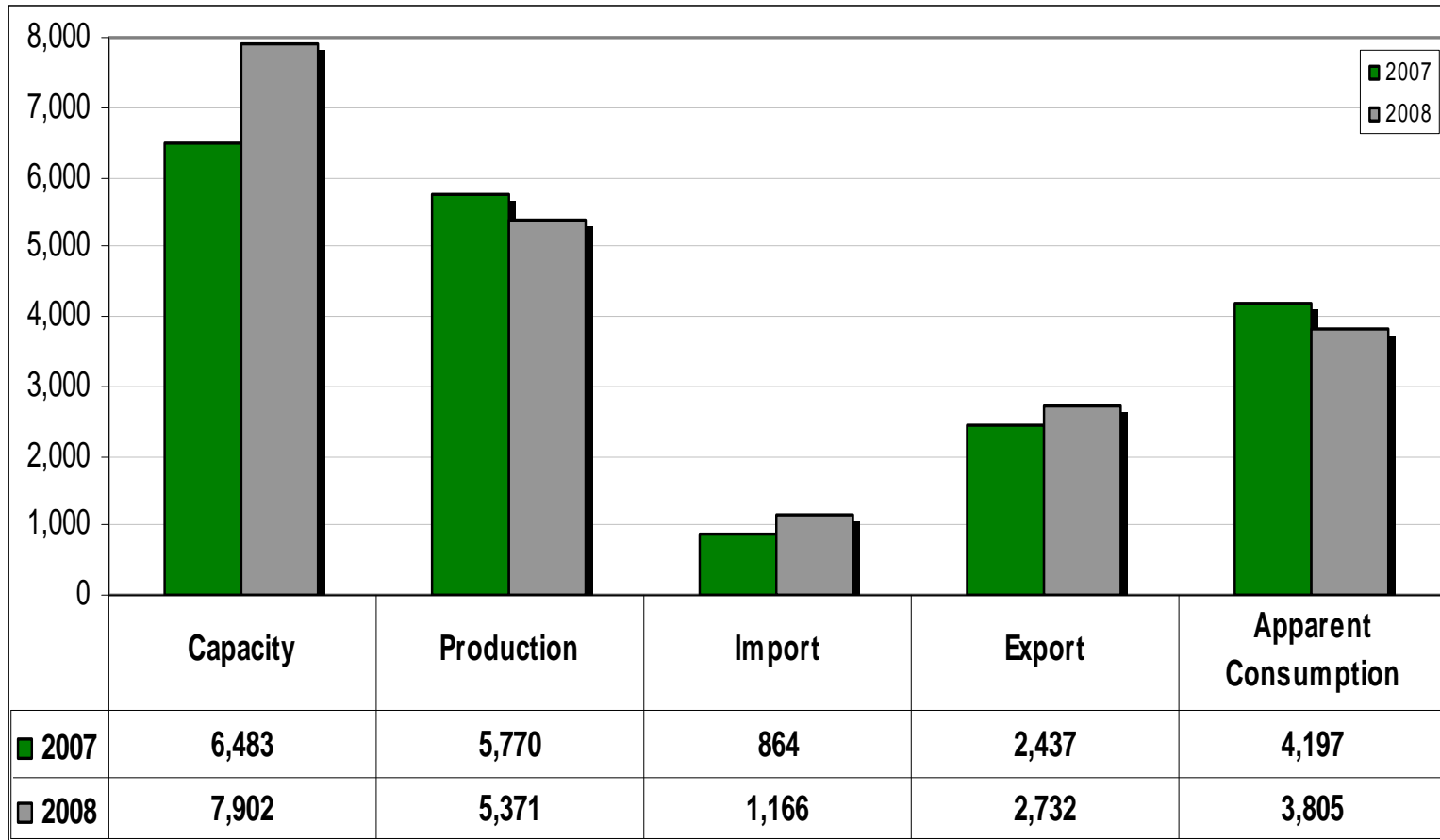


TISSUE PAPER x 1000 MT



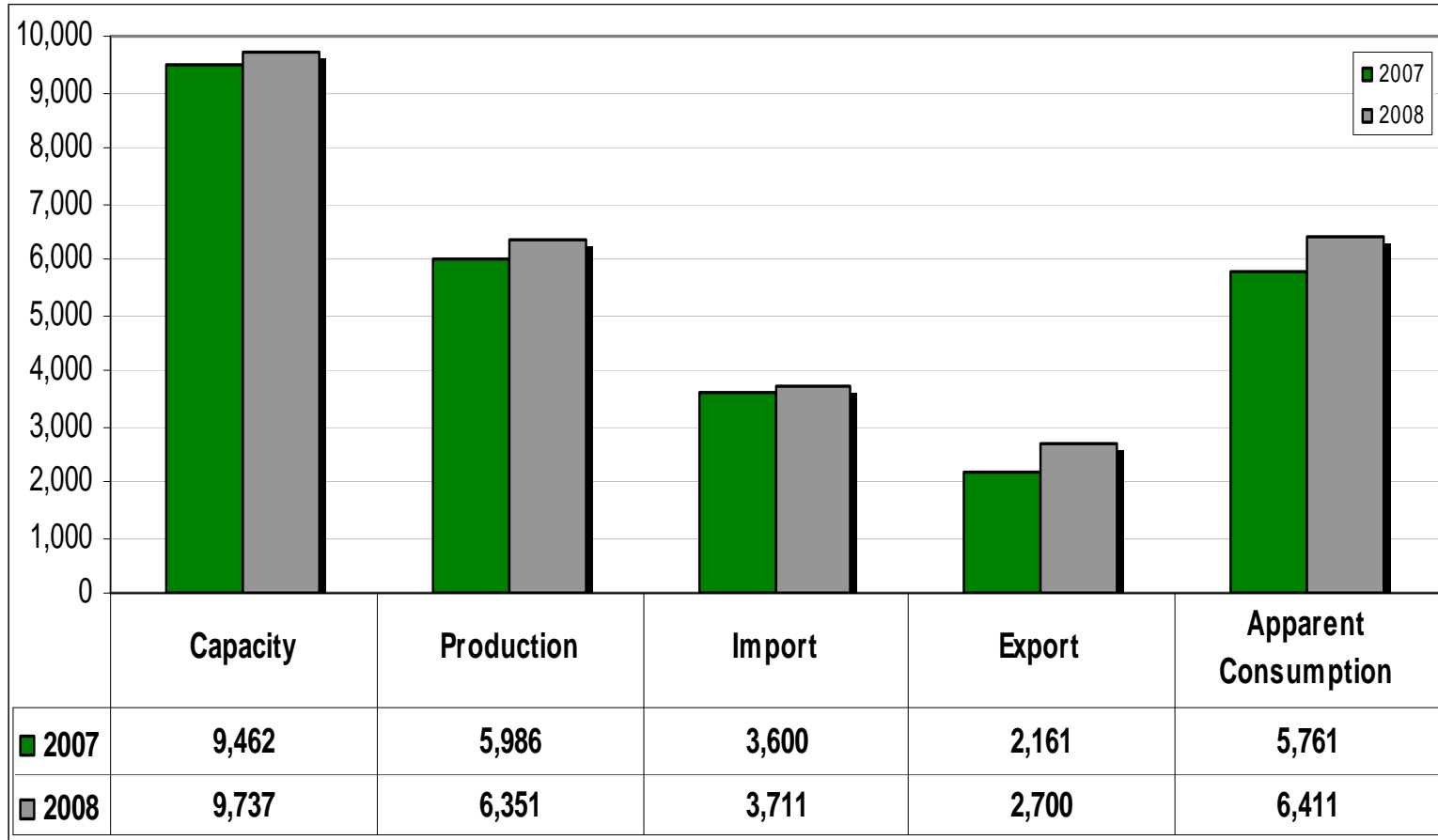


PULP x 1000 MT





WASTE PAPER x 1000 MT





**PT. TANJUNGENIM LESTARI
PULP AND PAPER**

ISO 9001

ISO 14001

CW/CoC (FSC)

**World Class Mill
High Standard Quality
Environmental Friendly**



LOCATION





TeL- HISTORY

- **Sept.,1997: Started construction of the mill**
- **Dec.,1999 : Started pulp production**
- **May, 2000: Started commercial operation**
- **Mill capacity :450,000 ADMT market pulp**
- **June, 2009 : 4. 0 Million ADMT-Acacia Pulp**
- **Mill certified : ISO 9001 ,14001 & CW (FSC)-CoC**



PROCESS FLOW



HTI PT.MHP



Log Transport



Log Piling



Feeding Logs to Drum barker



Debarking



Bleaching ECF



Digester- ODL plant



Chips Screening



Chips piles



Chipping



Drying at Pulp Machine



Pulp Final Product



Pulp transport to Tarahan



Tarahan port for Shipment



Recy & Energy generation



TeL Sustainability Efforts/Performance

- **Raw material -100% Plantation Acacia wood.**
- **100 % Green Energy -Power & steam - Acacia bark and Black liquor as fuel.**
- **State-of-art Technology Process-ECF bleaching.**
- **ISO 14001 and Cw-CoC certified company.**
- **In full compliance with Corporate & Environmental regulations.**
- **Continuous improvement through SGA activities.**
- **Social participation & development thru CSR implementation:**
 - Education
 - Health
 - Financial prosperity
 - Environment
- **Emphasis on Education and Training of employees.**



P&P Technology Selection – Main Criteria

- Economic Feasibility
- Flexibility of Operations
- Environmental Impact
- Product Quality
- Energy Efficiency
- Process Productivity
- Equipment Performance
- Maintenance
- Spares Management
- Process Controls
- Assets life

and

Sustained availability of Fibrous Raw material



Areas of innovations/developments

- Management /development of Fibrous Resource & and their Properties
- Processing -Pulping , Bleaching ,Papermaking and others
- Judicious waste paper recycling
- Energy performance
- Specialty Chemicals
- Process controls /information technology
- Asset effectiveness
- Pollution control development and Environmental management



Fiber Resource Development

- **Establishment of pulpwood plantations in degraded forest & underutilized land.**
- **Establishment of plantations of fast growing trees**
- **Wood development thru society participation.**
- **Tree improvement through relevant/recognized technologies to meet:**
 - Improved plantation productivity
 - Uniform/required fiber characteristics
 - Need based wood composition
 - Sustainability in operations.
- **Move towards Copenhagen commitments/ advantages of the plantation industry for total development.**



Acacia plantation at MHP-TeL





Acacia mangium wood

- Acacia belongs to family Leguminosae.
- It has origin in Australia ,New Guinea and Indonesia and as pioneer wood spp used for plantation.
- A major plantation species of humid tropical highland of Asia.
- Extremely vigorous growth (Mean Annual increment of over 25-30 m³ per hectare).
- Tolerance of very acid and low nutrient soil and ability to grow where competition is severe.



Acacia Plantation Contribution- Facts

- Acacia mangium is nitrogen fixing ability is utilized for the amelioration of degraded soil "
- It is not of weedy nature and has no potential to become an invasive species.
- Foliage nutritive value for livestock not studied/reported however , observations are that its palatability is low.
- The specie is not fire resistant but from its own litter will not readily ignite.
- Stem diameter above ~10 cm. resist/survive effectively from fire.
- Fully ripened AM seed has a very hard seed coat retains viability well in storage and physiological quality for adequate germination rate after proper storage.

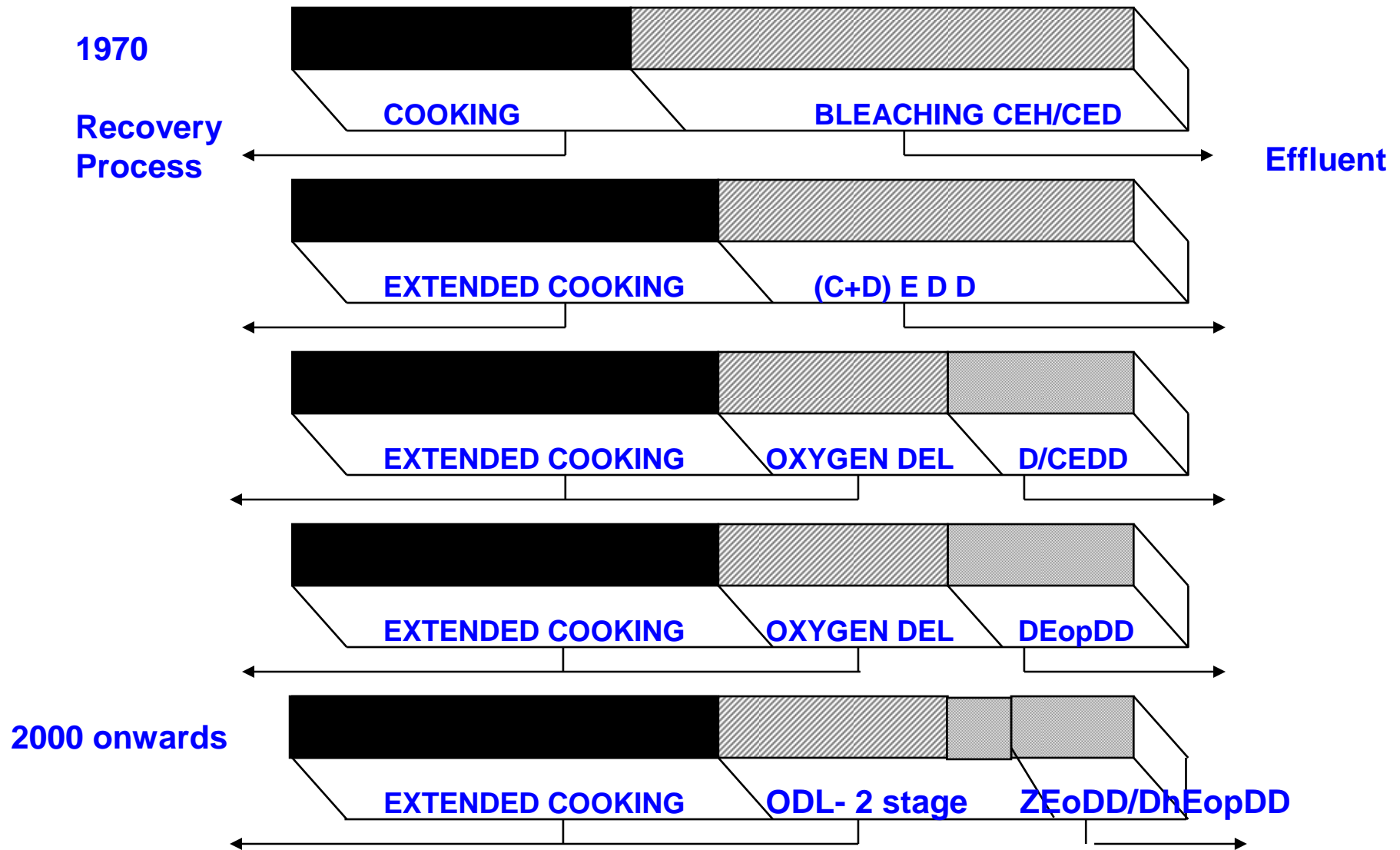


CDM projects – Acacia P&P offers

- **Sequestering Carbon Dioxide thru plantation.**
- **Plantation of Acacia wood thru society participations.**
- **Use of biomass- bark, wood rejects, effluent sludge etc. as green energy.**
- **Introduction of Acacia friendly equipment assets for efficient energy and water uses.**
- **Use of CO₂ (Lime kiln) and hydrogen (CP) as resources.**
- **Incorporation process developments, optimization and improvements to save energy/ fossil fuel thru using processing .**
- **Others**



Development needs/impacts- Pulping & Bleaching





Acacia offers

- Lower cooking and bleaching chemicals (~10-15%).
- Lower pollutants to effluent.
- Lower water uses and effluent volume.
- Lower sodium/chlorides/color in effluent.
- Efficient energy uses.
- Higher pulp yield.
- Consistent and acceptable fiber properties.
- Clean processing- minimum organic deposits.



Developments -Recovery operations

- Free Flow Falling Film evaporators
- B.L concentration > 80%
- On-line evaporators washing
- Steam parameters- $P > 100$ bar $T > 500$ c
- Improved emission controls and monitoring
- DNCG & CNCG burning in Boiler-Lower odor
- Dissolving tank vent gas burning
- Efficient CI-K purging system.
- Burning bio-sludge from ETP with BL



Developments – Papermaking

- Efficient and customized equipment development from stock thru final product processing .
- High levels of process monitoring synchronized with controls .
- High productivity systems and equipments.
- Customized consumables at every stage of operations.
- Efficient management of Chain of Custody thru development and use of IT.



Value to Speciality UCWF/CWF

Overall requirement	Offered by Acacia pulp
Sustainability	Environmental , Manufacturing & Availability
Brightness	Consistent and committed <u>brightness</u>
	Very low brightness reversion tendency/value
	Pulp available at high brightness values 91-92 % ISO
Cleanliness	Very clean pulp below 0.5 mm ² /m ² dirt count
	Zero self- resin depositing tendency
	Low bleached shieves
Formation and strength	Good Formation
	Higher bulk at given smoothness
	Tensile strength comparable with other short fiber pulps
Printing properties	Very uniform surface and excellent printing properties.
Machine operation	Lower energy, Chemical synergy, Lesser cleaning
	Efficient dewatering and drying & Higher Yield

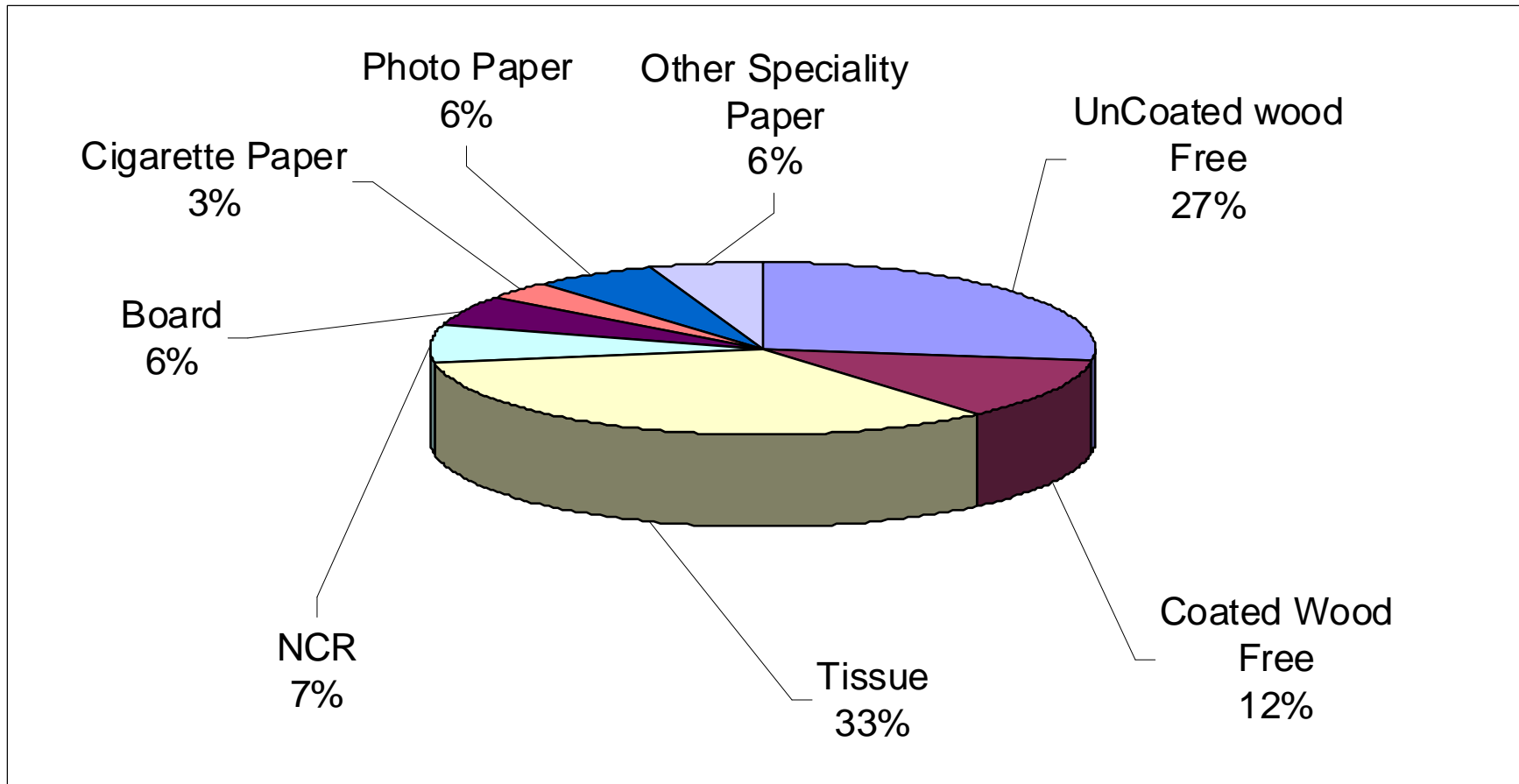


Value to Tissue

Overall requirement	Offered by Acacia pulp
Sustainability	Environmental , Manufacturing & Availability
Surface and bulk Softness	<u>Good softness</u>
	Hand feel/ face feel due to low roughness
	Bulk softness
Absorption	<u>Higher Absorbency</u>
	Due higher fiber population
	Lower bonding at papermaking
Fluffiness	Good Formation/ higher total bulk
Machine operations	Lower energy, Good formation , Chemical synergy
	Efficient dewatering and drying & Higher Yield
Customers perception	Clean & Hygienic and Soft



TeL -SALES BY END PRODUCTS-'09





Acacia pulp offers

- **Environmentally Sound – sustainable plantation wood source.**
- **Much easier to delignify than other hardwood pulps.**
- **Easier to bleach.**
- **Very clean pulp**
- **Needs lesser refining energy during paper making.**
- **Good wet strength.**
- **Low fiber coarseness –**
- **Good formation than other hardwood pulps.**
- **Needs lesser heat energy in drying**
- **Acceptable strength properties-Good runnability on high speed machine .**
- **Produces paper with very good smoothness.**
- **Good Printing Properties.**



Concluding comment

Pulp and paper industry has achieved a status of one of the most sustainable industries. Acacia developments are complementary and in synergy with strategic technological developmental efforts to make pulp and paper industry more attractive for **Investment, Environment , Employment and Society.**



Acacia Supports P&P Industry Image

PULP & PAPER INDUSTRY IMAGE – PAST and PRESENT/FUTURE

- | | |
|----------------------------------|-------------------------------------|
| ▪ Capital Intensive- | Financially Prospective |
| ▪ Raw Material Intensive- | Self Sustaining/Green |
| ▪ Manpower Intensive- | Efficient HRM |
| ▪ Energy Intensive- | Self sufficient/ contributor |
| ▪ Water Intensive- | Efficient water user |
| ▪ Pollution Intensive- | Minimum impact/Clean |

Most Sustainable Industry

THANKS