

# **Sweet Sorghum Ethanol Technology**



**PRAJ**

---

Presentation by

**Praj Industries Limited**

**INDUSTRIES**

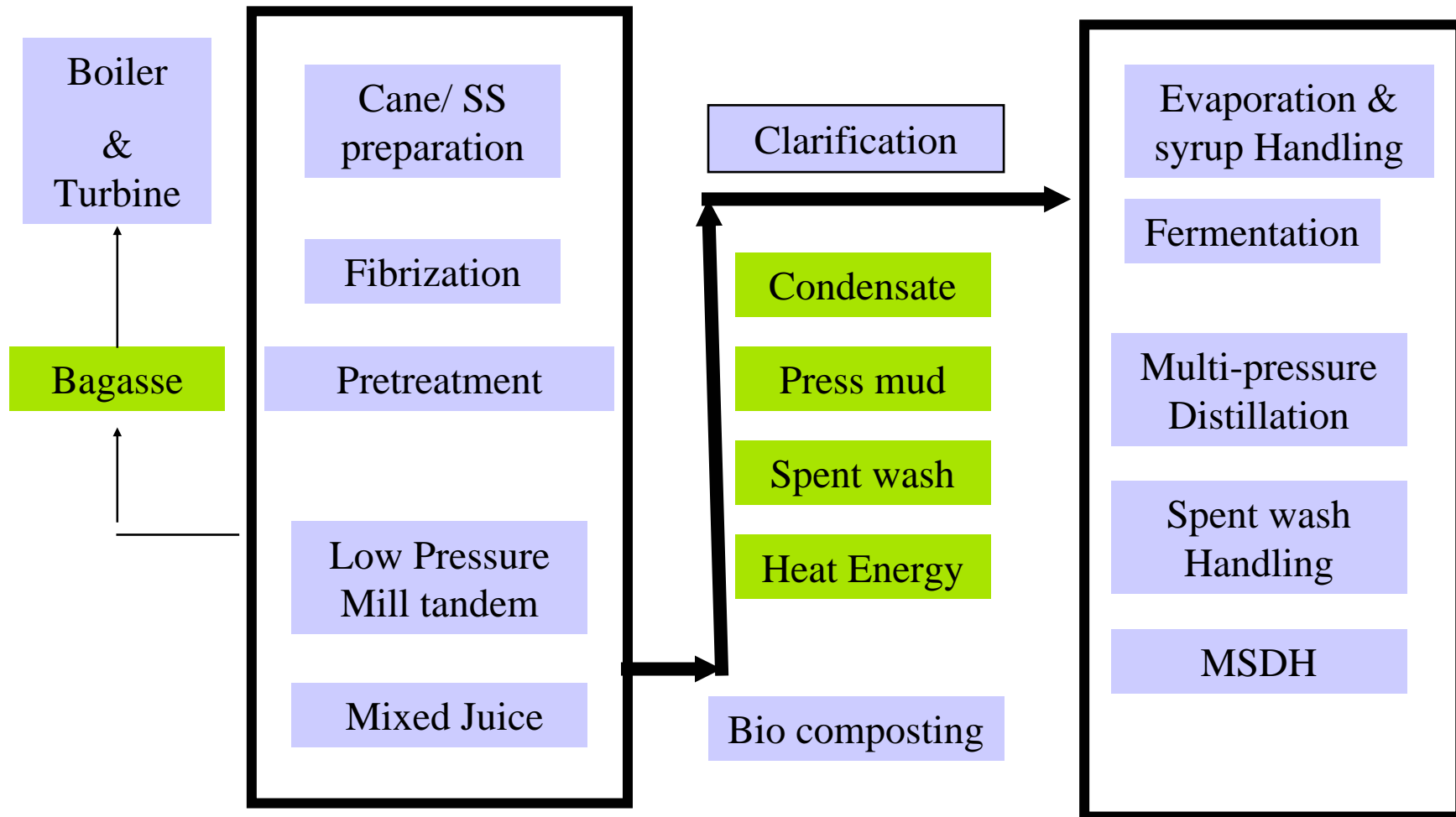


# Sweet Sorghum to Bioethanol Technology

PRAJ Smart Distillery  
Features & Benefits

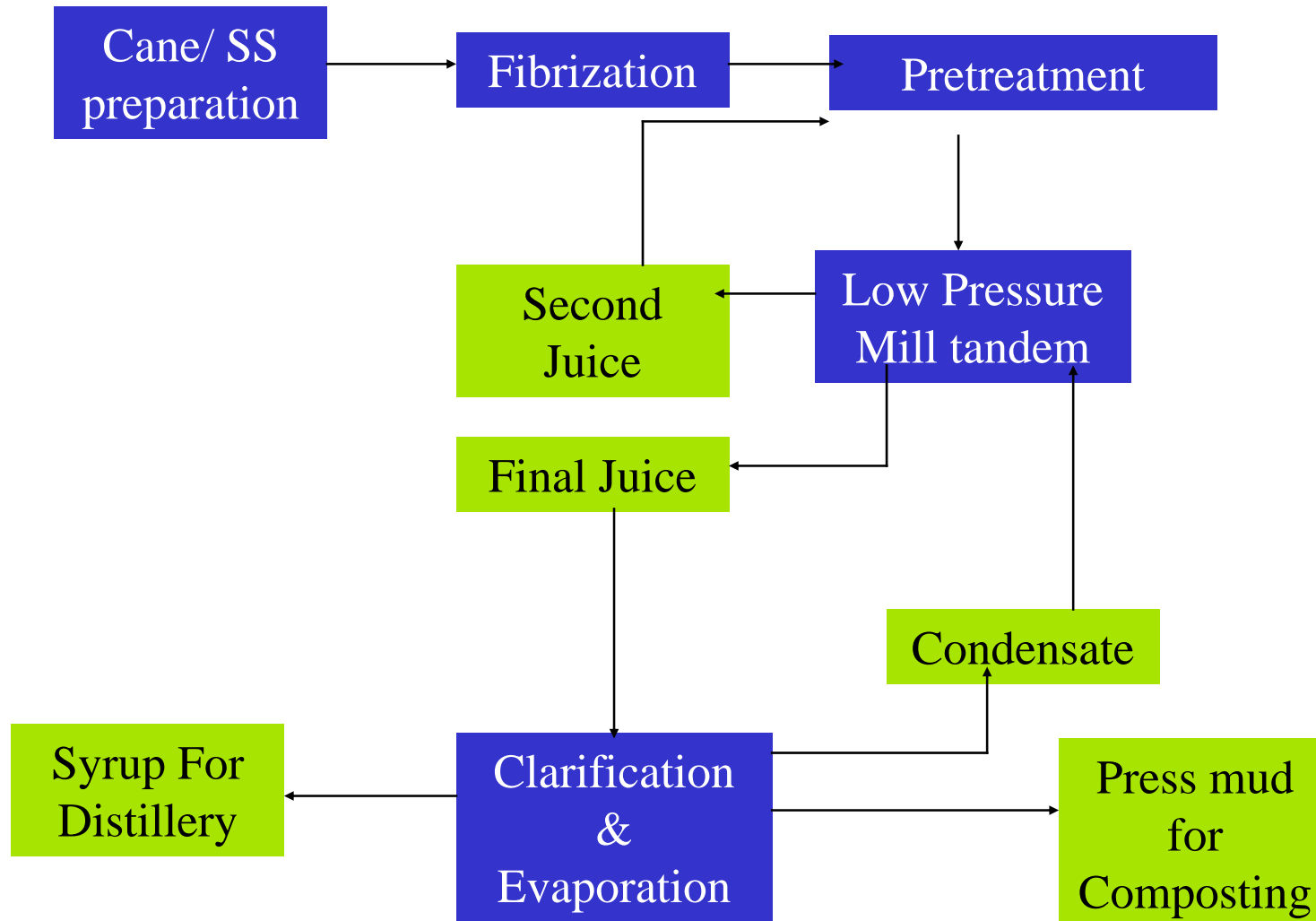


# Sweet Sorghum / Sugarcane Based Distillery Scheme





# The Scheme





# PRAJ SS-Ethanol Technology

---

- Compositional studies on SS and factors affecting ethanol production
- Testing of SS Bagasse for steam and power generation
- Development of Juice extraction treatment and bagasse handling / management
- SS syrup fermentation process with high yield & recycle of waste water up to 75%
- Energy efficient distillation, dehydration and evaporation systems
- Overall complex integrated for water and energy use



# PRAJ SS-Ethanol Technology

---

- Advantages:
  - Up to 270 days operation with feedstock combinations in certain regions
  - Integrated complex with low waste water (2.5 Lit/Lit of bioethanol)
  - Own press mud for Bio-composting
  - Low Steam & Electricity needs... 5.5 Kg/Liter and 0.9 KWH/Lit respectively) ...Surplus power for sale 1.7 to 1.8 MW/ KL of ethanol



Industrial SS processing  
Plant (50 TCH)  
(During Construction)





# Sweet Sorghum Industrial Processing

---





# Thermopermeation in Operation

---





# Fibrized Sweet Sorghum...





Cane / Sweet Sorghum give surplus bagasse...

---





# Process specifications SS Vs Cane Milling

Description	Cane Milling	SS processing
Sugar Extraction efficiency	Average 95%	96-97%
Power KW/MT of S. Sorghum	11 to 12	8 to 9
Yield of alcohol (With 10% FS in Stalk)	<b>52-53</b>	<b>55 - 60</b>
Juice % on stalk	96-100	100-105



## 2005-2007 Pilot / Industrial experiences

---

- Pilot trials:
  - Warna Sugar mill ethanol plant
- Full scale trial
  - Vaidyanath Sugar mill West of India- 45 KL/Day Bioethanol plant (Duration one week)
- Batch growing and ethanol production trials
  - Sagar Sugars Mills South of India – 72 KL/Day Bioethanol Plant
  - Bannari Aman Sugar mills South of India- 50 KL/Day Bioethanol plant



## Plant / Feasibility Study Assignments

---

- **Currently under execution:**
- **India:**
  - 45 KL / Day Sweet sorghum to Ethanol & Electricity Complex: Turnkey Engineering and execution contract
  - Farming, Harvesting, Milling, Bioethanol complex and power generation complex
- **Feasibility study contract in Mexico & Taiwan:**
  - Feasibility Study assignment for 250 KL/ Day plant
  - Farming, Harvesting, Milling, Bioethanol complex and power generation complex
  - Scope: Agriculture Trials, Plant engineering, Local Investment and operating cost estimates and viability analysis



**Typical Operating Performance of a  
100 KL distillery on cane /SS  
(Scenario from India)**



# Typical Performance 100 KL Distillery on SS / Cane

Plant Capacity	100 KLPD Ethanol (AA)
Feedstocks	SS: 1800 – 2000 TCD Sweet sorghum
Operating Days: Differ with regions	SS: 240 Max (can be combined with cane)
Wastewater	200 to 250 CuM / day
Press mud	45 to 50 Tons /day
Process water requirement	150 to 200 CuM / day (600 for start-up)
Bagasse generation	600 Tons / day
Possible steam & Electricity	Steam: 50 Tons / Hr Electricity: 10 MW
Electrical consumption	3.0 to 3.5 MW
Steam consumption (Depends on FS content in stalk)	Pretreatment- 2.7 to 3.2 Kg / liter of Ethanol, Total – 5.5 to 6.0 Kg / Liter OR 550 to 600 Tons / day



---

# Thank You for Your Attention !

Please do visit us at

[www.praj.net](http://www.praj.net)

Contact us at

[Info@praj.net](mailto:Info@praj.net)

**USE FUEL ETHANOL**  
**Clean...Renewable...Green**

---

[www.praj.net](http://www.praj.net)