



# **WASTE TO ENERGY PROJECT IN INDIA**

## **STARCH INDUSTRY SECTOR**

**BY**

**ABHIJIT NAIK  
YASHWANT ENERGY PVT. LTD.**

# **PRESENTATION**



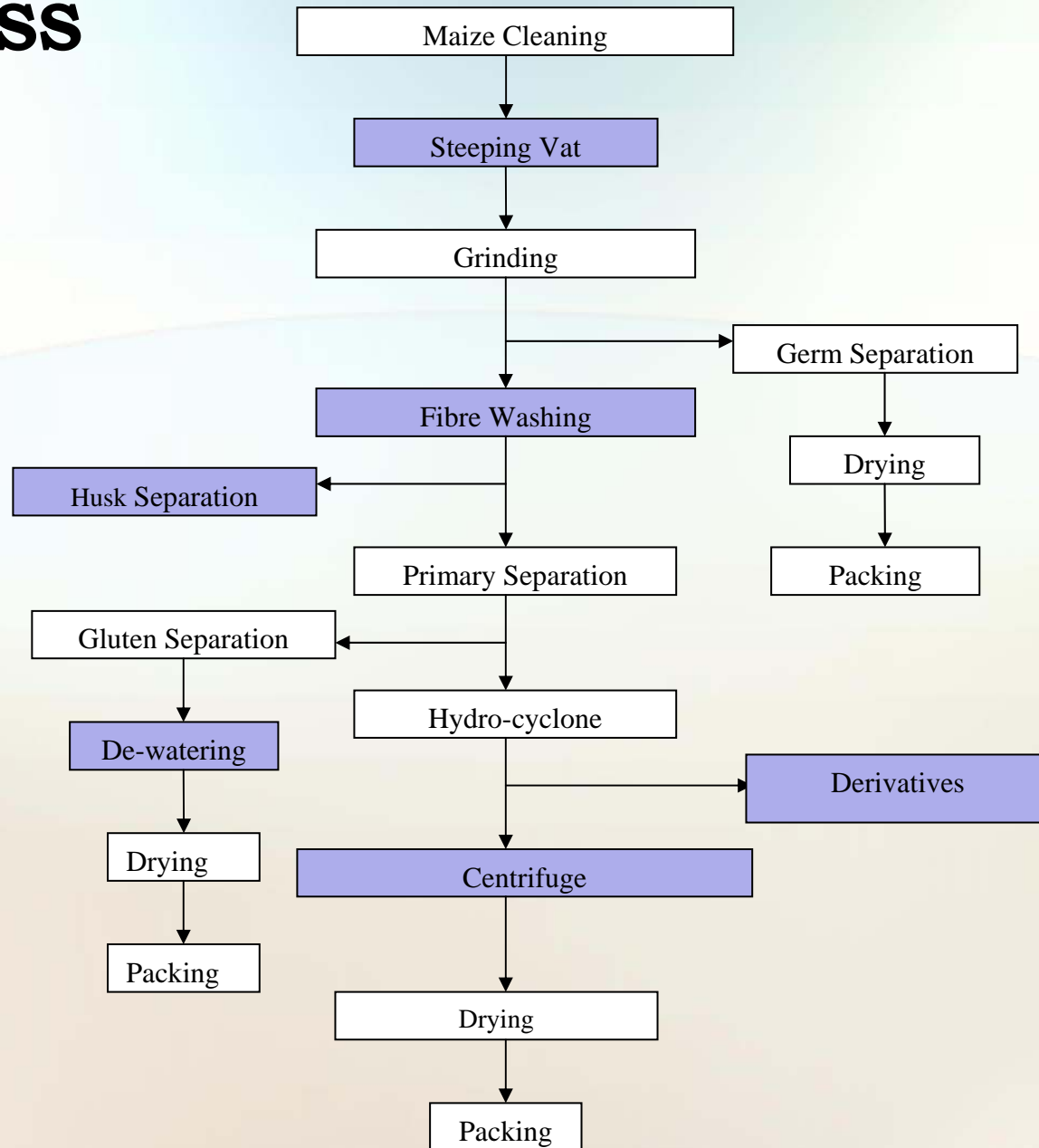
- **ABOUT THE STARCH INDUSTRY**
- **WASTE GENERATION POTENTIAL**
- **CURRENT PRACTICES**
- **FUTURE OPPORTUNITIES**
- **BARRIERS**



# **ABOUT THE STARCH INDUSTRY**

- **AGRO PROCESSING INDUSTRY – 40 YEARS**
- **STARTED WITH CAPACITIES LIKE 25 TPD CRUSHING**
- **INSTALLATIONS TILL 1000 TPD**
- **INDIA : 4500 TPD INSTALLATIONS (+2500 IN NEXT 2 YEARS)**
- **MAHARASHTRA : 1400 TPD INSTALLED CAPACITY**
- **GROWTH : 300% SINCE LAST 5 YEARS**

# PROCESS



# WASTE GENERATION POTENTIAL



- **STEEPING : CORN STEEP LIQUOR**
  - **MAJOR INGREDIENTS**
    - **PROTIENS : 35-45%**
    - **LACTIC ACID: 20-25%**
    - **SUGARS: 6-10%**
    - **MINERALS: 8-10%**
    - **FIBERS: 5-10%**
- **DE WATERING AND WASHING**
- **DERIVATIVE PLANT: BACKWASHING OF ION EXCHANGE**

# WASTE GENERATION



- **CSL**
  - **GENERATION: 0.6 M<sup>3</sup>/MT CRUSHING**
  - **COD : 1,20,000 mg/LIT**
- **OTHER WASHING**
  - **GENERATION: 3 M<sup>3</sup>/MT CRUSHING**
  - **COD : 2,000 mg/LIT**
- **OVERALL**
  - **GENERATION: 4 M<sup>3</sup>/MT CRUSHING**
  - **COD : 20,000 - 22,000 mg/LIT**

# PRACTICES



- **CSL WAS USED AS CULTURE FOR MANUFACTURING PENICILLIN AS WELL AS IN CATTLE FEED**
- **OPEN LAGOON SYSTEM FOR COD REDUCTION**
- **CRUDE LAGOONS COVERED BY POLYTHENE TO RECOVER BIOGAS**
- **USE OF BIO GAS FOR DRYING APPLICATIONS IN FIBER AND PROTIEIN**
- **USE OF BIO GAS IN BOILER FOR STEAM GENERATION**

# ENERGY GENERATION POTENTIAL



- **90-92% REDUCTION OF COD IN BIODIGESTER**
- **POTENTIAL OF 40 M<sup>3</sup> BIOGAS GENERATION PER MT MAIZE**
- **CH<sub>4</sub> CONTENT : 60-65%**
- **CALORIFIC VALUE : 4800-5400 KCAL/M<sup>3</sup>**
- **POWER GENERATION: 2 -2.2 KWH/M<sup>3</sup>**



# **A CASE STUDY**



- **FOR 100 TPD MAIZE CRUSHING PLANT**
  - **BIOGAS GENERATION : 4000 M<sup>3</sup> /DAY**
  - **POWER GENERATION : 375 KWH**
  - **CDM POTENTIAL: 12000 CER/ YEAR**
- **OVERALL NATIONAL PERSPECTIVE**
  - **POWER GENERATION : 25 MW**
  - **CDM POTENTIAL : 8,00,000 CER/ YEAR**

# **PROJECT: 200 MT/DAY PLANT YASHWANT GLUCOSE KARKHANA**



**BIODIGESTER  
CAPACITY: 3000 M<sup>3</sup>**

**BIO GAS ENGINE  
CAPACITY: 1063 KW**



# OPPORTUNITIES



- **ESTABLISHMENT OF HIGH EFFICIENT BIO-DIGESTERS (UASB) AT SITES OPTING FOR OPEN LAGOONS / COVERED LAGOONS**  
HIGHER REDUCTION OF COD TO GENERATE MORE BIO GAS
- **INTALLATION OF BIOGAS BASED POWER GENERATION PLANT**
- **USE THE WASTE HEAT OF FLUE GAS FROM GAS ENGINE IN HEATING APPLICATIONS**
- **AVAIL CDM BENEFITS FOR METHANE EMISSION REDUCTION (FOR BIO DIGESTER INSTALLATION) AND FOR POWER GENERATION**
- **AVAIL RECs FOR CAPATIVE POWER GENERATION**
- **CENTRAL FINANCIAL ASSISTANCE FROM MINSTRY OF NEW AND RENEWABLE ENERGY FOR POWER GENERATION**

# BARRIERS



- **INDUSTRY**
  - INITIAL CAPITAL INVESTMENT
  - CHANGE IN CURRENT PRACTICE LIKE REPLACEMENT OF BIOGAS BASED DRYER TO STEAM HEATED FIBER DRYER
- **TECHNOLOGY**
  - BIOGAS CONTAINS ABOUT 1-2% H<sub>2</sub>S HARMFUL FOR ENGINE
  - REQUIREMENT OF GAS PURIFICATION SYSTEM
  - AVAILABILITY OF BIOGAS ENGINES
- **POLICY**
  - ACCESS TO FINANCE
  - IT BENEFITS
  - TAXES AND DUTIES ON EQUIPMENTS
  - PCB NORMS
  - CAPTIVE POWER REC POLICY FOR SMALLER PLANTS

# INDUSTRY REQUIREMENT



- **A CORPUS FUND LIKE CARBON FUND**
- **TARGET THE WASTE TO ENERGY FIELD AS PRIORITY SECTOR TO BANKS AND FINANCIAL INSTITUTIONS**
- **EASY ACCESS TO TECHNOLOGY AND SUPPLIERS**
- **PCB CONDITIONS TO BE RELOOKED CONSIDERING THE CDM INVESTMENT POTENTIAL**
- **POLICIES TO INCLUDE SMALLER POWER PLANTS IN REC MECHANISM**
- **IT BENEFITS**



**THANK YOU !!**