



Debor Consulting
Scope of Services
for the
Sweet Sorghum Bio-industry

Hal Debor B.Eng.
Debor Consulting

Debor Consulting Services **For Sweet Sorghum Bio-Refineries**

- Conceptual Design
- Feasibility Studies
- Business Plans
- Capital cost estimates (CAPEX)
- Operating Cost estimates (OPEX)
- Investment Cash Flow
- Manpower requirements

Debor Consulting Services **For Sweet Sorghum Bio-Refineries**

- Project Planning
- Project Management
- Construction Management
- Project Commissioning
- Employee training programs

Debor Consulting Services **For Sweet Sorghum Bio-Refineries**

- **Site Studies**
 - **Climate data**
 - Annual temperature profile
 - Annual precipitation
 - Wind velocities during growing season
 - **Irrigation requirements**

Debor Consulting Services **For Sweet Sorghum Bio-Refineries**

- **Farming Operation**
 - Selection of planting equipment
 - Soil preparation – strip tilling & fertilizing
 - Seeding – air drills or no-till
 - Weed and pest control
 - Selection of harvesting equipment
 - Sweet sorghum billet harvesting system
 - Hay making equipment, square & round bales
 - Silage making equipment

Debor Consulting Services **For Sweet Sorghum Bio-Refineries**

- Irrigation Technology to apply
 - Flooding type
 - Overhead – circular or linear
 - Travelling Gun
 - Sub-surface drip (SDI)

Debor Consulting Services **For Sweet Sorghum Bio-Refineries**

We have project experience in these countries:

Canada, USA, Dominican Republic, Haiti, Panama, Ecuador, Brazil, Ghana, Russia, Kazakhstan, Egypt Tajikistan, Azerbaijan, China & Outer Mongolia, Greece, Chile and Peru.

Debor Consulting Services

Project Studies

Ghana – Caltech Venture

- 40 klpd potable alcohol project with 4MW biomass-cogeneration plant

Haiti – Give EcoEnergy

- Micro-bio-refinery producing 2MGPY of ethanol, 2.5MW electric power and producing 25,000mt of cooking briquettes.

Debor Consulting Services

Project Studies

Ecology Mir Group – Kazakhstan

- Agro Industrial Complex producing
 - 50,000 mt/y of Ethanol
 - 15 MW biomass cogeneration plant
 - 1 MLPY bio-diesel plant using biomass
 - 8,800 mt/y of dry-ice
 - 1,400 mt/y of greenhouse vegetables
 - 47,000 mt/y of organic fertilizer
 - 6,300 mt/y of yeast
 - 430,000 mt/y of animal food – green silage

Debor Consulting Services

Project Studies

EnerKlean Dominicana – Dominican Republic

- Converting an operating sugar mill to grow sweet sorghum and produce ethanol.
- Increasing the capacity of the biomass co-generation plant from 2.8MW to 7.8MW.
- Produce organic fertilizer from the vinasse by composting the solids.

Debor Consulting Services

Project Studies

Haiti – Give EcoEnergy

- Building a 30MW bio-energy plant using sweet sorghum as feedstock.

Panama – Give EcoEnergy

- Using 3,000ha to build a bio-refinery project producing potable alcohol and electric power for the national grid. The vinasse to produce an organic fertilizer.

Debor Consulting Services

Project Studies

Russia – Ecology Mir Group

- Using 2,000ha to grow sweet sorghum and produce syrup for the food industry and animal food in the form of baled hay and green silage.

Debor Consulting Services

Project Studies

Ghana – EnerKlean Canada

- Develop a 36,000 acre project to produce
 - Ethanol
 - Electric power for the grid
 - Organic fertilizer from the vinasse
 - Grow soybeans in rotation with sweet sorghum

Debor Consulting Services

Project Studies

Ghana – Ghana Nuts

- Build a 3.6MW gasification power plant using the press cake from the Shea nut edible oil operation. The biomass power plant would guarantee a secure 1.5MW power supply for the plant and the surplus would be sold to the grid.

Debor Consulting Services

Project Studies

China- Inner Mongolia – Gruppo NRG

- Develop a large bio-refinery project in Inner-Mongolia to produce:
 - Potable alcohol
 - Electric power
 - Animal food
 - Yeast from vinasse

Debor Consulting Services

Project Studies

Tajikistan – Ecology Mir Group

- Develop 2,000ha with sweet sorghum and produce
 - 44,000 mt/y of Syrup for the food industry
 - 2MW co-generation plant
 - 20,000 mt/y of wood pellets for heating stoves
 - 30,000 mt/y of bottled drinking water

Debor Consulting Services **Project Studies**

USA, Texas – Reshoot Production Co.

- Produce 5,000 lit/hour of bio-diesel from the sweet sorghum biomass. 6,000 acres of leased land would be required for the project.

Debor Consulting Services **For Sweet Sorghum Bio-Refineries**

Give us a call to see how we can help you with our unique commercially proven bio-technology concepts to convert sweet sorghum into profitable bio-products resulting in greater financial returns for your investment.

Debor Consulting

Thank You Sweet Sorghum
for the God given POWER
within YOU to help Mankind to
be Environmentally friendlier.

Contact: Hal Debor B. Eng

Email address hal@deborconsulting.com

Tel Cell +1 514-812-7947

www.deborconsulting.com

Skype : hal.debor