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Hosted by Cotton SA

Biomass Briquettes for Zimbabwe

By

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BIOMASS BRIQUETTES FOR ZIMBABWE

PRODUCING BIOMASS FUEL BY PROCESSING SEED COTTON BY-PRODUCT

ACVAZ

from cotton to clothing

ASSOCIATION OF COTTON VALUE ADDERS OF ZIMBABWE

Presented by Admire Masenda

COTTON COUNTRY

Cotton grown in 4 main regions of Zimbabwe which are hot and receive 400-600mm rainfall annually.

SECTOR OVERVIEW

- Cotton has historically been the second largest cash crop grown in Zimbabwe, after tobacco,
- Grown by thousands of smallholder farmers on average plot sizes of about one hectare
- Approx 350 000 families supported by cotton growing
- Govt stabilised sector with inputs for small scale growers
- Major price fluctuations over the past 10 years

VALUE PROPOSITION

Briquetting will provide the farmer with additional revenue which will increase the attraction to continued cotton growing.

There is a potential of anything up to US$0.20/kg of additional revenue from sales of cotton stalks for the farmer.

CHALLENGES TO BE ADDRESSED

- Socio- economic challenges
- Environmental challenges
- Legislative challenges

OPPORTUNITIES

Performance of value chain	Before cotton stalks processing	After cotton stalks processing (projected)
Area under cotton cultivation (ha)	400,000	700,000
Seed Cotton production kg per ha	500	700
Seed Cotton production nation wide (2019) projected (tons)	200,000	560,000
Ginned seed production		
Cotton stalk production tons/ha	116,000	324,800
Cotton stalk production nationwide (tons)	2,0 – 3.0	2,5
Cotton farmers	800,000	1,600 – 2,400
	400,000	400,000

BENEFITS TO THE FARMER

- Each farmer on average produces 500kg/ha
- If each farmer current selling price is $0.50/kg
- Poverty among farmers and rural inhabitants, in general, erodes their quality of life and social cohesion;
- Farmer revenue is currently $250.00

  Profits from growing cotton are lower than for other crops, representing a disincentive to grow cotton;
- If farmers are motivated by cotton stalks processing and are encouraged to increase yields then:
- Each farmer will increase yields to 700 kg per ha
- Selling price @ $0.50/kg
- Farmer revenue from seed cotton is now $350.00
- Additional revenue from cotton stalks is $50/ha

BENEFITS TO GINNERIES

Crop size increases from 200,000 tons to 560,000 tonnes.
Industry will be approaching maximum capacity utilization, decreasing the need for side marketing.

BENEFITS TO OIL EXPRESSERS

There is an increase of ginned seed for expressing cooking oil, as production jumps from 116,000 tons to 324,800 tons.

BENEFITS FOR TEXTILE & CLOTHING

There is an abundance of cotton lint supplies on the market thereby creating a sustainable value addition chain.

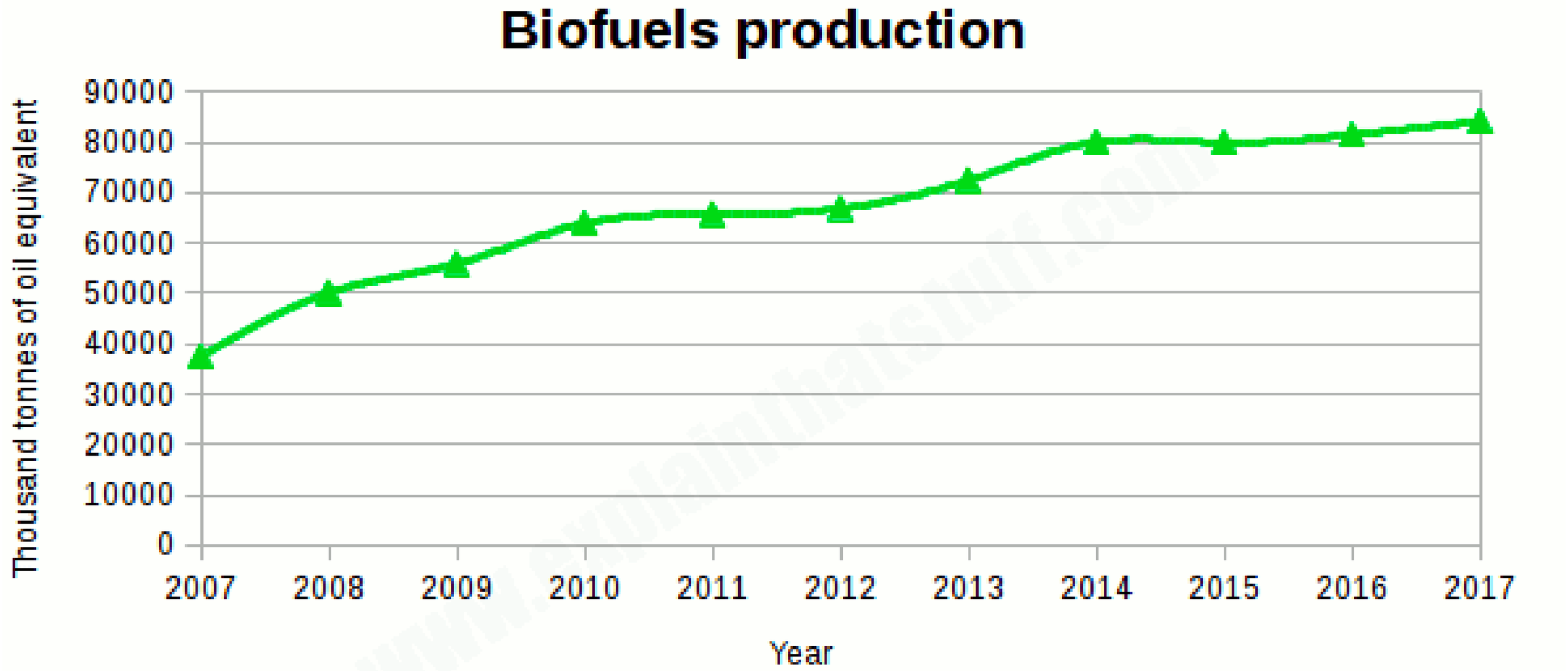
Proposed project objectives

- To improve the welfare of those in the value chain
- To create a sustainable market for cotton based biomass fuels
- To minimise carbon foot-print and climate change management.
- To reducing infestation of non-beneficial cotton pests.

Expected Milestones

- Install a 4,000 ton a year cotton stalk processing plant
- Collect 6,000 tons of cotton stalks from cotton farmers,
- Process them into briquettes and or pellets
- To work with and establish local and export B2B and B2C markets for both briquettes and pellets from clients that require fuel for heating
- To develop an economical collection system for cotton stalks and other suitable raw materials
- To ensure a higher plant population per Ha is planted by cotton farmers in the next season 2019/2020.

Market Analysis



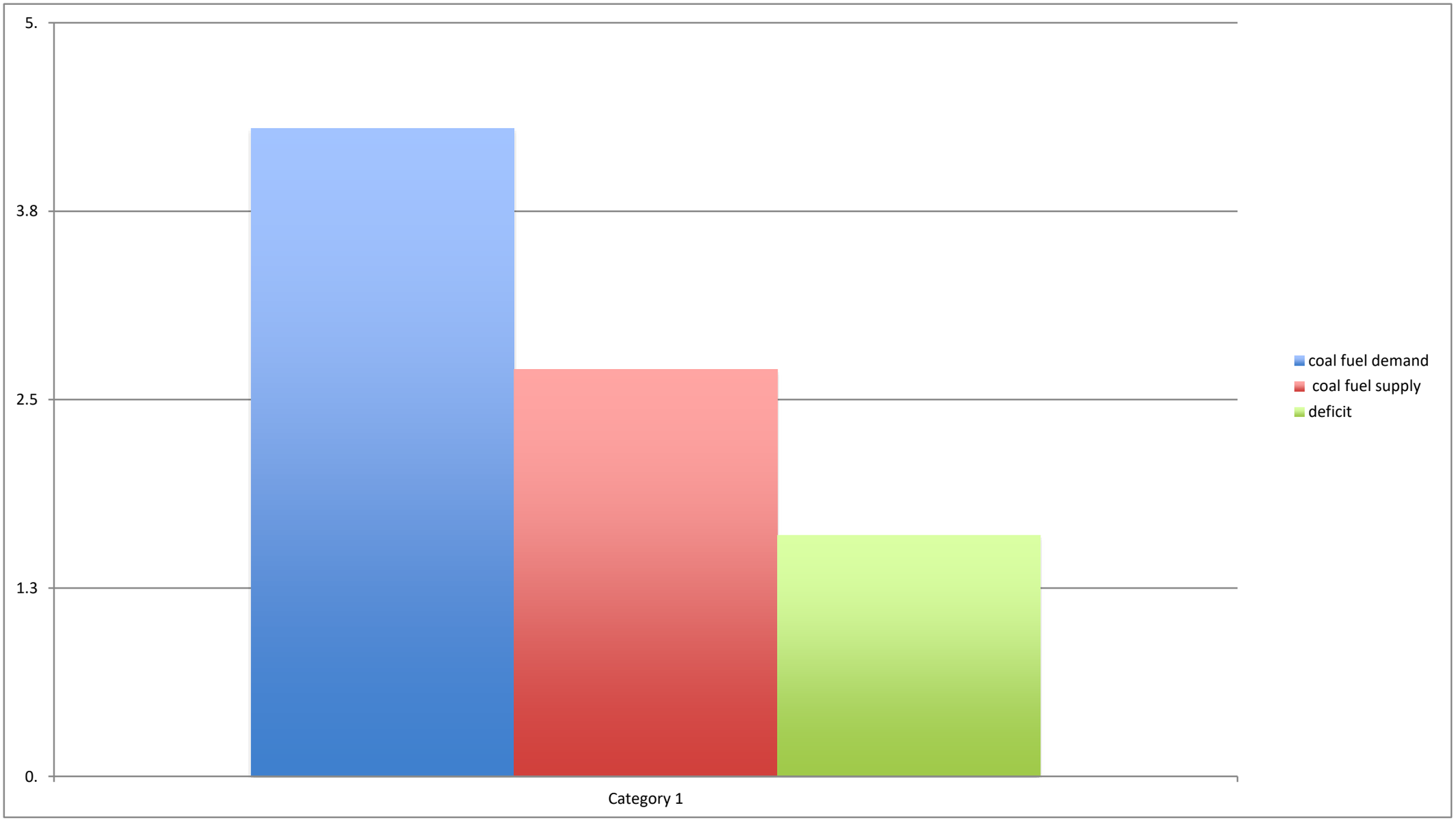
Source: BP Statistical Review of World Energy 2018.
https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html

Demand for bio fuels

- The world imported USD 11 billion worth of bio mass raw materials and finished goods in 2018
- The biggest importer is Japan with a demand of US$2.5 billion annually.*
- Biomass fuels are imported from countries such as Brazil, India, Pakistan, South Africa, etc
- Biomass fuels are being promoted as being friendly to the environment amidst concerns of global warming.
- Zimbabwe has a demand of 4,300 metric tons of coal/fuels a year but production was 2,700 metric tons in 2018.

*https://marketanalysis.intracen.org/TradeMap.aspx

Zimbabwe Fuel Situation



Demand and supply of coal fuel in Zimbabwe in ‘000 metric tons

Potential Markets

- Tobacco merchants require fuel to dry tobacco leaves
- Industry that use coal fired boilers can adopt biomass fuel with a minimal alteration to their boilers
- Biomass briquettes can be processed further into charcoal, and a ready market exists to individual consumers through supermarkets and retailers
- The Zimbabwe power company can replace some of its boilers to use biomass fuel in order to fulfill its demand for fuel.
- Households can be persuaded to adopt use of biomass fuels for heating and cooking

Ideal Business Structure

- Private sector,
- Experienced in running processing businesses.
- Players already be in the cotton processing industry,
- Familiarity in agro processing,
- Experience in project management.
- Structure must be market led,
- Innovative in product development,
- Ability to organize and encourage farmers to supply raw materials

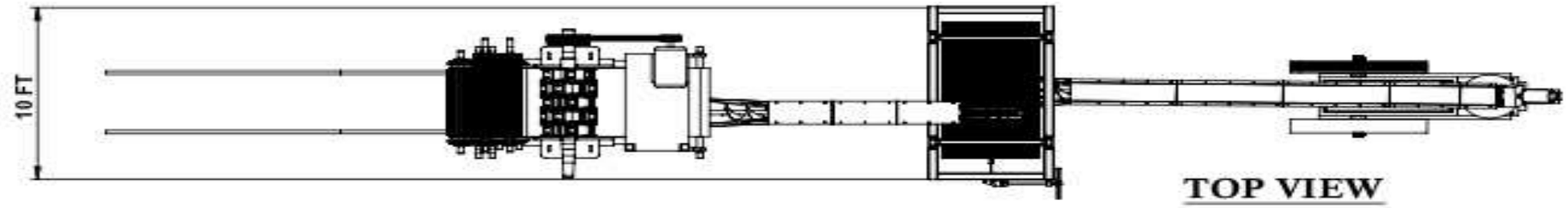
Financial Projections

Cost Center	Cost per Ton	Cost Per 4000 tons	Cost Per 8000 tons 25t/day
Uprooting	Free		
Material costs	5	20,000	40,000
Chipping	2.9	11,600	23,200
Transportation within 40 km radius	5	20,000	40,000
Off loading at factory	0.71	2,840	5,680
Sun drying labour	0.71	2,840	5,680
Sub total		57,280	114,560
Weight loss @10%	2.57	10,280	20,560
Hammer milling	2.5	10,000	20,000
Briquetting	9.3	37,200	74,400
Total cost	36.00	114,760	229,520
Profit projection	10	40,000	80,000
Farmers' income	$50/ha		
Cost of briquettes	28.69		

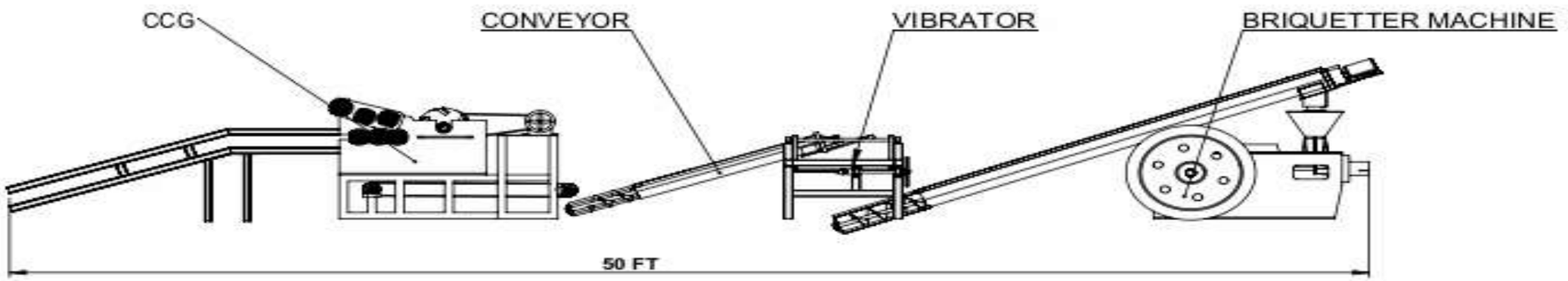
Operations

REV	CHANGES	DATE
1		00-00-2017
2		

DO NOT SCALE DRAWING IF ANY DOUBT ASK ENGINEERING DEPT



TOP VIEW



SIDE VIEW

SYMBOLS	ROUGH ▽	TURNING ▽▽	GRINDING ▽▽▽

MACHINING TOLRANCE FOR OPEN DIMENSIONS AS PER IS-2102 MEDIUM

DIMENSIONS	OVER	0.5	3	6	30	120	400	1000	2000
	UP TO	3	6	30	120	400	1000	2000	4000
TOLRANCES		±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

		SIGNATURE	DATE	MATERIAL	WEIGHT
DRAWN	AADIL KHAN				
CHECKED					SCALE: 1:1
APPROVED	MANINDERJIT SINGH				SHEET: 1/1

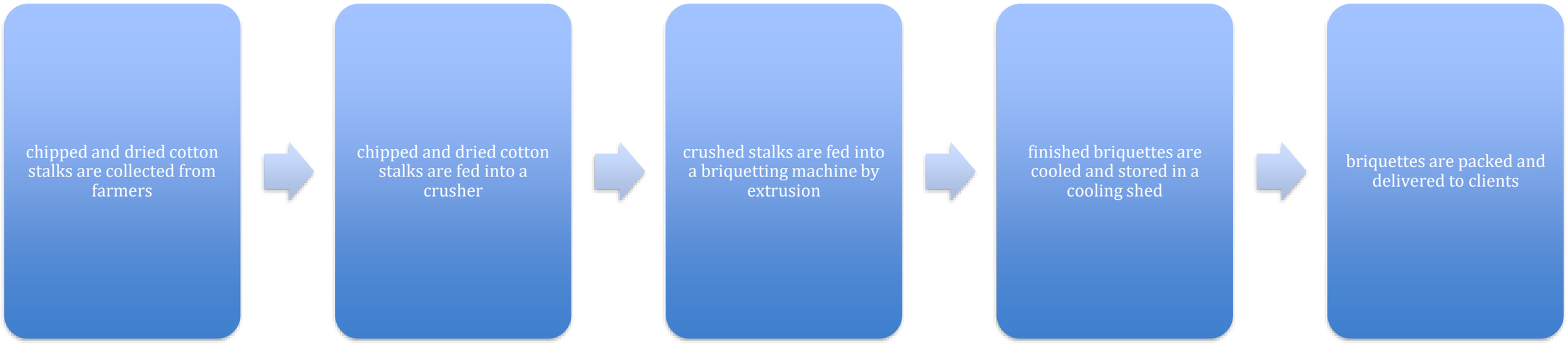
ECOSTAN®
V.P.O LEHRA, LUDHIANA TO MALERKOTLA ROAD

TITLE:

ORG NO:

A4

Operations


chipped and dried cotton stalks are collected from farmers
chipped and dried cotton stalks are fed into a crusher
crushed stalks are fed into a briquetting machine by extrusion
finished briquettes are cooled and stored in a cooling shed
briquettes are packed and delivered to clients

Finished product

Sustainable supply of bio mass raw materials
… market access for bio mass fuels.

Project Requirements

- Briquetting plant with a capacity of 4000 tonnes/year
- Briquetting plants cost projection is approx. USD80,000.00 - 150,000.00 per plant
- Building measuring 30m x 30m of approximately @ approximately $US566/ m ^2.
- 3 phase power connection to provide a load of 90HP
- Electricity in Zimbabwe currently costs $0.12/KWH

Thank you.