

MELANI BIOMASS GASIFICATION PROJECT, EASTERN CAPE, SA

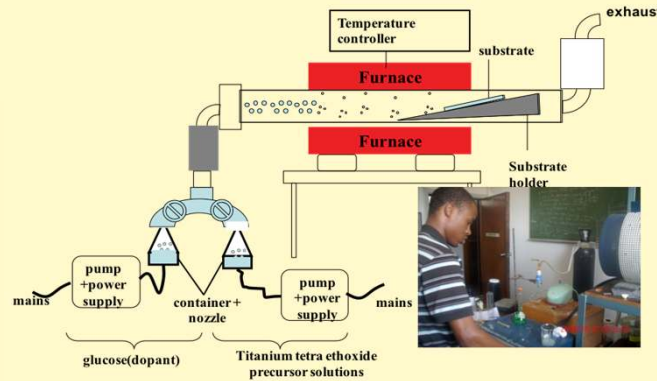
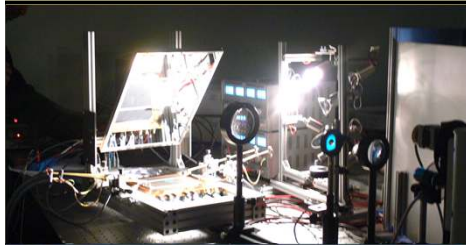


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FORT HARE INSTITUTE OF TECHNOLOGY RESEARCH



- ❖ Solar Energy
- ❖ Material Science
- ❖ ICT and Power Engineering
- ❖ Biomass Energy

PROJECT BACKGROUND



- Biomass gasifiers convert wood and wood waste into charcoal releasing gas as a by product.
- Research in biomass gasification has been undertaken for some years in South Africa.
- A System Johansson Biomass Gasifier (SJBG) installed at Rosherville (Eskom R&D) was used for research purposes.
- The SJBG proved to be ready for commercialization around the 90' s.
- Eskom, UFH and CCE embarked on a pilot and demonstration project-EC.



INTRODUCTION



- Community needs assessment study undertaken to establish community needs.
- Availability and suitability of fuel and space for project.
- Agreement with sawmill operator for provision of fuel free of charge for duration of project.
- Community socio-economic status survey.
- Construction and installation of gasifier system
- Business plan formulation.



COMMUNITY SOCIO-ECONOMIC STATUS



- Age distribution

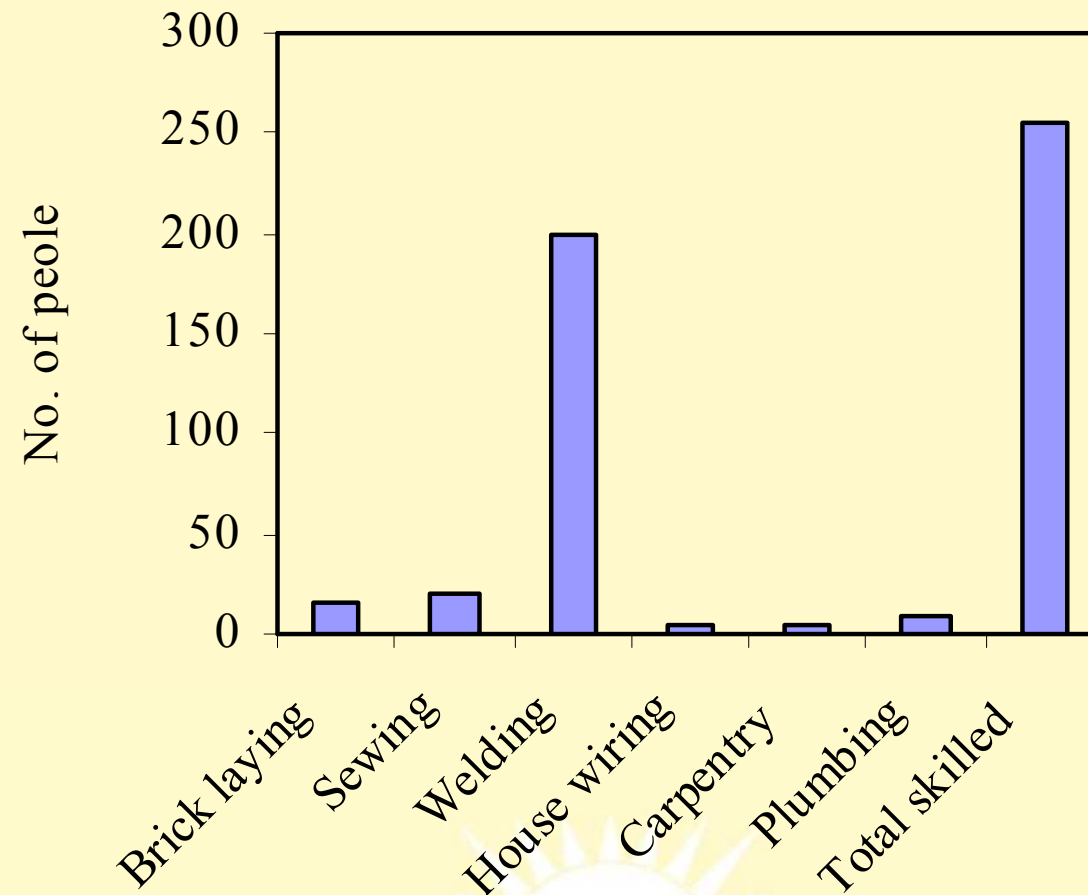
Age	Number of people
Under 10	65
Between 10 and 20	700
Between 20 and 50	1200
Between 50 and 70	500
Over 70	110
Total	2800



COMMUNITY SOCIO-ECONOMIC STATUS



- Community skills



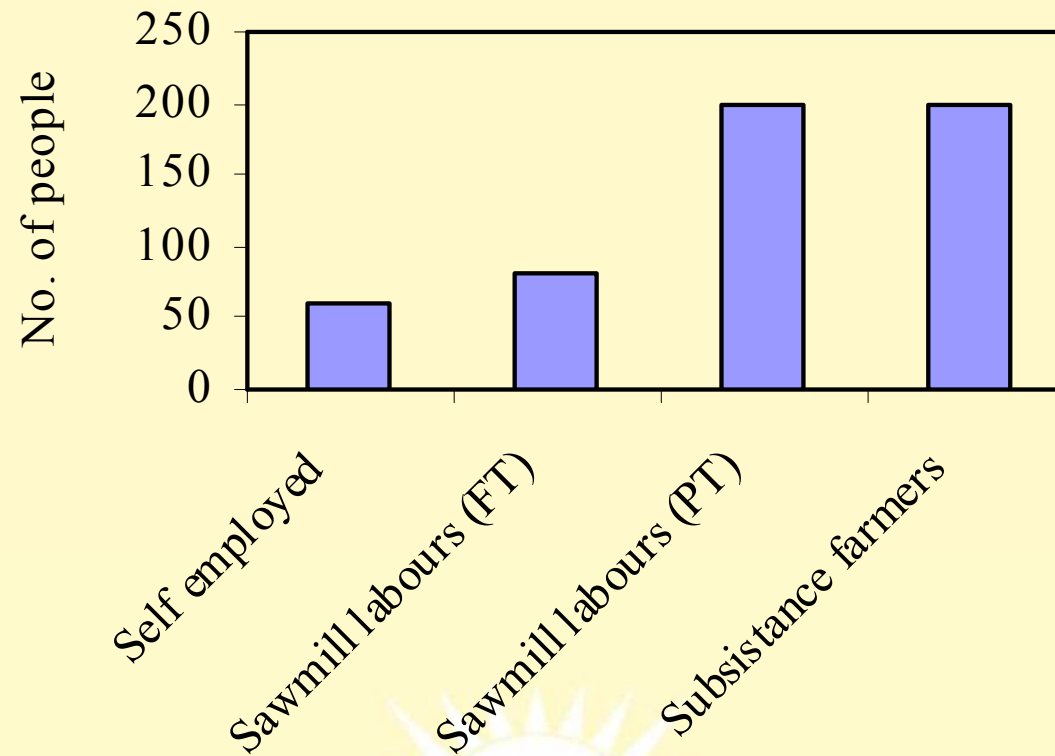
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COMMUNITY SOCIO-ECONOMIC STATUS



- Employment status



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COMMUNITY NEEDS



- Skills development.
- Employment.
- Infrastructure and funding for projects.
- Small business development.



ANALYSIS OF BIOMASS RESOURCES



- Proximate analysis

Properties	Composition (%)
Moisture content	15.5
Ash content	6.0
Volatile matter	70.0
Fixed carbon	8.5



PROJECT IMPLEMENTATION



- Gasifier system manufactured and installed.



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BIOMASS GASIFIER COST



- Capex-300nm³/h, 150kVA

Gas producer complete with cyclone, gas scrubber and particle interference filter	R1,645,012.00
150 kVA gensets	R999,290.52
Civil works	R600, 000.00
Total	R2,344,302.52



SMALL BUSINESS ESTABLISHMENT



- Two small businesses were identified in consultation with the community - *Grain mill and bakery.*
- A comprehensive business plan was drawn focusing on the two enterprises.
- Maize mill-containerized mill (ABC Africa)
 - *1000 bags of maize milled per month.*
 - *Annual profit estimated at R14 000.*
 - *2 full time jobs will be created-number will increase with increase demand.*
 - *CAPEX R25 000, can be recovered within the first year.*



SMALL BUSINESS ESTABLISHMENT



- Containerized bakery (Bakersmate).
 - *1000 loaves will be sold daily. (currently selling about 200)*
 - *At least 10 full time jobs will be created-additional jobs such as delivery etc.*
 - *Estimated profit of R60 000 pa.*
 - *CAPEX-R100 000 production capital that could be recovered within the first two years.*



PROJECT IMPLEMENTATION



THE FINAL PRODUCT



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RESEARCH ACTIVITIES



- Enhancement of the energy efficiency of the gasifier system.
- Environmental aspects of the gasifier system.
- Influence of fuel properties on gasification process.
- Utilization of gasification by-products in other areas.
- Computer modeling of flow dynamics and reactions.
- Performance monitoring of the gasifier system.
- Socio-economic aspects related to the project.
- Techno-economic aspects of the project (Viability and feasibility)



HOPE TO SEE MORE OF THESE PROJECTS IN FUTURE



We did not inherit this planet from our forefathers
but we borrowed it from our grand children.

THANK YOU

