

# BIOGAS INTEGRATION WITH ANIMAL INFRASTRUCTURE

20 February 2013  
Destiny Country Lodge



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Department:  
Agriculture, Rural Development  
and Land Administration  
**MPUMALANGA PROVINCE**



# PRESENTATION OUTLINE

- **Introduction:** global factors driving Renewable Energy, South African perspective
- **Mpumalanga as a niche:** Provincial and DARDLA alignment to integration livestock and biogas production.
- **DARDLA as a champion for biogas RE**
- **Project proposal:** concept and flow chart
- **Alignment to presidency outcomes**
- **Alignment to stakeholder needs:** challenges and benefits
- **Implementation priorities**
- **Human Capital development:** education, training, skills development
- **Conclusion**



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# INTRODUCTION

**Key factors driving the global trends towards renewable energy resources**  
(Rosegrant *et al.*, 2008):

- rising world fuel prices,
- increased demand for energy and,
- concerns about global warming

**South African progress on policies and legislations:**

- white paper on energy policy, white paper on RE policy, Biofuels Industrial Strategy.

South African Biofuels Industrial Strategy of 2007 aims to: Stimulate agricultural production and to generate employment opportunities through bioenergy production.



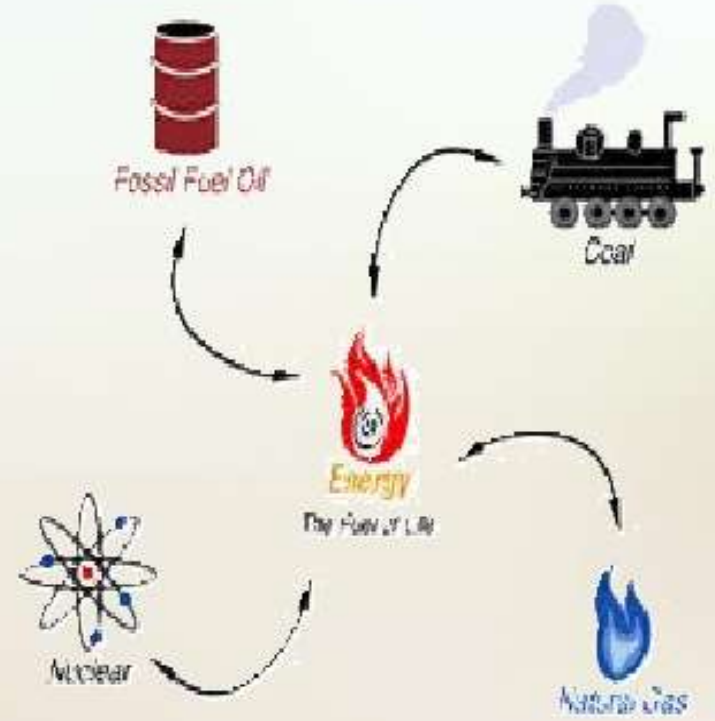
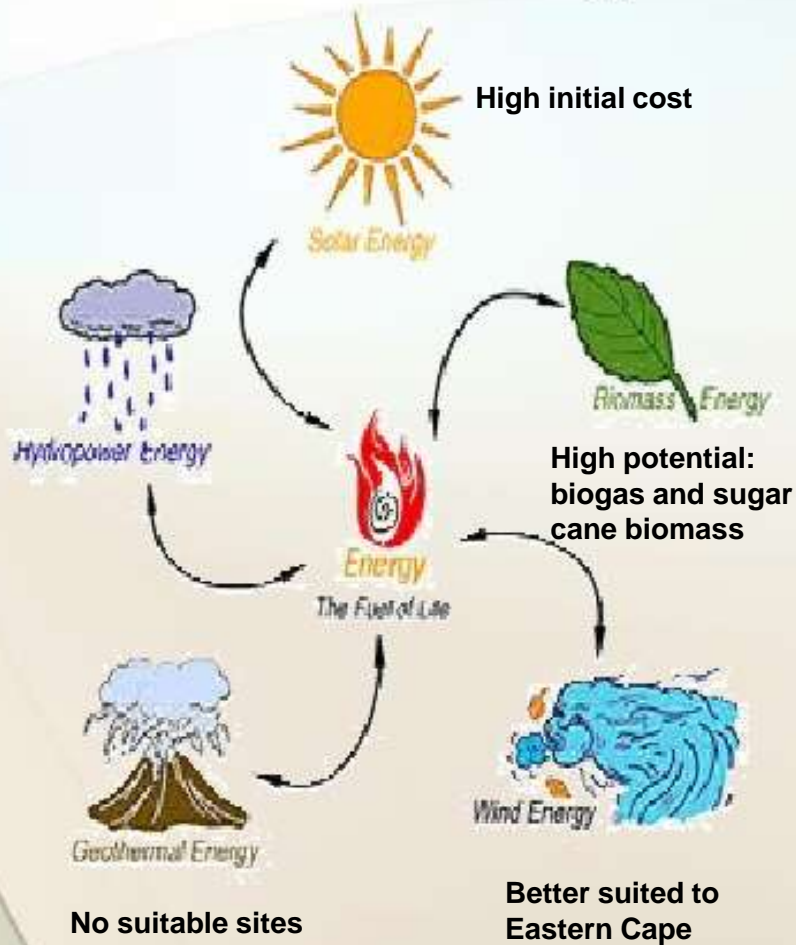
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# Renewable Energy

# Non-Renewable Energy



Small scale but not commercial

# MPUMALANGA AS A NICHE AREA FOR RE DEVELOPMENT

South Africa is one of the most carbon intensive countries and the climate change phenomenon could have detrimental consequences for social and economic welfare.

Mpumalanga is the **Energy Belt of South Africa**: 80% of SA's coal reserves and majority of coal fired power stations

**Currently with little or no renewable energy production**

## Why Mpumalanga is an appropriate area:

- Abundance of Renewable Energy Resources such as solar , hydropower and biomass
- Existing infrastructure roads, bulk power supply ESKOM, dams
- This is an opportunity for Renewable Energy initiatives
- Vast agricultural land resources and agricultural activities
- Human resources with both technical and non technical background
- Good average temperatures for biogas production all year

**Appropriate technology required to integrate livestock infrastructure, waste management and energy production by biogas technologies.**



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# DARDLA AS A CHAMPION FOR BIOGAS RENEWABLE ENERGY

## DARDLA Strategic Goal

- To manage and administer improved quality service
- To facilitate access to agricultural resources by Previously Disadvantaged Individuals (PDI's)
- To improve the performance of the agriculture sector
- To enhance the quality and safety of the environment
- To promote and manage conservation as well as sustainable use of bio-diversity and natural resources
- To develop and promote competitive and appropriate technologies

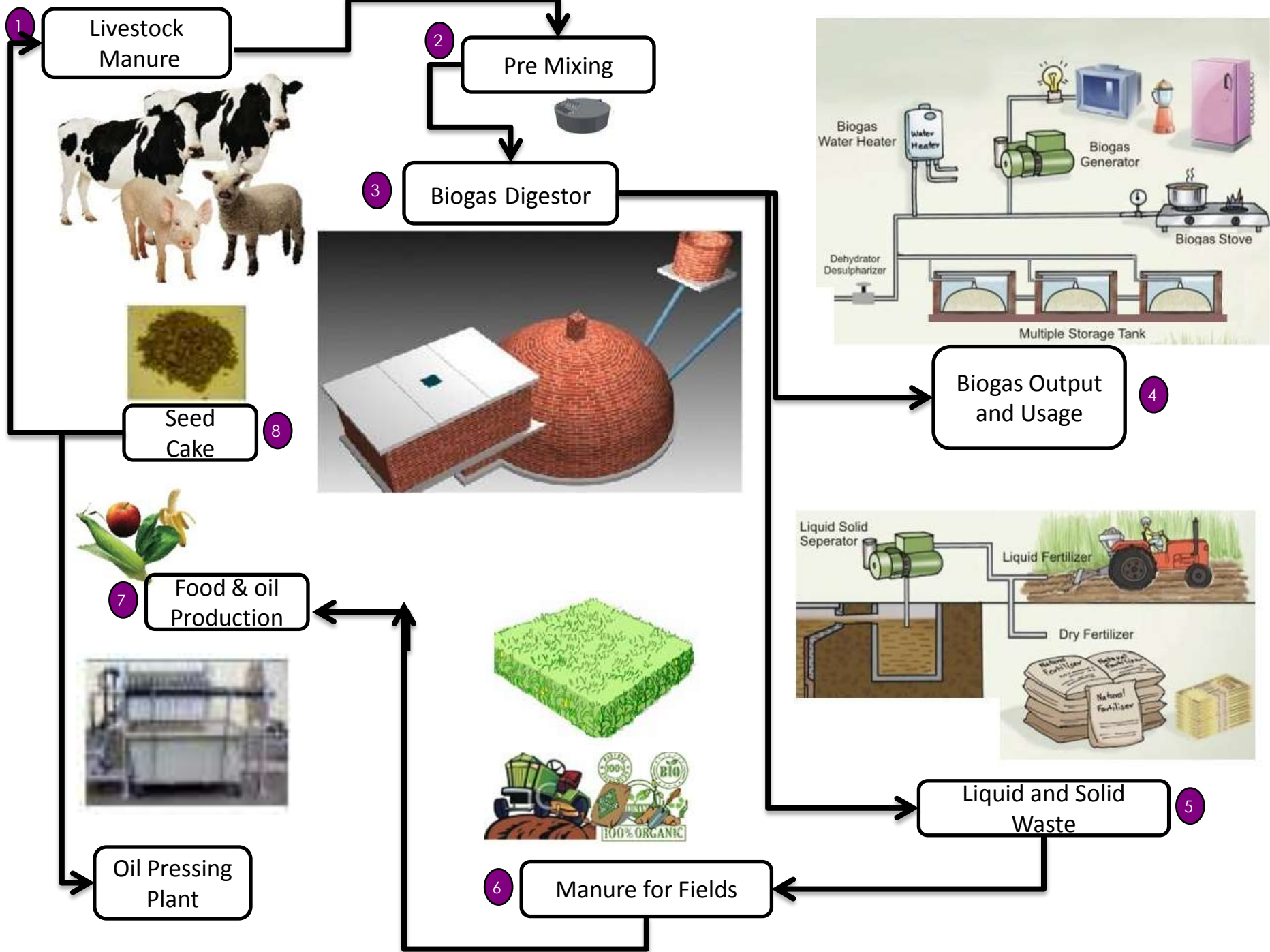
## DARDLA relevance to biogas

- Agricultural livestock holdings have high volumes of manure and problems with waste disposal, fertilizer increases input costs in crop production.
- Women and children, especially in rural areas are directly burdened by unavailable energy services and inefficient energy use. Time and opportunity cost of gathering fuel-wood and cooking chores prevents women from income generating activities and self development.
- Most rural households cook with wood, animal waste, crop residues and untreated coal thus exposing households to poor indoor air quality leading to health complications.



- Masibuyele emasimini
- Masibuyele esibayeni





# ALIGNMENT TO PRESIDENCY OUTCOMES

## Alignment to the Presidency's Ten Delivery Outcomes :

- **Outcome 4: Decent employment through inclusive economic growth;** empowerment through training and job creation on established integrated biogas and animal infrastructure.
- **Outcome 7: Vibrant equitable and sustainable rural communities with food security for all;** achievable through innovative agricultural practices for animal production integrated with energy security using biogas technology applications.
- **Outcome 10: Environmental assets and natural resources that are well protected;** enhanced as bioenergy particularly biogas addresses waste management and it is a viable, clean energy alternative to tree cutting for wood burning or conventional methods.



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## ALIGNMENT TO STAKEHOLDER NEEDS

### Project technical , social, and economic benefits :

- Biogas production turns manure waste into a resource
- The digested slurry is suitable fertiliser to be applied for crop production, soya fields
- Enterprise development, the animal and oil production enterprise will be linked to relevant markets and create economic activity in the area
- Environmental sustainability; deforestation and carbon emissions from burning fire wood are reduced as biogas will be used as an alternative energy source for cooking and water heating.
- Biogas production will address energy security, poor rural households who do not have access or cannot afford electricity will now use renewable energy sources thus affordable access to energy supply resources for cooking, lighting and heating



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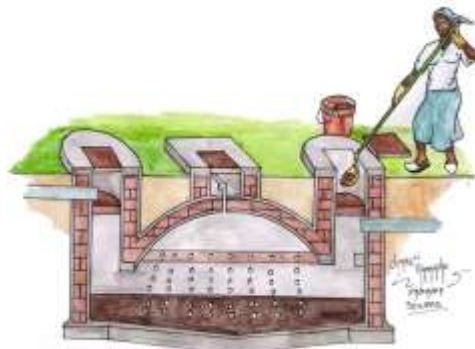
## IMPLEMENTATION PRIORITIES

The implementation of the project should present the biogas demonstration plant as an economic and viable system in an understandable, relevant and acceptable manner to the farm.

**Small scale:** initially to introduce concept and demonstrate how biogas can be produced from cow manure. Establish a small scale digester with components up to the end user appliances such as biogas burner stove and biogas lights. A small laboratory will be established biogas monitoring and also for yield and quality testing. Small scale case study.

**Large scale:** is to expand the system and use advanced technologies with more sophisticated components. Partner with commercial feedlots and poultry farms to develop functional models large scale operations.

•**The Goal** is to replicate the biogas system to other farms throughout the Mpumalanga province both for small scale and commercial scale farms.



# HUMAN CAPITAL DEVELOPMENT

Category	Approach	Skills	Annual Numbers
Graduates	Bursaries for related programs at South African Universities	Engineering design, project management, Rural development	3, honours and MSc students
Professionals	Multi-disciplinary project objectives and deliverables, conferences, networking sessions	Innovative research methods applied in RE linking Agricultural practices	15, technicians, researchers, extension officers,
Communities	Consultative workshops, Farmer days, information packages, experiential and social training	Food and Energy production, Enterprise management	50, unskilled workers, unemployed youth, community leaders

## Local collaborating/partner institutions

- **Institutions of higher learning;** University of KwaZulu-Natal, University of Stellenbosch
- **Departments;** Agriculture, Science and Technology, Energy, Economic Development



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## CONCLUSION

This project will help to address the energy supply challenges that the country is currently facing by not increasing demand for electricity, especially in poor urban. This project will promote the sustainable use of bio-energy to cater for the primary energy requirements of rural areas by using renewable energy sources such biogas in order to increase on-farm and household opportunities.

The development of the cattle feedlots enterprises will create jobs and economic activities. This green development strategy will contribute to the achievement of the Millennium Development Goals (MDG) of environmental sustainability. This will enhance the Mpumalanga provincial and South African national strategy towards promoting applied research and development in low carbon technologies and new clean energy sources as applied in agriculture.



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# THANK YOU

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