

EQUILIBRE BIOENERGY PRODUCTION LTD

Arundo Donax for BioPower Production





ABOUT EQUILIBRE





INTRODUCTION AND VISION STATEMENT

- Equilibre's vision is to become a **leader in the mass production of biomass for the production of clean energy** based on the intensive agro-cultivation of fuel crops, such as our specially developed Arundo Donax hybrid plant.
- Equilibre has developed a **comprehensive, integrated solution** for the production of clean energy that starts with the cultivation of fuel crops through to the implementation of fuel pellet, bio-fuel and **100% biomass electricity generation** plants.
- Equilibre has invested in scientific research in Mauritius in conjunction with the University of Mauritius and the Government's agricultural research unit (FAREI) over a 6 year period. We believe this has produced one of the world's **leading knowledge repositories for Arundo Donax**. Equilibre is proud to have been a **pioneer in the first successful combustion trial of Arundo Donax**, whereby electricity was successfully exported to the Mauritius national grid in April 2016 for a 10 hour period. This has resulted in a **proven combustion model** that demonstrates the effectiveness of Arundo Donax as a coal replacement.
- Equilibre realises that one of the greatest challenges for developing countries is the **high cost of importing fuel** as well as the **creation of jobs**. Our model addresses both issues and can become a **driver of significant socio-economic growth**.
- In addition, **our fuel crop is a net zero producer of greenhouse gasses** while the residual ash is organic in nature and does not require specialised disposal. Our pellet plants are able to produce a conditioned and compressed Arundo product that can be exported, thereby generating foreign currency.
- Equilibre has assembled a **world-class management team** with expertise in agronomy, engineering and project management. In addition, it has proven ability to develop successful enterprises across multiple emerging markets.



WHO WE ARE AND WHAT WE DO

1 The Arundo Donax Bioenergy Crop Experts in Mauritius

- Since 2012, Equilibre has initiated the development of Arundo Donax as a commercial bioenergy crop in Mauritius in collaboration with FAREI, MCIA and UOM
- Based on test performed in different regions across Mauritius and 28 months of growing, Equilibre has acquired know-how on Arundo's plantation methods, cultivation and harvesting practices and protective protocol in Mauritius
- Equilibre has an international technical partnership with BIOTHEK (Spain), a company with over 10 years experience offering comprehensive consultancy on biomass projects having specifically researched the K-12 Arundo Donax bioenergy crop

2 Pioneer in Production of Electricity from 100% Locally Produced Biomass

- Equilibre is the promoter of an electricity and biofuel production model specifically designed for biomass
- Equilibre partners with the local farming community to grow Arundo
- By including the biomass in the power production supply chain, Equilibre can guarantee revenue generation and a continuous supply
- Biomass is a source of green energy thus contributing to safeguard the environment.

3 Position Mauritius as the “showroom” for Africa

- We believe the model Equilibre is pioneering in Mauritius can be quickly and efficiently rolled out into the rest of Africa



PROJECT INTRODUCTION

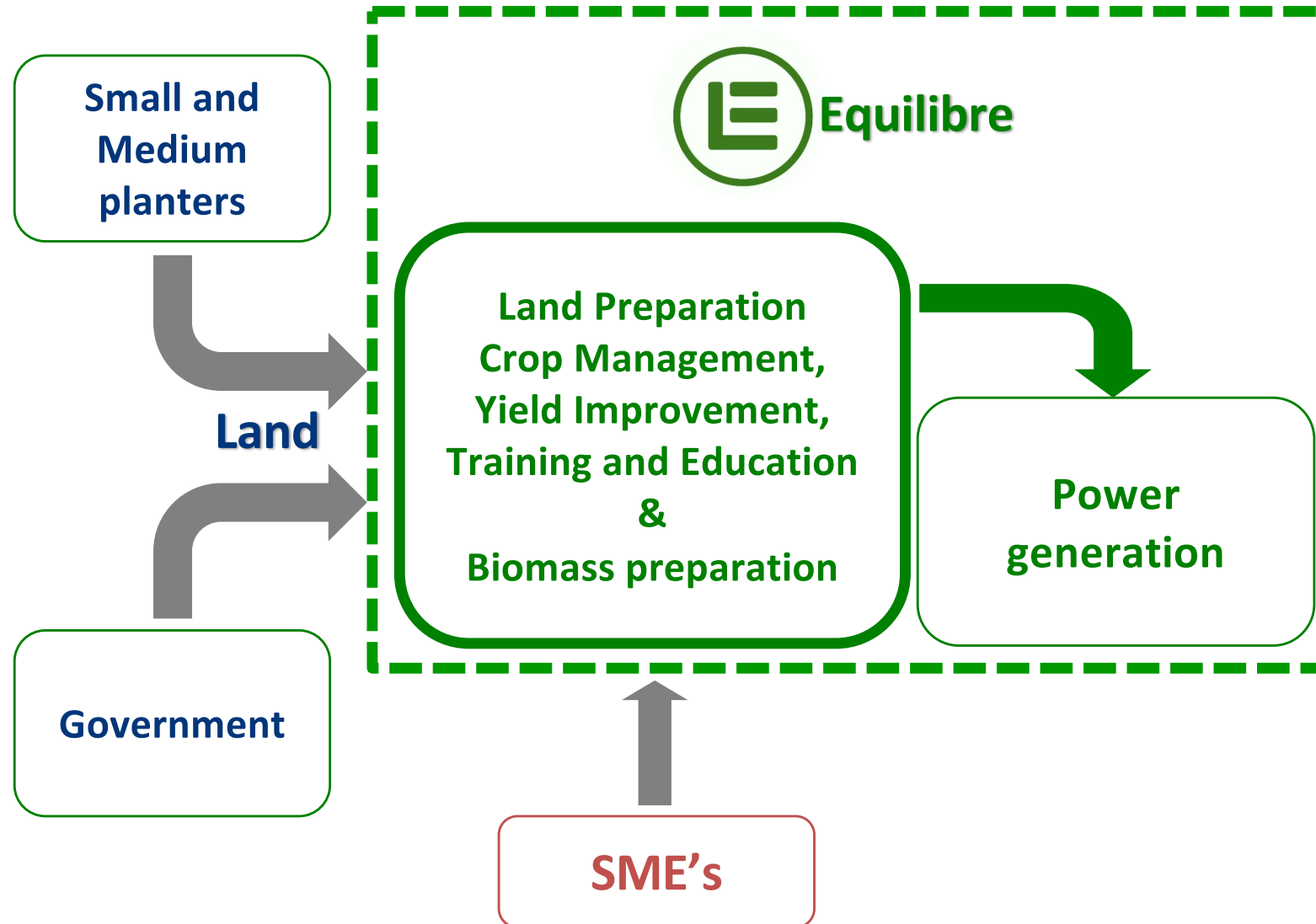


BENEFITS FOR THE COUNTRY



- ⓔ Creation of employment in the Agro Sector with socio-economic benefits
- ⓔ Higher income for the Government and an enlarged fiscal base
- ⓔ The Country will be less subject to international price fluctuation of imported fuels
lower hedging requirements
- ⓔ The Country will save foreign currency with more trading conducted in local currency
- ⓔ A greener economy - the energy produced using biomass will avoid further carbon emission and even reduce it through **carbon sequestration**
- ⓔ The Country will enable the valorization of marginal or non utilized agricultural land
sustainable revenue on land that is currently not contributing to the economy
- ⓔ ARUNDO biomass production provides a Sustainable Business Model for the Development
of a **“Green Economy”** Sector
- ⓔ This Green Project addresses the Climate Change Agenda and the COP 21 Paris Accord
2030 target

OUR MODEL

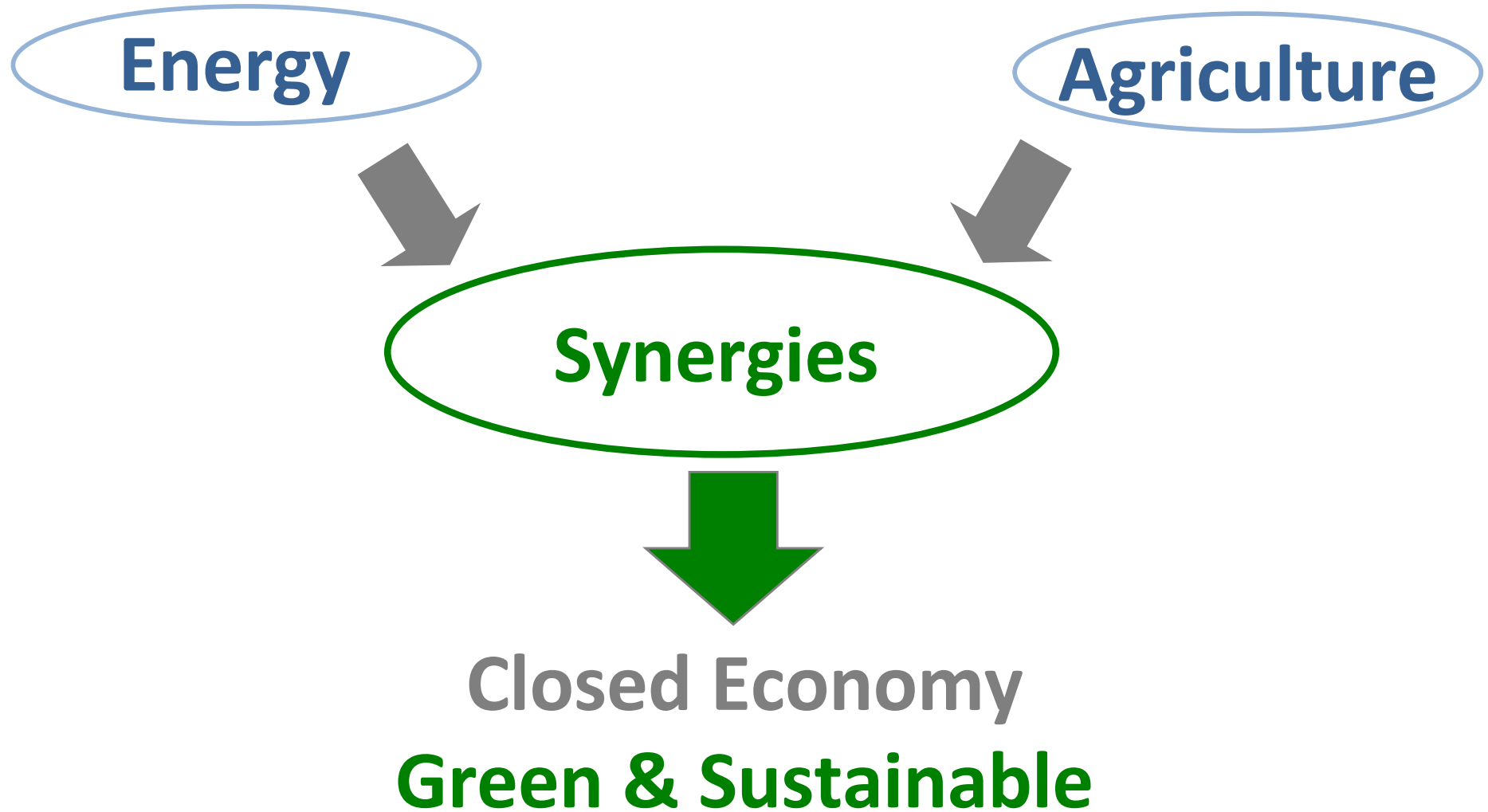




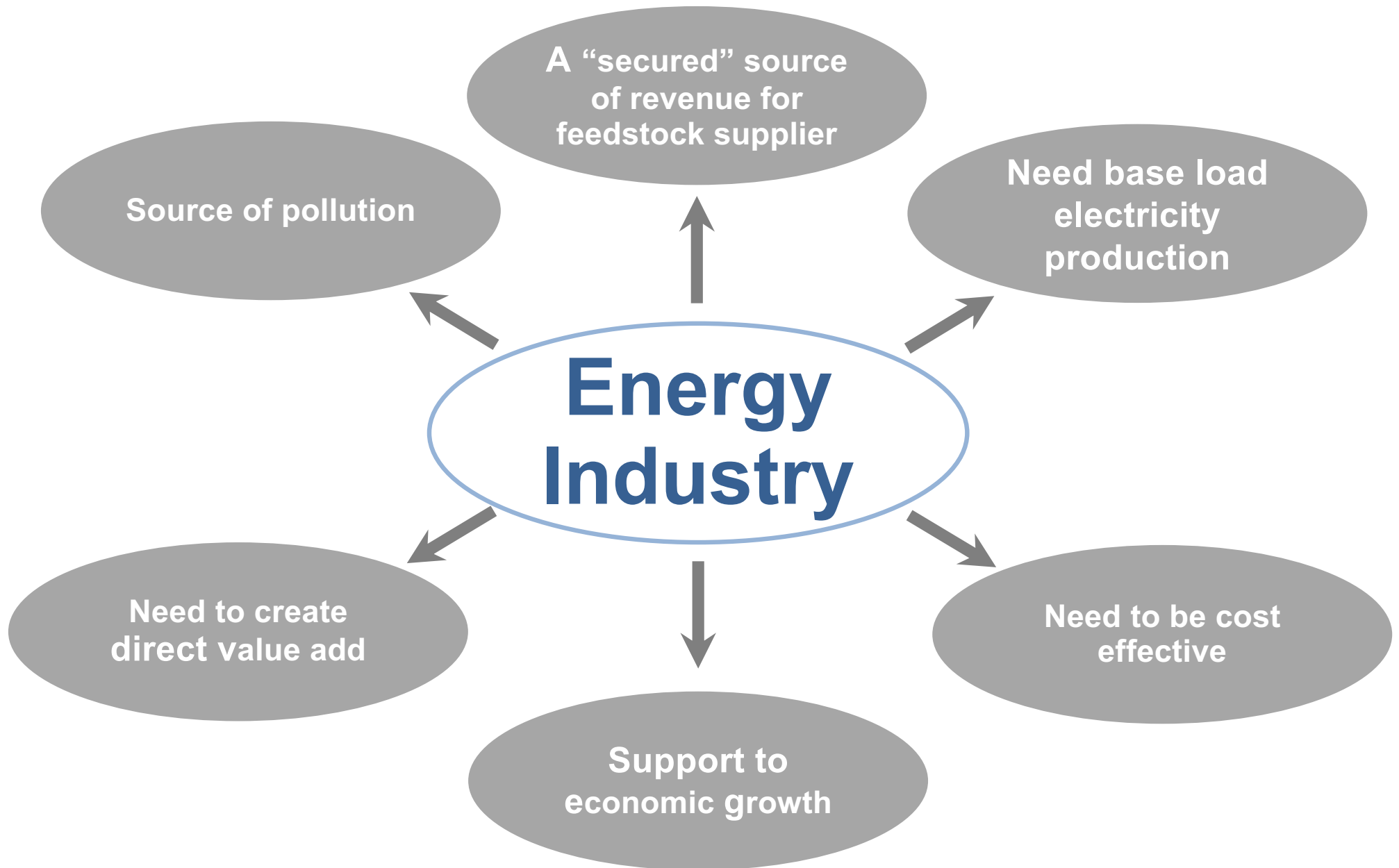
CONTEXT



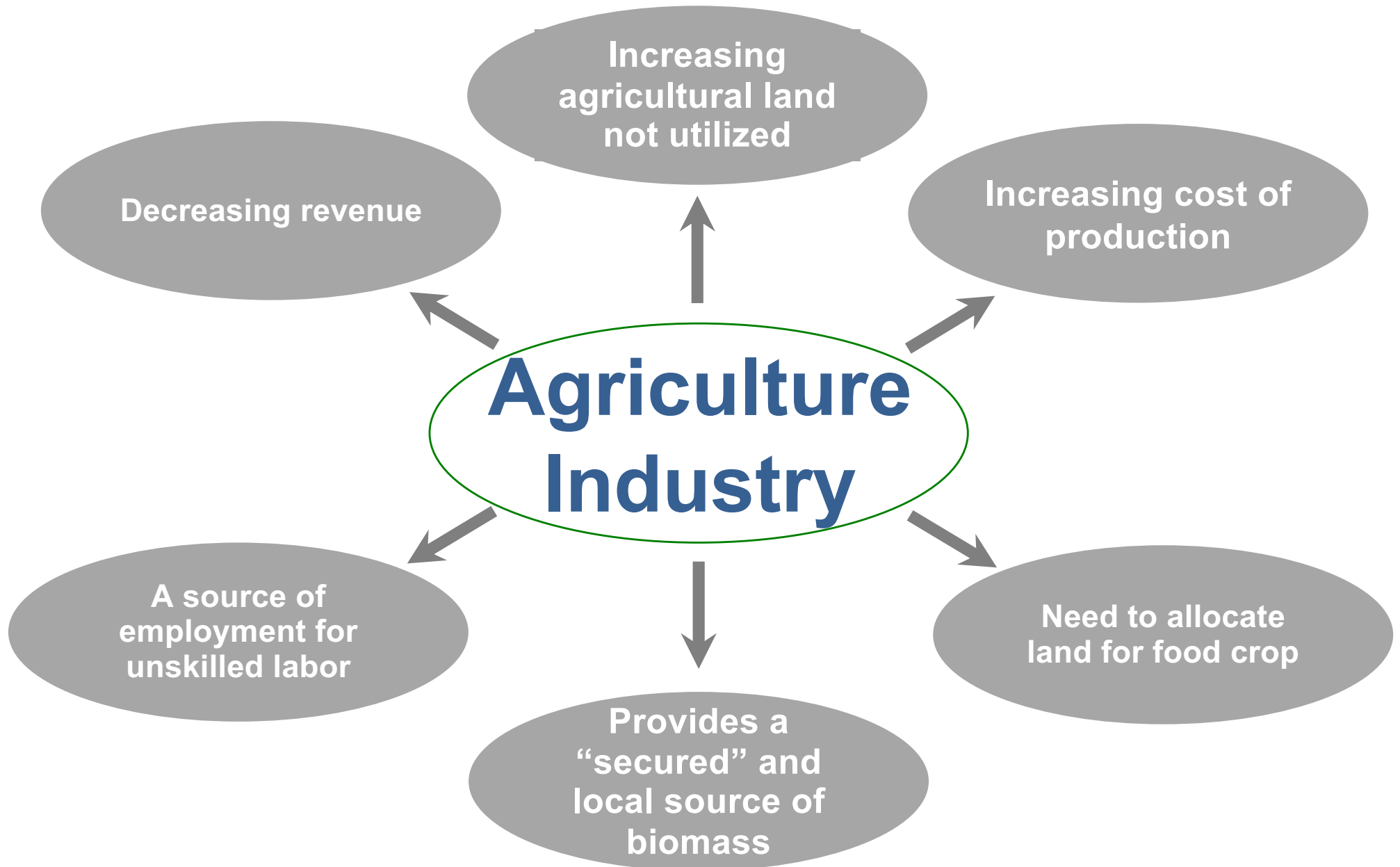
THE CHALLENGE



THE ENERGY INDUSTRY



THE AGRICULTURE INDUSTRY





OUR PROJECT





THE ARUNDO DONAX NURSERY



- So far 58,000 Arundo Donax ecotype variety K-12 plantlets have been imported from Honduras
- These plantlets were transferred into trays for hardening
- Plant development protocol supplied by Galliltec were followed and the plants responded very well in the controlled environment
- Plants were ready for field transfer within 45 days of hardening



ARUNDO BIOMASS FOR BIO-POWER PRODUCTION



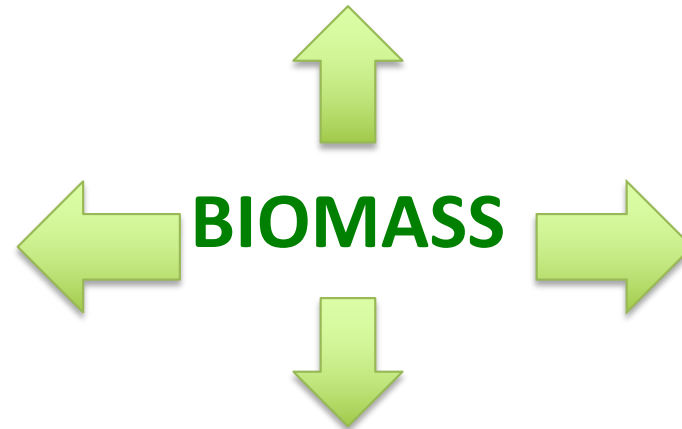
= GREEN COAL



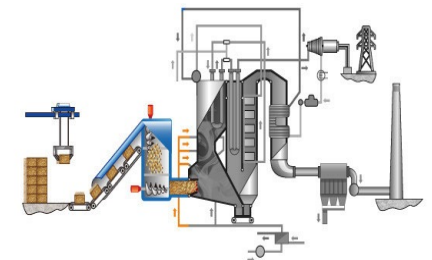
= BIOFUEL



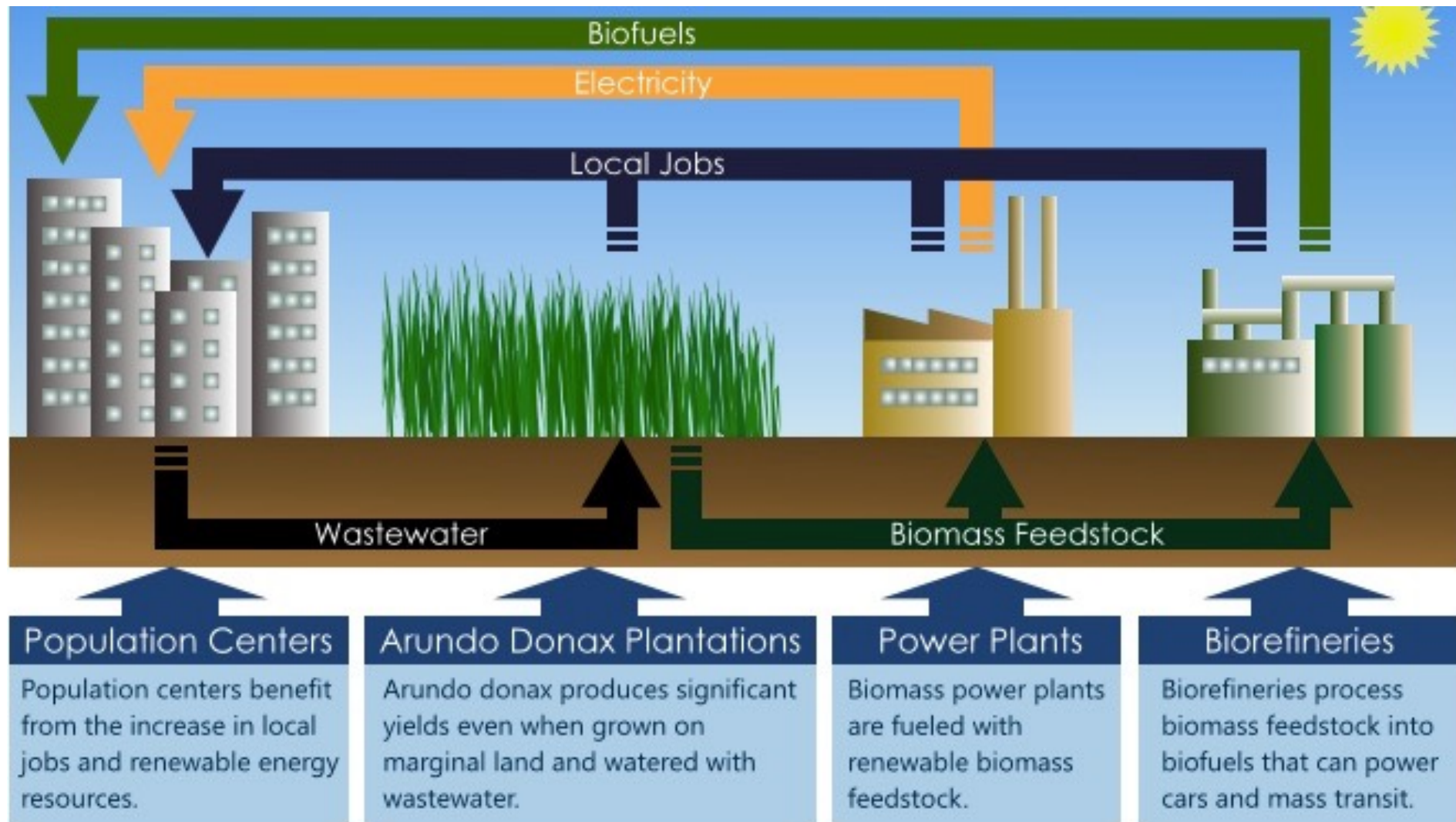
= BIO-POWER



= BIOGAS



ARUNDO DONAX RENEWABLE ENERGY MODEL



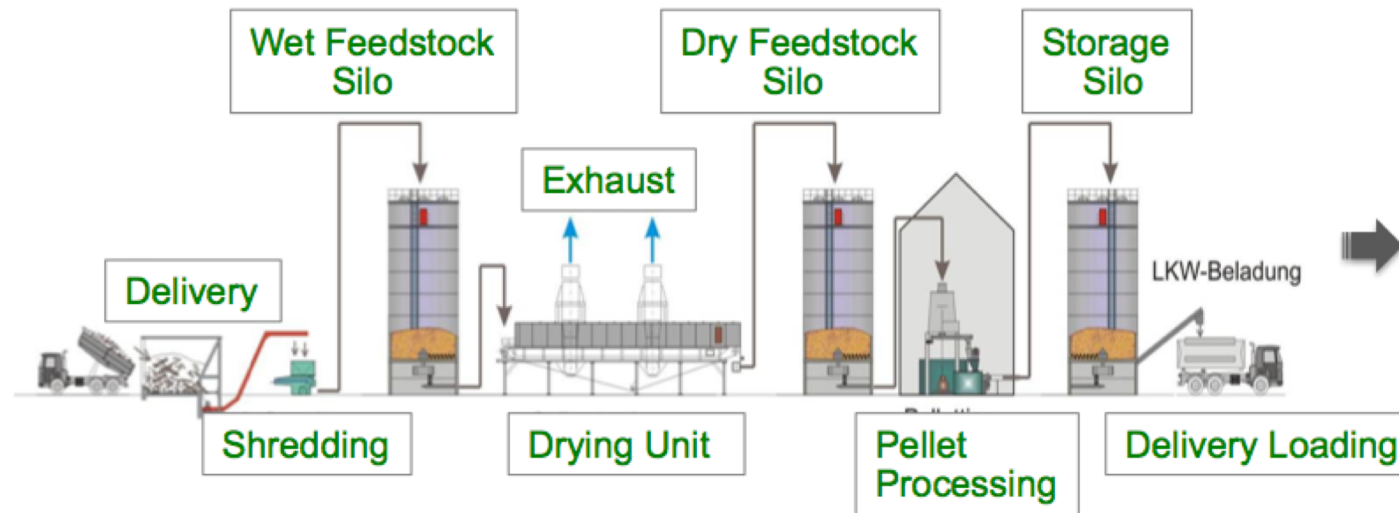
ARUNDO DONAX BIOMASS FOR PELLET PRODUCTION



Pellet Plant Site
(120,000 Tons/Year)



Pellet Storage Silos



Pelletizing Plant Schematics



Pellets



THE PROCESS



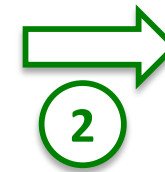
THE RENEWABLE ENERGY SOLUTION MODEL



Plant Establishment Nursery



New Plant



Plant Acclimatization



Field Planting



Field Establishment



New Field After 2 Months



Field After 3 Months



Field After 6 Months



Plant Characteristics

THE RENEWABLE ENERGY SOLUTION MODEL



Field Harvesting



Field Drying



Round Baling



Freshly Cut Plant Material



Dry Plant Material Collection



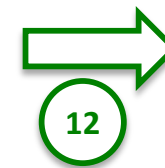
Field Baling & Densification



Bale Densification



Automatic Bale Collection



Loaded Bale Trailer

THE RENEWABLE ENERGY SOLUTION MODEL



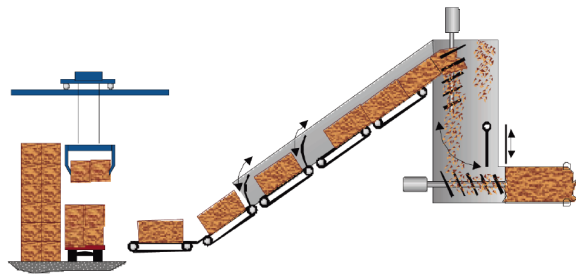
Power Plant Site



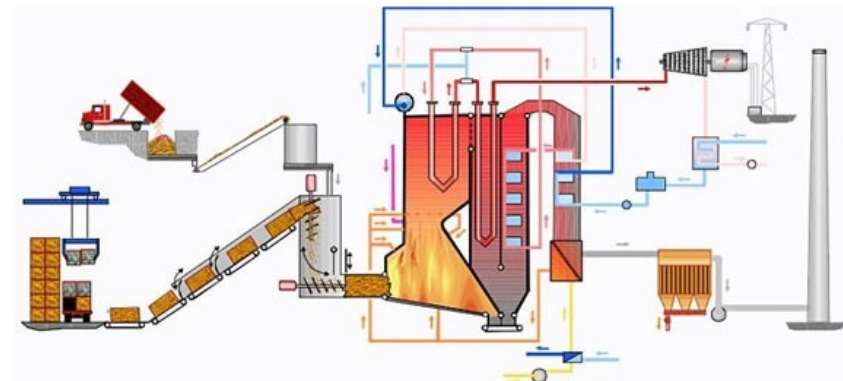
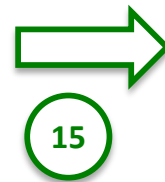
Bale Unloading



Bale Storage

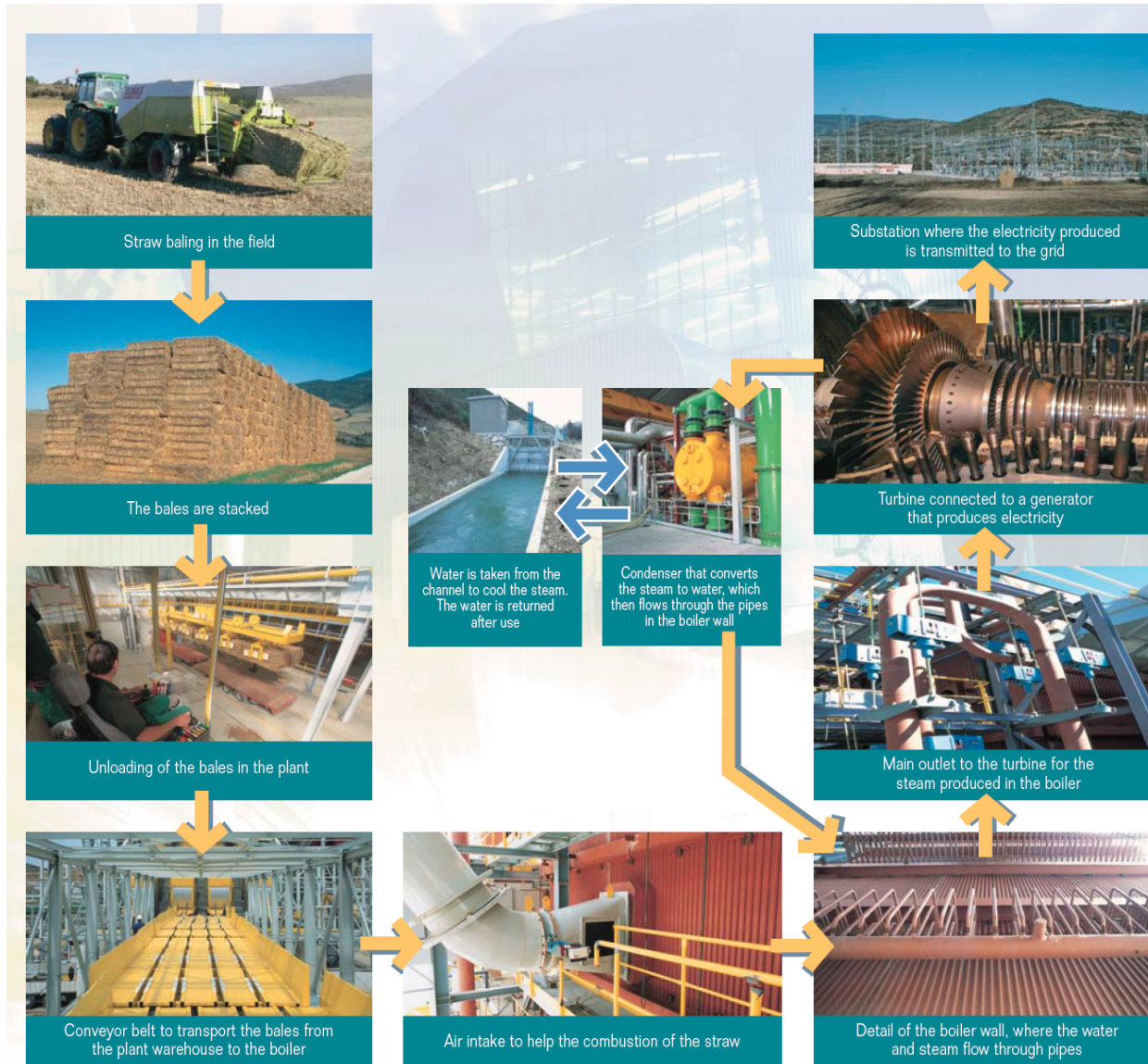


Bale Unloading & Feeding System



Boiler and Steam Turbine Power Plant

BIO-POWER PRODUCTION





ABOUT THE FEEDSTOCK



ARUNDO DONAX: HIGH YIELD & LOW COST



The worlds top energy crop; high yield, low maintenance



Grown in Mauritius; perfectly adapted as it has been found growing naturally



High calorific value; equal to sugar cane bagasse



Low requirement crop; low fertiliser and water (50% of Sugar cane's requirements)



Non seasonal; harvesting 12/12 months



Wide adaptability; resistant to drought, flood and cyclone



A sustainable solution for the small planters



CONCLUSION





THE PROBLEM STATEMENT

Annual Decline in Sugarcane Prices and Production (6% per annum) with Rising Industry Costs

- 17,000 ha productive land unutilized resulting in economic losses and social impact creating rising unemployment

Burning Coal to Generate Electricity Severely Increases the Environmental Impact

- Ash disposal hazardous and difficult to contain safely and appropriately causing leaching into the water system and ocean
- Main contribution of CO₂, NO_x & SO_x harmful emissions released into the atmosphere

The Country 's Energy Supply is mostly Dependent on Imports of Fossil Fuels

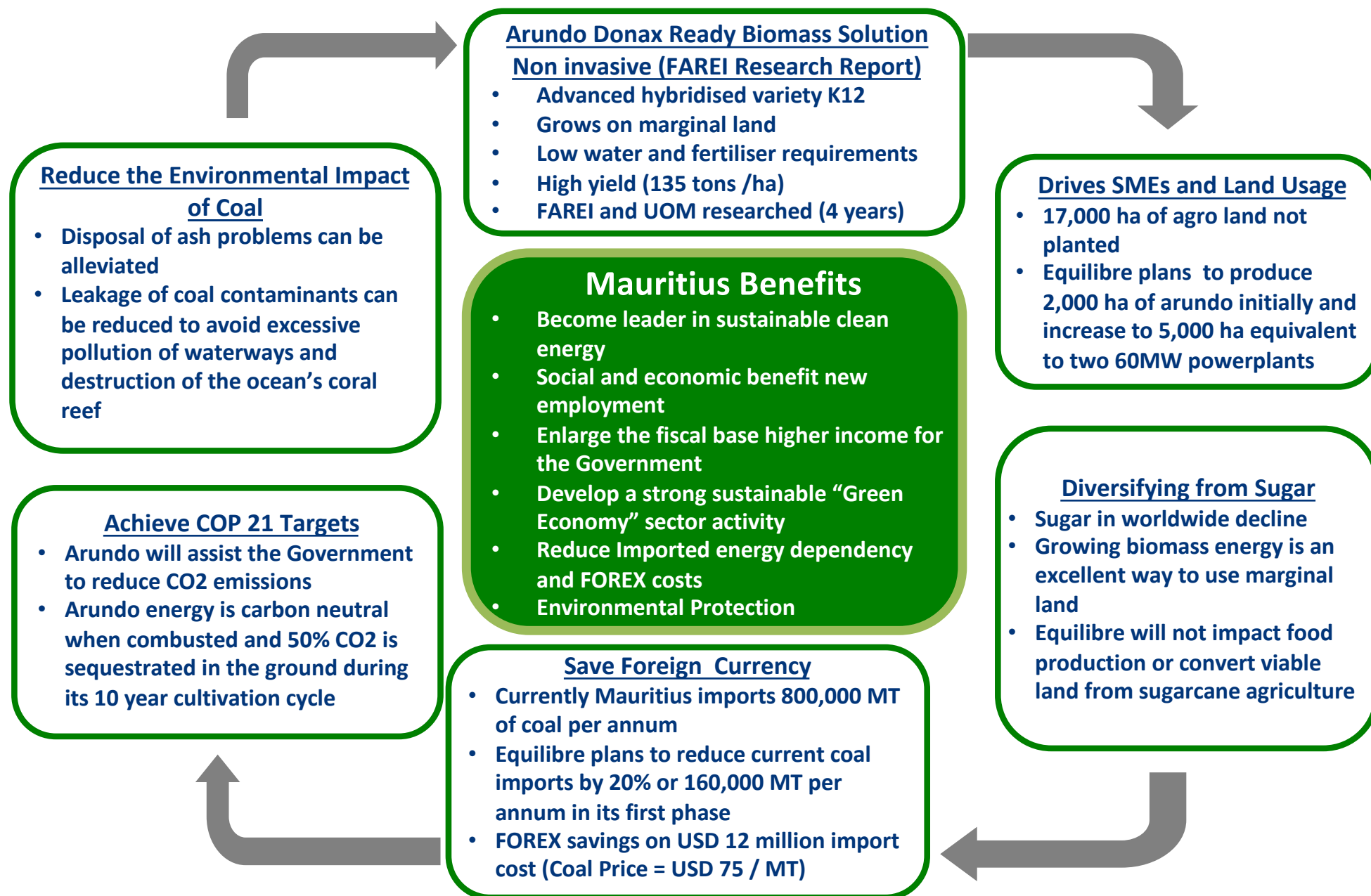
- Coal and transport fuels form a significant total of goods Imported and severely impact on the cost of Foreign Exchange

Post COP 21 Paris Accord the Country's Climate Change Agenda needs to be addressed

- To achieve a 30% target for sustainable energy by 2025 without damaging the economy, innovative strategies are required to be implemented by the Government



ARUNDO DONAX: THE SUSTAINABLE MODEL

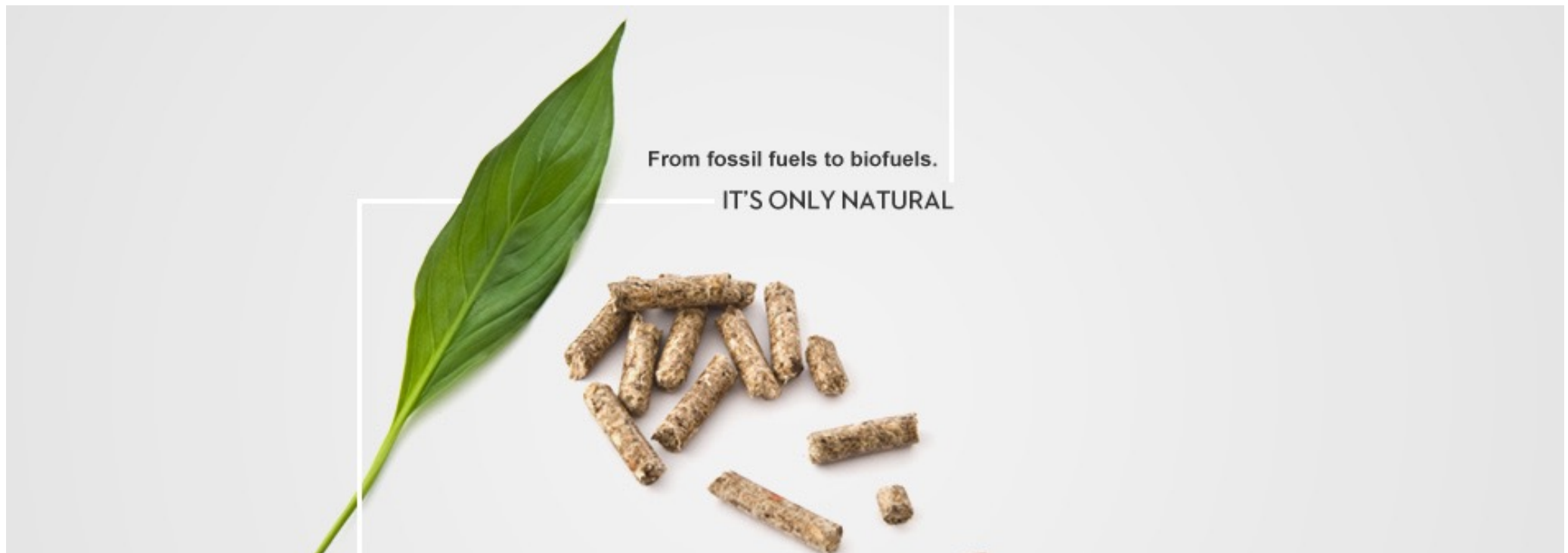




THANK YOU

INITIATED IN MAURITIUS

A MODEL FOR OTHER AFRICAN COUNTRIES



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